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Managerial roles in building dynamic capabilities: an exploratory study of Information and Communication Technology (ICT) companies in Bangladesh

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I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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List of Acronyms and Abbreviations

Terms	References
Managerial cognitive ability	Managerial cognitive capability is the capacity of an individual manager to perform one or more of the mental activities that comprise cognition (Helfat & Peteraf 2015)
Managerial social capital	Managerial social capital reflects a manager's ability to gain and access vital resources through exploiting personal connections and relationships (Adler & Kwon 2002).
Managerial human capital	Managerial human capital is the managerial skills set and knowledge developed by their personal and professional experience and education (Castanias & Helfat 2001)
Managerial entrepreneurship	An entrepreneur manager is the individual who generates innovation within an established firm (Lau, Shaffer, Chan & Man 2012).
Managerial ambidextrous role	The senior manager's behavioural capacity to achieve alignment and adaptability simultaneously (Gibson & Birkinshaw 2004).
Dynamic capability	Dynamic capability refers to organisational ability to address changes in the business environment through sensing, seizing, and reconfiguring organisational tangible and intangible resources and capabilities during rapidly changing business environment (Teece, Pisano & Shuen 1997; Teece 2009; Eisenhardt & Martin 2000)
Organisational structure	Organisational structure is the process of delegation of autonomy across the organisational member, decision rules and hierarchy (Teece 2009, O'Reilly & Tushman 2008).
Organisational culture	A dynamic community with cooperative mindset and capacity to embrace failure (Brown & Eisenhadrt 1997)
External environment	The external environment refers to the business ecosystem consisting individuals, organisations or institutions that can impact to the focal organisation, along with customers and suppliers. The standard-setting bodies, regulatory authorities, complimentors, the judiciary system, education and research organisations, also are included into the relevant community of organisations that may have potential impact on the focal organisation's strategic intent (Teece 2009).

Glossary

Abbreviation of key terminologies used in this research

BASIS- Bangladesh Association of Software and Information Services

CEO- Chief Executive Officer

CMM- Capability Maturity Model

DCV – Dynamic Capability View

ICT- Information and Communication Technology

RBV- Resource Based View

Abstract

The dynamic capability view (DCV) refers to the process of responding to changes in the external business environment through carrying out necessary transformations needed within the resources, capabilities, and the operational routines of an organisation. The process of building dynamic capabilities within the organisational boundary in emerging or developing economies is significantly under-researched, as the substantial body of scholarly investigation on this research stream has been mainly carried out within the context of developed economies. Due to the growing trend of offshoring value-added services to developing countries, it is crucial for managers to harness a systematic process of capability-building initiatives in emerging economies. This reinforces the importance of research on dynamic capabilities in this area. Furthermore, scholars emphasise the need for additional empirical research on how managerial attributes and roles in building dynamic capabilities influence firm performance.

Responding to these research gaps, this research aims to investigate the influence of individual managerial roles and attributes, the influence of organisational factors such as organisational structure and culture, and to examine the consequences of building dynamic capabilities within the context of medium-sized information and communication technology (ICT) companies in Bangladesh.

This research applies a case study method and qualitative research methodology to pursue the research objective and explore rich insights. Scholars have widely used the case study method to investigate the capability-building process in ICT companies, and for this research a total of four ICT companies were investigated. In addition to primary data collected, several secondary data sources were used, however, the interviews conducted with highly knowledgeable managers were the key source of information. The data collected was first transcribed, translated and then analysed to answer the research questions. Finally, four individual case reports and one cross-case report are reported to extrapolate the findings.

This research makes three theoretical and two practical contributions to the strategic management literature. The first theoretical contribution distinguishes the nature of dynamic capability practices within medium-sized ICT companies and extends the applicability of the DCV into medium-sized companies. Interventions are identified as organisational actions of temporarily allocating resources and routines to pursue necessary transformation within resources and capabilities to address changes in the external environment. This research makes a second theoretical contribution through offering rich

evidences around the influence of managerial attributes and roles in building dynamic capabilities. The research found that managers facilitate building dynamic capabilities through leveraging experience, relationships with the customers, internal relationships, attention, and creativity, following an ambidextrous approach. Finally, the findings on the consequences of dynamic capabilities shed lights to the present theoretical knowledge on the outcomes of dynamic capabilities with practical evidences.

This research offers two practical contributions for managers and policy makers. First, evidences of implementing effective and cost-efficient transformation through interventions will help managers to carry out necessary changes in similar external environmental contexts in an effective and efficient manner. Additionally, findings of this research may aid in developing managerial skills and capabilities to ensure superior utilisation of the resources of medium-sized ICT companies when transforming in response to changes in the external environment. Secondly, organisational policy makers will be able to better develop effective policy instruments to provide support to medium-sized ICT companies, and equip them with necessary resources, skills, and capabilities to sustain in a rapidly changing business environment.

There are a few limitations to this research. First, case study research emphasises analytical generalisation rather than statistical generalisation, therefore the findings of this research need to be carefully considered before applying them in a different context or to a larger population of ICT companies in developing economies. Future research should include quantitative investigation and mixed-method research to obtain robust results to aid quantitative measurement of the various constructs within the dynamic capabilities building practices. Additionally, the dynamic capabilities framework presented here may not be as applicable in different organisational, industry or national contexts due to differences in industry structure, business eco-systems, quality of higher skills, or the development status of the technological infrastructure. Finally, the findings of this research would benefit by being tested and generalised by further study adopting different theoretical lenses.

Chapter 1: Introduction

This chapter establishes the context for the research: it introduces the thesis topic, provides background information on the theoretical and academic context and establishes the research problem and justification for conducting this research. This chapter also provides a brief description of the research methodology, an overview of the outcomes and an outline of the remaining chapters in this thesis. Figure 1.1 below provides an outline of chapter 1 which is divided into seven sections. Section 1.1 introduces the research context, and section 1.2 outlines the research motivation. Section 1.3 presents the research gap and the aim of this study with brief discussion of the literature on dynamic capabilities. Section 1.4 provides the research questions, and section 1.5 outlines the methodology of this study. Section 1.6 provides a brief discussion of the findings, contributions, and limitations of this study. Finally, section 1.7 presents an outline of the thesis structure.

Figure 1.1: Outline of Chapter 1
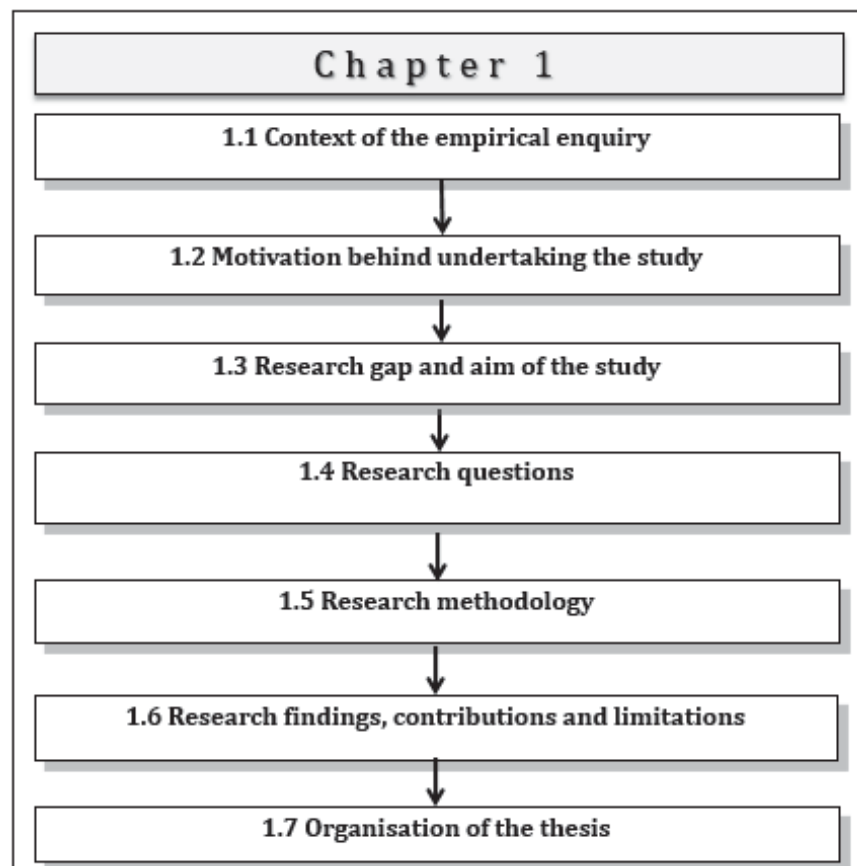
1.1 Context of the empirical enquiry

The term 'emerging market' was coined to rebrand 'third world' or 'developing countries' as part of an initiative led by the International Monetary Fund (IMF) (Agtmael 2012). Mauro,

Sussman and Yafeh (2002) consider an emerging market as one where the country is considering whether they are the net recipient of capital inflows and relative per capita income. Senik, Scott-Ladd, Entrekin and Adham (2011) recognise an emerging economy as one that experiences rapid economic growth through a rise in income and purchasing power. Narula and Nguyen (2011) state that the World Trade Organisation agreements, and various associations between countries, have caused increased competition in service sectors, exposing local companies in emerging markets to competition from foreign competitors. Moreover, increased competition in domestic markets has also resulted in hyper competition within the domestic markets of emerging economies (Kim, Lee & Park 2011; Singh & Chaudhury 2009). This high competition in domestic and international markets creates pressure on companies in emerging markets to become more effective in utilising their tangible and intangible resources to achieve the necessary organisational capabilities to sustain superior performance (Mahmood, Zhu & Zajac 2011).

Companies in emerging markets are facing tremendous competition from both domestic and international companies due to globalisation in the world economy. Despite highly competitive pressures, a considerable number of Information and Communication Technology (ICT) companies from developing countries have performed well in the global marketplace with their globally competitive products and services. Software development companies from India such as Tata Consultancy, Infosys and Wipro have won the confidence of large companies worldwide. Manufacturing companies such as Lenovo, Samsung and Acer have a proven leadership capability in ICT product development in the global marketplace. Additionally, Alibaba, an e-commerce company from China and a global leader in e-commerce exemplifies the significant importance of ICT companies from emerging markets. This company gained immense success through creating a bridge between Chinese suppliers and rest of the world using social network technologies.

Bangladesh is also an emerging market with significant potential for ICT companies. As a developing country and an emerging economy (United States Department of State, 2011; Organisation for Economic Co-operation and Development 2015), Bangladesh is known globally for its flagship exporting item of garment products. However, the potential and prospect of Bangladeshi ICT companies in the global marketplace is not widely known. The ICT industry of Bangladesh employs 70000 professionals and is worth around USD 400 million (Ahmed 2014). Availability of qualified young graduates from various disciplines at low wage rates makes Bangladesh an attractive destination for offshore investment (Ahmed, Ameen, Uddin & Khan 2016). Ahmed et al. (2016) find that about 8% of companies are established with full foreign investment, as joint ventures with local companies or as

offshore development centres. Recently, software development and e-commerce has attracted the attention of investors from Silicon Valley (Techinasia 2015; Fenox Venture Capital 2015) and some leading ICT companies in Bangladesh have successfully collaborated with highly reputed foreign companies (Grameen Solution 2015), however it remains the case that development of the ICT industry in Bangladesh falls short in comparison to its neighbour, India. On the positive side, the mobile telecom sector of Bangladesh has experienced rapid growth during the last decade (Bangladesh Telecom Regulatory Authority 2015).

Increasingly, ICT companies in Bangladesh are proving themselves in the global marketplace in a unique manner that does not necessarily conform to traditional managerial knowledge (Tija 2003). Managers of ICT companies in Bangladesh face various challenges such as high employee turnover (Tija 2003), weak ICT infrastructure (Islam & Selim 2006), lack of a skilled ICT workforce (Riyadh, Bunker & Rabhi 2010; Rahman, Uddin & Siddiqui 2012), limited adoption of e-commerce (Jamil & Ahmed 2009), and lack of reliable power supply (Riyadh, Bunker & Rabhi 2010). As a result, managers of ICT companies in Bangladesh have to possess distinctive managerial skills to achieve superior performance due to the unique nature of their business environment. These managers need to possess capabilities to transform internal resources and capabilities, in other words they need to acquire dynamic capabilities to address the changes in the external environment. Next, the successful initiatives of some promising companies in the ICT industry of Bangladesh are outlined.

In 2000, Bdjobs was the first company in Bangladesh to start an online job portal service. At that time, the concept of an online recruitment service was novel to job providers as well as job seekers in Bangladesh. From a small start-up company, Bdjobs is now one of the leading corporate companies in Bangladesh with around 4500 clients and with a million resumes in their resume bank (Bdjobs 2015). In 2014, a well-known online recruitment company, SEEK from Australia, bought a 25% share of Bdjobs worth AUD 5 million (The Australian Business Review 2015). This is a promising event for the ICT companies in Bangladesh. Senior managers played critical roles in creating this exemplary success for the company. Senior management of Bdjobs have been integral to the ongoing success of the company since its inception. Over the years the company has successfully transformed itself as one of the leading providers of human resource solutions and corporate training services in Bangladesh. The ability to successfully create new capabilities has given the company confidence to expand its online business portfolios by introducing a shopping portal and 'mobile credit card' service (Bdjobs 2015).

Although the company has successfully upgraded its backend technology following technological developments in the relevant field of the ICT industry, the recent wave of social media may pose a serious threat to the core business model of Bdjobs. The emergence of social media, especially linkedIn which offers a direct linkage between job seekers and job providers, may challenge the business model upon which Bdjobs is based. Finally, many corporations now maintain their own websites, and use these to manage their own recruitment processes and to store resumes of potential candidates. Therefore, Bdjobs can no longer rely on its past success, and must look to continuously innovate to maintain its business growth.

Recently, some Bangladeshi ICT companies, such as Cellbazar and Bkash, delivered successful entrepreneurial initiatives. Cellbazar, established in early 2000, sold to the parent company of Grameen Phone, Telenor with a significantly increased valuation. Cellbazar offered a novel way of buying and selling products using mobile phones. As the Bangladesh Government has eased regulations on online purchasing, the website became one of the largest online marketplaces in Bangladesh. BKash, a mobile banking company that enables the transfer of money through mobile phones, as well as delivering payment services for different utilities or commercial transactions, has experienced rapid growth within last few years. At present, the yearly transaction through mobile banking is more than one billion USD in Bangladesh. Bill Gates invested 11 million USD into Bkash because of its prospect to deliver financial services to the poor, a group still largely untapped by existing financial systems (New York Times 2015; The Wall Street Journal 2014). The recent positive trends in the ICT industry of Bangladesh, therefore, offers an important avenue to study managerial roles in building organisational capabilities to deliver superior performance.

In this context, I wish to explore how managers aid ICT companies to become more innovative and successful, regarding changes in the external business environment, within the context of empirical enquiry.

Next, the motivation behind undertaking the research study is discussed.

1.2 Motivation behind undertaking the study

There are several reasons behind conducting this study on ICT companies in Bangladesh. Due to my work experience in Bangladeshi ICT companies, I have access to reputed organisations to collect the necessary data for the empirical study. My ethnic background and my work experience helped me in carrying out the research investigation. Finally, my

strong curiosity to know how managerial capabilities can influence organisational capabilities and success, played a vital role in pursuing this research.

During my tenure as a project co-ordinator in an ICT company, a sister concern of a leading not-for-profit organisation in Bangladesh, I was involved in an Enterprise Resource Planning (ERP) software development and deployment project. After I joined the company, I discovered this ERP project had been previously started with only partial success. The executive management, at the time of my employment, reinitiated the project because of its importance for building the necessary organisational capabilities to introduce new services. This ERP project aimed at delivering several information system modules including accounting, human resource (HR), fixed asset tracking, inventory management, and a management information System (MIS) software package across head office, regional and field levels of the organisation. While working on this project, I observed that individual managerial capabilities acted as either facilitators or inhibitors in overcoming various internal resistances.

An individual manager having superior capabilities may overcome some of these internal barriers to capability development more successfully than the managers who lack those capabilities. For example, within the ERP project, the most successfully delivered module was an accounting software module where significant credit was attributable to the manager responsible for the accounting department. On the other hand, the advanced programming knowledge of the HR manager, and a personal stake in pushing software developed by himself, acted as a serious deterrent in deploying new software for the HR department. Fixed asset tracking and inventory software was deployed successfully, but these modules were never utilised effectively at an operational level for the benefit of the organisation. Additionally, the manager of the management information systems (MIS) department could not negotiate with the senior management about the use of data and standardisation of reports across the company. I consider that the lack of understanding of the organisational capability development process by managers, and the role of individual managers in building these capabilities, was one of the key factors behind the partial success of the ERP project.

The context as explained above triggered a deep interest in me to examine the influence of the individual manager in building necessary organisational capabilities to address changes in the external environment. Based on the extant literature, organisational capabilities to successfully identify opportunities, followed by executing necessary actions to reconfigure organisational assets, and operational capabilities to address changes arising in the rapidly

changing external environment, are defined as dynamic capabilities (Teece 2017; Teece, Pisano & Shuen 1997; Teece 2009). The term external environment refers to the business ecosystem including individuals, organisations or institutions that can have an impact on the focal organisation and its customers and suppliers (Teece 2009). Additionally, standard-setting bodies, regulatory authorities, the judiciary system, education and research organisations, are included in the business ecosystem may have a potential impact on the focal organisation's strategic intent (Teece 2009). The roles of individual managers in building organisational dynamic capabilities have recently been articulated in the literature (Helfat & Peteraf 2015; Helfat & Martin 2015; Martin 2011; Kor & Mesko 2013; Smith & Tushman 2005) which has emphasised the vital need for further research.

Considering above context, my research aims at investigating the influence of individual managers in building organisational dynamic capabilities in ICT companies in a developing country, namely Bangladesh.

1.3 Research gap and aim of the study

Scholars of strategic management aim to build a better theory of superior firm performance. The origin and sustainability of competitive advantage (Teece, Pisano & Shuen 1997; Eisenhardt & Martin 2000; Ghemawat & Costa 1993; Pitelis 2009), managerial courses of action that deliver superior results during both stable and dynamic external environments (Ghemawat & Costa 1993; Schreyogg & Sydow 2010; Eisenhardt, Furr & Bingham 2010, Helfat & Winter 2011), and the effective balance between exploration and exploitation activities to sustain firms during changes in the external environment (O'Reilly & Tushman 2007), are some of the vibrant research agendas. These research agendas offer promising research avenues for scholars.to investigate the organisational capability building processes during rapid changes in the external environment. The extant literature suggests a significant research gap in this area, specifically in: the process of dynamic capabilities building (Teece 2017; 2009; 2007; Helfat & Winter 2011, Ambrosini & Bowman 2009), managerial roles in dynamic capabilities building (Gavetti 2005; Smith & Tushman 2005; Helfat & Peteraf 2015; Helfat and Martin 2015; Martin 2011; Kor & Mesko 2013; Agarwal & Selen 2009; 2014), research on capabilities building (Alam 2010; Guillen 2000; Ray & Chakrabarti 2006; Luo 2004; Kandampully 2002; Hatum & Pettigre 2004) and managerial roles in service companies in emerging markets and developing countries (Acquaah 2007; Mahmood, Zhu & Zajac 2011).

Rapid changes in the external environment expose managers to challenges in sustaining superior performance. Helfat and Winter (2011) argue that organisations that focus heavily

on performance during rapid changes in the external environment may show inferior performance in driving efficiency across organisational boundaries. However, narrowly focusing on efficiency may result in firms becoming outdated due to changes in the external environment, resulting in a loss of competitive advantage (Eisenhardt & Martin 2000; Winter 2003; Teece 2009). Teece, Pisano and Shuen (1997) propose the Dynamic Capability View (DCV) as a new theoretical platform that aims to understand superior firm performance within a rapidly changing external environment. Dynamic capabilities play vital roles in performing the reconfiguration of organisational resources and capabilities, while operational capabilities are engaged in on-going value creation processes (Winter 2003). Therefore, managers need to balance organisational resource allocation and utilisation between dynamic and static contexts to maximise returns (Parayitam & Gharana 2010). Scholars have identified different managerial attributes such as cognitive ability, social capital, and human capital (Adner & Helfat 2003; Helfat & Peteraf 2015), and managerial roles such as managerial entrepreneurship (Teece 2009) and managerial ambidextrous roles (Smith & Tushman 2007) that are pivotal in building dynamic capabilities. Managers may deliver superior organisational performance through effectively building dynamic capabilities during rapidly changing external environments. Additionally, organisational factors affecting dynamic capability building require further research (Wang & Rafiq 2014; Hawass 2010; Jansen et al. 2009) and finally, the consequences of dynamic capabilities need more in-depth research (Teece 2009; 2007; Helfat & Winter 2011; Ambrosini & Bowman 2009). ICT companies operating in a rapidly changing business environment (Brown & Eisenhardt 1997) offer valuable insights on managerial roles in building dynamic capabilities in the context of an emerging economy (Holzweber, Mattson, Chadee and Raman 2012).

Through the theoretical lens of the DCV, this study has examined the managerial roles in building organisational dynamic capabilities in the context of ICT companies in a developing country, Bangladesh. As discussed earlier, some of the ICT companies in Bangladesh have achieved success, but the managerial roles that facilitate their superior performance during a rapidly changing external environment have not been empirically investigated. Therefore, the contribution of managers of these companies, their roles and attributes, to the development of organisational dynamic capabilities may offer valuable insight, and so requires empirical investigation.

Considering the above context, the primary research objectives are to understand:

1. the influence of managerial roles and attributes in building organisational dynamic capabilities in ICT companies in Bangladesh,

2. the various organisational factors that facilitate or constraint managers in building dynamic capabilities in ICT companies of Bangladesh, and

3. the consequences of dynamic capabilities within the context of ICT companies.

Through conducting an empirical study in a developing country, this research presents practical evidences on managerial roles in building dynamic capabilities in ICT companies in Bangladesh. Moreover, this study will create avenues for further research in the context of emerging markets and replicating this study in the context of developed countries may also provide useful insights. The detailed research questions are outlined in the following section.

1.4 Research questions

The key research questions for this study involve exploring how **m**anagerial roles and attributes influence building organisational dynamic capabilities in a rapidly changing external environment.

Underpinning the key research objectives laid out in the previous section are the research questions, and sub-research questions:

1. How do managerial attributes and roles influence building organisational dynamic capabilities?

1.1 How does managerial cognitive ability influence the building of organisational dynamic capabilities in ICT companies in Bangladesh?

1.2 How does managerial social capital influence the building of organisational dynamic capabilities in ICT companies in Bangladesh?

1.3 How does managerial human capital influence the building of organisational dynamic capabilities in ICT companies in Bangladesh?

1.4 How do ambidextrous managerial roles affect organisational dynamic capabilities building in ICT companies in Bangladesh?

2. How do organisational factors influence in building organisational dynamic capabilities?

2.1 How does organisational structure influence organisational dynamic capabilities building?

2.2 How does organisational culture influence organisational dynamic capabilities building?

3. What are the consequences of building dynamic capabilities?

1.5 Research methodology

Following qualitative research methodology, this research applies the case study method (Yin 2013) to explore rich insights on managerial roles, attributes and organisational factors, such as culture and organisational structure, in building dynamic capabilities within the context of this empirical enquiry. Hartley (2004) states that the case study method can result in enhanced reliability and credibility through integrating multiple perspectives. Yin (2013) points out that the case study method can offer analytical generalisation through the logic of replication, but that it lacks statistical generalisability. Researchers have previously used the case study method to investigate capability-building processes within ICT companies (Tarafdar & Gordon 2007; Martin 2011). Further cross-case analysis is conducted (Yin 2013) to identify the commonalities and differences of findings across the cases for generalisability in this context.

A total of four ICT companies were investigated to answer the research questions. The four participant companies have a strong footprint in their respective business domains and a good reputation in their local and international marketplaces. The companies have been in service for between seventeen and twenty years, with Com B the longest established and Com A the youngest company as outlined in Table 1. The participating companies have demonstrated effective delivery of ICT services consistently for more than a decade in a rapidly changing ICT business industry. This suggests the companies are in possession of dynamic capabilities and have been developing them over time; thus, providing a strong rationale for selection as participants for this research. One of the four companies, Com D is considered as a deviant case (Yin 2013) to verify the findings from the remaining three companies. Key informers from Com D confirm that the company made a profit in only one financial year since its inception in 1999. This sustained negative financial performance, despite many transformative initiatives, provided a valuable opportunity to confirm the findings from the rest of the three cases where sustained superior performance was delivered. Data has been collected from both primary and secondary sources from these companies to carry out the empirical investigation to answer the research questions.

To investigate the selected cases, various sources for data were considered, such as interviews with the managers, company websites, company reports, strategy documents, operational reports, human resource policy documents, news articles, promotional materials, and information from third party websites. However, this research determined interview data as the key source of data for investigating the research questions. From each company at least ten interviews were conducted as a source for primary data. Data were

collected from highly knowledgeable managers through interviews that were cross checked with secondary data collected from multiple sources and evidences. After interviews were conducted, these were transcribed, translated, and analysed to explicate the rich insights related to the research questions. Subsequently, each case study was prepared, followed by a cross-case analysis to assist with developing the generalised framework in the context of building dynamic capabilities in ICT service organisations in emerging economies, in this case, Bangladesh. The below table provides a general overview about the companies studied in this research:

Table 1.1: General information about the companies studied for this research

Name	Year established	Business	Yearly revenue (approximate figures)	No of employees
Com A	2000	Internet based service	USD 4 million	106 in year 2016
Com B	1997	Financial software development, services and solutions	Not revealed	Core employees approximate 165, operators approximately 4500 in year 2016
Com C	1998	Software development, services and solutions	USD3.9 million	Core employees approximately 220, operators approximately 1200 in year 2016
Com D	1999	Software development, services and solutions	Not revealed	54 employees in year 2016

Research findings, plus the contribution and limitations of this study are outlined in the next section.

1.6 Research findings, contributions and limitations

This research reveals rich insight into the influence of managerial roles in building dynamic capabilities within the context of empirical enquiry. The findings suggest that managerial experience, relationship with the customers, and ability to solve novel problems are very important in building dynamic capabilities within organisational boundaries. Long tenure within the focal company offers the managers rich exposure to the business domain of the focal company. In addition, managers can develop strong relationships with customers that enable them to receive and integrate valuable feedback from these customers. This research also finds that it is critical to adjust organisational structures following change initiatives, and a supportive culture plays a vital role in nurturing dynamic capabilities across the organisational boundary. Finally, the research offers valuable insights into the

consequences of dynamic capabilities, as outlined in the literature with evidences from four ICT companies. These findings make an important theoretical and practical contribution. This research has made three theoretical and two practical contributions. This research extends the DCV applicable to medium-sized companies, which is a significant contribution to strategic management literature (Teece 2017; 2010; 2009; Teece, Pisano & Shuen 2009). Secondly, through explicating the distinctive managerial roles in building dynamic capabilities, this research sheds light onto this less understood area of research interest (Helfat & Peteraf 2015). Thirdly, the findings of this research offer important insights into the consequences of dynamic capabilities contributing to the scholarly understanding of dynamic capabilities (Ambrosini & Bowman 2009; Barreto 2010). Additionally, this research offers two practical contributions for organisational managers and policy makers. First, evidences of effective and cost-efficient processes of transforming organisational resources and capabilities will assist managers working in similar contexts, while, secondly, policy makers will benefit from the research insights on developing more effective policy instruments to assist the medium-sized companies.

As a qualitative localised study, there are limitations to this research. First, Yin (2013) notes that a case study researcher carries out analytical generalisation rather than statistical generalisation, therefore the findings of this research need to be carefully considered before applying them in a different context, or to a larger population of ICT companies in developing economies. This research is limited to four cases, therefore future research should consider investigating a larger number of cases to attain more generalised findings. Additionally, future research should include quantitative investigation and mixed-method research to aid quantitative measurements of various constructs within the dynamic capabilities-building practices. Further, the dynamic capabilities framework presented here to articulate managerial roles may not be as applicable in different organisational, industry or national contexts due to differences in industry structure, business ecosystems, quality of higher skills, or development status of the technological infrastructure. The findings of this research would benefit by being further tested and generalised through adoption of different theoretical lenses, such as a quantitative approach.

1.7 Organisation of the thesis

This section outlines the organisation of this thesis. Chapter 2 critically analyses extant literature across the different functional areas that have contributed to the development of a conceptual framework to illustrate the influence of managerial roles and attributes in building organisational dynamic capabilities. Organisational level factors that act as

facilitators or inhibitors are elucidated from the literature and are reviewed along with varying cross-functional perspectives. This chapter ends with identification of research gaps within the extant literature in relation to the research questions and presents a conceptual framework addressing the research gaps. Figure 2.1 diagrammatically represents the organisation of this thesis.

Figure 1.2: Outline of the thesis
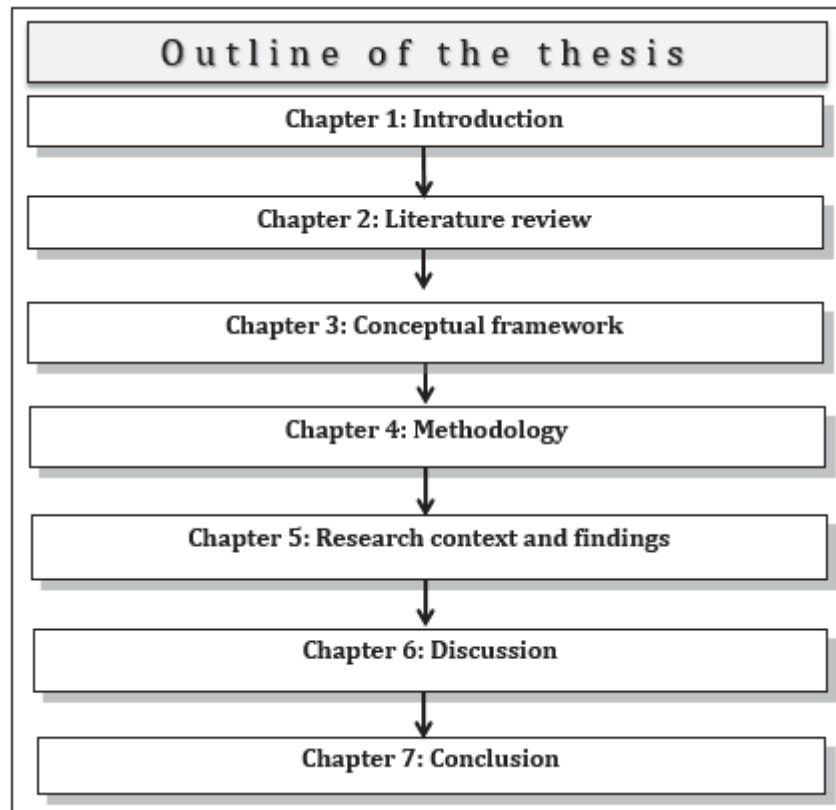
Chapter 3 offers a detailed discussion on the conceptual framework to aid the empirical investigation. The building blocks of the conceptual framework, and the underlying logic of the conceptual model, are explained in this chapter. Then chapter 4, discusses the research design and methodology and explains the proposed methodological choices for this study, including a detailed description of the research methods adopted. Further, the scope of the study, ethical consideration, and time frames for completion of the doctoral study are discussed. Chapter 5 first presents an overview of the context of the empirical enquiry including the global ICT industry and the ICT industry in Bangladesh, along with some key facts and information about the research context. Then, the chapter offers detailed case reports based on the findings obtained through the case study research, followed by a cross-case analysis. Chapter 6 offers a discussion of the research findings considering the extant

literature and, finally, Chapter 7 draws conclusions from this research highlighting its contribution, limitations, and suggestions for future research direction.

Next, chapter 2 is presented.

Chapter 2: Literature review

This chapter aims to identify the research gap and offers a conceptual framework to aid the empirical investigation. To attain these objectives, a critical analysis of extant literature across the different perspectives of DCV that have contributed to the development of the conceptual framework, with an emphasis on managerial roles and attributes in building organisational dynamic capabilities, is critically analysed. Organisational factors that act as facilitators or inhibitors of building dynamic capabilities are explicated from the literature, and the consequences of dynamic capabilities are reviewed to aid in developing a theoretical understanding of dynamic capabilities. This chapter ends by outlining research gaps within the extant literature in relation to the research questions and presents a conceptual framework addressing the identified research gaps. Figure 2.1 diagrammatically presents the organisation of this chapter.

Figure 2.1: Outline of chapter 2
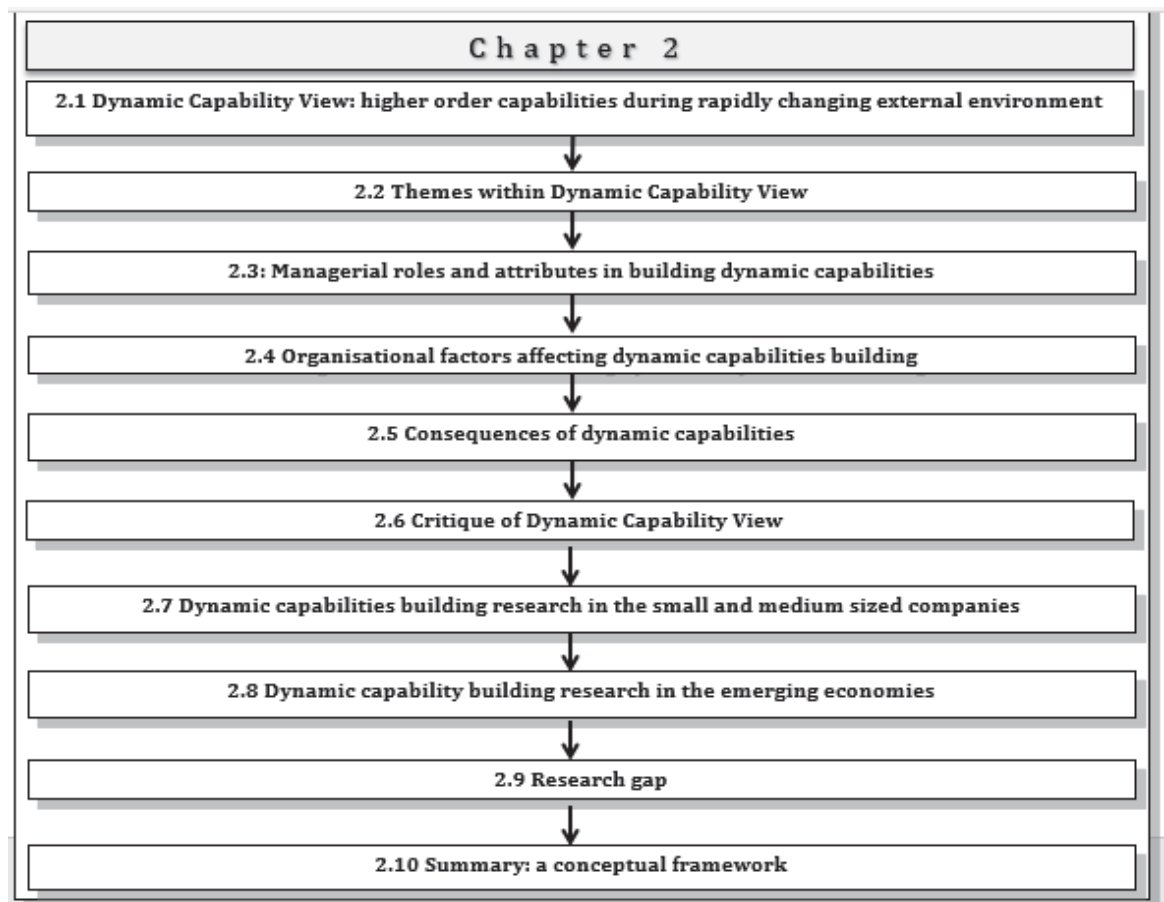
An analysis of the literature on dynamic capability building (Teece, Pisano & Shuen 1997; Teece 2009; 2010; Eisenhardt & Martin 2000; Zollo & Winter 1999; 2002; Tushman &

O'Reilly 2007) is presented in Section 2.1 and 2.2. Further, section 2.3 presents a discussion of the influence of managerial roles and attributes in building dynamic capabilities; section 2.4 presents organisational factors affecting building dynamic capabilities; section 2.5 offers a discussion on the consequences of dynamic capabilities; section 2.6 explicates the critique of dynamic capabilities; section 2.7 provides a review on the dynamic capabilities building practices in small and medium sized enterprises; section 2.8 provides a review on the dynamic capabilities building practices in emerging economies section 2.9 identifies the research gap in the literature and, finally, section 2.10 summarises the chapter by presenting the conceptual framework based on the identified research gaps. Throughout the literature review, examples from ICT companies are incorporated which are relevant in the context of the intended empirical enquiries.

2.1 Dynamic Capability View: higher order capabilities during a rapidly changing external environment

In the context of a rapidly changing external environment, with highly knowledge-intensive value-creation processes, capability building remains a critical concern for managers as such dynamic capabilities serve as a buffer between a firm and the rapidly changing external environment (Holzweber et al. 2012). Highly technological industries with well-developed global markets to exchange goods and services, but poorly characterised business environments for exchanging managerial and technological know-how, are particularly fertile areas for possession of dynamic capabilities (Teece 2007). The business environment needs to have certain characteristics to allow firms to possess dynamic capabilities (Teece 2007). Firstly, Teece (2009) suggests that the business environment needs to be fully exposed to international competition that creates tremendous scope for both opportunities and threats in association with rapid technological changes which is evident in the ICT industry (Holzweber et al. 2012). Secondly, Teece (2007) further adds that the nature of technological change should follow a systematic pattern to combine multiple innovations and inventions to create products or services meeting customer needs that are observed in ICT companies (Brown and Eisenhardt 1997). Underpinning these external characteristics, the DCV provides a useful theoretical lens to uncover the managerial roles in building dynamic capabilities in ICT companies during a rapidly changing external environment (Teece 2009).

Scholars have applied the DCV to uncover the managerial roles in building dynamic capabilities in ICT companies, specifically computing, electronics and telecommunication firms in the US (Martin 2011; Gulanic & Eisenhardt 2001), for investigating the role of

information technology in achieving agility (Sambamurthy, Bharadwaj & Grover 2003), and investigating the role of dynamic capabilities in delivering effective services by outsourcing companies in India (Holzweber et al. 2012). Brown and Eisenhardt (2001) argue that ICT firms in the US are very suitable for applying the DCV because of the fast-paced nature of the industry, technological changes, and short product life cycles. Martin (2011, p.122) points out that software companies must deal with tremendous opportunities to reallocate and reconfigure their knowledge resources and that the '*capacity to create, extend and modify resource base of the organisation is crucial to realizing competitive advantage*' in a volatile and dynamic software industry. In the context of the Indian ICT industry, Holzweber et al. (2012) further identify that dynamic capabilities have proven to be critical for ICT companies in emerging countries such as India to deliver ICT services to their offshore clients more effectively. Therefore, the theoretical perspective of the dynamic capability view will be instrumental for studying ICT firms, especially in the context of developing countries, and may allow new insights.

The next sections will present relevant background of the Dynamic Capability View (DCV).

2.1.1. Rapidly changing external environment

Understanding the nature and characteristics of the external environment is critical to formulating appropriate courses of action to address various changes in the external environment. Pavlou and Sawy (2011) proposed the notions of environmental turbulence and market turbulence to capture the rapidly changing nature, or the turbulence, of the external business environment faced by technological companies. The authors articulate environmental turbulence as a construct comprising technological turbulence and market turbulence. Technological turbulence refers to rapid technological development, and opportunities arising from technological breakthroughs. Market turbulence refers to various aspects of the market such as customer preferences and the rate of new product introduction. Zhou and Wu (2010) consider market growth as an important indicator of a rapidly changing external environment reflected in the high growth of the industry, the rapid growth of demand and a potential market to attract and serve. Teece (2009) considers all actors within a business ecosystem that may have potential impact on the focal company including customers, suppliers, competitors, and regulatory organisations, are part of the external environment of the focal company. The focal organisation needs to carefully monitor the actions of actors within the external environment as well as other factors such as technological changes, customer's preference changes and competitive actions, in order to formulate effective strategies to maintain competitiveness. Table 2.1 summaries various elements of a rapidly changing external environment based on the extant literature.

Table 2.1 Factors that influence the external environment from extant literature

External environment			
Technological turbulence	**Business Ecosystem**	**Market growth**	**Market turbulence**
Rapid technological changes Opportunities arise due to technological breakthroughs Scope of many new product ideas Difficult to forecast future technological development. (Pavlu & Sawy 2011)	Regulatory authorities Companies that complement products or services of focal companies Policy makers Competitors (Teece, 2009, Zhou & Wu 2010)	Very high growth rate of the industry Rapid growth of market demand There are many potential customers in this industry to provide mass-marketing opportunity. (Zhou & Wu 2010)	Customers' product preferences change a lot over time Marketing practices are constantly changing New product introductions are very frequent The product environment is continuously changing Environmental changes are very difficult to forecast. (Pavlu & Sawy 2011)

2.1.2 Theoretical ground of the DCV

The DCV is grounded in several key theoretical paradigms. Firstly, the DCV incorporates the Schumpeterian (1934) view of innovation and considers managerial entrepreneurship as critical element for success in a rapidly changing external environment. Secondly, Teece (2009) applies the Schumpeterian notion of creative destruction (Schumpeter 1934) in the micro environment. He coins the term '*internal creative destruction*' (Teece 2007 p.1341) to describe the process of reconfiguration of organisational resources and capabilities through innovation, and invention of new paths, that may discontinue past capabilities, processes or paths. Next, Stefano, Peteraf and Verona (2009), through a bibliometric analysis, found a strong linkage between the DCV and the resource-based theory of firms (Penrose 1959; Wernerfelt 1984), and transaction cost economics (Williamson 1981). Finally, Barreto (2010) states that the DCV considers managers as bounded rational beings and suggests that the perspective heavily relies on the theories of evolutionary economics that underpin the importance of routines and adaptation (Nelson & Winter 1982). Based on these theoretical underpinnings, the DCV aims to explain superior firm performance during a rapidly changing external environment.

Table 2.2: A Summary of the underlying theories of the DCV

Theoretical perspective	Contribution to Dynamic Capability View
Schumpeterian (1934) view of innovation and entrepreneurship	Critical role of entrepreneurs in a rapidly changing business environment
Resource-based theory of firm (Penrose 1959; Wernerfelt 1984) confirmed by bibliometric analysis of Stefano, Peteraf and Verona (2009)	Resource reconfiguration

Transaction cost economics (Williamson 1981)	Organisational position, path, and organisational boundary
Evolutionary economics that underpin the importance of routines and adaptation (Nelson & Winter 1982)	Bounded rationality of managers

The DCV endeavours to explain why and how firms can sustain their competitive advantage, and the success and failure of firms during a rapidly changing external environment (Teece, Pisano & Shuen 1997, Eisenhardt & Martin 2000; Winter 2003; Adner & Helfat 2003; O'Reilly & Tushman 2008; Teece 2009; 2010; 2017). High competition and rapid technological advancement have created tremendous pressure on firms to renew their resources, firm-specific assets and skills, faster than before thus shifting the scholarly focus to firm performance in a rapidly changing external environment (Teece, Pisano & Shuen 1997; Eisenhardt & Martin 2000; Teece 2009). Dynamic capabilities enable firms to sustain their competitive advantage through: relentless modification or creation of organisational configurations through identifying, acquiring, integrating, building or reconfiguring organisational resources (Eisenhardt & Martin 2000); reconfiguring organisational learning patterns (Zollo & Winter 2002); development of internal and external competencies to address changes in the marketplace through managerial entrepreneurship (Teece 2007; 2009); managerial ambidextrous roles (O'Reilly & Tushman 2008), and dynamic managerial capabilities (Adner & Helfat 2003; Helfat & Peteraf 2011; 2015; Helfat & Martin 2015). Contrary to the view that dynamic capabilities are relevant in a rapidly changing external environment (Teece 2017; 2009; Teece, Pisano & Shuen 1997), Eisenhardt & Martin (2000) argue that dynamic capabilities are also applicable in a moderately changing environment, and the nature of dynamic capabilities will differ according to the context of changes in the external environment. The DCV has a strong linkage with Resource-Based View (RBV)(Wernerfelt 984) influenced by Penrosian view of firms (1959), an influential theory in strategic management that offers a valuable contribution to explaining superior firm performance during a moderately stationary external environment.

2.1.3 Resource Based View (RBV): a starting theory of firm

The RBV considers a firm as 'a pool of resources' (Penrose 1959, p.149) and suggests that resources are distributed heterogeneously across the boundary of a firm and differ persistently over time (Penrose 1959; Barney 1991; Mahoney & Pandian 1992; Amit & Schoemaker 1993; Eisenhardt & Martin 2000). Penrose (1959) argues that efficient deployment of administrative roles, processes and tasks can deliver optimum utilisation of resources that may help firms to outperform their competitors. Scholars of the RBV attempt to explain the superior performance of firms primarily in a moderately stationary external

environment based on the assumption that superior performance can be achieved through effective bundling of critical resources and capabilities (Penrose 1959; Wernerfelt 1984; Barney 1991; Adner & Helfat 2003). Following the RBV, scholars have theorised that firms can sustain competitive advantage when they have resources that are valuable, rare, inimitable and non-substitutable (popularly termed as the VRIN attribute) (Barney 1991; Conner & Prahalad 1996; Peteraf 1993; Eisenhardt & Martin 2000). Moreover, effective assembly of resources with VRIN attributes and complimentary processes and capabilities can enhance the potential of firms to sustain competitive advantage (Barney 1991; Collis & Montgomery 1995). Newbert (2008) finds empirical support for the underlying basis of the RBV that the value and rareness of resources possessed by a firm are key determinants of competitive advantage, rather than the possession of specific resources and capability. However, the RBV comes under scholarly scrutiny because of its inability to explain the process of creation of the valuable and rare resources.

Critiques of the resource-based view

Priem and Butler (2001a, 2001b, p.60) reveal that the underlying assumptions of sustainable competitive advantage in the RBV-based VRIN framework are tautological because '*both competitive advantage and value are defined as increasing efficiency and effectiveness in RBV'.* They clarify that the RBV is more suited to explaining sustainability of competitive advantage where sustainability is defined as co-occurrence of competitive advantage and possession of resources that have inimitability, non-substitutability, and non-transferability. The RBV has little contribution to the explanation of prediction, generation or creation of competitive advantage, considering the demand side of the external environment (Priem & Butler 2001b). Moreover, Eisenhardt and Martin (2000) point out that the notion of long-term competitive advantage as advocated in the RBV is not realistic in a high velocity market environment because firms cannot remain as a bundle of heterogeneous resources, rather firms require addition, recombination, and release of resources continuously. They further add that during rapid changes in the external environment, market duration of advantage becomes unpredictable, as a result the RBV's logic of leverage is not sufficient for sustaining competitive advantage. Therefore, scholars have criticised the RBV for its inability to explain the superior performance of firms during rapid changes in the external environment (Ambrosini & Bowman 2009). Recently, scholars suggest that the RBV and the DCV will merge to combine their theoretical strengths to allow scholars to build better theories of firms' superior performance (Williamson 1999; Barney, Ketchen & Wright 2011). Finally, Teece (2009) mentions that the RBV undermines the importance of intangible assets, managerial entrepreneurial activities and the importance

of managerial roles, in identifying threats and business opportunities during rapid changes in the external environment.

Teece (2009) acknowledges that the RBV is a good starting point in explaining superior firm performance, however, with an aim to overcome the limitations of the RBV, the DCV endeavours to build a better understanding about superior firm performance during rapid changes in the external environment following the research call by David Teece and colleagues (1997). The roles of managers in the value-creation processes of organisations are more important in the DCV than the RBV. The managers following the RBV primarily rely on the process of a selection and retention mechanism to identify and gain the valuable resources that will generate superior return in the future, helping firms to outperform their competitors (Makadok 2001). Therefore, to make decisions of resource acquisition, managers play the critical role of predicting and analysing the future value of the target resource through collecting relevant information from the marketplace (Makadok 2001). Conversely, the DCV emphasises the managerial ability to identify and act upon the identified variation in the external environment through: the entrepreneurial actions of managers (Teece 2009); the ambidextrous role of senior management (O'Reilly & Tushman 2008); reconfiguring learning patterns (Winter 2003) and the successful acquisition, integration, recombination or release of resources to accommodate changes in the marketplace (Eisenhardt & Martin 2000). The managers, as articulated in the DCV, emphasise reconfiguring organisational skills, capabilities and resources in order to adapt to the changes in the external environment (Lavie 2006; Teece, Pisano & Shuen 1997; Teece 2009, 2017).

The next section discusses the various definitions of dynamic capabilities.

2.1.4 Definition of dynamic capabilities

Dynamic capability refers to the organisational ability to address changes in the external business environment with an entrepreneurial approach. This involves identifying opportunities and then undertaking the necessary actions to successfully commercialise the identified opportunity through reconfiguring organisational tangible and intangible resources and capabilities (Teece, Pisano & Shuen 1997; Teece 2009; Eisenhardt & Martin 2000). This theoretical perspective is the dynamic-capability view (DCV) (Teece 2009, Eisenhardt & Martin 2000; 2012; Zollo & Winter 2002). Helfat and Peteraf (2003 p.999) identify operational capability as that which '*generally involves performing an activity using a collection of routines to execute and coordinate the variety of task required to perform that activity*'. On the other hand, dynamic capabilities are the capabilities that are required to

govern, and are applied to operational capabilities to accommodate changes arising from changes in the external environment (Teece 2009). Scholars have identified several organisational capabilities as dynamic capabilities, such as organisational learning (Zollo & Winter 2002; Agarwal & Selen 2009), innovation capability (Lawson & Sampson 2001), agility (Sambamurthy & Bharadwaj 2003), and entrepreneurial alertness (Lawson & Sampson 2001; Teece 2009; Agarwal & Selen 2009). The importance of managerial capability (Adner & Helfat 2003, Helfat & Peteraf 2015; Agarwal & Selen 2009; 2011; 2013) in building these dynamic capabilities is also highlighted in the literature.

Easterby-Smith, Lyles and Peteraf (2009) suggest that a widely accepted definition of dynamic capability is yet to be developed because the prior definitions are very broad and leave questions such as '*what constitute such capabilities, what their attributes are, how they can be recognized and where they come from*' unanswered (Easterby-Smith et al. 2009, p.2). The authors further note that, due to the divergence of the understanding of the nature and properties of dynamic capabilities, scholars have contradictory suggestions regarding the consequences of dynamic capabilities.

Table 2.7 outlines the definitions of dynamic capabilities based on the extant literature. The definitions suggest dynamic capabilities as an organisational process that acts upon the organisational resource base, capabilities and operational routines to change them in response to variations in the external environment. Makadok (2001) suggests that dynamic capabilities cannot be bought, rather they need to be built, therefore dynamic capabilities are rooted in the firm having a path-dependent nature (Zollo & Winter 2002).

Table 2.3: Definitions of dynamic capability

References	Definition of Dynamic Capability	Key contribution
Teece, Pisano & Shuen (1997, p.516)	The firm's ability to integrate, build and reconfigure internal and external competencies to address a rapidly changing external environment.	A research agenda for dynamic capability research.
Eisenhardt & Martin (2000, p.2)	The firm's processes that use resources – specifically the processes to integrate, reconfigure, gain and release resources to match and even create market change. Dynamic capabilities thus are the organisational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve and die.	Extending the resource-based view for a dynamic environment. Including the scope of proactive change to the external environment within the scope of dynamic capabilities.
Zollo & Winter (2002, p.340)	A dynamic capability is a learned and stable pattern of collective activity through which the organisation systematically generates and modifies its operating routines in pursuit of improved effectiveness.	Dynamic capabilities are systematic operating routines. Includes the capability to reconfigure learning patterns as an important aspect of dynamic capabilities.

Winter (2003, p.991)	Dynamic capabilities are those that operate to extend, modify or create ordinary capabilities.	Linkage of dynamic capabilities with the operational capabilities. Identify dynamic capabilities as higher-order capabilities and operational capabilities as zero-order capabilities.
Zahra et al (2006, p.918)	The ability to reconfigure a firm's resources and routines in the manner envisioned and deemed appropriate by its principal decision maker.	Integrate top management intent with dynamic capabilities.
Wang & Ahmed (2007, p.35)	A firm's behavioural orientation to constantly integrate, reconfiguration, renew and recreate its resource.	Explains dynamic capabilities from organisational behaviour perspective.
Teece (2009, p.5)	Dynamic capability can be disaggregated into the capacity (1) to sense and shape opportunities and threats, (2) to seize opportunities, and (3) to maintain competitiveness through enhancing, combining, protecting and, when necessary, reconfiguring the business enterprise's intangible and tangible assets.	Offered three key distinctive dynamic capabilities to capture the process of organisational interaction with environmental dynamism to carry out necessary transformation.
Barreto (2010, p.271)	A dynamic capability is the firm's potential to systematically solve problems, formed by its propensity to sense opportunities and threats, to make timely and market-oriented decisions, and to change its resource base.	Includes the importance of timeliness and propensity for decision making.

Zollo and Winter (2002) clarify that dynamic capabilities should contain a systematic pattern, therefore a disjointed effort to overcome a crisis cannot be termed dynamic capabilities. Similarly, definitions provided by Helfat et al. (2007) and Zahra et al. (2006) reject the scope of luck in constituting dynamic capabilities, rather they emphasise the deliberate intent behind dynamic capabilities. Finally, Ambrosini and Bowman (2009) argue that dynamic capabilities are not identical to strategic change, rather dynamic capabilities are a specific kind of change that intend to apply on the resources base (Eisenhardt & Martin 2000) or operational routines (Helfat et al. 2007). Finally, Barreto (2010) suggests combining both the time aspect and systemic process within dynamic capabilities. Scholars have conducted empirical tests and identified various dynamic capabilities that are integral to firms' value creation; for example, new product development, joint ventures, and cross functional business innovations (Gulati et al. 2002); project portfolio management (Killen & Hunt 2010); collaborative capabilities such as entrepreneurial alertness, collaborative learning, and collaborative agility (Agarwal & Selen 2009). These dynamic capabilities assist firms to sustain superior performance in a highly competitive marketplace (Agarwal & Selen 2009; 2013).

2.2 Themes within the Dynamic Capability View

Following the research call of Teece and colleagues (1997), the Dynamic Capability View has appeared as an important scholarly area of interest in the field of strategic management literature. This research stream has produced four key dominant perspectives since its introduction. Firstly, Eisenhardt and Martin (2000) apply the RBV within the context of a

rapidly changing external environment through proposing the dynamic resource-based view. Secondly, from the perspective of organisational learning, Zollo and Winter (2002) suggest firms reconfigure their learning pattern following changes in the external environment to avoid core rigidities. Thirdly, the ambidextrous perspective (Smith and Tushman 2005) recommends maintaining a balance between operational efficiency and the innovative initiatives of the companies. Finally, Teece (2009) proposes an organisational-level dynamic capability framework encompasses sensing, seizing, and reconfiguring elaborating on the initial conception of dynamic capabilities outlined by Teece and colleagues (1997). Figure 2.2 diagrammatically represents the timeline.

Figure 2.2: A timeline view of key perspectives contributing to the development of DCV
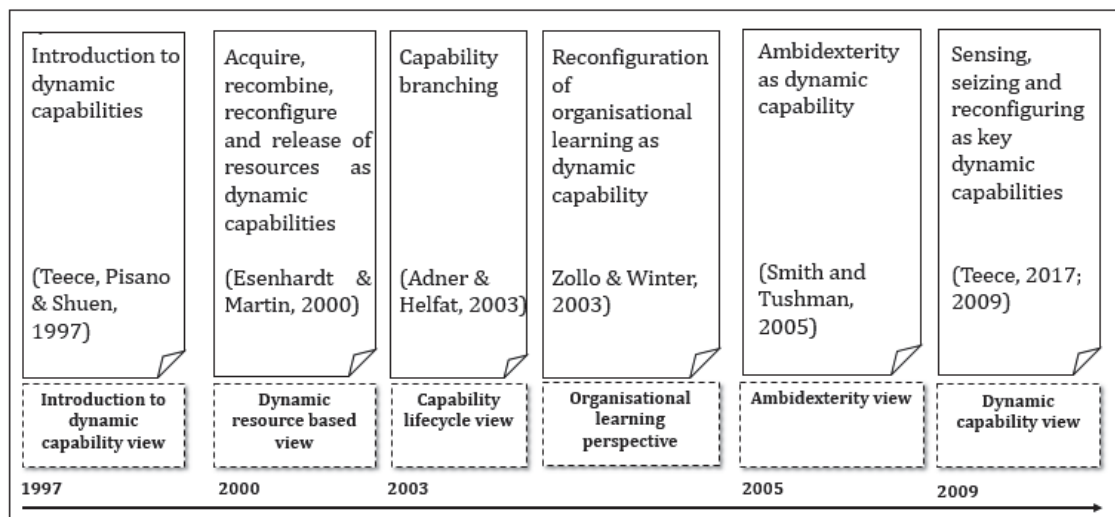
As Helfat and Peteraf (2009) argue, the DCV is still not a theory, and these dominant perspectives within the literature within DCV will offer valuable insights as discussed in this section. Table 2.4 offers a summary of these dominant perspectives within the DCV.

Table 2.4: A summary of four dominant perspectives within DCV

References	Perspective	Themes
Eisenhardt & Martin 2000; Helfat & Peteraf 2003	Dynamic resource-based view, Capability life cycle Section 2.2.1	Situates the DCV within the scope of RBV and offers the notion of a 'dynamic resource-based view' to address the importance of reconfiguring firms' resources in accordance with changes in the external environment.

Proposed the term 'capability life cycle' which captures the strategic roles of top management during different phases of the capability lifecycle from beginning to capability branching. Distinctive role of managers in pursuing successful branching of their capability following the strategic intent of management. |

Zollo & Winter, 2002	Reconfiguring Organisational learning Section 2.2.2	Focus on the routine and learning pattern of an organisation to explain the ability to change with changes in the external environment.
Tushman & O'Reilly 2008; O'Reilly & Tushman 2004, 2008.	Ambidexterity view Section 2.2.3	Ambidexterity as a dynamic capability and provides discussion on the role of senior managers in pursuing an effective balance between exploration and exploitation activities. They provide a comprehensive discussion on various aspects of organisational factors such as organisational structure, decision rules, managerial roles in pursuing successful exploration and exploitation simultaneously to sustain competitive advantage of firms.
Teece, Pisano & Shuen 1997; Teece 2017; 2009	Teece's framework of DCV Section 2.2.4	Categorises dynamic capabilities into three major higher-order capabilities: sensing opportunities and threats from the external environment, seizing opportunity and reconfiguring internal tangible and intangible assets and capabilities to maintain competitiveness.

Each of these dominant perspectives will be discussed in next few sections.

2.2.1 Dynamic resource-based view and capability life cycle

Scholars have attempted to extend the resource-based view (RBV) in explaining superior firm performance during rapid changes in the external environment (Eisenhardt & Martin 2000; Adner & Helfat 2003; Danneels 2011; Lawton, Rajwani & O'Kane 2010). The scholarly quest that applies the RBV in a dynamic external business environment is referred as the dynamic resource-based view (Helfat & Peteraf 2003). Dynamic resource-based view suggests that a firm's ability to create competitive advantage will depend on its ability to apply dynamic capabilities in a timely and intelligent manner to create a '*resource configuration*' that may originate competitive advantage (Eisenhardt & Martin 2000, p.1116). Galunic and Eisenhardt (2001 p.1230) explain the mechanism for achieving effective resources and capability reconfiguration in a large technology-based company through architectural modularity in a high-paced technological market. The authors recommend an organisational form, namely a '*dynamic community*', with a focus on the modularity of organisational resources and processes that are capable of reconfiguration in a dynamic manner to co-evolve with changes in the external environment (Gulanic & Eisenhardt 2001, p.1229). The dynamic resource-based view recommends organisations to build an internal environment and culture that may foster pursuing building resource configuration, considering the changes in the external environment.

Dynamic capabilities may emerge through nurturing an environment of helping the weak performers, rewarding the high performers and tolerating conflicts and competition while remaining fair, in a context that perceives managers as leaders, entrepreneurs, corporate architects and custodians of the organisational culture (Gulanic & Eisenhardt 2001, p.1246). A collaborative and supportive community within an organisation encourages organisational members to accept challenges and risks as well as prepare to develop a

mindset to embrace failures. Gulanic and Eisenhardt (2001) discuss an operational practice in pursuing reconfiguration called charter change where a charter is defined as a product-market domain, and the key function of a charter is to frequently realign matches between resources across different divisions, as well as to produce new combinations of product-market context for the evolving marketplace. The authors argue that the chartering process is a critical dynamic capability that allows frequent revision of the corporate architecture through incorporating divisional resources within the charter, facilitating achieving superior profitability of the focal company in the high-tech industry for two decades prior to the study. Finally, Brown and Eisenhardt (1997, p.1) found that ICT firms in a high velocity marketplace rely on semi-structured processes of strategy making, possess a futuristic orientation to perform time-paced evolution through sequenced steps, and this eventually facilitates building core capability.

The pattern of dynamic capabilities may change in accordance with the nature and dynamics of the market (Eisenhardt & Martin 2000). Helfat and Peteraf (2003) consider a capability life-cycle approach to explain the fundamental source of resource and capability heterogeneity of a firm. Organisational capability follows a certain life cycle from the beginning to final retirement (Helfat & Peteraf 2003, p.1005). The authors propose different key stages of capability life cycle, namely, founding or development, maturity and capability branching, or the transformation stage, where capability branching includes options of renewal, redeployment or recombination, replication, and retrenchment or retirement of organisational capabilities. The authors further suggest that if a capability undergoes different branches such as renewal, redeployment and recombination in a different time interval, it may deviate from the original nature of the initial capability. At the same time, it is important to note that if a firm exits from the business, the capability may still remain within the industry, therefore the capability life cycle has a distinctive path that may cross the organisational boundaries. The organisations need to reconfigure their resource base during various stages of the capability life cycle to remain relevant with the market and the external environment, as evident from the practices of different successful companies.

In practice, successful firms deliver superior performance through evolution of their resources and capabilities over time. For example, managers at International Business Machines Corporation (IBM) perceived an external business opportunity in a timely manner and successfully carried out the necessary changes within resources and capabilities to transform IBM into a premium consultancy service company from being a leading computer manufacturing firm (O'Reilly & Tushman 2008). Similarly, in commercialising the radial tyre, the Goodyear tyre company reacted promptly in adopting the newly developed

technology, which eventually made obsolete their own mainstream traditional product line. Eventually this transformation appeared as a right decision as the whole industry moved into the radial tyre technology (Smith & Tushman 2005). Investigating the failure of the typewriting company, Smith Corona, at the time of the emergence of the computer industry, Danneels (2011) reveals that managers needed to possess strong resource cognition to achieve effective resource configuration through creating new resources, accessing external resources and releasing existing resources, for the company to maintain competitiveness through offering new products. Similarly, at the highly successful photographic company, Kodak, managers failed to make timely decisions regarding the emerging digital camera technology, which finally bankrupted the company (Bloomberg 2012). So, resource configuration in accordance with the market place, carries significant importance in a rapidly changing market place.

Schreyogg and Klisch-Eberl (2007, p.919) suggest the dynamic resource-based view as a '*radical dynamization*' approach, with a full-focus on adaptability considering the context of a high velocity market. This adaptive responsive approach requires sound judgment regarding changes in the external environment and the impact on the strategic decision-making process of firm, due to the nature of change. Ambrosini and Bowman (2009) suggest taking cautious steps in formulating a strategic course of action regarding different choices due to environmental uncertainty. They point out that the predictability of changes in the external environment is a key factor in selecting appropriate options for capability building. If the external environment presents a rapid change with a predictable pattern, then firms may undertake a well-understood deliberate change process, leveraging their knowledge and experience, however, if the environment possesses a high degree of unpredictability or uncertainty then firms need to maintain the scope of changes to remain flexible to the environmental changes. It is nevertheless noted that a deliberate effort may lead in a wrong direction if the selection of actions is wrong, while nurturing the scope of flexibility may not be feasible in terms of cost or may not deliver any advantage if competitors can be more flexible at less effort and cost.

The proactive strategic actions of managers to create favourable changes in the marketplace are considered within the scope of organisational dynamic capabilities (Eisenhardt & Martin 2000). Oliver and Holzinger (2008) identify a mechanism of enacting change or favourable conditions in the marketplace through strategic management of political relations. These kinds of actions are referred as proactive strategic actions by which managers aim to manipulate factors of the external environment. Eisenhardt and Martin (2000) identified cross-functional R&D teams, new product development routines, quality

control routines, technology and knowledge transfer routines as micro foundations of dynamic capabilities to achieve effective resource reconfiguration and suggest that the underlying functionalities of dynamic capabilities can be replicated across firms. Finally, the dynamic resource-based view offers valuable insights into achieving superior performance using dynamic capabilities, from the lights of resource-based view, as well as drawing significant attention from scholars and sparking a rich research stream within DCV.

The next section deals with dynamic capabilities from the perspective of organisational learning.

2.2.2 Reconfiguring organisational learning

Considering the context of uncertain technological, market and environmental circumstances, Dharmadasa (2009) describes organisational learning as a purposeful quest to maintain and improve organisational productivity, competitiveness and innovativeness. Organisational learning can be considered as actively leveraging the know-how and individual expertise that resides in individual minds (Scarbrough 2003). Teo, Wang, Wei, Sia and Lee (2006, p.264) defines organisational learning capacity as: '*An organisation's shared assumptions and mechanisms (in terms of processes or culture) that contribute to its capabilities to sustain and improve performance unfettered*'. On the other hand, Spicer and Sadler-Smith (2006, p.135) define organisational learning as:

> *'Organisational learning may be defined as the development or acquisition of new knowledge or skills in response to internal or external stimuli that leads to a permanent change in collective behaviour and that enhances organisational efficiency and/or effectiveness.'*

Zollo and Winter (1999) suggest continuous re-evaluation, reorientation and recombination of learning routine to accommodate rapid technological changes or regulatory changes in a highly competitive external environment, while Cohen and Levinthal (1990) warn that during rapid and unpredictable changes in the external environment, failure to reconfigure organisational learning patterns may result in core rigidities. Camison and Fores (2010) echo the importance of external knowledge to adapt in a competitive environment. The dynamic capabilities of an organisation need to be applied to the operational routine in a systematic, replicable and repetitive manner (Zollo & Winter 1999). They explain that, if the organisational actions are creative, but not an outcome of systematic process during the time of rapid changes, it is not an example of

dynamic capability exercise, but rather they place an emphasis on the capability to generate innovation in a systematic manner.

Zollo and Winter (1999) note that during rapid technological changes, or fast changes in customers' preferences, it is important for managers to perform at a higher level of cognitive learning. The external environment provides critical feedback on the process of organisational capability renewal actions through different stimuli, such as reflection on the potential application of improved routines, and the probable value and viability of existing organisational routines. Zollo and Winter (1999) further add that during the phase of exploring new ideas, or creating a range of options, the cognitive aspect of managers plays a critical role. Behavioural mechanisms, meanwhile, play important roles in replicating new tasks within existing sets of routines. Empirical studies on British software companies emphasise the importance of individual-level learning, group learning and organisational learning to creatively deploy recombined knowledge to deliver successful innovation (Hawass 2010).

Johannessen, Olaisen and Olsen (2001) caution that heavy reliance on technology and ICT systems in managing organisational knowledge may undermine the strategic importance of tacit knowledge, which is difficult to transfer through technology. The authors further argue that the ability to incorporate information technology to transfer the tacit knowledge of employees, facilitates organisations to sustain a competitive advantage. Conway (1995) showed that during different phases of the innovation process, such as idea generation, problem solving or the testing phase, informal mechanisms of information transfer are important for transferring information and ideas. Likewise, Benner and Tushman (2002) emphasise the importance of establishing the effective interaction between tacit knowledge and the ICT infrastructure of the firms. Daft and Weick (1984), and Bhardwaj and Monin (2006), emphasise the use of a combination of informal and formal information flow in order to capture both the tacit and explicit knowledge of an organisation.

In high technology industries, knowledge is highly appreciated and is critical to achieving competitive advantage (Ryu, Kim, Chaudhury & Rao 2005). Holzweber et al. (2012) find that intranet solutions, sharing information and knowledge with staff from different locations and branches of the organisation, facilitate employees to access the best practices during the delivery of services to customers. Garud and Kamaraswami (2005) suggest that it is important to achieve a balance between centralisation and decentralisation in knowledge management (KM) initiatives to attain success. Additionally, centralisation may enable the company to achieve efficiency, economy of scale and synergistic benefits across the

organisational boundary; however, it is difficult to implement. The authors found that the centralised management of knowledge directories and bodies of knowledge provide efficiency, whereas home page, specific databases and utilities are better maintained at the individual and group level. Holzweber et al. (2012) find that to initiate innovation within business processes, administrative innovation may be necessary to allow the adoption of new structures and processes.

Capability that is embodied in collective learning and is highly tacit in nature cannot be developed through imitation of competitors, suppliers or customers, but it needs to be developed internally (Zollo & Winter 1999). Knowledge codification is an important activity for internal capability development, however it involves direct cost such as time, resources and the managerial attention required for developing the required tools and providing task-specific support. There are also indirect costs such as increased organisational inertia against the formalisation and structuration of task execution (Zollo & Winter 1999). However, if the focal firm lacks pre-existing experience, a high level of commitment to internal development is crucially important (Qian, Agarwal & Hoetker 2012).

Daghfous (2004) argues that organisational innovation is an evolutionary process to adapt to the ever-changing business environment, and those organisational innovations rely on the firms' ability to acquire, assimilate and utilise knowledge-intensive practices and the development of effective tools to capitalise on knowledge resources. In the context of service firms, learning and the ability to adapt are necessary to introduce new service offerings to their customers (Hertog, Van der Aa & Jong 2010). They further state that learning from both failed and successful projects is a meta-capability that can inform service innovation management processes. Empirical studies have established the fact that inter, and intra-organisational learning processes create the basis of dynamic capabilities (Agarwal & Selen 2009; 2011; 2013). The process of organisational learning, inter-organisational learning and innovation is tightly linked (Oliver 2001) but static characteristics such as type of knowledge, and organisational structure, are also involved in organisational learning and innovation. In addition, type of knowledge and organisational structure has a direct relationship with inter-organisational learning and innovation, and an indirect relationship with organisational learning (Ahuja & Katila 2001).

Communications across the organisational boundary, knowledge sharing, and robust knowledge management are fundamental for ICT companies to achieve growth. Software development companies follow sophisticated procedures to develop their final products; therefore, the importance of superior capability is central for the companies to succeed in a

highly competitive global marketplace. Firms not only need to learn fast but also to build strategic assets to sustain superior performance during the rapidly changing environment. Capability, state-of-the-art technology, and critical client information need to be integrated, reconfigured or transformed in accordance with the strategic purpose of the company to meet new challenges (Holzweber et al. 2012). Effective knowledge-management practices can facilitate diffusion of innovation faster, which in turn delivers benefit for the companies in inter-organisational relationships. Mahmood, Zhu and Zajac (2011) mention that their technological knowledge base defines the scope of productivity of a firm's R&D activities, therefore it is imperative to continually acquire and assimilate this organisational technological knowledge base through continuous coordination and deployment of knowledge, skills and expertise. Although, it is important to integrate external knowledge, obtain a balance between learning new skills and capabilities and sustaining operational efficiency is also crucial for business organisation to maintain financial sustainability. The capability that perform this balance is called ambidexterity which is discussed next.

2.2.3 The ambidexterity view

The ambidexterity perspective, anchored in the notion of exploration and exploitation, was originally proposed by March (1991). Senior managers face the challenge of nurturing and refining the existing capabilities that enable firms to compete in present conditions, as well as reconfiguring these capabilities with contextual shifts or changes in the external environment (O'Reilly & Tushman 2004 2008). In order to successfully adapt, organisations have to exploit or maximise returns from existing resources and assets through reducing variance, increasing productivity, and deploying robust control mechanisms that may ensure a higher level of efficiency; at the same time, organisations have to explore or identify new viable opportunities, and this depends on the capability for searching, discovery, innovation, autonomy and the ability to recognise opportunities from variations in the external environment. Capability to pursue these two kinds of activities simultaneously is referred to as ambidexterity (O'Reilly & Tushman 2008) and is considered as a dynamic capability (Smith & Tushman 2005). From the perspective of ICT companies, Tarafdar & Gordon (2007, p.364) define 'ambidexterity' as the successful balance between '*strategic vision and operational excellence*'. From the perspective of information system functionalities, Vinekar, Sinkman & Nerur (2006) suggest that to attain ambidexterity it is important to maintain both agile and traditional system-development practices, with the aligned organisational structures, processes and tools required to perform both.

Specific activities for exploration

The specific set of skills that are required of senior management to perform exploration are distinct from those required for exploitation (O'Reilly & Tushman 2008). The authors further clarify that firms should allocate resources to carry out strategy-making routines for effective scanning and searching of opportunities and threats linked to variation. At the same time, resources need to be allocated to track technological changes as well as to build competitive intelligence through nurturing a culture of openness. O'Reilly & Tushman (2008) maintain that the outcome of exploration activities may be uncertain, remote from the present time horizon, and may carry a threat to existing organisational units, Similarly, Siggelkow (2001) finds that organisations become less effective in pursuing exploration and become subject to extinction during technological and market changes. March (2003) notes that established organisations will always emphasise their existing knowledge, the generation of short-term return through further specialisation of their skills, and that positive feedback from customers' demand and profit may result in path dependency (Benner & Tushman 2002; Gupta, Smith & Shalley 2006).

Specific activities for exploitation

Exploitation activity may deliver short-term positive performance outcomes through reducing variation, increasing efficiency and increasing adaptation with the environment at the present time, however, as the environment changes its context, the achieved adaptation may become a liability as the firm has to readapt in a different environmental context (Bocanet & Ponsiglione 2012). As a result, the success recipe of an exploitation-oriented firm may not repeat the same outcome in the longer term in a changed external environment. Therefore, O'Reilly & Tushman (2008) note that to drive efficiency it is important to maintain a short-term perspective, continuous innovation and incremental innovation, while successful exploration may involve greater flexibility, autonomy, risk taking and less formal system with a longer time orientation.

Organisational structure

Organisational structure plays a vital role in allowing a firm to manage both exploration and exploitation in a simultaneous manner. Duncan (1976) coined the term ambidexterity to highlight the essence of a dual structure of an organisation with an organic structure to initiate and nurture innovation or exploration, and a mechanistic structure to ensure efficient exploitation from the innovation. The literature labels this structural adjustment effort temporal sequencing (Lovas & Ghoshal 2000). O'Reilly & Tushman (2004) explain that under the temporal sequencing of adaptation there is a general assumption that firms

can realign their organisational structure faster than changes in the external environment. As this may not be the case in a fast-paced market situation, O'Reilly and Tushman (2004) suggest building separate sub-units, business models, incentive mechanisms, competency measurement, culture, and distinctive internal alignment, for exploration and exploitation of sub-systems of organisational structure. O'Reilly & Tushman (2008) emphasise that these two strategically distinctive organisational divisions should be held united by organisational strategic intent through common values and mechanisms that structurally bridge these two divisions through leveraging shared resources and assets, and a common fate incentive system supported by specialised teams that can manage this inconsistent alignment (O'Reilly & Tushman 2004; Smith & Tushman 2005, Rotemberg & Saloner 2000). Finally, O'Reilly & Tushman (2008) suggest firms ensure a balance between centralisation and decentralisation to allow the effective flow of information from the customer-facing business unit to the top management.

In order to escape the competency trap (Leonard-Barton 1992) or avoid the failure trap (Siggelkow & Rivkin 2006), organisations need to obtain alignment of competencies, structure and culture while at the same time nurturing inconsistency. The competency trap is generated through repetition of a successful way of operation that eventually discourages exploration of new ways of operation, whereas the failure trap is caused when a firm constantly seeks an alternative way of doing business but repeatedly fails due to a lack of experience, and as a result cannot reap higher rent from any exploration.

To achieve ambidexterity, senior leaders should have the behavioural and cognitive flexibility to achieve simultaneous exploration and exploitation and a long-term commitment to facilitate learning, cross functional knowledge flow, overcoming the status quo, and to build a culture that accepts failure (O'Reilly & Tushman 2008). Finally, successful behavioural integration of the top management team, as well as their ability to synchronise actions to establishing common goals, are critical for achieving ambidexterity (Lubatkin, Simsek, Ling & Veiga 2006). Ambidextrous organisations deliver superior performance through longer survival (Cottrell & Nault 2004), better financial performance (Govindarajan & Trimble 2005; Markides & Charitou 2004); improved learning and innovation (Holmqvist 2004; Katila & Ahuja 2002) and successful management of ambidexterity may facilitate the building of other dynamic capabilities (Gibson & Birkinshaw 2004).

The operations of the information system function can be divided into two major aspects, firstly, the supply aspect ensures the delivery of ICT services, including building, running

and maintaining ICT infrastructures such as servers, databases and networks efficiently, reliably at low cost (Mark & Monnoyer 2004). Intended operational improvements drive the resource allocation for these aspects. Secondly, demand-side functionalities should capture the long-term horizon of business through supporting businesses using the innovative application of information technologies; as a result, return on investment may not be a driver of this function. This requires cross-functional communication of business unit leaders, identification of potential business opportunities, experimentation with different solutions, risk-taking behaviour and managing accountability of ICT projects (Mark & Monnoyer 2004; Peppard & Ward 2004; Tarafdar & Gordon 2007). Tarafdar and Gordon (2007 p.372) find that ICT service companies use different criteria for approving maintenance projects than larger, complex and innovative projects. These authors reveal that this practice facilitates organisations to become ambidextrous, with an ability to identify the strategic importance of innovation at the same time as maintaining long-term evaluation criteria. The authors found that top management approves innovative projects with a long-term goal to remain at the edge of technological development through applying intuitive criteria for the approval.

Next Teece' s (2009) Dynamic Capability View (DCV) framework is discussed.

2.2.4 David Teece's framework of DCV

The seminal paper of Teece, Pisano & Shuen (1997) stimulated to the research stream on dynamic capabilities. It remains the most influential scholarly work on the DCV, has significant influence on later scholarly work, and provides the underlying basis of the key constructs, especially the understanding of the notion of dynamic capability (Ambrosini & Bowman 2009; Schreyogg & Kliesch-Eberl 2007; Barreto, 2010). Schreyogg and Kliesch-Eberl (2007 p.922) consider David Teece's framework as an '*integrative approach*'. Teece (2009 p.4) suggests harnessing unique and difficult to replicate dynamic capabilities '*to continuously create, extend, upgrade, protect and keep relevant the enterprise's asset base'* with changes in the external environment. The DCV framework aims to provide guidance to managers in a perfectly competitive market to avoid zero profit scenarios. The DCV proposes adapting to changing customer preferences and technological opportunities, as well as shaping business ecosystems through developing new products, process and designing and implementing effective business models (Teece 2009).

Teece (2009) categorises dynamic capabilities into three major higher-order capabilities: sensing opportunities and threats from the external environment, seizing the opportunity,

and reconfiguring internal tangible and intangible assets and capabilities to maintain competitiveness (Teece 2009). According to Teece (2007 p.1344):

'Dynamic capabilities relate to high level activities that link to management's ability to sense and then seize opportunities, navigate threats and combine and reconfigure specialised and co-specialised assets to meet changing customer needs, and to sustain and amplify evolutionary fitness, thereby building a long-run value for investors.'

Teece (2007) warns that it is challenging for firms to deploy an enterprise-level capability of sensing, seizing and reconfiguring capabilities, through the micro foundations of dynamic capabilities, which are, organisational structure, decision rules, disciplines, and processes or procedures across the organisational boundary. Regarding the scope of dynamic capabilities in pursuing changes within organisations, contrary to the Dynamic Capability View supported by organisational micro foundations as proposed by Teece (2009), Helfat and Peteraf (2003) suggest that the pool of capabilities of firms should have scope to adjust to changes, and argue that adaptation, learning and change, within the organisational boundary may not require the interference of dynamic capabilities as intermediaries (Helfat & Peteraf 2003, Helfat & Winter 2011). Figure 2.3 outlines Teece's framework of the DCV along with the underlying micro-foundations.

Figure 2.3: David Teece's (2009) Dynamic Capability View (DCV) framework
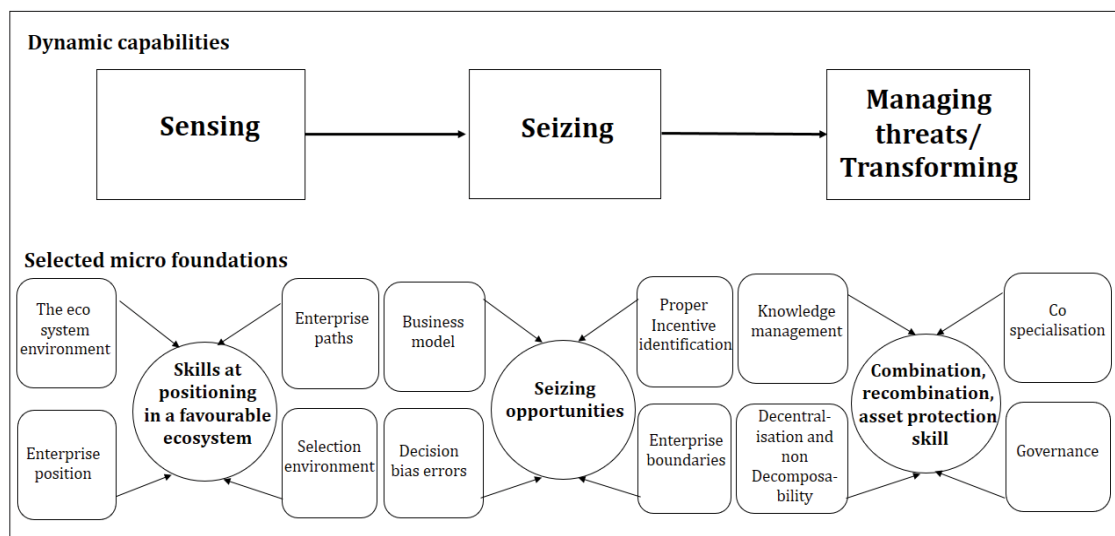
Next the organisational-level dynamic capabilities based on Teece's (2009) DCV framework are discussed.

Sensing

Sensing is an organisational dynamic capability that helps firms to identify unexplored opportunity through maintaining awareness to changes in the external environment (Teece 2009). Teece (2009) recommends managers pay serious attention to recognising the variance in the external environment and the unpredictable actions of actors such as competitors, stakeholders, regulators or customers. Yu (2001) suggests two mechanisms to grab and realise business opportunity. Firstly, ordinary discovery is an entrepreneur's attempts to exploit opportunities through improving some unnoticed aspects of an area of interest and extraordinary discovery refers to a phenomenon when entrepreneurs contemplate upcoming events through new ideas which may have radical implications (Yu 2001). Chan, Hou and Lin (2013) divide sensing capability into two categories: proactive sensing and responsive sensing. Proactive sensing refers to attentively performing environmental scanning in a systematic manner to identify early indications of new ideas, trends or capabilities. The authors also suggest that sensing an opportunity in a timely manner can assist the organisation to capitalise on the identified knowledge and accommodate changes in a rapid manner, that is, responsive sensing (Tan and Sia 2006).

In the context of an emerging economy, namely India, Ray and Chakrabarti (2006) assert that in a fast-paced business environment early recognition of business opportunity, threats, customers' needs, and delivering the products with required quality, are critical for success. While Teece (2007) stresses sensing trends in the marketplace to pursue reconfiguration of a firm's assets and technologies, Christensen (1997) suggests that following customers' changes in preferences may deprive a firm from capturing opportunities from disruptive innovations. Considering market orientation as a multidimensional construct, Lavie, Stettner and Tushman (2010) suggest considering both a customer-led and customer-leading approach in addressing changes in customers' preferences in the marketplace. Managers need to maintain entrepreneurial alertness to successfully identify opportunities from the external business environment.

Entrepreneurial alertness is critical for the cultivation of important dynamic capabilities such as digital options and agility and performing continuous innovation through competitive actions (Sambamurthy, Bharadwaj & Grover 2003). The authors identified two aspects of entrepreneurial alertness: strategic foresight and systematic insight. Strategic foresight refers to the ability of a firm to anticipate discontinuities in the business ecosystem, including potential threats, opportunities and disruptive moves by competitors, whereas systematic insight refers to the ability of firms to effectively articulate the competitive actions regarding various digital options and agility. Hence, in the context of a

service organisation, Agarwal and Selen (2009 p.435) outline the entrepreneurial alertness of a firm as:

> *"Underpinning the logic of opportunity and innovation, entrepreneurial skills are likely to help front-of-house staff maintain customer satisfaction and provide operations staff with a higher-order ability to explore and exploit options when subjected to varying customer needs, thus arming them with an ability to spontaneously deliver customized solutions to customers."*

Managers need to act on the identified opportunity to instigate a change initiative (Tan & Sia 2006). Entrepreneurial action is suggested as the ability to exploit market opportunity through responding to environmental signals and maintaining a proactive attentiveness to information (Zaheer & Zaheer 1997). Based on an empirical study, Zaheer and Zaheer (1997) found that both alertness and responsiveness enable firms to create greater influence in the market. Considering entrepreneurial action as subjective and creative, Smith and Gregorio (2001) articulate that firms combine their existing knowledge to analyse the market situation in a subjective manner to identify opportunity, and act on that opportunity. Sambamurthy, Bharadwaj and Grover (2003) therefore argue that effective entrepreneurial action requires a combination of exploration and exploitation of opportunities in the marketplace, and entrepreneurial firms will be more successful in sensing discontinuities in the market, as well as coming up with an effective resource capability configuration to exploit the identified opportunity. Finally, Holzweber et al. (2012) suggest that managers need to continuously look forward to grabbing business opportunities and effectively enact their strategic choice and need to play a key role in building the basis for the long-term success through effectively reconfiguring the business settings of their organisation considering the organisation's and customers' strategic position.

Zollo and Winter (1999) acknowledge the importance of environmental scanning and perceive the scanning process as an input, rather than considering it as a sub-process of dynamic capability building. Based on an empirical study of six US ICT firms, Brown and Eisenhardt (1997) find that successful managers pursue and continuously investigate a wide range of low-cost solutions with an aim to connect future technologies with the present ones through a rhythmic transition process. The authors find that managers of successful firms not only possess a strong orientation towards the future, but they also need to enact, or even create, future events. Verona and Ravasi (2003), through examining the innovation process at a Danish hearing aid company, find that the continuous innovation

capability of a firm is a function of the ability to identify or sense new opportunities, knowledge creation, and the ability to seize the opportunities through organisational processes, structures and knowledge integration.

Seizing

To seize opportunity, organisations need to create effective business models that encompass proper incentive mechanisms, determination of enterprise boundaries and the control mechanisms that may eliminate decision biases or errors (Teece 2017, 2009). Rapid managerial action to capitalise on identified opportunities using an innovative business model is essential (Eisenhardt & Martin 2000). Amit and Zott (2001 p.493) define a business model as:

> *'A business model depicts the design of transaction content, structure, and governance so as to create value through the exploitation of business opportunities. We propose that a firm's business model is an important locus of innovation and a crucial source of value creation for the firm and its suppliers, partners, and customers.'*

Amit and Zott (2010) suggest business model innovation for firms to survive in times of rapid changes in the external environment. Through illustrating the financial performance of Apple Inc., the authors suggest that incorporating new business models through the 'iTune' music service created an important positive impact on the profitability of the company. Barreto (2010) clarifies that timely decisions and market-oriented decisions are two key criteria for managerial decision making to grab opportunities in a rapidly changing marketplace. Finally, choice of business models has significant impact on the focal firms and at the same time firms need to reconfigure their resources and capabilities to commercialise the adopted business model, as Teece (2017, p.7) suggests

> *'Key business model choices have deep systemic implications for the enterprise, affecting the way it does business. Other decisions are simply investment choices that do not implicate a firm's business model. For instance, a resort that decides to go "off the grid" and supply its own electricity is making a business model choice.'*

Firms go through a process of reconfiguring organisational resources and capabilities to carry out commercialisation of the innovative initiatives.

Reconfiguration

Reconfiguration capability is a firm's ability to recombine knowledge resources and technological competencies to perform innovations (Hawass 2010). Lavie (2006) articulates three key mechanisms of reconfiguration of organisational capability. Firstly,

capability substitution is appropriate when the intended capability requires a significantly different nature of knowledge and technology, compared to the present nature of the technology and knowledge base of the firm. This effort may involve competency-destroying activities to implement path-breaking initiatives against the legacy system. Secondly, capability evolution is the incremental learning processes that enable firms to connect existing capabilities with the intended technological development. Finally, capability transformation refers to the process of combining the existing knowledge-base and capability portfolios of the firm with the new domain of knowledge-base that can be found within the industry. This effort requires integration of internal knowledge with external knowledge to result in successful capability reconfiguration. Pavlou and Sawy (2011, p.243) break down 'reconfiguring capability' into two capabilities, 'integrating capability' and 'coordinating capability' to outline the operational aspect of reconfiguration that includes recombination of activities, routines and task across organisational boundaries. Teece (2009) articulates knowledge management, internal governance mechanisms, decision rules, and co-specialisation as the micro foundations of the reconfiguration processes in pursuing sustainable growth

Evolution of capability with the advancement of the technology carries immense importance for the sustainable growth of any organisation (Teece 2009). Organisations need to maintain agility to evolve effectively through reconfiguration of internal resources and capabilities. Pavlou and Sawy (2011) stress that in order to achieve responsiveness to the external environment, firms need to revamp operational capability based on a renewed knowledge base, and coordinate tasks, resources and activities effectively to excel in transforming operational capabilities. Sambamurthy et al. (2003) note that agility is critical for companies to co-evolve with the growth of their partners, technological advancement, and changes in the marketplace, and they define agility as a dynamic capability and critical antecedent of firm performance, with three higher order capabilities: customer agility, partnering agility and operational agility. The authors further mention that to enhance agility, firms rely more on information technologies, including processes, knowledge and communication tools.

2.2.5 Summary:

David Teece's dynamic capability framework (2009) offers distinctive propositions in compared with the dynamic capabilities conceptualised by Eisenhardt and Martin (2000). Firstly, Teece, Pisano and Shuen (1997) and Teece (2009) advocate a direct relationship between dynamic capabilities and sustainable competitive advantage, whereas Eisenhardt and Martin (2000) propose an indirect relationship, suggesting that in a rapidly changing

environment firms will rely on successive creation of temporary advantage. Moreover, Eisenhardt and Martin (2000) suggest considering the scope of negative consequences as an outcome of the execution of dynamic capabilities. The authors explain that due to the potential scope of decision errors by the managers as well as complexity to contemplate the external environment in an accurate manner. Finally, Eisenhardt and Martin (2000) focus on the process of transforming resources to deliver relevant resource configuration considering the changes in the external environment, whereas Teece (2009) advocate performing internal creative destruction through transforming both resources and capabilities of the organisation in accordance with the changes in the external business environment. David Teece's framework of dynamic capability also integrates the learning mechanism as a micro foundation and offers a plausible linkage between the identified opportunity in the marketplace and organisational resources and capability transformation through rapid decision making. Organisational learning perspective offers valuable insight, however lacks necessary guidelines on how learning can be integrated to create value. On the other hand, ambidexterity view contributes valuable guidelines through integrating the necessity of *maintaining efficiency* during transformation process in response to environmental dynamism. However, until recently ambidexterity perspective heavily focused on the structural aspect of organisations in obtaining the balance between exploration and exploitation with no conclusive theoretical development.

Next managerial roles in building dynamic capabilities will be discussed.

2.3: Managerial roles and attributes in building dynamic capabilities

Selection of appropriate strategic courses of action to address changes in the external environment through successful internal alignment remains a key challenge for the managers of different levels within the organisational boundary (Schreyogg & Kliesch-Eberl 2007). Sustaining the generation of efficiency-based rent and performing reconfiguration with the aim to pursue dynamic rent, exposes managers to cognitive challenges in overcoming decision biases (Helfat & Winter 2011). Furthermore, managers have to handle various internal and external factors to overcome resistance to their strategic actions (Eisenhardt & Bingham 2010). Finally, Taylor and Helfat (2009) confirm that middle managers play critical roles in forging and maintaining organisational linkage through communication and coordination during technological transition.

Managerial capabilities comprise roles and attributes that are considered as key mechanisms in the dynamic capability perspective in pursuing an effective resemblance

between a firm's capabilities and the changing environmental context (Bergen & Peteraf 2002; Adner & Helfat 2003; Sirmon & Hitt 2009). The role of managers is vital in identifying new frontiers of growth and opportunities for firms, as well as redesigning the competitive position of firms in a turbulent environment (Kor & Mesko 2013; Castanias & Helfat 1991, 2001; Mahoney 1995; Penrose 1959). Managers play the role of change agents to continuously scan the external environment for ideas and opportunities of new technologies, new product applications or new combinations of competencies, to integrate with existing knowledge and capabilities that may enable successful innovation (Tripas & Gavetti 2000; Helfat & Raubitschek 2000).

Agarwal and Selen (2009), in the context of the telecommunication service industry, have identified that managers play critical roles in fostering entrepreneurial alertness and organisational learning across the organisational boundary through managing effective collaboration with partnering companies. Holzweber et al. (2012) stress that to build enterprise-level capability to deliver cost effective and dynamic services to the client, senior managers and key clients can play a critical role in co-producing intended services. Hertog, van der Aa and Jong (2010) have identified six critical capabilities of managers for performing service innovation. First, signaling user needs and defining technological options that encompass the importance of identifying customer requirements more intimately, and designing the service system with multiple digital options to satisfy them. Secondly, conceptualising and unbundling refer to the capability of the firm to conduct stringent research regarding the new service, and to organise an internal process to initiate capability building processes. Then, coproducing and orchestrating capability will consider the scope of user involvement in the service-delivery processes and reconfigure organisational resources and capabilities to facilitate that new service-delivery mechanism. Finally, learning and adaptation capability stress the importance of organisational learning in successfully incorporating the new service-delivery mechanism within the organisational boundary. The authors emphasise the critical roles of managers in performing service innovation through building dynamic capabilities.

Next managerial roles and attributes of managers in building dynamic capabilities are discussed in more detail.

2.3.1 Managerial role in building dynamic capabilities

Top management's entrepreneurial roles play a critical role in sustaining dynamic capabilities (Daft 1978; Teece 2009). Teece (2009) terms dynamic capability as a meta-capability which facilitates translating managerial entrepreneurship capability into

operational excellence and suggests that the top management of an organisation acts as a bridge between the technical environment and the organisation. He suggests that the degree of exposure to technological environments, and the rank and status of the top management administrators of an organisation, has a critical impact on the ability to initiate change in the organisation. Teece (2009) repeatedly mentions successful entrepreneurs such as Steve Jobs, who was tremendously effective in creating significant change in the business ecosystem through his serial innovation of the Apple 'i' product series, as well as unique business models such as iTunes or App Store, as being the significant factor behind success of Apple Inc. Adner and Helfat (2003) state that strategic decision making needs to identify the required changes needed for firms over time. They further mention that omission of the time-varying dimension from the applied and theoretical literature of strategic management creates a barrier to gaining a deeper insight into the effect of strategy on the corporate level.

Ashkenas, Ulrich and Francis (1998) emphasise the role of leadership as a key enabler of organisational change. When the dynamics of the market creates immense pressure on organisations, a self-empowered leader can play a critical role in navigating organisations (Bowen & Lawler 1995; Sims & Manz 1996). Not only technical competency, but also the entrepreneurial skill and creativity of managers are key capabilities in order to succeed in a turbulent business environment (Roepke & Agarwal 2000). Restriction of individual initiatives and judgment is considered as an inhibitor to entrepreneurial leader development within the information technology (IT) division at 3M (Roepke & Agarwal 2000). At 3M 30% of sales has to be realised from products that are less than four years old, therefore the company has a strong focus on innovation which is reflected in the corporate culture and through delegation of authority to the employees to pursue their initiatives (Roepke & Agarwal 2000). Taylor and Helfat, (2009) identify four critical influences namely economic, social, structural and cognitive on middle managers in performing necessary linkage activities to combine complementary assets across business units in innovating and commercialising new technology.

Teece (2009) argues that decentralisation may bring the top managers closer to the frontiers of new technological development and markets and enable them to adapt to changes in the external environment through building dynamic capability. Roepke and Agarwal (2000) suggest that in the present era of information and knowledge, the leadership mode needs to be changed from command and control towards collaboration to encourage the participation of the knowledge worker through their competencies. Sambamurthy and Zamud (1999) found that IT governance, an IT decisions, rights and

rules, have a significant impact on the capability of a firm to direct and coordinate their IT capability. Senge (1997) also suggests that a top-down approach to control does not foster a spirit for employees at all levels of organisation to engage with courage, intelligence, patience and commitment, to contribute to organisational prosperity. Roepke and Agarwal (2000) conclude that the collaborative approach facilitates the empowerment of people at lower levels of the organisation.

Majchrzak, Rice, Malhotra, King and Ba (2000) investigated the process of technology adaptation within the context of an inter-organisational network where virtual teams are situated across geographically distant locations. They found that the ability of leaders to control the adaptation process is critical for successful technology adaption. They highlight the importance of thoughtful choice of managers to select appropriate technological structures that will be suitable and adaptable within the context of existing technology infrastructure and encourage managers to create an environment to openly discuss the various constraints to adaptation. Teece (2007) concludes that, the excellence of organisational processes, routines, decision rules and leadership roles in evaluating new investment scope, is a fundamental prerequisite for achieving success in intercepting new opportunities successfully. Resource and asset alignment and co-alignment should not be constrained by the biases or valid procedures that are created through the experience of previous success. To perform alignment and adaptability it is important to achieve ambidextrous practices within organisations.

Ambidextrous roles of managers

Lavie, Stetter and Tushman (2010) suggest that in order to gain a balance between exploration and exploitation, managers may undertake proactive management through manipulating organisational structural forms such as creating a separate structure permanently or temporarily. However, other methods of achieving this balance remain less understood, and the association of proactive effort and balancing effort also remains under-examined. The authors suggest that ambidextrous managers play a critical role in this uncertain condition through providing supportive systems and strategic decisions to choose between exploration and exploitation in any domains.

Senior managers' behavioural capacity to achieve alignment and adaptability simultaneously is regarded as contextual ambidexterity (Gibson & Birkinshaw 2004). Prasertsakul (2013) defines alignment as the resemblance of all organisational activities to achieve a common goal, whereas adaptability refers to the ability of a firm to reconfigure organisational activities to meet the changing demand of the external environment.

Alignment is important for firms that operate in a relatively stable market environment, whereas adaptability is critical for firms in more dynamic and unstable environments (Ireland & Webb 2007; Gibson & Birkinshaw 2004). Prasertsakul (2013) mentions that the contextual ambidexterity view advocates that individual managers can deliver maximum value to their existing customers from their own functional area, and at the same time need to keep a strong alertness to the external environment for any changes requiring immediate response. Contextual ambidexterity helps a firm to achieve coordination through adopting a dual structure or business unit (Prasertsakul 2013). Prasertsakul (2013) finds that senior managers need to foster alignment and adaptation of current operational processes with the emerging technologies to pursue contextual ambidexterity. Finally, Vollery, Mueller and Siemens (2013) observe that ambidextrous individual managers foster collective learning through encouraging collaborative partnerships with strategic partners, research institutes, and working together with the employees.

Lavie, Stettner and Tushman (2010) find that risk-averse behaviour, performance feedback and the past experience of senior managers, are key antecedents for senior management teams to perform a balance between exploration and exploitation activities. Lavie, Stettner and Tushman (2010) note that there is an insufficient measurement of the effectiveness of ambidexterity (He & Wong 2004; Lin et al. 2007). As a result, the appropriate mode that may ensure an effective equilibrium of exploration and exploitation remains obscure (Lavie, Stettner & Tushman 2010). This tension is further prominent in the empirical study of Bocanet and Christina (2012) where they concluded that it is not possible for firms to find a perfect balance between exploration and exploitation. O'Reilly and Tushman (2008) argue that ambidexterity offers difficult managerial challenges and needs execution in the appropriate strategic context to attain sustainable competitive advantage through complex organisational design.

Next distinctive managerial attributes that facilitate dynamic capabilities building are discussed.

2.3.2 Managerial attributes in building dynamic capabilities

Scholars have attempted to identify distinctive managerial attributes that are required to perform dynamic capabilities in a turbulent external environment (Gavetti 2005; Sirmon & Hitt 2009). Managerial capabilities play a key role in applying dynamic capabilities to the operational capabilities of firms (Helfat & Peteraf 2003). Managers from different layers of the organisational structure have to perform distinctive roles in pursuing the institutionalisation process of dynamic capabilities within organisational routines (Menguc

& Auh 2006). Dynamic managerial capabilities play a key role in applying dynamic capabilities to the operational capabilities of firms (Helfat & Peteraf 2003). In doing so, managers have to make critical decisions about existing resource configuration and organisational skill set, to align with the intended capability building, considering changes in the external environment. The variation of performance between two firms may vary due to the quality of decisions that managers will make during the transitional phase (Gavetti 2005).

Adner and Helfat (2003, p.1012) propose that '*dynamic managerial capability*' is comprised of three underlying factors: managerial human capital, social capital and managerial cognition. They define the term '*dynamic managerial capability*' as:

> *'Dynamic managerial capabilities are the capabilities through which managers build, integrate and reconfigure organisational resources and competencies.'*

Adner and Helfat (2003, p.1013) identify that assessment of '*correct courses of action*' by managers varies during the time of uncertainty across firms, which eventually leads different managers to take different strategic decisions. Rosenbloom (2000) uses the example of NCR Corp. to demonstrate how the company managed to change successfully during different technological changes in the digital image industry, and further argue that individual leadership capability is a vital element for the organisation to apply dynamic capability in pursuing change. In similar vein, Tripsas and Gavetti (2000) give the example of Polaroid where the senior managers failed to guide the organisation in a time of rapid technological change, which eventually caused the organisation to fail in their core product. Hatum and Pittigrew (2004) mention that during a time of environmental change, or changes in the market, managerial capability is an important antecedent for achieving organisational flexibility. They argue that new managerial capability is required to achieve success during environmental turbulence.

Next, three key managerial attributes namely, managerial social capital, managerial human capital and cognitive skills of a manager are discussed in more detail.

Managerial social capital

Managerial social capital reflects a manager's ability to gain and access vital resources through exploiting personal connections and relationships (Adler & Kwon 2002). Empirical studies demonstrate that managerial social capital acts as a positive catalyst for organisations to attain organisational resources and capabilities and creates an impact on organisational performance (Uzzi 1996; 1997; 1999; Kale, Singh & Perlmutter 2000; Peng

& Luo 2000; Rowley, Behrens & Krackhardt 2000; Renko, Autio & Sapienza 2001, Acquaah 2007). According to social capital theory, actors such as individuals, the community or organisations can create value or receive a benefit through accessing critical resources that are embedded into network relationships (Lin 2001). Lin, Cook and Burt (2001) defines social capital as the accumulated resources that an individual or organisation can derive because of personal or social network relationships. Managerial social capital therefore is denoted by the managerial capability to access resources through their network relationships (Adler & Kwon 2002).

Managerial social networks can act as a bridge to connect organisations with informational channels, resources and opportunities, which can be leveraged to create firm-specific advantage (Gargiulo & Benassi 2000). Moreover, the formal and informal network ties of managers allow them to collect vital information for effective decision making (Geletkanycz & Hambrick 1997). Kor and Mesko (2013) point out that the nature of interactions between managers and their network members such as friends, mentors or colleagues have a significant impact on the managerial ability to construct perception, and formulate meaningful interpretation, of the information about the external environment that eventually helps them to determine feasible organisational goals and actions. Salvato and Vassolo (2017) suggest that managerial interpersonal interactions act as an important factor for building dynamic capabilities. Mintzberg (2009) mentions that conversations with colleagues and friends inside and outside of the firm can place managers in a better position to focus on appropriate external or internal stimuli, strategic directions for collecting additional information, and effective ways of processing data to generate logical outcomes. As a result, knowledge and interpretive lenses that managers acquire through network relationships help them to develop their beliefs and expectations for the firm (Nahapiet & Ghoshal 1998).

Relationships with government officers and managerial social capital that is developed through online social networks can be very useful for the firms. Talukder, Quazi and Djatikusumo (2013) find that virtual social networks such as Facebook have a positive influence on the attitude of individuals in incorporating ICT innovations within the organisation, in the context of SMEs in Indonesia. They suggest that virtual networks can provide several advantages to the organisations, such as low cost and faster communication, increased exposure and coverage, identifying new opportunities, accessing new markets and overcoming the limits of geographical boundaries. In their seminal work Peng and Luo (2000) have shown that, in an emerging market such as China, managerial networking with the top executives of other firms and government officials, results in improved

organisational performance. In similar vein, Acquaah (2007) through examining the context of a developing country in Africa, namely Ghana, found that managerial networks and ties with a diverse range of personal contacts or organisations, including competitors, customers, suppliers, government and bureaucratic organisations, politicians, regulatory bodies, trade or employee associations, and community organisations and institutions, can facilitate building dynamic capabilities. Luo (2002), on the other hand, empirically validated the moderating role of strategic proactiveness on the relationship between industrial dynamics and managerial networking through conducting a single case study based on 364 firms in an emerging market, China. The study suggests that managers tend to increase their networking with the executives of suppliers, buyers, and competitors, as well as government officials, as the competition, regulation and uncertainty in their industries increases. The study implies that firms in emerging markets face stronger regulatory and competitive pressure; therefore, the networking activities of managers aims at sharing resources more effectively in a fast-paced industry with a high degree of uncertainty and volatility.

Rowley et al. (2000) identify that the degree of influence of strong social ties on firm performance depends on the context of the industry. Despite the positive findings around social ties and firm performance, the empirical findings also suggest that strong social ties also can act as an inhibitor in progressing organisational activities and learning resulting in a negative impact on firm performance (Gargiulo & Benassi 2000). Occasional interactions are identified as weak ties, and frequent interactions between firms are defined as strong ties (Powell & Grodal 2005). Partners with strong ties may converge into a self-organising network and this can be effective in exposing firms to external knowledge sources. However, strong ties may force individual firms into a path-dependency situation where there is a similar conception of reality, and new ideas external to the network are resisted. Strong ties may also cause 'network locking' through a high institutional cost to exiting from the network (Agarwal & Selen 2009).

Considering the context of ICT firms, Infosys encourages rich social networks for its employees to foster knowledge sharing through encouraging a culture of 'asking question' using an online portal, email or informal discussion (Garud & Kamaraswami 2005). Employees around the world have access to these portals and can share their views with a quick response. Moreover, Infosys attempts to strengthen their informal network through deploying a tool called People Knowledge Map which records the area of specialisation of the internal employees so that they can be traced easily if needed by any projects within the company. This tool not only connects different communities with the respective knowledge

base but also helps the new employees to get accustomed to the knowledge management network within the company. At Infosys, rotation of young team members across the projects is evident while experienced members remain with the team. This rotation and effective transfer of knowledge of idiosyncratic technologies, tools and client requirements, facilitates the organisation to govern the formal processes of knowledge sharing in parallel with the informal one (Garud & Kamaraswami 2005).

Daft (1986) argues that collaboration can engage core employees in the process of innovation and can be an implementation strategy of innovation. The managers of Indian ICT companies are cooperating with various external parties such as government agencies, international bodies and universities, to create the scope of collaboration. Holzweber et al. (2012) find that managers have identified collaboration as a potential mechanism to pursue growth and, as a result, the ability of the managers to effectively manage their collaborative relationship with clients, or even direct competitors, is very critical. Collaboration offers the companies the opportunity to share the cost and risk of the projects. Indian ICT companies often cooperate with their competitors in pursuing growth, market share and self-interest with a focus on outsourcing decisions, outsourcing outcomes and dynamic interactions between firm capabilities and outsourcing (Holzweber et al. 2012; Oshri, Kotlarsky, Rottman & Willcocks 2009). Holzweber et al. (2012) find that Indian ICT companies compete symbiotically with their competitors, in that they compete with their competitors at the same time as collaborate with them. The authors find that medium-sized companies collaborate with IBM and often attempt to compete against them through offering competitive bids. This approach helps the companies to stay connected with the business environment.

Leading Indian companies have pioneered forming IT-groups to manage business functionalities keeping a close connection with the client's business processes (Holzweber et al. 2012). Holzweber et al. (2012) state that engagement with the business network is very important and managers can harness the advantage of network involvement through different kinds of tools and technologies, such as knowledge repositories, databases and decision support tools, to help managers overcome the hierarchical constraints of the organisational structure.

Managerial human capital

Managerial human capital is the ability of managers to combine their knowledge, skill and innovation capacity (Bontis, Keow & Richardson 2000). Hatum and Pittigrew (2004) suggest that the diversity and heterogeneity of the background and experience of managers

facilitate organisational capability to adjust with the competitive environment. Managerial human capital is the managerial skills sets and knowledge that are developed by their personal and professional experience and education (Castanias & Helfat 2001). Diverse contextual background, experience in different industries, technological regimes or geographic locations facilitate managers to access and develop specialised skills and knowledge (Kor 2003). Wright, McMahan and McWilliams (1994), from the perspective of the resource-based view, argue that in certain contexts organisations can generate sustainable competitive advantage through achieving a pool of human capital.

In today's rapidly changing and fast-paced business environment human capital can be considered as a strategic resource for organisations to remain competitive, as employees' knowledge and skills are critical (Subramaniam & Youndt 2005). Holzweber et al. (2012) mention that Indian multinational companies such as Infosys, Tata Consultancy, and Wipro keep a global perspective in recruiting and are ready to recruit talented skilled personnel from any part of the world. Hitt, Ireland, Camp, and Sexton (2001) argue that human capital addresses the issues of whether an employee has the necessary combination, and level, of knowledge and skill to perform a task that they are assigned to do. Hsu and Wang (2012) note that organisations that operate in the area of advanced technology require employees with a high degree of knowledge and skills to solve problems efficiently and to make effective decisions.

The individual programmer or software developer is a key success factor in delivering ICT business services (Holzweber et al. 2012). Holzweber et al. (2012) identified a lack of local educational standards as a main reason the top Indian companies, such as Infosys, Tata Consultancy or Wipro, are ready to recruit software engineers from global markets. Feeny and Willcocks (1998) introduced the term 'core Information System (IS) capabilities' to shed light on the human skill aspect of ICT service companies, including recruitment of staff for high performance ICT functionalities. Indian companies often recruit talented skilled personnel to acquire capabilities to manage complex business processes. Infosys has a strong focus on their human capital and is one of the few companies in the world that reports human capital in its balance sheet (Garud & Kamaraswami 2005).

Next managerial cognitive ability is discussed.

Managerial cognitive ability
According to Gary and Wood (2011) strategic management research primarily investigates the heterogeneity of managerial cognition through analysing how mental activities utilise the information structure. Helfat and Peteraf (2015) illustrate two aspects of 'cognition':

mental activity and mental structures. The latter has been concentrated heavily in management research, coining the term 'knowledge structures'. Barr, Stimpert and Huff (1992) called mental structure 'cognitive maps', whereas Kaplan (2008) calls it frames and Prahalad and Bettis (1986) coined the term 'mental models', to represent the mental structure of managers. With an aim to link managerial capabilities and mental activities, Helfat and Peteraf (2015, p.10) define managerial cognitive capability as '*the capacity of an individual manager to perform one or more of the mental activities that comprise cognition*'. Helfat and Peteraf (2015) introduce the notion of managerial cognitive capacity as the capability of managers to perform certain mental capabilities. Helfat and Peteraf (2015) identify that cognitive capabilities strengthen dynamic managerial capabilities for sensing, seizing, and reconfiguring, along with the scope of their impact on a firm's strategic decisions. With the recognition of diverse types of cognitive capabilities, Helfat and Peteraf (2012) analysed attention and perception about sensing, problem solving and reasoning, about seizing and language, communication and social cognition, with regard to the reconfiguring phenomenon.

The association between mental representation and mental actions are complex because of the possibility of modification, retrieval or generation of the mental representations when an individual carries out the mental activity (Helfat & Peteraf 2015). This can be demonstrated with the case of computer programmers engaged in problem solving, where the programmers repeatedly retrieve an accurate mental model (Ericsson & Lehmann 1996). The authors further found support for the argument that expert computer programmers initiated their task by having an initial depiction of their design and then modify this accordingly. Helfat and Peteraf (2015) assert beliefs, values, motivations and other mental states to be other key subjects that an individual relies on while performing mental activities. Zollo and Winter (1999) argue that managerial cognition facilitates selecting and approving promising creative initiatives that aim at replicating or diffusing across the organisational boundary, however at the same time they also highlight that cognition can also contribute to the rigidity of the system. Finally, individual-level factors such as managerial commitment (Ambrosini & Bowman 2009) and path dependency (Teece 2007; Ambrosini & Bowman 2009; Schreyogg and Kliesch-Eberl 2007) may act as facilitators or inhibitors in building dynamic capabilities.

The next section will provide a discussion on the organisational factors affecting building dynamic capabilities.

2.4 Organisational factors affecting dynamic capabilities building

The process of executing dynamic managerial capabilities requires an appreciation of the individual and organisational factors that enable managers to make critical decisions during environmental turbulence, as well as the detailed processes or courses of action that are critical for the effective implementation of the capability-building decisions (Adner & Helfat 2003; Helfat & Peteraf 2003; Gavetti 2005; Helfat & Winter 2011). Critical organisational factors such as organisational structure, culture, absorptive capacity and organisational memory may have a significant impact on organisational dynamic capabilities.

Organisational structure is one of the key issues in building dynamic capabilities through successful reconfiguration. Eisenhardt and Martin (2000) stress the importance of ensuring an organisational structure being capable of transformation. The authors advocate that modularity within the organisational structure enhances the likelihood of successful transformation. Teece (2009) recommends decentralised organisational structures, with more autonomy for managers to perform entrepreneurial activities in rapidly changing external environments. Teece (2009) further notes that organisational structure, decision rules, incentive systems, and managerial autonomy are critical factors that facilitate performance of entrepreneurial activities. However, Chen and Xu (2011) favour adaptive governance mechanisms, where the internal governance of an organisation has the capability to align and adapt with the change processes that innovation processes require. Owen, Goldwasser, Choate and Blitz (2008) suggest two alignments: vertical alignment to convert the innovation objectives of a business strategy into an organisational strategy through developing a roadmap, and horizontal alignment which refers to the re-organising of business processes and organisational resources to carry out strategic priorities. Chen and Xu (2011) found that through engaging in a collaborative, innovative environment, firms learn the critical capability to manage their own innovation of adaptive governance mechanism. Finally, Arndt, Fourné and MacInerney-May (2018) find that in pursuing organisational learning formalisation has a significantly positive affect whereas routinisation and centralisation has a negative effect on dynamic capabilities.

Makadok (2001) states that in designing and constructing dynamic capabilities within an organisation, structural factors play a critical role. Moreover, Lavie, Stettner and Tushman (2010) find that organisational structure is a key organisational-level antecedent to perform an effective balance between exploration and exploitation. Brown and Eisenhardt (1997) suggest a counterintuitive view of the role of organisational structure in performing successful innovation. Contrary to the popular view that an organic structure facilitates

innovations, they find that an effective balance between an organic and a mechanistic structure with clear and well-defined managerial roles, responsibilities and priorities that are communicated via extensive communications may deliver better results in pursuing effective change. Schreyogg and Kliesch-Eberl (2007) identify structural inertia as a key capability-rigidity driver that can cause significant constraint for managers. O'Reilly and Tushman (2008) argue that in order to attain the core objectives of dynamic capability, senior managers need to proactively grab potential opportunities through successful integration of new assets within existing asset portfolios in order to overcome organisational inertia and path dependencies. Through their empirical study on manufacturing firms in India, Ray and Chakrabarti (2006) find that organisational inertia has a negative influence on strategy and performance. They define organisational inertia as active constraints on pursuing strategic change. Considering that organisational inertia consists of two variables (initial size and age), they found that both variables have a significant negative effect on profitability and market performance. It should be noted that their study analysed only manufacturing firms, and service firms are intentionally excluded from the sample. In an empirical study on pharmaceutical companies in an emerging country, Argentina, Hatum and Pettigrew (2004) find that the companies with more centralised organisational structures performed better in conducting innovative activities, which is contrary to the findings from developed economies. They suggest that the difference may arise due to the high volatility of the economy of Argentina.

Firms develop their knowledge base incrementally through practices. These practices are converted into organisational routines and create organisational memory. An organisation which can exploit its memory through leveraging knowledge-management practices may become more innovative in practice in addressing problem solving or pursuing innovation (Hargadon & Sutton 1997). Innovation can occur from a routine application of organisational memory (Nelson & Winter 1982). Following the organisational memory perspective, Walsh and Ungson (1991) argued that the acquisition, retrieval and storage of information are the routines that support organisational memory. Organisation memory is defined further as the stored information of organisational history which can be utilised to make decisions at the present (Hargadon & Sutton 1997). However, Alavi and Tiwana (2002) demonstrate that organisational knowledge is stored in both tacit and explicit forms, and if the degree of the tacit form of knowledge is higher, it makes the codification of organisational knowledge difficult. Alavi and Tiwana (2002) argued that the effective transactive memory system of an organisation enhances the team members' capability to contribute knowledge and improve task performance. It is important for organisations to

possess an absorptive capacity to integrate external knowledge that may have a significant impact on dynamic capabilities building.

Absorptive capacity is defined as the organisational ability to accumulate external knowledge and to integrate that external knowledge within existing resources and capabilities to pursue innovative initiatives (Van den Bosch et al. 1999). Empirical studies on this theme suggest that absorptive capacity increases the speed, rate and scale of innovations and, at the same time, the innovation outcome contributes to the knowledge base and the absorptive capacity of the organisation (Helfat 1997). Managers with more diverse and heterogeneous expertise improve the absorptive capacity of an organisation during changes in the external environment (Calori, Baden-Fuller & Hunt 2000). Absorptive capacity facilitates incremental innovation because firms draw such innovation from their existing knowledge base (Anderson and Tushman 1990). Several researchers suggest that radical innovation involves a new combination of knowhow and existing technologies (Kogut & Zander 1992; Van den Bosch et al. 1999). Although absorptive capacity explains the fact that an organisation needs to adapt external knowledge in order to remain competitive in the market, it does not explain how organisational learning can be converted into organisational performance. This is because the main focus of absorptive capacity is on the dynamic and combinative capabilities of the knowledge-creation process (Kogut & Zander 1992; Van den Bosch et al. 1999), therefore it is considered as an organisational factor affecting the dynamic capability-building processes (Martin 2011).

Barney (1986b, p. 656) defines culture as "a set of core managerial values that define how they conduct business". Zollo, Minoja and Coda (2017) suggest that culture can support, or hinder deployment of multiple strategic choices made in different organisational domains in an effort to respond to the changes in the external environment. Organisational culture has an important effect in building dynamic capabilities through facilitating contextual ambidexterity (Wang & Rafiq 2014; Yang & Atuahene-Gima 2007) and, in association with organisational structure, leadership roles and strategies (Simon 2010). Simon (2010) argues that organisational culture that supports contextual ambidexterity is highly inimitable, needs considerable time to develop and is critical to the business unit, and the author recognises such organisational culture as a casually-ambiguous organisational resource. Further Yang and Atuahene-Gima (2007) state that an organisational culture that supports contextual ambidexterity enhances a business unit's performance by facilitating integration of exploration and exploitation capability. Drawing data from 150 UK and 242 Chinese high-tech companies, Wang and Rafiq (2014) note organisational culture plays a critical role in enabling contextual ambidexterity that eventually fosters new product

innovation. The authors further reveal that an ambidextrous organisational is a higher-order construct consisting of organisational diversity and a shared vision. Additionally, through conducting an empirical investigation among the business leaders in Australia, Simon (2010) reveals organisational culture as a critical dynamic capability, along with leadership and strategic thinking, that enables building, integrating and reconfiguring organisational resources in a turbulent environment. Finally, Hawass (2010) suggests that embedding a culture of change and transformation within the organisation's social environment fosters pursuing innovation that will assist in managing internal social friction that may arise due to transformative initiatives (Capron & Mitchel 2007).

Next consequences of dynamic capabilities are discussed.

2.5 Consequences of dynamic capabilities

Scholars are divided about the consequences of dynamic capabilities on firm performances. Barreto (2010) identifies four kinds of relationship. Firstly, the direct relationship as advocated by Teece, Pisano and Shuen (1997), and Teece (2007; 2009) that dynamic capabilities are directly linked with the sustainable competitive advantage of firms in a rapidly changing environment. Secondly, Eisenhardt and Martin (2000), expressing doubt on this direct linkage, stress that creation and sustainability of competitive advantage will depend on the resource configurations that are a result of effective application of dynamic capabilities, and that during a rapidly changing external environment the duration of competitive advantage will be very short. As a result, they suggest that firms have to continuously create temporary advantage to sustain competitive advantage. Thirdly, Zollo and Winter (2002) argue that the performance outcomes of dynamic capabilities may be generated through the successful reconfiguration of operational capabilities considering changes in the external environment. Finally, Ambrosini and Bowman (2009) suggest dynamic capabilities may create negative performance outcomes as managers' perceptions of the context of the external environment may not be accurate enough to apply dynamic capabilities effectively.

Teece (2009) argues that the effective orchestration of these capabilities will lead to successful innovation and superior financial performance through capturing sufficient value. Teece (2007) mentions that in order to sustain performance through successful revitalisation during unstable external environments, successful firms eventually create hierarchies and procedures to restrain behaviours and interactions that may create constraints to future reconfiguration. Teece (2007, p.1344) warns that '*Excessive internal change for the sake of it can lead to internal chaos and performance failure*'. Eisenhardt and

Martin (2000) note that, during a rapidly changing marketplace, dynamic capability relies on temporary advantage (the logic of opportunity) to create competitive advantage. As dynamic capabilities are unstable processes, this practice is challenging to sustain over a longer time span (Eisenhardt & Martin 2000).

Managers face serious challenges in making appropriate decisions during rapid changes in the external environment. For example, Wang and Ahmed (2007) suggest that during environmental uncertainty managers face challenges of deciding whether to remain committed to one decision or to building a high degree of adaptive capability. Additionally, Ambrosini and Bowman (2009) find that each option has its own associated risk as the first option will deteriorate firm performance, if the selected courses of actions are wrong, whereas the second option will be costly for firms if competitors can adapt faster, and at a lower cost, or if their competitors do not face additional costs in maintaining capacity for adaptation and organisational flexibility to changes. Helfat et al. (2007) suggest two key performance indicators to measure the performance of the dynamic capabilities of firms. Firstly, technical fitness should be taken into consideration to assess whether the firm is maintaining its capability through a continuous process of learning to remain at the forefront of the technological development. Technical fitness has to consider the cost of capability. Secondly, the ability of the organisation to deliver superior performance through successful completion of tasks should be considered as evolutionary fitness. The evolutionary fitness will consider whether the organisation is successful in modifying its resource base and operational capability to address changes in the external environment. Martin (2011), in his research on the role of general managers of six IT companies in the US, considers technical fitness, market demand, competitive advantage, financial performance and evolutionary fitness as the outcomes of dynamic capabilities. The author applies financial measures such as productivity (revenue per employee), earning before income tax, and sales, as objective and salient measures to identify the relative performance among the cases.

Doving and Gooderham (2008) find a significant impact of dynamic capabilities on the ability of small accounting firms in Norway to perform related diversification through successfully increasing their scope of service offerings to clients. Peteraf and Barney (2003) suggest a deeper understanding about different performance matrixes and their uniform application to clarify the linkage with dynamic capability and firm performance. Gottschalg and Zollo (2007) identify that the capacity to align incentive mechanisms continuously as dynamic capability, and it is an important capacity of a firm to protect rent creation and enhance performance. Agarwal and Selen (2009), considering the context of service firms,

operationalised the performance outcomes of different dynamic capabilities within the organisational boundary as an Elevated Service Offering (ESO) with three sub-constructs: Strategic ESO, Productive ESO and Operational ESO. The authors have found a positive relationship between dynamic capabilities and firm performance in a service value network environment. Furthermore, Capron and Mitchell (2009) consider the firm's effectiveness in creating new capability as a mediating variable between the capability gap and different internal social and technical constraints and the dependant variable named 'firm's survival in long term'. In their study, they use this variable to measure effectiveness across three capabilities of the telecommunication firm, which belongs to the broader ICT industry, namely, R&D capability, marketing capability and information technology capability.

Considering the context of technology-based industries, Teece (2007) states that the return of value from a certain technology may depend on the possession of technologies and their products, and the technology strategies of the market participants. Teece (2007) suggests integrating both external and internal knowledge bases to succeed in the dominance of systems and networks in the business ecosystem. Creation of learning mechanisms, knowledge-sharing practices, mature processes and procedures of knowledge integration, are critical for business performance as well as key micro foundations of dynamic capabilities (Chesbrough 2003; Teece 2007). Holzweber et al. (2012) identify five issues that demonstrate the unique aspect of sustaining business performance over a long period of time for ICT off-shoring companies. Firstly, achieving the enhancement of the co-creation of ICT services and, secondly, emphasising activities that enhance value for the customers. Thirdly, new customers are approached following a global operational approach. Fourthly, having a continuous focus on identifying new markets such as the Asia-Pacific region and, finally, through converting new customers into loyal customers. Dynamic capabilities, especially information exchange and coordination, play a critical role in achieving these objectives for sustainable business performance. Moreover, dynamic capabilities, along with the client-driven approach, maximise ICT service excellence for both ICT service providers as well as the clients.

The DCV offers a valuable theoretical and empirical contribution to the development of the notion of sustainability in strategic management literature. Scholars of the DCV attempt to uncover: organisational sustainable performance (Jacobides, Winter & Kassberger 2012; Teece, Pisano & Shuen 1997; Eisenhardt & Martin 2000; Smith & Tushman 2005; Teece 2009); strategic sustainability and sustainable competitive advantage (Teece 2009; Ambrosini & Bowman 2009); stakeholder sustainability (Foerstl, Reuter, Hartmann & Blome 2010), sustainable improvement (Renaud, Narkier & Bot 2014), proactive

environmental sustainability (Lawton & Rajwani 2010), and, recently, sustainable supply chain development (Chowdhury & Quaddus 2015). Furthermore, Castiaux (2012) suggests that intensification of the green strategy has an impact on the capability dynamization. The authors further added that integration of environmental dimensions within a firm's strategy considering the stakeholders and different concerned actors, challenges the existing resource and capability portfolio as existing dynamic capabilities are to be replaced with new dynamic capabilities. Clearly, scholars have been applying the DCV to obtain deeper insight into corporate sustainability through various empirical settings. Jacobides, Winter and Kassberger (2012) suggest that total wealth created by a firm during the entire course of industry evolution is more important than generating sustainable profit over the period because, as an industry grows, the price and cost margin becomes marginal. Therefore, the authors suggest paying more attention to the adjustment process of profitability over time rather than attempt to achieve sustainability of profit over time. Zott (2003) reveals that cost associated with resource deployment, and learning how to deploy resources, affect the long-term sustainability of firm performance, especially in cases when a firm purposefully refrains from pursuing reconfiguration of resources due to cost associated with the reconfiguration. Drawing on evidence from General Electric corporation and Intel corporation, Hodghinson and Healey (2011) argue that firms need to pursue developing sustainable solutions supported by superior skills and capabilities. Through strong motivation, Intel successfully transformed itself as a digital platform provider for the health, entertainment, and mobile industries while, with a strong focus towards sustainable innovation, General Electric corporation has succeeded in pioneering industry-leading green products. Finally, Wang and Rafiq (2014) state that, in the dynamic high-tech industry, the effective practice of contextual ambidexterity may deliver both short-term and long-term sustainable performance, as firms may often face situations where they must pursue finding new ways of creating revenue when consolidation realised as the only choice.

Tavani, Sharifi and Ismail (2013), from the perspective of dynamic capability, suggest that an agile supply chain enables firms to respond to changing and uncertain business environments to assist firms to sustain their position in the market place. Similarly, Chowdhury and Quaddus (2015) reveal that firms need to possess dynamic capabilities to adapt to the changing demand of the stakeholders allowing the firm to be more resilient in managing risk in the context of the global supply chain of the apparel industry. On the other hand, Renaud, Narkier and Bot (2014), from the evidence of ICT companies, propose an enabling enterprise architecture group that may play the role of facilitator in pursuing

sustainable improvement of organisational capabilities through executing change in a strategically-aligned manner with the business. Castiaux (2012) reveals that, through integrating environmental considerations within organisational strategies, ICT firms within the empirical enquiry, pursued innovative processes that delivered ecofriendly products, services and processes. Whereas, in order to obtain a favourable external environment to reduce uncertainty, proactive political strategies are a promising avenue to sustain economic rent generation processes, and shape public policy in accordance with the focal firm's interest and strategic fitness (Oliver 2008; Lawton & Rajwani 2010).

Ambrosini and Bowman (2009) acknowledge the DCV, over other fields addressing organisational change, as most the promising theoretical avenue with a strong focus on the organisational process of transforming resources in a persistent manner over time. Finally, Teece (2007 p.1320) emphasises that 'maintaining incentive alignment', possession of intangible assets, controlling cost, quality management, and efficient inventory management, may deliver superior performance, however, it may not be sufficient to sustain superior performance in the longer term. Firms may be able to deliver persistent superior performance if the diffusion of innovation is slowed because of the uncertainty in imitation (Lippman & Rumelt 1982).

This research does not aim to measure firm performance, however, a clear understanding about the measurement indicators applied in empirical investigation on performance outcomes of dynamic capabilities may be instrumental during the empirical investigation. Drnevich and Kriauciunas (2011) consider relative firm performance to capture the performance of firms through comparing the performance of the focal firm with different key indicators of the industry. Other scholars have used financial indicators such as sales growth, customer retention, return on investment, market share (Human & Naude 2009), performance sales growth, return on assets, return on sales, performance success, and growth success (Verdu´-Jover, Go´mez-Gras & Llore´ns-Montes 2006). On the other hand, Capron and Mitchell (2009) consider effectiveness in capability building as an indicator of the performance outcomes of a firm. Table 2.6 illustrates performance measurement from extant literature.

Table 2.6: Performance outcomes or consequences of dynamic capabilities

Performance outcomes or consequences of dynamic capabilities	
Relative firm performance	Relative firm performance at the process level (RFPP) Performance impact of ICT use relative to industry group average Organisational performance: the use of ICT and its related organisational changes in the last three years has impacted: - - Productivity Business process performance Quality of products or services Relative firm performance at the firm level (RFPF) Profitability relative to industry group average - how would you rate the profitability of your organisation? (Drnevich & Kriauciunas 2011)
Capability development	Firm's effectiveness in creating capabilities Technical capability gap Marketing capability gap Use of internal development vs. external sourcing based on firm's internal frictions Fit of targeted capabilities with internal systems, social acceptance of targeted capabilities (Capron & Mitchell 2009)
Financial measures	Performance sales growth, return on assets, return on sales, perform success, growth success (Verdu´-Jover, Go´mez-Gras, Llore´ns-Montes 2006). Sales growth, customer retention, return on investment, market share (Human & Naude 2009)

Service innovation	Elevated service offering (Agarwal & Selen 2009)
	     - Strategic
	     - Operational Performance
	     - Productivity

The next section will explicate the research gap and outline a conceptual framework to address this research gap.

2.6 Critique of Dynamic Capability View

The theoretical developments of the dynamic capability perspective have left some questions unresolved (Easterby-Smith, Lyles & Peteraf 2009; Ambrosini & Bowman 2009; Barreto 2010). There are debates regarding the origin, definition, nature, measurement, consequences and performance outcomes of dynamic capabilities (Ambrosini & Bowman 2009, Easterby-Smith, Lyles & Peteraf 2009, Barreto 2010). Ludwig and Pemberton (2011) point out that excessive attention to the monitoring of the external environment may undermine the significance of internally-originated obstacles that may impede the integration of dynamic capability-building practices within organisational routines.

Firstly, there are substantial arguments raised by scholars about the origin of dynamic capabilities. Teece (2009) has advocated distinctive organisational micro-foundations as the sources of dynamic capabilities, whereas others argue that dynamic capabilities may originate in the absence of organisation-wide micro-foundations and may emerge through managerial roles (Gavetti, 2005) and through collaborations (Agarwal & Selen 2009). The definition of dynamic capability has attracted criticism since the original proposal offered by Teece, Pisano and Shuen (1997). Williamson (1999) has argued that the definition of dynamic capability is tautological as the definition of dynamic capability is associated with

the successful attempt to reconfigure the resources and capabilities in accordance with the changes in the external environment, with little insight into how these successful efforts can be repeated in a different environmental context. Easterby-Smith, Lyles & Peteraf (2009), on the other hand, suggest that the definition of dynamic capability is too broad.

There is considerable confusion among scholars about the nature of dynamic capabilities, more specifically whether the construct 'dynamic capability' is defined as a latent variable (such as ability, capacity, or a facilitating device) or whether dynamic capabilities are an ingredient of processes, routines or behavioural patterns of organisations (Stefano, Peteraf & Verona 2009). The authors mention that the degree of observability is different in latent and constituent variables that challenges the empirical identification of dynamic capabilities (Stefano, Peteraf & Verona 2009). Latent actions cannot be observed until that are performed, whereas the constituent elements are normally tangible or can be tracked or observed (Helfat et al. 2007).

Easterby-Smith et al. (2009) state that dynamic capabilities cannot be observed and must be determined by other indicators. As dynamic capabilities are applied on the operational capability they cannot be observed if there is no change happening, and at the same time the change processes need to be completed to measure the application of dynamic capability (Ambrosini & Bowman 2009). One of the possible solutions for this problem is to perform a longitudinal study to capture the impact. Helfat et al. (2007) suggest that research on dynamic capabilities that takes a process orientation should establish a linkage with action. Ludwig and Pemberton (2011) warn that managers may face significant challenge to attain flexibility due to powerful path dependency to enact the change initiatives across the organisational boundary. At the same time stakeholders may also expect managers to make immediate and rapid decisions to respond to the changes in the external environment without having deeper insights into the path dependency of the focal organisation. Ludwig and Pemberton (2011) finally conclude that path dependency should be considered as a detrimental element within the wider context of dynamic capability literature and that path dependency exposes the scope of contradictions and limitations of dynamic capabilities to be executed effectively within the context of an organisation. The scope of generalisability of the prescriptions offered to managers based on dynamic capability view's theoretical underpinning is also an avenue for further scholarly research.

Regarding DC tools as a universal solution has resulted in an excessive range of hypotheses, propositions and managerial prescriptions that often lack sufficient empirical evidence (Schreyögg & Kliesch-Eberl 2007). Ludwig and Pemberton (2011) find that a common

theme across the dynamic capabilities literature is that through increasing capability reconfiguration processes, loosely guided by the external environment, monitoring activities will deliver success in high velocity environmental conditions. They add that the propositions of dynamic capabilities are difficult to generalise across industries. The authors find empirical evidence from the steel industry in Russia that the speed of resource depreciation plays a critical role in managerial decision-making.

Consequences of dynamic capability are not convergent based on empirical investigation. The key proposition of dynamic capability is to maintain relevance with the external environment, however this may not always lead to superior performance, particularly if the direction of the firm's external environment is leading them in the wrong direction. Ludwig and Pemberton (2011) demonstrate within the context of the Russian steel industry that managers engage in resource renewal initiatives in response to radical depreciation of the value of the resource, however, the authors also suggest that managerial engagement in resource renewal activities may not guarantee their successful implementation. Girod and Whittington (2017) reveal that based on dynamic panel data analysis of large U.S. corporations between 1985 and 2004, during dynamic environmental periods, reconfiguring initiatives are associated with positive performance whilst restructuring initiatives result in negative outcomes. They add that in general, persistent restructuring is associated with positive outcomes and limited reconfiguration results in negative consequences. The authors consider restructuring as a fundamental change in organisational principles with irregular frequency while reconfiguration refers to frequent incremental changes within an organisational boundary. They suggest choosing appropriate organisational reform based on the rate of change in the external environment. Ludwig and Pemberton (2011) assert that the purpose of dynamic capability may not necessarily be to generate competitive advantage, but to assist organisations to survive during specific external environmental contexts. The authors further state that dynamic capability building processes alone may not result in sufficient drive to achieve this goal, however, development of suitable and appropriate responses based on deeper understanding of the complexity of the external environment may reduce uncertainty during recurring strategic challenges.

Zollo, Minoja and Coda (2017) discuss dynamic capabilities (Teece et al. 1997; Zollo & Winter 2002; Helfat et al. 2007) as adaptive change that requires integration across different strategic options through initiating and deploying organisational changes to addresses strategic issues relevant to different classes of stakeholders. The authors considered dynamic capabilities as processes to develop shared representation and

explanation of events occurring in the external environment in order to effectively prioritise the potential strategic interest and relevance of the company. Dynamic capabilities include processes of searching for potential solutions to issues that are of serious concern, selecting from the alternative courses of action through experimentation, tailoring and adjusting the solutions within the local context and finally scaling the best options across the organisational boundary (Zollo et al. 2016). Ludwig and Pemberton (2011), clarify that institutionalisation of respective internal processes, either through building new routines or pursuing radical renewal, may drive dynamism that needs to be addressed through rapid decision making.

2.7 Dynamic capabilities building research in the small and medium sized companies

Scholars have investigated the process of building dynamic capabilities within small and medium sized enterprises (SMEs). SMEs possess distinctive characteristics to large enterprises, and therefore the process of building dynamic capabilities and the consequences are also unique in nature. Carlos (2011) suggests that SMEs are generally considered as resource-trapped when compared with the large corporations. Furthermore, according to Lu and Beamish (2001), there is a general belief that due to resource scarcities there may be a limit to the ability of SMEs to act upon an identified opportunity in the international marketplace and be exposed to high risk and potential negative performance due to internationalisation. Several other authors, however, found that if firms could access rare or valuable resources through their social network relationships, resource-constrained SMEs may also achieve success in the international market place (Coviello & McAuley 1999) and through this process develop higher order capabilities (Zahara et al. 2006).

Based on an online survey of South African SMEs, Adeniran and Johnston (2012) reveal specific dynamic capabilities such as sensing, seizing and integrative capabilities that may assist SMEs achieve competitive advantage. Specifically, sensing capability assists SMEs to anticipate their customers' responses to changes in the external environment ahead of competitors. They go on to say that integrative capability assists SMEs to allocate resources effective to generate long term return, and that behavioural innovativeness or behavioural capability assists SMEs to build a culture that may able to embrace new ideas, processes and new strategies to achieve competitive advantage. The authors finally suggest that through effectively building dynamic capabilities SMEs can successfully transform internal resources and capabilities to maintain competitiveness in a context of changing external environments. Barbero, Casillas and Feldman (2011) suggest that SMEs need to achieve a

strategic fit between the resources and capabilities and the intended strategies to pursue growth in a rapid manner, however Man, Lau and Chan (2002) conclude that the long-term performance of SMEs significantly depends upon the entrepreneurial capabilities of managers.

Aramand (2009) based on the case study evidence of four high tech SMEs from South Korea, suggests that prior technological capabilities of the founders, social networking and cross-cultural relationship building capabilities, internal product design and development capability and outsourcing capabilities are the common denominators across all the firms in achieving global scale success in introducing new product. The author further suggests that this success may aid in generating competitive advantage in the global marketplace. Carlos (2011) concludes that to generate competitive advantage SMEs need to develop completely new higher-order capabilities which can be acquired through the social capital of the top decision makers. At the same time, an ability to respond efficiently and promptly to international challenges positively influences the international performance of the SMEs. Senik, Scott-Ladd, Entrekin and Adham (2011) suggest that to pursue internationalisation, networking is an important source of strategic intelligence for SMEs. The authors further explicate three key sources of networking for SMEs. They are relationships with the business associates, relationships with government institutions, and personal relationships. The authors recommend policy makers provide institutional supports to the SMEs to become successful in pursuing internationalisation.

2.8 Dynamic capability building research in the emerging economies

Scholars have conducted empirical investigations on dynamic capabilities building in companies in the context of emerging economies. Companies in emerging economies often face distinctive challenges, however, dynamic capabilities are proved to be relevant within the context to assist in sustaining with the changes arising in the external environment. Scholars have conducted investigations in companies from different industries within emerging economies as well as companies from different countries within emerging economies. Prahalad and Mashelkar (2010) found that Indian managers follow a distinctive approach to sponsor organisational changes to pursue effective transformation. Their approach encourages the inflow of ideas from a diverse range of sources, followed by a screening process to identify the perfect fit with the organisational capability and performance objectives, such as low cost. Managers apply cloud sourcing and information platforms to solve small problems using simple design tools, whereas big problems are

broken down into smaller issues to be solved with a similar approach. Garud and Kamaraswami (2005) provide practical evidence on how one of the leading ICT firms in India maintains agility in its software development practices. Since 2000, Infosys has been following an iterative model of software development which is a fluid and adaptive process that is particularly suited for complex projects in a rapidly changing environment. The iterative model parallels the development and deployment of the modules of the project where each team has to perform a specialised component of the project, at the same time as they perform an overlapping portion of a different module. Because of this intentional overlapping, key knowledge regarding development and deployment is shared across the project teams reducing risk due to employee turn-over, as well as fostering organisational learning (Garud & Kamaraswami 2005).

Infosys has successfully adopted the capability maturity model (CMM) (Carnegie Mellon University 2018) and currently operates at the level 5 of this model (Garud & Kamaraswami 2005). The CMM was developed by Carnegie Mellon University to deliver a framework to software development companies to assess and improve their software development processes. The CMM has a scale of 1 to 5 where each level is designed with a set of activities that may allow the companies to advance to the next level. Infosys, operating at CMM level 5, has the capability to quantify, measure and continuously modify its software development processes (Jalote 2000) and considers CMM level 5 as the fundamental guideline for organisation-wide learning and change (Garud & Kamaraswami 2005). The closure report of every project facilitates CMM adoption smoothly in the organisation. This report contains key issues that affected the project adversely and key learning areas that can be taken into the future from this project. This report helps the organisation identify the scope of improvement and apply knowledge to practice. Ultimately, CMM accreditation helped the company achieve superior operational performance resulting in greater customer satisfaction.

Garud and Kamaraswami (2005) identified that Indian companies have refashioned their customer relationship process through deployment of a creative approach to service delivery, along with the capability to perform complex tasks that result in significant advantage. These firms consider creativity as a driver of management performance and possess strong dynamic capabilities that act as a buffer between the resources held by the firm and its external environment. Holzweber et al. (2012) find that, in managing the supplier client relationship, information coordination and information exchange positively influence performance outcomes. Dynamic capabilities facilitate the co-production process

of service delivery through combining ICT resources and the capabilities of both client and ICT service suppliers.

Holzweber et al. (2012) argue that ICT service companies need to develop a strong capability of information exchange and inter-firm coordination to manage the client–supplier relationship effectively. Inter-firm coordination is explained as transaction-related activities between partnering firms, including the acquisition of partnering firms, competitors or clients to maintain competitiveness in the marketplace (Holzweber et al. 2012). The authors recommend information sharing and the sharing of critical knowledge of the market and customer preferences with their business partners for superior service delivery. At the operational level effective coordination and integration of tasks and activities that may involve complex procedures are keys to success (Pavlu & Sawy 2011). Holzweber et al. (2012) find that internal coordination is critical to ensure the appropriate environment for the innovation that may allow the employees to generate new ideas, as well as incorporate their ideas within organisational systems, followed by providing them with reward. A transparent feedback mechanism is critical to effectively integrate new ideas generated by employees.

In order to respond to changes in the requirements of clients, Indian ICT firms create change options, considering competitive forces (Holzweber et al. 2012). The execution of the change processes starts with creating an awareness of the change options and recognition of the users' need to change. Firms depend on their coordination capability to bring key clients into the process of developing and executing the change processes. In a study of Bangladesh ICT firms, Tija (2003) finds that most of the ICT companies in Bangladesh can be considered at level one of CMM. Some Bangladeshi ICT companies have already initiated the adoption of CMM in software development practices, however, the author recommends that to compete in the international marketplace it is important to reach at least CMM level three.

Lee (2012) reveals that firm level innovations are related to both internal and external knowledge flow. Based on the context of Malaysia, the author finds weak cooperation between innovative firms in Malaysia which may hinder the ability of these firm to capitalise upon the global technological pool successfully. Fearon, Yang, McLaughlin & Duysters (2013), within the context of Chinese supply chain management and based on empirical evidence, suggest the capability to improve relationships with Government officials (also known as Guanxi) is a dynamic capability and consider it critical for the Chinese companies to effectively perform service innovation. Becker-Ritterspach and Bruche (2012) find

evidence based on the case of a company from an emerging economy (Tata Motors Ltd), that business groups offer access to internal and external resources and capabilities in creation of internationally exploitable assets. They also found that business group affiliation allows buffering to the risk involved in exploiting internationalisation opportunities.

2.9 Research gap

Managerial roles in dynamic capability-building processes require further empirical findings (Gavetti 2005; Smith & Tushman 2005; Helfat & Peteraf 2015; Helfat & Martin 2015; Martin 2011; Kor & Mesko 2013; Agarwal & Selen 2009; 2013). Martin (2011) stresses that the leadership roles in creating dynamic capabilities require more empirical study to untangle the diverse roles of senior managers in building organisational-level dynamic capabilities. Similarly, Helfat and Peteraf (2011) recommend that an empirical study to investigate the managerial roles in building organisational-level sensing, seizing and reconfiguring capabilities, be conducted. Agarwal and Selen (2009; 2014) emphasise further research to understand the role of managers in building dynamic capabilities such as entrepreneurial alertness, organisational learning and agility in service organisations.

Wang and Rafiq (2014) highlighted the positive relationship of organisational culture in fostering new product innovation in the context of UK and Chinese high-tech industries and suggest further investigation of the role of organisational culture in new product innovation in the context of developing countries. Wang and Rafiq (2014) further suggest investigating organisational culture, within the social and performance management context, of organisations that foster organisational ambidextrous capability, which is a dynamic capability. Moreover, the role of organisational culture in facilitating the senior team, and organisational integration mechanisms, warrant further research (Wang & Rafiq 2014). Hawass (2010) recommends further research on the relationship between organisational culture and structure and organisational reconfiguration capability through conducting case studies on managers who have demonstrated a track record of achieving business success through reconfiguring organisational technological assets addressing changes in the external environment.

Teece (2007) notes that the processes of improving organisational performance through applying higher-order dynamic capabilities such as sensing, seizing and reconfiguring, based on the effective combination of managerial entrepreneur activities, knowledge management and robust governance, are still not fully understood. Barreto (2010) notes the lack of empirical evidence in formulating a clearer conception of dynamic capabilities and recommends further study to develop superior understanding about the consequences

of dynamic capabilities. Additionally, Easterby-Smith et al. (2009) expect that more empirical evidence will inform the research stream of dynamic capabilities in a manner that may aid deeper understanding of the origin, nature, building processes and the consequences of dynamic capabilities. On the other hand, the linkage between operational and dynamic capabilities is not investigated in any detailed manner (Helfat & Winter 2011) and requires further investigation to gain a superior understanding about the impact of dynamic capabilities on operational routines. Additionally, Ludwig and Pemberton (2011) reject dynamism as the core feature of today's business environment, and instead regard dynamism as one of many crucial elements of today's business environment. They therefore suggest shifting the locus of theoretical attention to offer more direct benefit to decision makers. Finally, the process of integrating the understanding of dynamic capabilities, or deploying dynamic capabilities into the operational processes of firms, remains a less understood area (Helfat & Winter 2011; Ambrosini & Bowman 2009). Ambrosini and Bowman (2009) emphasise that how dynamic capabilities are created, and their consequences, needs further research. Finally, research on dynamic capabilities in the context of a developing country will aid valuable insights into the implications of dynamic capabilities.

Companies in emerging economies are now more integrated with the global economy, however, a significant body of research from the management and marketing disciplines has studied the competitive strategies of firms mainly to explain the strategic behaviour of the firms in developed economies (Aulakh, Kotabe & Teegen 2000). Furthermore, Garner (2004) argues that the workers of developing countries are gradually acquiring the necessary skills and competencies to perform competitive tasks, which is evident from the growing trend of off-shoring value-added services to developing countries. Alam (2010) also highlights that research on service firms in the emerging markets of Asia and South Asia is very limited, especially the process of performing service innovation. Guillen (2000) recommends stringent research into investigating the ultimate origin of the capabilities of firms in emerging markets, considering the different strategic choices made by firms participating in different business groups.

Hatum and Pettigrew (2004) acknowledge the gap in the literature investigating the nature of organisational behaviour in emerging markets to address the rapid changes and competitive pressure in the external environment. Drawing empirical evidence from Argentina, they mention that due to a difference in economic stability, the decision-making processes and governance mechanisms, firms exhibit significant differences to those in developed countries, which, in effect, influences their organisational capability to achieve

flexibility in a competitive business environment with environmental uncertainty. Similarly, Ray and Chakrabarti (2006) argue that, due to economic transition through privatisation and other deregulations, companies of emerging markets face a greater magnitude of environmental contingencies, than companies in mature markets. Early recognition of opportunities and effective processes of customer engagement (Ray & Chakrabarti 2006), dynamic capabilities to seize business opportunities (Luo 2003), capability to perform service innovation (Kandampully 2002), delivering IT services to clients (Holzweber et al. 2012) and organisational flexibility (Hatum & Pettigre 2004) are the important research agendas that may help firms in emerging markets to achieve a strategic fit with the competitive external environment. Teece (2009) highlights that the entrepreneurial roles of managers in sensing new opportunities, leading organisations to seize these opportunities, and transforming organisational resources, are the essence of dynamic capabilities, and very critical for strategic management. Finally, the remarks of Teece and Linden (2017 p.9) add significant importance on the empirical enquiries of this study:

> "*studies that focus on specific aspects of dynamic capabilities, such as opportunity recognition, entrepreneurialism, or flexibility will illuminate aspects of business model innovation and implementation. These relationships, and their implications for performance, will need to be teased out for years to come.*"

The research gap is summarised in the following table:

Table 2.7: Research gap

Research gap	References
Managerial role in dynamic capability building	Gavetti 2005; Smith & Tushman 2005; Helfat & Peteraf 2015; Martin 2011; Kor & Mesko 2013; Agarwal & Selen 2009, 2014
Organisational factors affecting dynamic capability building	Wang and Rafiq 2014; Hawass 2010)
Consequences of dynamic capability building	Teece 2009; Teece 2007; Helfat & Winter 2011; Ambrosini & Bowman 2009,
Capability building research in emerging markets	Alam 2011; Guillen 2000; Ray & Chakrabarti 2006; Luo 2004; Kandampully 2002; Hatum & Pettigre 2004

Finally, considering the above research gap, the primary focus of this research is to investigate how managerial capability plays an effective role in building organisational dynamic capabilities in the ICT companies in a developing country, namely Bangladesh.

2.10 Summary: a conceptual framework

Based on the extensive literature review and the research gap identified, Figure 2.4 presents current thinking presented as a conceptual framework highlighting managerial attributes and roles that facilitate the building of enterprise-level dynamic capabilities based on

Teece's framework of the Dynamic Capability View, which then affects enterprise performance. As evident from the extant literature, organisational-level factors also act as facilitators or inhibitors between managerial roles and organisational-level dynamic capabilities. In this context, my key research question is how managers can facilitate the dynamic capability building processes.

Figure 2.4: A conceptual framework
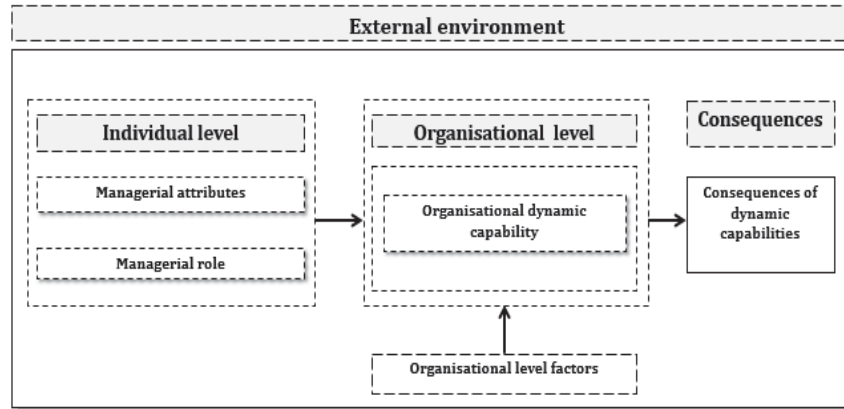
The above conceptual framework will be further discussed in detail in the next chapter.

Chapter 3: Conceptual framework

The primary quest of this research is to understand the managerial roles in building dynamic capabilities in ICT companies in Bangladesh. This chapter will present detailed arguments on the underlying logic of the conceptual framework that aims at filling the research gap presented in the literature review. More specifically, how managerial attributes such as cognitive ability, social capital and human capital are contributing in building dynamic capabilities and how managers of ICT companies are performing ambidextrous roles in pursuing organisation-level dynamic capability building, will be the main focus of this conceptual framework. Figure 3.1 provides the outline of the chapter three.

Figure 3.1: Outline of the chapter
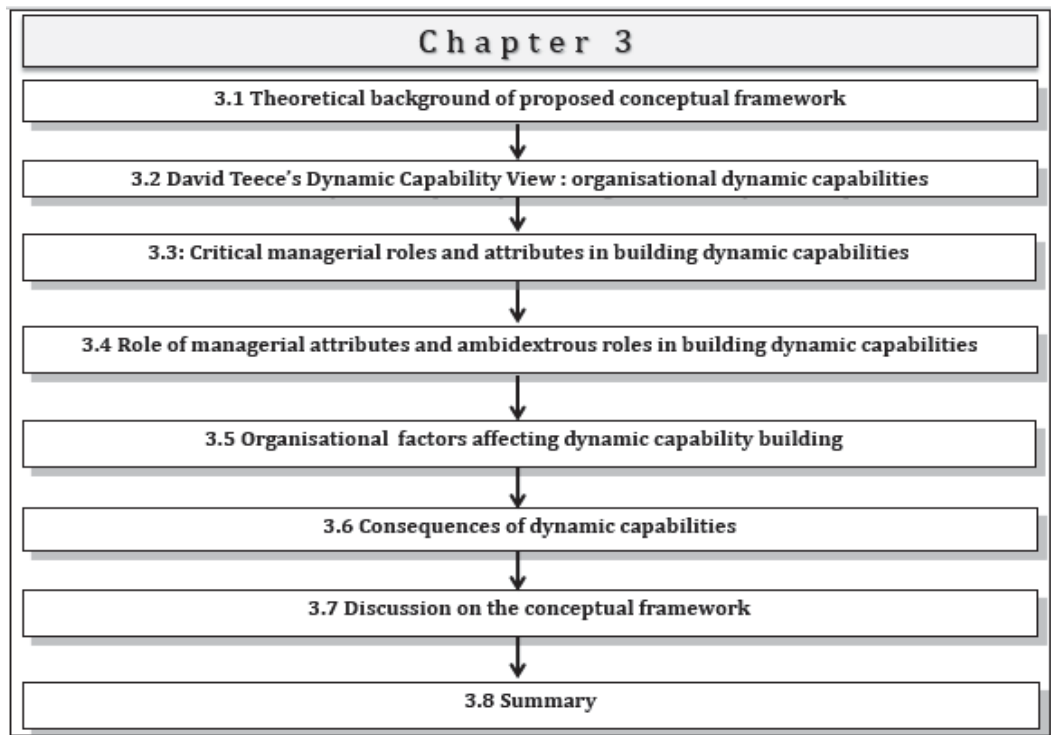
This chapter offers a detailed discussion on the underlying logic and concepts of the conceptual framework and how the different concepts relate in answering the research questions presented in this thesis. The organisation of this chapter is presented in Figure 3.1. Section 3.1 will provide a brief overview of the conceptual framework. In section 3.2, David Teece's (2009) dynamic capability view will be discussed highlighting the managerial roles in building dynamic capabilities. Sections 3.3 and 3.4 will critically analyse the managerial roles in building dynamic capabilities from two theoretical angles, namely dynamic managerial capability (Helfat & Peteraf 2015) and contextual managerial

ambidexterity (Wang & Rafiq 2014). How managerial attributes such as cognitive ability, social capital and human capital build dynamic capabilities is explicated in section 3.3. Section 3.5 will present the organisational factors affecting dynamic capabilities building and section 3.6 illustrates the different consequences of dynamic capabilities, based on review of Barreto (2010). Finally, section 3.7 offers discussion on the conceptual framework in the light of the research gaps.

3.1 Theoretical background of proposed conceptual framework

Scholars have tried to develop theories on the individual managerial roles in building dynamic capabilities. Since Adner and Helfat (2003) coined the term 'dynamic managerial capability' several researchers have extended the term to confine into a theoretical framework. Sirmon and Hitt (2009) investigate the notion of dynamic managerial capability combining with the theoretical perspective of contingency theory and offer insights on the key contingencies involve in resource investment and deployment decisions. Martin (2011) devised a theoretical framework outlining the top management's role in building dynamic capabilities incorporating Teece's (2009) framework of dynamic capabilities that includes sensing, seizing, and reconfiguring as the key building blocks of organisational dynamic capabilities. However, Martin (2011) does not elaborate on the middle managers roles in carrying out the dynamic capabilities across the organisational boundary. Kor and Mesko (2013) offer a theoretical framework of the top management's roles in building dynamic capabilities through integrating Teece's (2009) framework and dominant logic theory proposed (Prahalad & Bettis, 1986) and extended by Bettis and Prahalad (1995). The authors did not offer any empirical evidence or place an emphasis on further research on their framework. Helfat and Peteraf (2015) offer a detailed explanation of the role of managerial cognition in building sensing, seizing, and reconfiguring capability and leave the theoretical framework subject to future empirical investigation. The above-mentioned frameworks do not incorporate the significance of the ambidextrous roles of managers (Smith and Tushman 2005) in obtaining a balance between innovative initiatives and ongoing operational efficiency. Moreover, organisational factors and the consequences of dynamic capabilities are not incorporated in these frameworks and this creates room for developing a better theory on the managerial roles in building dynamic capabilities.

The literature review highlights that managers play a vital role in facilitating dynamic capabilities building in the organisation (Teece 2009; Eisenhardt & Martin 2000; Teece, Pisano & Shune 1997; Adner & Helfat 2003; Smith & Tushman 2005; Gavetti 2000; Martin 2011; Helfat & Peteraf 2015; Helfat and Martin 2015; Bergen & Peteraf 2002; Adner & Helfat

2003; Sirmon & Hitt 2009; O'Reilly & Tushman 2008). According to the extant literature, managerial attributes such as social capital, human capital and cognitive ability (Adner & Helfat 2003; Helfat & Peteraf 2015) and managerial ambidextrous roles (Gibson & Birkinshaw 2004; Smith & Tushman 2005) play pivotal roles in developing dynamic capabilities at the organisational level. Based on the literature review offered in chapter two the conceptual framework outlined in Figure 3.2 is proposed to capture a broader picture of the managerial roles in building dynamic capabilities with an aim to investigate these within the context of medium-sized ICT companies to explore rich insights. Figure 3.2 illustrates an outline the underlying theories that aim to facilitate the empirical investigation of managerial roles in building dynamic capabilities.

Figure 3.2: The underlying theories of the managerial roles in building dynamic capabilities
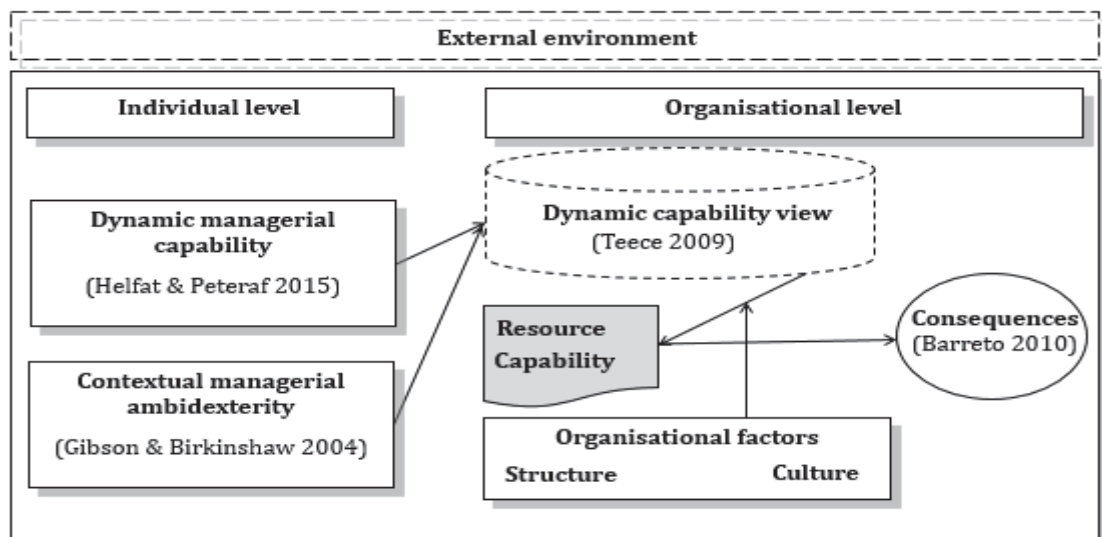
In the following sections, these theories will be analysed in detail. First organisational-level dynamic capabilities will be discussed based on Teece (2009), considering the critical managerial roles in building them.

3.2 David Teece's Dynamic Capability View: organisational dynamic capabilities

Dynamic capabilities carry significant importance during rapidly changing business environments (Teece, Pisano & Shuen 1997; Teece 2009). Scholars have attempted to explicate organisational-level dynamic capabilities such as sensing, seizing and reconfiguring capabilities. Pavlou and Sawy (2011) suggest the sensing capability as an enterprise-level capability and identify different indicating items such as frequency of

environmental scanning performed by the companies, periodic review of the effect of changes in the business environment on customers, assessing product development processes considering customer's requirements, and amount of time devoted to implement new ideas. Scholars have identified different aspects of organisational seizing capability. Eisenhardt and Martin (2000) consider the propensity of decision making as a key criterion for managerial decisions during a dynamic environment. Berreto (2010) further adds that timeliness and market orientation are key criteria for managerial decisions. Finally, reconfiguring capability is explained as integrating and coordinating capability (Pavlou & Sawy 2011) and strategic flexibility (Zhou & Wu 2010). These dynamic capabilities in combination assist organisations to address changes in the external environment in an entrepreneurial manner.

Teece (2007) suggests entrepreneurship as the ability to sense and appreciate opportunities with the prompt initiation of novel and superior combinations of resources and existing capabilities. He further stresses that entrepreneurial management concentrates more on identifying opportunities, and developing processes to address the opportunity, rather than focusing on analysing and optimising the existing processes. He clarifies that disparate co-specialised elements across the organisational boundary need to be creatively coordinated through non-routine activities to effectively carryout entrepreneurial activities. Teece (2007) states that, in order to create viable business opportunities, individual managers need access to sensitive information, the ability to recognise or sense opportunity, and a capacity to shape development processes. Teece (2007) argues that organisational knowledge management and learning capacities to improve customers' needs, and explore novel solutions, influence the individual manager's capability to recognise new opportunity.

Considering the competitive forces in the marketplace, Teece (2009) stresses the importance of entrepreneurial attitude of managers in the present business environment in sensing opportunities, seizing opportunities and reconfiguring and transforming organisational resources and capabilities. Considering the context of Hong Kong, Lau, Shaffer, Chan and Man (2012), characterise the entrepreneur manager as the individual who generates innovation within an established firm. Guo, Zhao and Tang (2012) find evidence from 146 firms in China that managerial entrepreneurial skill positively contributes to the firm's capability to deliver business model innovation. Entrepreneurial managers actively engage in identifying and developing new ideas and opportunities and pursue senior management to implement these identified ideas. Teece (2009) recommends that managers/entrepreneurs play a vital role in key strategic decisions through

articulating goals, creating a supportive culture, building trust and assisting the organisation to evaluate opportunities. Hitt et al. (2001) state that in a corporate environment a manager determines the strategic vision for the organisation.

Teece (2007) notes that managers need to choose appropriate decisions from an extensive range of commercialisation options for unlocking potential technological opportunity through R&D activities. At the same time Teece (2007) suggests exploring options to utilise the research output of external parties, and concurrently learning customers' needs. Hawas (2010) exemplifies the NEC Corporation to emphasise how managerial vision can creatively predict future technological trends. In order to succeed in the changing technological environment, promising business opportunities need to be integrated with the technological convergence, as NEC Corporation successfully did by linking their computing and communication to capitalise on new business opportunities in the emerging ICT technologies. Capron and Mitchel (2007) find that senior executives need to make collective decisions and need to possess sufficient knowledge to make capability-sourcing activities.

Teece (2009) mentions that managers or entrepreneurs are critical agents for promoting and shaping organisational learning processes. Teece (2007) argues that management teams that are more engaged with problem-solving competencies may face serious challenges to overcoming narrow search horizons when sensing new business opportunities for their enterprises. Hoven, Probert, Phaal and Goffin (2012) suggest that managers in ICT companies need to scan the market and competition to recognise opportunities that may be valued by the customers, and analyse these opportunities considering existing and required technologies and capabilities. Hoven et al. (2012), based on an empirical study, find that in successful ICT companies managers need to keep themselves open to the choice of appropriate technology for the company. Furthermore, the authors find that the managers mentor the technology teams to develop an effective approach regarding technology-related issues, at the same time as the managers develop productive personal attributes to develop effective leadership capabilities. Hoven et al. (2012) find that senior executives of ICT companies, such as the CTO, have to play an instrumental role during shifts within the organisation through aligning technology with the corporate strategy and business model. The authors further suggest that the CTO deliver a clear picture of the value, focus and role of technology to ensure the engagement and support of the stakeholders for current deployment, and future search for technology. Finally, Teece (2009) advises managers to think in a strategic manner, act in an entrepreneurial manner, and execute their actions in a nearly perfect manner.

Teece (2007) insists that, in order to translate the identified opportunities into commercial success, entrepreneurs and managers have to identify and target market segments with appropriate technologies. Moreover, he further notes that managers and entrepreneurs have to understand the evolutionary paths of the selected technologies to forecast the responses of competitors, suppliers, and customers. Managers not only need to predict when competitors, suppliers and customers will respond but also to analyse how they will respond.

Teece (2007) suggests maintaining a working hypothesis regarding future conjecture about technological development. He recommends managers to continuously update these working hypotheses as new evidences emerge and advocates for quick action as new evolutionary processes becomes more evident. Teece (2007) recommends managers override ineffective decision-making processes, rules and resource allocation processes to build enterprise-level dynamic capabilities. Teece (2007) states that managers have to consider multiple growth trajectories to make unbiased decisions in the light of uncertain future demand and competitive responses. In a rapidly changing business environment, managers should make interrelated investment in co-specialised intangible assets.

Table 3.1 illustrates detailed items of organisational dynamic capabilities within the scope of this research:

Table 3.1 Organisational-level dynamic capabilities based on (Teece 2009)

Dynamic capabilities based on literature	
Sensing	
Elements based on literature	Pavlou and Sawy (2011) - Managers frequently scan the environment to identify new business opportunities. - Managers periodically review the likely effect of changes in our business environment on customers. - Managers often review our product development efforts to ensure they are in line with what the customers want. - Managers devote a lot of time implementing ideas for new product development.
Explanation and adaptation	The authors advocate sensing as an active pulsation of identifying and developing new products to address changing customer needs or other changes in the external environment through systematic review of the external environment.
Seizing	
Elements based on literature	Eisenhardt and Martin (2000) - Propensity in decision making. Berreto (2010) - Make timely and market-oriented decisions.
Explanation and adaptation	During a rapidly changing external environment managers need to make decisions in a timely manner as well as with high propensity.
Reconfiguration	

Elements based on literature	**Reconfiguration capability**
	Pavlou and Sawy (2011)
	   - Managers can successfully reconfigure our resources to come up with new productive assets.
	   - Managers often engage in resource recombination to better match our product-market areas and our assets.
	Hawass (2010)
	   - Managers integrate internal and external technologies more successfully than competitors.
	   - Managers are more successful than competitors in commercial application of technologies to end market.
	   - Managers are more successful than competitors in diversifying into new markets by deploying existing technologies.
	   - Managers are more successful than competitors in adapting our innovation process to market changes.
	Strategic flexibility
	Zhou and Wu (2010)
	   - The flexible allocation of marketing resources (including advertising, promotion and distribution).
	   - Resources to market a diverse line of products.
	   - The flexible allocation of production resources to manufacture a broad range of product variations.
	   - The flexibility of product design (such as modular product design) to support a broad range of potential product applications.
	   - Redefining product strategies in terms of which products the firm intends to offer and which market segment it will target.
	   - Reconfiguring chains of resources the firm can use in developing, manufacturing, and delivering its intended products to targeted markets.
	   - Redeploying organisational resources effectively to support the firm's intended product strategies.

Explanation and adaptation	Firms need to redeploy, recombine, or transform resources and capabilities to address technological changes, changes in the customer preferences, or competitive actions in effectively developing new products in the market place.

In the next section, the influence of managerial attributes and roles in building dynamic capabilities are discussed.

3.3 Critical managerial roles and attributes in building dynamic capabilities:

Managers play important roles in facilitating dynamic capabilities across the organisational boundary. To pursue the aim of building dynamic capabilities, managers need to act in an entrepreneurial manner to address the opportunities arising in the external market place. At the same time, it is important to maintain a balance between innovative initiatives and operational productivity. Managers that are successful in fostering dynamic capabilities may also be able to successfully exploit their cognitive ability, social capital, and human capital to navigate the organisation during environmental uncertainty and rapid changes. In this section, a detailed discussion will be offered about different managerial roles and attributes that play pivotal roles in building organisational dynamic capabilities.

3.3.1 Managerial social capital

Burt's (2000) social network theory suggested that the routine innovation capability of Edison's laboratory was originated from the 'structural hole' the company occupied in a larger network, which enabled the company to fill the information gap between the subgroups of the network. The actors who fill the gap between subgroups are defined as 'brokers'. Brokers can gain competitive advantage over competitors because of their network position that enables them to observe newly created skills and opportunity in the network earlier than others (Hargadon & Sutton 1997). Furthermore, due to the disparity in information flow between the different subgroups of the network, brokers can exploit the advantage of the valuable knowledge that is held across group boundaries. The networks with disconnected structures are more likely to have more knowledge disparity than a network with a convergent structure (Cowan & Jonard 2004). As a result, it is possible for the brokers to provide technological solutions to diverse industries through utilising their access to the disparate industry network (Hargadon & Sutton 1997; Fleming, Mingo & Chen 2007). Moreover, social network theory suggests that the actors within the network share the same resources and are aware of the opportunities that exist within the network (Burt 1983; Gilsing, Nooteboom, Duysters & van den Oord 2008). Ahuja (2000) pointed out that the positions of firms in inter-organisational networks play a role in influencing a firm's behaviour because of their facilitative role in various organisational contexts. Ahuja (2000) further clarified that the direct ties of a firm can provide knowledge and resource-sharing spill-over benefits, whereas indirect ties may provide access to the knowledge spill over. Acquaah (2007), based on an empirical study in a developing country, Ghana, suggests that managerial ties with other top executives enable firms to gain critical information and knowledge to reduce the uncertainties of the future. According to Dyer and Nobeoka (2000), network relations of managers between key suppliers and customers facilitate formation, attainment and effective use of knowledge. Stronger supplier relationships may help companies to gain raw materials at competitive prices, fast deliveries and better service, whereas improved customer relationships may positively influence performance through increased sales and brand loyalty (Peng & Luo 2000; Park & Luo 2001). In addition to these, relationship with competitors may open scope for collaboration through sharing resources and capability leading reducing operational cost (von Hippel 1988). Peng et al. (2009) argue that in the context of emerging markets managerial ties are critical for entrepreneurial firms as superior resource allocation methods are underdeveloped or absent. Westhead, Wright and Ucbasaran (2001) find that in emerging markets such as China, the network relationships of managers with government officials helps firms to receive strategic information and different facilities to capture market opportunities through improving

information-capturing capability. Managerial social capital comprises the relational capital of a manager based on their personal, social and commercial relationships. Kazienko, Musial and Kajdanowicz (2011) place an emphasis on an individual manager's roles and activities on virtual social networks, whereas Acquaah (2007) links managerial social capital with a range of personnel from society, as well as industry. Table 3.2 illustrates managerial social capital based on the extant literature.

Table 3.2 Managerial social capital based on literature

Managerial Social Capital	
Elements based on literature	**Virtual Social network** Kazienko and Mushia (2011) Dynamic component of social capital activity in networks - Number of relations in different social networks - Blog contribution - Invitation received - Response to invitation - Comments on forums - File contribution such as photos, videos or others **Social Position** - Interactions via chat, email - Common activities - Similar interest - Duration of relationship **Relational capital** Acquaah (2007) - Politicians and executives - National government - Politicians and executives - Officials in regulatory and supporting institutions (e.g., standards boards, Internal Revenue Service, ministries, Central Bank, Environmental Protection Agency) - Officials in industrial and investment institutions - Relationship with suppliers, buyers, competitors
Explanation and adaptation	Managerial ties, connections, and the nature of their interactions within the social space, contributes in managerial social capital

3.3.2 Managerial human capital:

Castanias and Helfat (2001) consider managerial human capital as a manager's inner learned skills that include expertise, knowledge and abilities. Hitt et al. (2001) further identify senior managers' ability to effectively coordinate and configure the firm's resources as significant human capital. In the context of the information technology industry, Sambamurthy, Bharadwaj and Grover (2003) mention the experience and intuition of individual employees help firms to develop capability to foresee the business potential of different emerging technologies, as well as to anticipate competitive innovative actions by their rivals.

Brown and Eisenhardt (1997) demonstrate that in the context of high velocity computer industries, successful managers effectively combine limited structures, such as priorities or responsibilities, through extensive interactions with fellow employees, along with the delegation of a degree of autonomy for improvisation. The development of human capital positively influences employees' capability to perform their job within designated autonomy, which results in improved organisational performance (Hsu 2007). Kor and Mesko (2013) argue that the higher human capital that a firm possesses may deliver greater competitive advantage, as human capital will increase along with the accumulation of specialised information, skills and knowhow. Increased human capital will facilitate better communication between employees, which may reduce errors in decision making resulting in improvement in quality, as well as organisational performance (Luthans & Youssef 2004). In order to evaluate, perceive and interpret specific business environments, managerial specialised knowledge and skill set play a critical role (Kor & Mesko 2013). As a result, human capital focused management may be able to process internal and external stimuli to successfully convert this into strategic priorities that will allow the organisation to select appropriate paths for the growth of the firm through various strategic choices such as diversification, competitive positioning, development initiatives and capability acquisition (Kor & Mesko 2013). Therefore, human capital is positively linked with organisational performance (Hsu & Wang 2012). Table 3.3 provides detail on the elements of human capital from the extant literature.

Table 3.3 Managerial Human capital based on literature

Managerial Human Capital	
Items from Literature	Adopted from Doving and Gooderham (2008) **Quality of educational institute** - Quality of the graduate school attended by the partners - Qualifications, experience, achievements and professional productivity of the faculty - Quality of the students' scholastic work and records of graduates in scholastic work and practice - Basis of and requirements for admission of students - Age (experience) of the program and total educational programs of the institution. Authors calculated an average ranking of universities or educational institutions from which all partners at the firms graduated (total ranking reversed scored divided by the number of partners). Adopted from Doving and Gooderham (2008) **Heterogeneity of human capital** - Percentage of staff with IT qualification - Percentage of staff with a bachelor's degree - Specific and identifiable routines and systems aimed at reconfiguring the competency base of the practice - Total experience as partners in the focal firm (proxy for firm-specific tacit knowledge) - Range of alliances with external complementary service providers - Proportion of relatively large client firms served by the practice - Intention of seeking out new markets or launching new services - Number of staff in practice.

	Adopted from Ravichandaran and Lertwongsatien (2005)
	Information System (IS) performance
	- Our IS staff has very good technical knowledge
	- Our IS staff has very good technological ability to quickly learn and apply new technologies as they are available
	- Our IS staff has the knowledge to manage projects in the current business environment
	- Our IS staff can work closely with the customers and manage a productive relationship
	- Our IS staff has very good business knowledge and business priorities and relationships
	- Staff has a good understanding about our organisational technologies and business processes
	- Good knowledge about firm's procedure and policies
	- Core beliefs and values of the organisations.
Explanation and adaptation	Experience, knowledge, technical skill and educational background are key components of managerial human capital.

Managerial human capital can be renewed using the information and knowledge that managers acquire through various relationships, therefore managerial social capital and human capital are linked with each other (Coleman 1988). Moreover, increased human capital in the form of specialised knowledge and skills can increase the cognitive abilities of employees that ultimately results in superior performance and productivity (Davidsson & Honig 2003). Doving and Gooderham (2008), in the Norwegian context, reveal that heterogeneity and continuous development of human capital in small accounting companies plays a critical role in applying dynamic capabilities to internal development to pursue related diversification of service offerings.

Organisational human capital is reflected through the accumulated experience, knowledge and skills of the human resources of the firm. Doving and Gooderham (2008) provide detail of items showing the heterogeneity of human capital, while Ravichandaran, Lertwongsatien and Lertwongsatien (2005) provide detail of human capital from the perspective of information system companies.

3.3.3 Managerial cognitive ability

This research will follow the definition of managerial cognitive capability provided by Helfat and Peteraf (2015) that comprises: perception and attention, problem solving and reasoning capability, and communication and the social cognition of managers. Teece (2007) argues that the creative and cognitive capacities of individuals heavily influence opportunity discovery and creation. It is very natural that every manager would differ from another in all types of mental capabilities (Helfat & Peteraf 2012). As particular cognitive capabilities are needed more for certain types of dynamic managerial activity, and considering the heterogeneity inherent among managers, it would be the case that

managers with superior sensing capabilities may not necessarily have superior reconfiguring capabilities (Helfat & Peteraf 2012). Fischer, Gebauer, and Fleisch (2012) suggest that managerial cognition can play a significant role in developing service businesses. Managerial cognitive ability that plays a valuable role in sensing and seizing and reconfiguring capability is discussed next. Salvato and Vassolo (2017) find that individual behaviour and emotion also play critical roles in influencing individual cognition to act in a particular environment, however, this research only focuses on the attention, awareness and problem-solving aspects of individual cognition. Table 3.4 outlines elements of managerial cognitive ability that are within the scope of this research based on Helfat and Peteraf (2015).

Table 3.4 Managerial cognitive ability based on Helfat and Peteraf (2015)

Managerial cognitive capability	
Items from literature	Helfat and Peteraf (2015) - Perception and attention - Problem solving and reasoning, - Communication and social cognition.
Explanation and adaptation	Perception and attention, problem solving skill and social cognition are critical components of managerial cognitive ability.

3.3.4 Contextual managerial ambidexterity

Gibson and Birkinshaw (2004) first proposed the concept of contextual ambidexterity to capture senior managers' behavioural capacity to achieve alignment and adaptability simultaneously. Prasertsakul (2013) suggest alignment as the resemblance of all organisational activities to achieve a common goal, whereas adaptability refers to the ability of a firm to reconfigure organisational activities to meet the changing demand of the external environment. Alignment is important for firms that operate in a relatively stable market environment, whereas adaptability is critical for firms in more dynamic and unstable environments (Ireland & Webb 2007; Gibson & Birkinshaw 2004). Prasertsakul (2013) mentions that the contextual ambidexterity view suggests individual managers deliver maximum value to their existing customers from their operational activities, while keeping strong alertness to the external environment for any variation requiring rapid action. Prasertsakul (2013) finds that contextual ambidexterity is a central task of senior managers to foster alignment and adaptation of current operational processes with the emerging technologies. Additionally, Vollery, Mueller and Siemens (2013) observe that ambidextrous individual managers foster collective learning through encouraging collaborative partnership with strategic partners, research institutes, and, at the same time, working together with the employees. Finally, Birkinshaw, Zimmermann and Raisch (2016)

investigated dynamic capabilities from an ambidexterity perspective, finding that behavioural integration is critical to adapt with environmental discontinuities.

3.4 Role of managerial attributes and ambidextrous roles in building dynamic capabilities:

In this section role of managerial social capital, human capital and cognitive ability in building sensing, seizing and reconfiguring capability and role of managerial ambidextrous roles fostering dynamic capabilities through adaptation and alignment is discussed.

3.4.1 Role of managerial social capital in building sensing capability

Managerial ties create opportunities for firms to receive strategic information in a timely manner from an authentic source, which often enables managers and firms to better understand the customer demand and gain an underlying insight about the task, activities and operations (Borgatti & Cross 2003). Managerial ties can be a source of novel information that can be exchanged only through personal conversations or interactions (Luo 2003). As a result, managerial ties enhance a firm's ability to acquire new information that may result in improved performance (Pedersen & Lyles 2008). Furthermore, stronger managerial ties enable firms to proactively react on identified opportunities (Dow 2006) even faster than their competitors (Bruton, Dess & Janney 2007). Fornoni, Arribas and Vila (2012), based on their empirical study of entrepreneurs in Argentina, conclude that accessibility of strategic information is not correlated with the number of contacts that managers have, rather the quality of contacts. Therefore, they suggest managers and entrepreneurs establish, nurture and enhance a smaller number of quality links. Managerial networking capability is also considered as a higher order capability that enables organisation access and to share resources and capabilities within a network of companies (Agarwal & Selen 2009).

3.4.2 Role of managerial human capital in building sensing capability

Individual managerial human capital play vital roles in facilitating creation and discovery of entrepreneurial opportunity (Marvel 2013), in other words organisational sensing capability. Experience aids managers to obtain deeper insights about an opportunity that recently arise in the market place (Eisenhardt and Brown 1997); experience in diverse industry or technology paradigm also assist managers in foreseeing the future trajectory of technological development (Martin 2011); and extensive experience equip managers with superior understanding about the changing nature of customers preferences. Additionally, managerial knowledge and skill also paly vital roles in identifying feasible scope through

assessing the identified opportunity in a practical manner that are aligned with the organisational existing resources and capabilities (Bradley, McMullen, Artz, & Simiyu 2012). However, it is also highlighted that managerial experience and prior knowledge may result path dependency (Kor 2003), therefore experience managers often fail to appreciate a new opportunity due to dissimilarity with their prior experience and knowledge. As in case of Nokia, senior managers fail to anticipate the future convergence of mobile technology with the internet that result grave consequences to the company (Troianovski and Grundberg 2012). Finally, education also play a vital role as new graduates from reputed institutions often exposed with latest knowledge and Knowle how that assist them to identify an opportunity in a subtler manner (Doving and Gooderham 2011). In general, it can be argued that individual managerial human capital plays a significant role in facilitating organisational sensing capability.

3.4.3 Role of managerial cognitive ability in building sensing capability

Sensing activities are likely to draw on perception and attention cognitive capabilities (Helfat & Peteraf 2015). The interpretation of respective data of environmental variation is critical, both for precise opportunity recognition, and the acknowledgment of new opportunities that result from feedback from the environment as business people enact new initiatives (Helfat & Peteraf 2015). If firms aim to achieve advantage over the long term through entering early into a specific market, Lieberman and Montgomery (1988) suggest that quick recognition of opportunities or new ideas is very significant, and they found that practice and training enhances the capabilities of attention. The authors find that acute cognitive capabilities are mandatory where, in an unfamiliar and complex situation, an individual attempt to sense threats and opportunities. The alertness component of the brain can search out and detect new opportunities in the surrounding environment, while the orientation capacity shifts the attention of the brain towards relevant information.

Eggers and Kaplan (2009) find that the managers concentrating on telecommunications technology were more informed and identified the potential of the market accurately. While the cognitive perception capabilities of managers are influenced by the external environment, practice can improve the cognitive capabilities further. In some circumstances, heterogeneity in managerial cognitive capabilities may result in a subsequent spill-over in organisational performance because of the potential scope of early mover advantage through superior managerial sensing capabilities (Helfat & Peteraf 2015).

Proposition 1

Based on the discussion on section 3.4.1, 3.4.2 and 3.4.3; table 3.5 summarises the role of managers in building sensing capability that supports proposition.1. Figure 3.3 diagrammatically represents the proposition 1.

Table 3.5: Role of managers in building sensing capability

Sensing	
Social capital	- A source of novel information (Luo 2003) - Create opportunities to receive strategic information (Borgatti & Cross 2003) - Sources of new information that may result in improved performance (Pedersen & Lyles 2008) - Enable firms to proactively react on identified opportunities (Dow 2006) - Offer chance to learn new methods of acquiring data about customer demand and various competitive conditions (Soh 2003)
Human capital	- Experience and intuition of individual employees helps firms to develop the capability to foresee the business potential of different emerging technologies and anticipate competitive innovative actions (Sambamurthy, Bharadwaj & Grover 2003) - Human capital will increase along with the accumulation of specialised information, skills and knowhow (Kor & Mesko 2013) - Human capital focused management may be able to process internal and external stimuli to successfully convert this into strategic priorities (Kor & Mesko 2013) - Assist to evaluate, perceive and interpret specific business environments, managerial specialised knowledge and skill set plays a critical role (Kor & Mesko 2013).
Cognitive ability	- Creative and cognitive capacities of individuals heavily influence opportunity discovery and creation (Teece 2007) - Sensing activities would probably draw on perception and attention cognitive capabilities (Helfat & Peteraf 2015) - Acute cognitive capabilities are mandatory in the case where, in an unfamiliar and complex situation, an individual attempt to sense threats and opportunities (Lieberman & Montgomery 1988) - Heterogeneity in managerial cognitive capabilities may result in potential scope of early mover advantage through superior managerial sensing capabilities (Helfat & Peteraf 2015).

Figure 3.3: Proposition 1
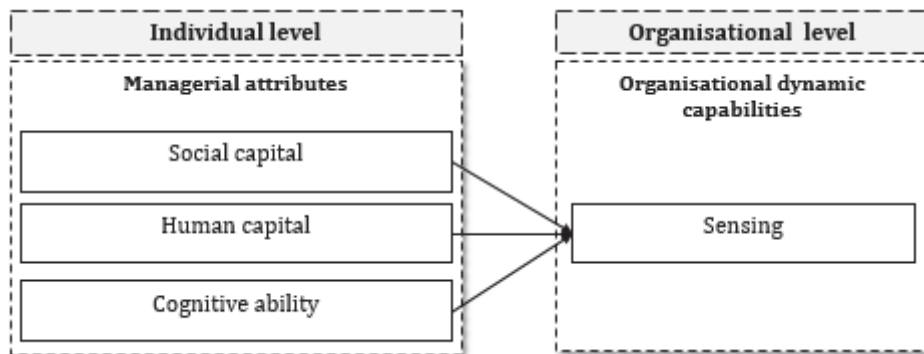
Proposition 1 is outlined as below:

Proposition 1

Individual managers a. social capital b. human capital and cognitive ability facilitate organisational sensing capability.

3.4.4 Role of managerial social capital in building seizing capability

Bocanet and Ponsiglione (2012) suggest that in order to avoid biases in managerial decision making and being entrapped within the organisational knowledge boundary, well-nurtured communication across all levels of the organisational structure can be an effective method to adjust to the changing external environment. Lau et al. (2012) conducted an empirical study on entrepreneurial managers in the context of an emerging market, Hong Kong, and found that the networking capability of individual managers is a behavioural quality that helps them to solve difficult problems in an innovative way. Furthermore, they suggest that entrepreneurial behaviour by managers contributes to corporate-level entrepreneurship. Helfat and Peteraf (2015) emphasise the need to allocate investment for building new skills and assets. In the context of countries from emerging markets, such as China, Zhao and Tang (2012) suggest that top management should initiate a serious effort to enhance the human capital of Chinese firms for successful business model innovation. Zhao and Tang (2013), based on their study on 146 Chinese firms, find empirical evidence that managerial and entrepreneurial skills, and the managerial ties of top management have a significant positive impact on business model innovation. The authors find that interactions between managerial ties and entrepreneurial skills improve business model innovation, whereas interaction between managerial skills and managerial ties acts as an inhibitor to business model innovation. This empirical study, in the context of an emerging economy, confirms the fact that managers' individual characteristics drive business model innovation in a direct and interactive manner. Zhao and Tang (2013) argue that managers' strong social ties may be able to convince the stakeholders of the newly-established business logics and business models.

Managerial social capital can facilitate the capture of business opportunities in many ways and organisations need to pay close attention to designing proper incentive mechanisms to encourage the entrepreneurial behaviour of managers. Peng and Luo (2000) find that managerial ties help firms to access valuable resources, Wong and Ellis (2002) further confirm that firms that have strong managerial ties will have more chances to develop partnerships with attractive vendors, suppliers and business partners. However, as echoed by Teece (2009), appropriate performance incentive mechanisms are warranted and to

seize business opportunities, it is important to design and implement a performance-oriented remuneration program within organisations. Finally, in the context of the emerging market of China, Chan, Hou and Lin (2013) find empirical evidence that performance-oriented wage systems foster strong employee relationships resulting rich managerial social capital.

3.4.5 The role of managerial human capital in building seizing capability

Individual managerial human capital play critical role in fostering seizing capability. Extant literature suggests that managerial human capital play important roles in assisting development of superior strategic decision, and at the same time experience and long tenure work experience also expose managerial with the key capabilities of the organisational that result a superior about capability development decision (Stephano and Mitchel 2009). Heterogeneity and diverse work experience assist managers to develop alternative strategies, options and scenarios to develop a rich conjecture about the future reality (Martin 2011) resulting a superior decision quality. However, experience with positive feedback may result reinforcement into the same path, which is mention in the literature as 'success tarp' may restrain managers from converging into an agreement regarding the technological development or changes in the customers' preferences in prompt manner. Managers also face information negative impact of information overloading (Sirmon, Hitt and Irelnd 2007) and also due to individual commitment to a certain technology (Gavetti 2005) or business domain (Danneels 2011) or business model (Smith and Tushman 2005) to continue business. As evident from the case of Polaroid (O'Reilly and Tushman 2008) and Kodak (Lucas and Goh 2009), senior managers fail to devise appropriate strategic decision in a timely manner despite of their full awareness and organisational advancement within the digital camera technology due to disagreement of the proposed business model and successful track record of their existing business operations. Despite of these issue, business organisations are investigating in their individual human capital to harness the tacit knowledge and consider human capital as key to succeed during rapidly changing external environment with superior strategic decisions and intellectual resources (Hatch and Dyer 2004).

3.4.6 The role of managerial cognitive capability in building seizing capability

Although heterogeneous in nature, the effectiveness of respective managers depends on the underlying cognitive capabilities in the sensing and seizing of opportunities. Athanasiou (2000) documented heterogeneity amongst individuals regarding fluid intelligence, while

Stanovich and West (1997) found that heterogeneity in the ability to avoid bias in appraising an argument, an essential element in the critical thought process, is evident in statistically-controlled intelligence circumstances. On the other hand, managers with supplementary reasoning and problem-solving cognitive capabilities will develop advanced business models and make superior investment decisions (Helfat & Peteraf 2015). As business models and full-sized investment decisions are irreversible, with consequences on the long-term performance of organisations, the differential cognitive capabilities between managers would lead to heterogeneity in the business models, and investment decisions leading to continual long-term performance create a degree of difference between firms (Ghemawat 1991).

Seizing the right opportunity in the instant is another facet of dynamic managerial capabilities. Seizing opportunities can be explained by irretrievable tangible and intangible investment decisions. Additionally, strategic decisions often demand that managers take decisions regarding hefty sums in complex and uncertain circumstances. Teece (2017) finally states that business models may be required for the seizure of proper business opportunities.

Proposition 2

Based on the discussion on section 3.4.5, 3.4.6 and 3.4.7; table 3.5 summarises the role of managers in building seizing capability that supports following proposition.

Table 3.6: Role of managers in building seizing capability

Seizing	
Social capital	- Networking capability positively impacts problem solving skills (Lau et al. 2012) - Managerial ties of top management can facilitate business model innovation (Zhao & Tang 2013) - Social ties assist in convincing the stakeholders of business logics and business models (Zhao & Tang 2013) - Create partnership opportunities (Wong & Ellis 2002) - Assist accessing valuable resources (Peng & Luo 2000)
Human capital	- Increased human capital fosters superior communication that may reduce errors in decision making (Luthans & Youssef 2004).
Cognitive ability	- Heterogeneity in the ability to avoid bias in appraising an argument, an essential element in the critical thought process, is evident in statistically-controlled intelligence circumstances (Stanovich & West 1997) - Supplementary reasoning and problem-solving cognitive capabilities will supposedly develop advanced business models and result in making superior investment decisions (Helfat & Peteraf 2015).

Figure 3.4: Proposition 2
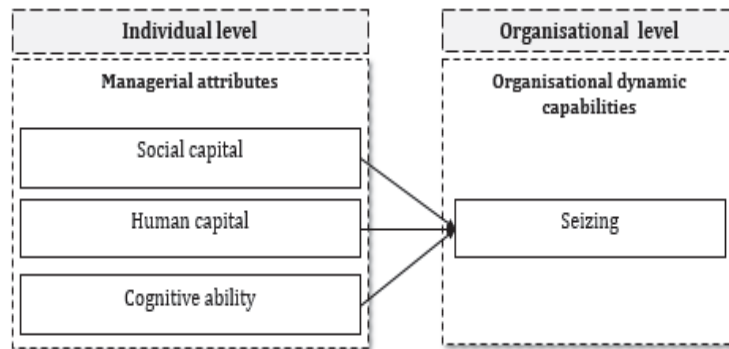
Proposition 2 is outlined as below:

Proposition 2

Individual managers a. social capital b. human capital and cognitive ability facilitate organisational seizing capability.

3.4.7 Role of managerial social capital in building reconfiguring capability

Managerial roles are critical in creating organisations as dynamic communities through linking architectural modularity, corporate culture, and dynamic capabilities with a combined economic and social logic (Gulanic & Eisenhardt 2001). The social capital of top management also plays a vital role in achieving strategic flexibility within an organisation (Ferna´ndez-Pe´rez, Garcı´a-Morales & Bustinza-Sa´nchez 2012). Additionally, Chan, Hou and Lin (2013) find that employees' relationships at different management levels play a key role in overcoming barriers to change. Through examining four cases in the context of Taiwan, the authors suggest that, at the organisational level, the scope of relationship capital can be the relationship with customers, partners and employees.

3.4.8 Role of managerial human capital in building reconfiguring capability

Individual human capital has significant roles to paly to facilitate reconfiguring capabilities. Organisations may face a number of internal resistances to carry out reconfiguration of resources and capabilities across the organisational boundary such as social friction, capability gap (Capron and Mitchel, 2009), challenges of integration and coordination of newly acquired resources and capabilities within organisational boundary to execute value creating operational routines and procedures (Pavlou and Sawy 2011). Additionally, managers may face unfamiliar problems during reconfiguration with no prior

organisational expertise. Managerial experience specially experience with new technologies may prove to be useful in addressing challenges with integrating innovative technologies (Martin 2011). Moreover, superior skill and knowledge may prove to be useful in developing creative solutions of a new problems (Hitt et al. 2001). Finally, learning enables managers to continuously equip themselves with superior knowledge that assist in developing cost-effective solutions to tackle new problems (Hatch and Dyer 2004). At the same time, it should be also noted that prior experience may result path dependency that may intimidate selecting innovative approaches during reconfiguration managers may insist in pursuing experience-based solution that may result negative consequences due to changing nature of the business context (Tripsas and Gavetti 2000).

3.4.9 Role of managerial cognitive in building reconfiguring capability

Zollo and Winter (2002) stated that adaptation to the external environment necessitates the exploration and augmentation of new strategic ideas and learning procedures. In addition, to sustain competitive advantage, adaptation is necessary to keep up with strategic changes as changes become evident (Zajac et al. 2000; Peteraf & Reed 2007). Managers play the role of harmonising the coordination of strategic assets adaptation, therefore strategic changes are hard to imagine without the involvement of top managers (Whittington 1992). During strategic adaptation, it is suggested that managers have to enact the key role in overcoming the resistance to change (Kaplan & Henderson 2005). Helfat and Peteraf (2015) state that managerial capabilities for reconfiguration can coordinate the adaptation process across assets through overcoming the resistance to change. The authors conclude that top management's ability to influence subordinates to undertake innovative communication is one of the key factors for successful asset reconfiguration.

The process of selecting, configuring, aligning, and modifying tangible and intangible assets is regarded as asset orchestration (Helfat & Peteraf 2015; 2009). The authors further suggest that the heterogeneity in cognitive capabilities may result in the variation in asset orchestration capabilities, which would possibly differ across organisations (Helfat & Peteraf 2012). It is difficult to reverse the asset reconfiguration process because of the coordinated adaptation of strategic change. Hence, the irreversibility across firms, in conjunction with heterogeneity across asset reconfiguration capabilities, may result in importunate divergence across firm performances (Helfat & Peteraf 2015).

The communicative technique of managers and the way they portray their vision for the organisation can be a driver for subordinate motivation, initiating schemes and consequently, entrepreneurial growth (Westley & Mintzberg 1989). Also, managerial skills

using the influence of communication skills may influence workers to change their initiatives. Hill and Levenhagen (1995) declare that the metaphorical use of language by managers may facilitate strategic changes with the alignment of the worker's motives with that of the organisation.

In order to overcome organisational resistance to change, social cognitive capabilities can play important roles. Social cognitive capabilities, in relation to a manager's social skills, relate to the capabilities of a manager when he/she has to achieve asset alignment under constant varying circumstances, which entails cooperative commotion in an organisation (Teece et al. 1994). A few social cognitive capabilities are non-voluntary, such as where the attribution of intention towards others is apprehended to be involuntary (Kolb & Whipsaw 2009). Helfat and Peteraf (2015) suggest that social cognitive capability will have the potential to influence others. The social cognitive capability of managers would give the managers influential ability to promote asset reconfiguration. Managers need the knowhow regarding organisational members, and to act accordingly in a planned framework which would take in the views of the organisation more inclusively and effectively. Lastly, social cognition is essential for the management of power relations, which is necessary for the avoidance of barriers and inertia to alteration (Krackhardt 1990). Personage differs in terms of age groups, maturity of language by age, and is unlike other cognitive capabilities (Carroll 1993). Additionally, individuals also differ in specialised language skills, with numerous reading disorders apparent in the population. Because of the discerning capabilities in the arena of language and social cognitive capabilities, there is bound to be heterogeneity in the cognitive capabilities (Helfat & Peteraf 2015).

Proposition 3

Based on the discussion on section 3.4.9, 3.4.10 and 3.4.11 Table 3.3 summarises the role of managers in building sensing capability that supports the proposition 3 and Figure 3.5 diagrammatically represents the proposition 3.

Table 3.7: Role of managers in building reconfiguring capability

Reconfiguring capability	
Social capital	- Creating organisations as dynamic communities through linking architectural modularity, corporate culture and dynamic capabilities with a combined economic and social logic (Gulanic & Eisenhardt 2001) - Social capital of CEO's plays an important role in the strategic flexibility of an organisation (Ferna´ndez-Pe´rez, Garcı´a-Morales & Bustinza-Sa´nchez 2012) - Relationships at different management levels facilitate overcoming barriers to change (Chan, Hou & Lin 2013)
Human capital	- Successful managers effectively combine limited structures through extensive interactions with fellow employees, along with the delegation of a degree of autonomy for improvisation (Brown & Eisenhardt 1997)

	- Heterogeneity and continuous development of human capital in small accounting companies plays a critical role in applying dynamic capabilities to internal development to pursue related diversification of service offerings (Doving & Gooderham 2008).
Cognitive ability	- Managerial capabilities for reconfiguration can benefit significantly coordinating the adaptation process across assets through overcoming the resistance to change (Helfat & Peteraf 2015) - Social cognitive capabilities, in relation to a manager's social skills, relate to the capabilities of a manager when he/she has to achieve asset alignment under constant varying circumstances, which entails cooperative commotion in an organisation (Teece, Rumelt, Dosi and Winter 1994).

Figure 3.5: Proposition 3
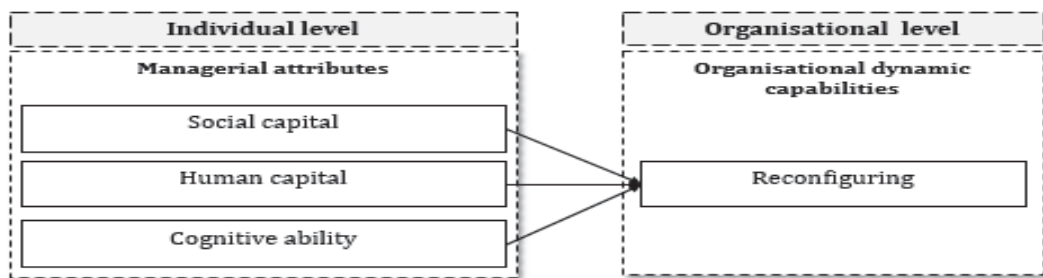
Proposition 3 is outlined as below:

Proposition 3

Individual managers a. social capital b. human capital and cognitive ability facilitate organisational reconfiguring capability.

3.4.10 Role of contextual managerial ambidexterity in building dynamic capabilities through achieving adaptation and alignment

Vollery, Mueller and Siemens (2013) find that ambidextrous managers engage in divergent thinking to make decisions regarding developing new ideas through conversation, observation and reflection, and they apply convergent thinking to nurture a participative culture with employees, partners and stakeholders to ensure the highest return from the existing operations. Moreover, the authors find that managers give the lower-level employees more authority and freedom to express their own ideas and provide effective guidance to carry out the implementation processes. Similarly, Wang and Rafiq (2014, p.73), based on the empirical evidence of their study of UK and Chinese high-tech firms, find that individual involvement and organisational culture play a role in achieving the desired integration of exploration and exploitation for contextual ambidexterity. Taylor and Helfat (2009) find empirical evidence that managers can positively facilitate the technological transition of a company through effective coordination between cross-functional teams that involve core technology and complementary assets. The authors find evidence in the case of IBM and the NCR Corporation that middle managers and senior managers play pivotal

roles in pursuing successful technological transitions. Moreover, Turner and Maylor (2013) show evidence of ambidextrous managerial practices in their study of a Global ICT company's UK arm. The authors find that individual managers can play an instrumental and unique role in determining technological and commercial solutions and implementing them in collaboration with customers, in an uncertain and changing context. Based on the above arguments the proposition 4 is argued. Figure 3.6 diagrammatically outlines the proposition 4.

Figure 3.6: Proposition 4
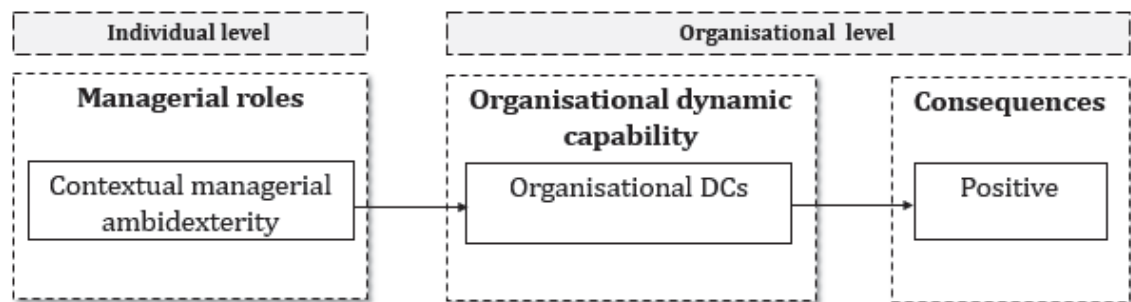
Proposition 4 is outlined as below:

Proposition 4

Contextual managerial ambidexterity assists organisations to obtain alignment of innovation and maintain operational performance to aid organisational dynamic capabilities with positive consequences.

Next role of organisational factors such as organisational structure and culture are discussed.

3.5 Organisational factors affecting dynamic capability building

Organisational structure and culture are considered as critical organisational factors that may have an impact on the dynamic capabilities on the focal companies. Hawass (2010) places an emphasis on having a future-oriented organisational structure that supports strategic orientation, innovative organisational culture, and having a culture, procedure and strategy that pursues efficient and effective methods and procedures for organisational learning. Teece (2009) suggests that entrepreneurial managers must assist organisations to evaluate different opportunities through engaging in strategic decisions including creating a helpful culture, developing goals, and building trust. Table 3.8 illustrates the organisational factors within the scope of this research. Eisenhardt and Martin (2000) outline the importance of a supportive culture to nurture dynamic capabilities with an

emphasis on supporting weak performers, collaborative approaches and forming a dynamic community to foster effective transformation of organisational resources and capabilities in accordance with the changes in the external environment.

Wang and Rafiq (2014) emphasise that organisational culture that supports ambidexterity needs to be developed from a bottom-up, rather top-down, approach through ensuring the participation and involvement of individuals in the organisational culture and context. Lavie, Stettner and Tushman (2010) find that the organisational tendency to explore over exploit is affected by organisational culture and structure as well as age, size, absorptive capacity and availability of slack resources. Hawass (2010) finds evidences that organisational culture and structure, in combination with a firm's strategy, positively effects organisational reconfiguration capability, one of three organisational dynamic capabilities within Teece's (2009) DCV framework. Finally, Simon (2010) find that business leaders in Australia place emphasis on the importance of nurturing of a flexible culture that encourages learning and innovation, resulting in sound development of financial, physical and human resources over long time. The authors also acknowledge global corporations such as Microsoft and Google as benchmarks in achieving this objective. Table 3.8 summarises the overview of organisational factors that may affect dynamic capabilities building. The above discussion offers ground to consider proposition 5. Figure 3.6 diagrammatically represents proposition 5.

Table 3.8: Organisational factors within research scope

Organisational factors	
Organisational structure	Future-oriented strategic orientation, organisational structure
Organisational culture	Innovative organisational culture, and having a culture, procedure and strategy that pursues effective, efficient and effective methods and procedures, for effective organisational learning.

Figure 3.6: Proposition 5a
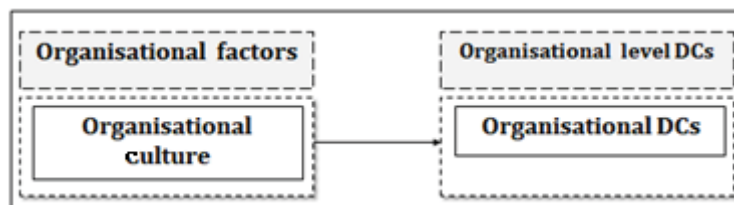
Proposition 5a is outlined as below:

Proposition 5a

Organisational structure may play a role of either facilitator or inhibitor during building organisational dynamic capabilities.

Figure 3.7: Proposition 5b
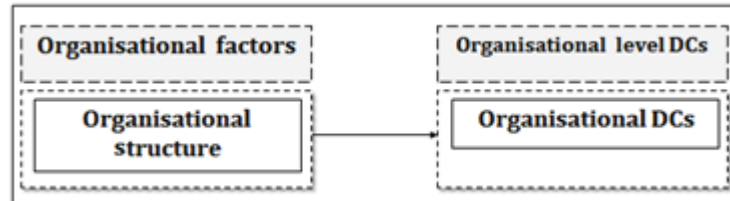
Proposition 5b

Organisational culture may play a role of either facilitator or inhibitor during building organisational dynamic capabilities.

3.6 Consequences of dynamic capabilities

Reviewing extant literature, Barreto (2010) reveals four kinds of relationship to outline the impact of dynamic capabilities on firm performances. Firstly, dynamic capabilities are directly linked with sustainable competitive advantage (Teece, Pisano & Shuen 1997; Teece 2007; 2009). For example, Agarwal and Selen (2009) find a positive relationship between firm performance and dynamic capabilities in the context of a network of firms within the telecommunication industry. Secondly, creation of competitive advantage will depend on the resource configurations that are a result of the effective application of dynamic capabilities in a timely and intelligent manner (Eisenhardt & Martin 2000) as Danneels (2011) suggests that managerial resource cognition plays a critical role in timely and appropriate decision making by the managers during environmental dynamism. Thirdly, dynamic capabilities cannot offer the certainty of creating advantageous organisational performance as it is not possible to consider all the contingencies during investment in dynamic capabilities (Winter 2003). Finally, dynamic capabilities may create negative performance outcomes as managers' may not be able to perceive the context of the external environment in an accurate manner to apply dynamic capabilities effectively (Ambrosini & Bowman 2009). This is evident in Danneels' (2011) study of Smith Corona where, during the time of declining market size of typewriting industry, the managers of Smith Corona made a series of mistakes before the company finally filed for bankruptcy. The above discussed four possible consequences of dynamic capabilities are listed in Table 3.9. Figure 3.8 diagrammatically represents proposition 6.

Table 3.9: Consequences of dynamic capabilities based on Barreto (2010)

Consequences of dynamic capabilities	
Positive Relationship	
Evidences from literature	Agarwal and Selen (2009) - Conducted empirical study on telecommunications company with positive findings on the linkage between dynamic capabilities and performance outcomes
Explanation and adaptation	In a context of collaboration, dynamic capabilities positively impacted to enhance the organisational service resulting positive performance outcomes.
Indirect relationship	
Evidences from literature	Lu, Zho, Bruton and Li (2010) - Conducted empirical test and found capability as a mediator to firm performance Pavlou and Sawy (2011) - Conduct empirical investigation on business unit level that reveals an indirect relationship between firm performance and dynamic capabilities mediated via operational capabilities.
Explanation and adaptation	Superior performance must be mediated by capability.
No relation	
Evidences from literature	Zollo and Winter (2002) - Argued that there is no linkage between firm performance and dynamic capabilities
Explanation and adaptation	The authors perceive dynamic capabilities as an evolutionary process of adaptation.
Negative relationship	
Evidences from literature	Ambrosini and Bowman (2009); Eisenhardt and Martin (2000) - Argued dynamic capabilities may produce negative outcomes
Explanation and adaptation	In a rapidly changing business environment a manager may need to make decisions which may be proved to be wrong.

Based on the above arguments the proposition 6is proposed:

Figure 3.8: Proposition 6
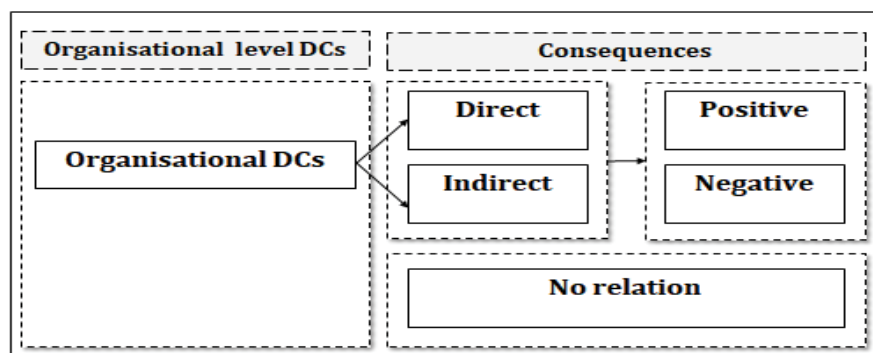
Proposition 6 is outlined as below:

Proposition 6:

Dynamic capabilities may influence a. directly, b. indirectly that may result c. positive or d. negative consequences on organisational performance or dynamic capabilities may have no relation on organisational performances.

3.7 Discussion on the conceptual framework

Salvato and Vassolo (2017) suggest that conceptualising dynamic capabilities from the perspective of higher-level organisational routines (Schilke 2014; Zollo & Winter 2002) or as decision making rules, as envisioned by Eisenhardt and Martin (2000), is useful, however it cannot explain the source of dynamism within the firm. The authors further explain that the existing organisational-level perspective perceives dynamic capabilities as collective endeavours without explaining the process of how dynamic capabilities originate and operate within an organisation, as well as the limits of organisational dynamic capabilities within the scope of top management's cognition and actions. As routines are path dependant, exploration may not be possible in a different business domain (Winter 2008) following patterned actions for resource dynamisation which restrict autonomy of the individual organisational member to act in a creative manner that adversely affects the innovative change initiative (Salvato & Vassolo 2017). Finally, Salvato and Vassolo (2017, p. 3) conclude that present dynamic capabilities theories can neither elaborate nor explain how individual employees can affect positively organisational-level renewal of assets, nor '*can it explain how a dynamic, firm-level routine, once it has emerged, can be perpetuated without also curbing the innovativeness of individual employees, on which the capacity to adapt is premised*'. The figure 3.8 illustrates detailed elements within the conceptual framework.

Figure 3.9: Themes within conceptual framework
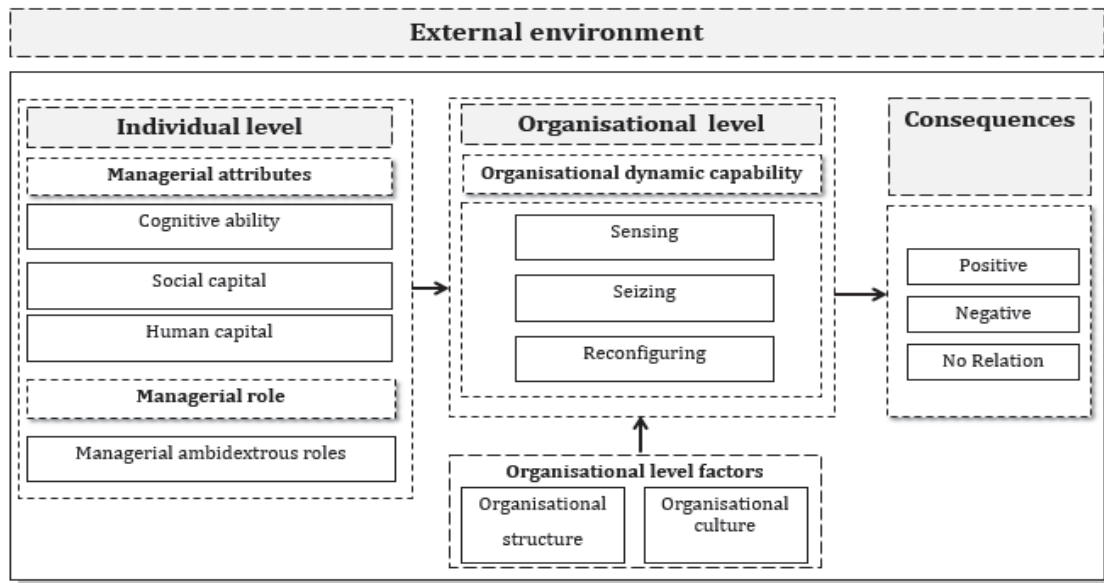
To address the above-mentioned void in the present understanding of dynamic capabilities, this research extends Teece's (2009) framework of dynamic capabilities that considers sensing, seizing and reconfiguring as the major building blocks of dynamic capabilities, at the individual-level of dynamic capability building processes. Managerial actions to facilitate sensing, seizing and reconfiguring and balancing exploration and exploitation is considered as 'managerial entrepreneurship' (Teece 2009) and 'managerial ambidexterity' (Smith & Tushman 2005) in the extant literature. In addition, managerial attributes are primarily based on the notion of dynamic managerial capability (Adner & Helfat 2003), which comprises managerial 'human capital', 'social capital' and 'cognitive ability'. This conceptual framework will enrich our understanding of the origin, nature and process of dynamic capabilities building that scholars have indicated warrants further research. (Teece 2009; 2007; Helfat & Winter 2011; Ambrosini & Bowman 2009). Additionally, this conceptual framework will facilitate empirical investigation on the influence of the attributes and roles of managers in building enterprise-level dynamic capabilities addressing the research gaps identified by various scholars (Gavetti 2005; Smith & Tushman 2005; Helfat & Peteraf 2015; Martin 2011; Kor & Mesko,2013; Agarwal & Selen 2009; 2014). Finally, this conceptual framework will aim to fill the research gap of capability building research in emerging markets articulated by scholars (Alam 2010; Guillen 2000; Ray & Chakrabarti 2006; Luo 2004, Kandampully 2002; Hatum & Pettigrew 2004). This conceptual framework will guide the research methodology used to carry out the investigation, following the research design.

3.8 Summary

This chapter started with outlining a conceptual framework based on the literature review chapter. Throughout the chapter, the detailed underlying logic of the conceptual framework is critically analysed to devise propositions for the conceptual framework. These propositions will act as the underlying logic of the conceptual framework to not only guide the selection of an appropriate method to conduct the empirical investigation, but also to explore the empirical evidences to offer rich insights on the propositions of the conceptual framework. In the next chapter, a detailed discussion of the appropriate methodology for this study is presented.

Chapter 4: Methodology

This study aims at investigating the role of individual managers in building organisational dynamic capabilities in medium sized ICT companies using the theoretical lens of the DCV. Using a qualitative methodology, this research intends to bring rich insight through reporting evidences from case studies to explicate the indispensable managerial roles and attributes in dynamic capabilities building during a rapidly changing external environment, relevant to the ICT industry in the context of empirical enquiry.

Figure 4.1 provides an outline of this chapter. Section 4.1 will discuss the research epistemology, methodology and the method that will be applied in this research. Section 4.2 will offer insights on the research design and section 4.3 will illustrate the detailed research model. Section 4.4 will discuss data access and the ethical consideration of this study. Section 4.5 will outline the methodological scope, limitations and challenges and finally section 4.6 will summarise the chapter.

Figure 4.1: Outline of chapter four
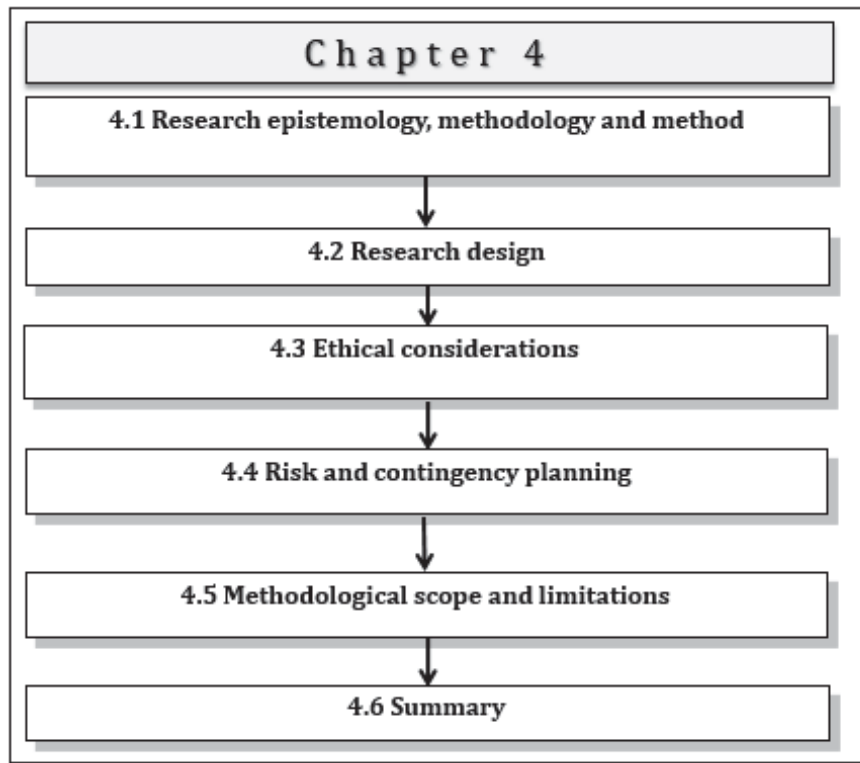
In the next section the research epistemology, methodology and method will be discussed.

4.1 Research epistemology, methodology and method

This research is conducted with a constructivist epistemology following a qualitative research methodology using the multiple case study method following Yin (2003) as outlined in Figure 4.2. Yin (2003) situates the case study method on the constructivist paradigm. Gray (2009) argues that the constructivist perspective perceives that truth and meaning are constructed through the interaction of the subject with reality. Gray (2009) further notes that meaning is constructed rather than discovered, whereas truth is subjective to one's perspective (Stake 1995). Therefore, the case study method can be linked with subjectivism due to its recognition of the researcher's perspective in analysing the data; however, case study findings may attain a degree of objectivity through performing theoretical generalisation (Gray 2009). On the other hand, Silverman (2005 p.212) argues that qualitative research cannot provide objective reflection of reality because:

> '*many of the models that underlie qualitative research are simply not compatible with the assumption that 'true' fixes on 'reality' can be obtained separately from particular ways of looking at it*'.

Figure 4.2: Overview of research methodology
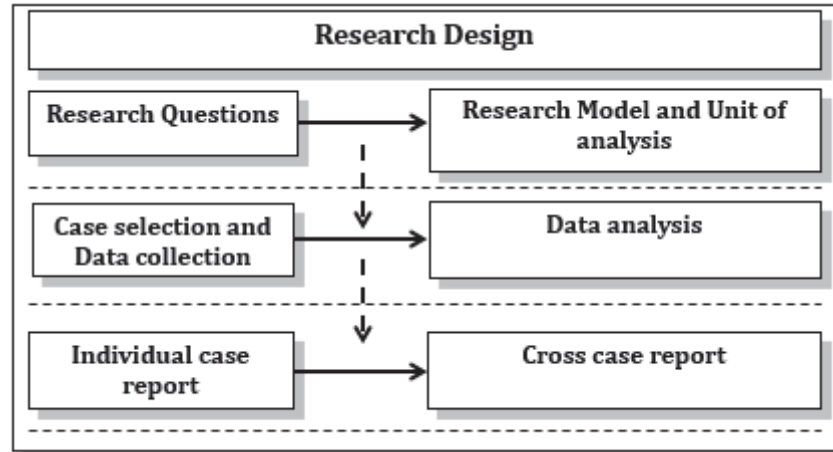
Case studies are widely used in organisational studies and social sciences with increasing confidence (Hartley 1994; Hartley 2004). Yin (2003a) states that to investigate the desired complexity of social phenomena distinctive case studies are needed. He argues that the case study method provides an opportunity to the researcher to accumulate meaningful characteristics of events such as processes, or causes, while remaining holistic to the context. Hartley (2004) defines case study research as a detailed investigation of the data that are collected over a period about intended phenomena within the context, with the aim of examining the circumstances and processes and highlighting the theoretical implications.

A case study methodology allows enhanced reliability and credibility due to the presence of multiple perspectives (Eisenhardt 1989).

Yin (2003a) states that the case study method can be applied in the situation where the boundary between the context and the phenomenon is not clearly manifested and the researcher does not have any control over the context. Aramand and Valliere (2012) suggest that the clear boundary between dynamic capabilities and other organisational capabilities are difficult to draw within a firm's context, furthermore, senior managers also require sufficient background knowledge to explicate dynamic capabilities from other type of organisational capabilities, therefore, a case study with face to face interview with the senior managers is an appropriate method to study the process of building dynamic capabilities within the context of empirical enquiry. Moreover, the nature of the research questions is one of the key criteria for selecting the research method (Yin 2003). Yin (2003) mentions that if the research aims to answer 'how' and 'why' questions, then the case study can be the appropriate research method. The key research question of this research is to address how managerial roles can facilitate building dynamic capability in the ICT companies in a developing country, namely Bangladesh. Therefore, the case study method will allow investigating and uncovering current managerial practices to develop enterprise-level dynamic capabilities in ICT companies of Bangladesh. The multiple case study method will facilitate the development of a theoretical framework using the logic of replication (Yin 2003). In the next few sections different aspects of the research design and methodology will be discussed in detail.

There is a clear rational for choosing the case study as a preferred methodology for this research. Firstly, the case study method is widely used to investigate ICT companies. Kaiser and Buxmann (2012), for example, conducted multiple case studies on five ICT organisations to uncover the distinctive nature of core elements of organisational design, strategy, structure and processes. Tarafdar and Gordon (2007) adopted a qualitative methodology to conduct a case study to uncover how information system competencies influence process innovation. The case study method has been widely used in investigating dynamic capability building in ICT companies (Gulanic & Eisenhardt 1997; Brown & Eisenhardt 2001; Martin 2011). Secondly, the case study method encourages participants to express their views and understanding about the reality, emphasising a close collaborative relationship between the researchers and the participants (Crabtree & Miller 1999). This approach not only provides in-depth understanding about the reality to researchers, but also provides scope to understand the actions of the participants in the specific context (Lather 1992; Robottom & Hart 1993). Finally, Eisenhardt and Graebner

(2007, p.27) argue that the multiple case study method allows '*broader exploration of research questions and theoretical elaboration*'. Similarly, Yin (2003, p.19) suggests that '*multiple case study design is stronger than the single case design*'. Considering these aspects, the multiple case study method is selected for this research.

The case study method is heavily used in investigating dynamic capabilities in different companies. For example, Fischer, Gebauer, Ren, and Fleisch (2012) conduct multiple case studies to understand the process of sensing, seizing and reconfiguring processes in service companies. Similarly, Chan, Hou and Lin (2013) apply the multi-case comparative method to four companies in Taiwan's electric scooter industry and uncovered the formation of elements of dynamic capability, particularly sensing capability. The case study method is also used in investigating behavioural patterns in teams within software development companies during software development in uncertain conditions (Chan, Hou & Lin 2013).

4.2 Research design

It is critical to develop a robust research design for effective case study research (Yin 2003). Yin (2003, p.19) states '*A research design is the logic that links the data to be collected (and the conclusions to be drawn) to the initial questions of study*'. Research design consists of logically combined steps including data collection, interpretation and analysis which are linked to the research question (Hartley 2004; Yin 2003a, pp.19-21). Miles and Huberman (1994) and Stake (1995) argue that the propositions of the case study guide the data collection sources, establish the direction and scope of the study, and shape the conceptual framework of the study. Eisenhardt (1989b) and Yin (2003), advocate identifying the consistent pattern of data that are collected from a series of cases where each case either confirms or disconfirms the emergent theory. The logic of replication will be applied to confirm or disconfirm the emergent theory (Eisenhardt 1989b; Yin 2003). In replication logic, each case is treated as a separate experiment so that theoretical links within one case can be verified by the others (Yin 2003).

Figure 4.3: Overview of research design
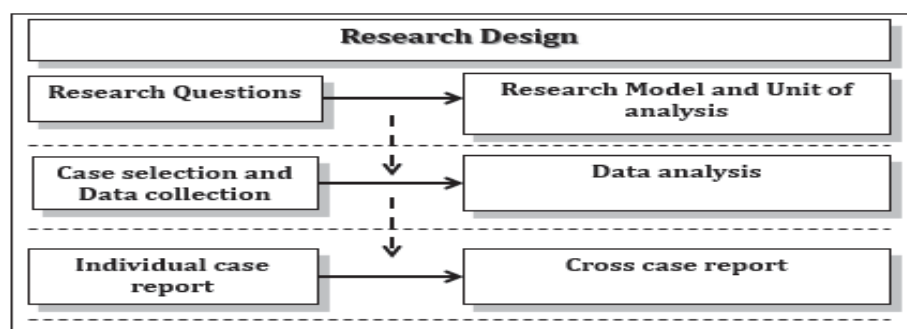
In the next few sections unit of analysis, data collection, data analysis and reporting case findings, will be discussed in detail.

4.2.1 Unit of analysis

Yin (2003) notes that the case study strategy is best suited to facilitate research questions that aim to answer how and why questions. Yin (2003 p.22) states '*each proposition directs attention to something that should be examined within the scope of study*'. Yin (2003) mentions that research propositions may help the researcher to remain within the scope of the research while conducting the research. Yin (2003) argues that it is critical to develop a robust theoretical model prior to conducting the case study to allow the researcher to triangulate the findings theoretically based on the extant literature.

Additionally, Yin (2003) suggests keeping the unit of analysis as a generic term to ease the process of comparing case study findings with the previously conducted research. The unit of analysis is important to ensure that the research objective of the study clearly matches with the defined unit of analysis (Gray 2009). Furthermore, the conceptual framework provides suggestions regarding the inclusion and exclusion of subjects or unit of analysis from the study. The managerial role in the capability building process is the primary unit of analysis of this study as evident in the study of Turner (2011) who considered managerial roles as the unit of analysis in studying managerial practices in technological capability building projects. Semi-structured interviews with managers, archival data, company reports, and online news articles will serve as the key sources of data for this research.

The research model or methodological framework of this study as outlined in Figure 4.4 consists of primarily three key building blocks. First, at the define and design stage, the research framework is defined and designed to investigate the managerial roles in building dynamic capabilities in the ICT companies in the context of empirical enquiry. At this stage potential participants are considered, and the unit of analysis is clearly articulated with a detailed data collection protocol. Then single case studies are conducted through collecting data, followed by preparing individual case reports. Finally, the a cross-case analysis is conducted to identify the commonality across the cases.

Figure 4.4: Methodological framework based on Yin (2003)
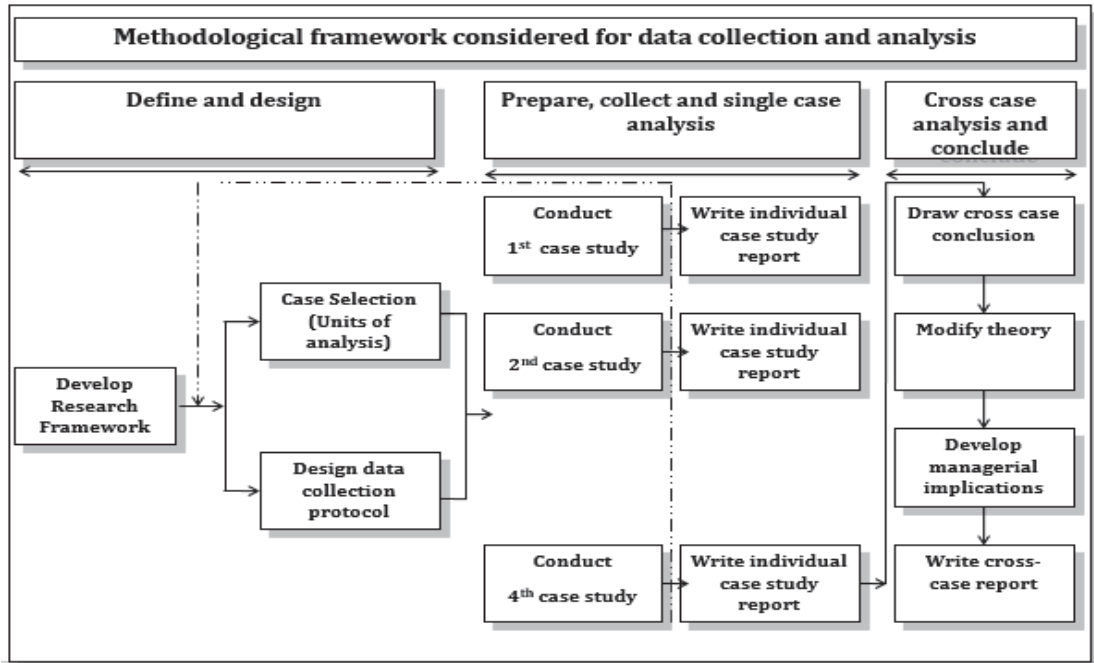
4.2.2 Case selection

A case should be selected based on the logic of theoretical sampling that means '*they are particularly suitable for illuminating and extending relationships and logic among constructs*' (Eisenhardt & Graebner 2007, p.27). Cook and Campbell (1979) suggest reporting sufficient detail about the context of the case study including the competitive dynamics of the industry, business cycle, and financial performance data so that the reader can appreciate the sampling choice of the researcher. Gibbert and Ruigrok (2010) recommend that the researcher explains the selection of the case through disclosing to what extent the case represents the specific industry.

Yin (2003) mentions that in multiple case studies it is difficult to identify the necessary number of cases for the study. He further notes that the number of necessary cases should not be determined based on sampling purpose, rather the number of cases should be determined based on replication logic, considering literal and theoretical purpose. The number of cases that are required for a multiple case study depends on the degree of certainty a researcher aims to attain from the research. Miles and Huberman (1994) suggest obtaining maximum variation in selecting cases and Eisenhardt (1989) advocates that variation may enhance external validity through theoretical and literal replication and suggests that six to ten cases are adequate to attain sufficient generalisability through using the logic of replication.

In order to ensure evidence can be drawn on maximum possible aspects of the underlying theories of this research, a purposive theory-driven sampling strategy is deployed (Eisenhardt 1989) that also facilitates theoretical and literal replication (Yin 2003). In doing so, each participant organisation is cross checked whether they have proven evidences of dynamic capabilities in the past, and whether this is maintained to disqualify any participant organisation without a proven record of accomplishment of dynamic capability practices. Financial performance and new product introduction are some of the criteria used to identify existence of dynamic capabilities practices to select appropriate cases for the study. The sufficient number of cases required to obtain generalisation is subject to scholarly debate, as Eisenhardt (1989) originally suggests six to ten cases to develop a generalised theory, but later Eisenhardt and Graebner (2007) suggest that three to four cases and more can offer a rich resource for theoretical saturation if there is one case which is significantly different in nature to the rest. Aeron and Jain (2011) conduct their exploratory study on the process of building technological capability in telecom start-up companies through recruiting four cases with one deviant case with significantly distinctive characteristics from the rest.

For this research, at least eight organisations were contacted, however only five companies responded to the first communication. Senior managers of potential companies were contacted via email in accordance with the sample email correspondence in Appendix 1. Four organisations agreed to participate in this research and one organisation could not decide whether to participate or not. It is important to note that, one company was successfully recruited with significantly opposing performance, which is considered as deviant case as suggested by Yin (2003) and illustrated by Aeron and Jain (2011). The deviant case offered greater value to this research, however more participant organisation would allow greater generalisability of the findings of this research.

Scholars have conducted empirical investigation into dynamic capability building in SMEs in the context of the Norwegian business industry. For example, Doving and Gooderham (2008) investigated dynamic capability building in small and medium accounting firms in Norway. However, Teece (2009) suggests that the existence of dynamic capabilities is more evident in large companies. Following Teece's (2009) suggestion, this research excluded small firms and conducted an empirical study on medium-sized firms that have identifiable processes to reflect dynamic capability building practices. Aramand and Valliere (2012) consider firm with innovative activities and constant effort in seeking new opportunities in the market are critical criteria to identify appropriate firms to study dynamic capabilities building processes. Additionally, include, the changing business environments (Mathiassen

and Vainio 2007), the operational capabilities are easier to distinguish in the software companies than the manufacturing companies such as automobile companies (Ethiraj et al. 2005), and finally, the capability to design, develop and maintain software systems and services to the marketplace are the key rationales for selecting software companies to study dynamic capabilities building processes. Medium sized companies with more than ten years of operating history may demonstrate observable routines and practices leading to dynamic capabilities building possible to identify through investigation.

Based on the above insight, this research first identified an appropriate case (organisation) for this study following the criteria outlined in Table 4.1 and commenced the investigation with a person from the top management who has deep insight about the capability building processes of the company. As most of the ICT companies in Bangladesh are SMEs (Nyenrode Business Universiteit 2014) and these companies are mainly managed by the owner and CEO of the company (Mamun, Igel & Islam 2000), top management can provide valuable insight for this study. Following the snowball approach as applied by Martin (2011), successive key informants who matched the criteria outlined in Table 4.2 are identified and approached. Finally, the total number of informants for each case is restricted to within ten, as suggested by Creswell and Poth (2017). Interviews are conducted in English if the informant has sufficient confidence and expertise in expressing their views in English, otherwise interviews are undertaken Bengali, then translated into English through certified translators after transcribing from recording.

Table 4.1 Criteria used for case selection

Criteria	Explanation
Industry	Organisation must operate in ICT industry
Size	Medium size with more than 100 employees
Operating time	More than 10 years of operation
Evidence of attempted innovation	Successful introduction of new products, services
Evidence of systematic processes or operating routines to address external factors	Organisation have identifiable routines, processes or approaches to manage dynamic capabilities
Experienced managers are available to offer valuable insight	Experienced and knowledgeable managers are available who can effectively inform this research
Performance outcomes	Company demonstrates a consistent corporate performance.

Table 4.2 Criteria used for respondent selection

Approach: Snowball sampling	
Criteria	**Explanation**
Experience	Has more than at least two years at the focal company, initially priority will be given to managers with five years or more years of experience at the focal company
Exposure to new product development	Informants have significant exposure to development of new products or services
Exposure to technological change	Informants have experienced technological changes
Exposure to changes of customer requirement	Informants have experienced and managed changing customer requirements
Exposure to competitive actions	Informants have experienced changing competitive landscape of the business
Domain knowledge	Informants have obtained comprehensive domain knowledge about the focal company and the key customers.

Table 4.3 outlines the five companies approached for this research and the nature of response, plus their response to allowing access to data for this research. Finally, four companies that offered access to conduct this study formed the sample for this research.

Table 4.3 Approach for access, responses and final selection

Company (not real name)	Nature of response	Response to access request	Agreement of confidentiality
Com X1	Initially showed interest but later did not response to the initial email correspondence.	None	None
Com X2	Initially showed interest but later did not response to the initial email correspondence.	None	None
Com X3	Initially showed interest but later did not response to the initial email correspondence.	None	None
Com Y	Initially showed interest but later ignored tactfully by the senior management who assigned middle managers	No response contemplated as negative response after several requests for appointment with the top management	None
Com A	First attempt through physically visiting the head office gave no result, afterwards attempt to meet top management results in no outcomes. Finally, a reference was used to gain access to the top management	Responded positively after liaison with the top management and positive signal of top management to significantly facilitate the data collection	Signed by all informants
Com B	Approached the top management through social references that immediately produced positive result	Top management significantly facilitated the data collection	Signed by all informants
Com C	Approached via email after noticing a newspaper advertisement and received immediate positive response	Top management significantly facilitated the data collection	Signed by all informants
Com D	Approached the top management through social references that immediately produced positive result	Top management significantly facilitated the data collection	Signed by all informants

4.2.3 Design data collection protocol

Yin (2003, p.8) states that '*the case study's unique strength is its ability to deal with a full variety of evidence – documents, artefacts, interviews and observations*'. Yin (2003) illustrated several sources for data including but not limited to interviews, archival data, documentation, physical artefacts, direct or participant observations and survey data. In the study of ICT companies in the United States, Martin (2011) utilises interviews, emails, follow-up phone conversations, archival data, internal documents, annual reports, news articles, and press releases, however the primary source of data in his research is semi-structured interviews of highly knowledgeable informants. Tarafdar and Gordon (2007) collected data for their case study on ICT companies through interviews, secondary records and data analysis, as well as follow-up interviews for gaining new information and insights about the findings.

Eisenhardt and Graebner (2007) state that interviews are a very good source of primary data to investigate infrequent events, however, to overcome the issue of bias, the authors suggest selecting highly knowledgeable informants who can inform the research questions from diverse perspectives. The authors further suggest incorporating a sufficient number of informants. Yin (2003) argues that the case study method demands the use of ego, intellect and emotions more rigorously than the other research methodologies because the data collection processes in the case study method is not routinised. Yin (2003, p.59) states some characteristics of a good case study researcher includes their ability to ask '*good quality questions*' and be prepared to be a good listener. Moreover, an investigator needs to be '*flexible and adaptive*' to the research context as well as to possess a sound understanding about the focal area of study and finally, advised researcher to remain '*unbiased by preconceived notions*'.

Data collection processes demand frequent interactions between the theoretical issues and the collected data (Yin 2003). Cassell (2009 p.503) states that interviews are semi-structured for their purpose and thus give 'in-depth' data which is not 'standardised'. According to Creswell (1998) in order to conduct in-depth exploratory case study ten informants, represent a reasonable sample size. For this research, at least ten participants are interviewed to construct one case study and the process is repeated following multiple case studies until sufficient saturation of the findings become evident. Therefore, a total of forty-three interviews were conducted to prepare at-least four case studies. Following Martin (2011), snowball sampling method (Miles & Huberman 1994; Gray 2009) has been applied to identify potential informants.

Data collection and management protocol followed in this study

During data collection a systematic procedure was undertaken to ensure appropriate behaviour as directed by the ethics approval guidelines followed. Once an organisation accepts to take part in this research, an information sheet, a brief background of the research and consent forms are communicated with the participant organisation (Appendix 2, 3, 4a, 4b and 5), and a meeting is arranged with the top management to sign the consent form for participant companies, as well as to schedule the data collection process. Wu (2010) suggests that top management can facilitate the data collection procedure through referring to highly knowledgeable informants. Then, with support of the top management of the organisation, a schedule for semi-structured interviews of the knowledgeable senior managers is arranged. Additionally, in each of the cases, top management assigns one senior manager to coordinate the data collection procedure and to remain as the key contact point during research on the organisation. All the interviews are conducted at the participant organisation's workplace to ensure the most comfortable environment for the informant's interview. The researcher becomes acquainted with the participant organisation environment to understand the social norms and official protocols to ensure organisational rules are respected and followed. During the interview schedule, the researcher normally arrives at the premises earlier than the scheduled time of interview and reports the key contact person. They then facilitate the interview schedule. Moreover, if a potential interviewee is busy with operational duties, the researcher normally waits while the interviewee completes these. Several interviews needed to be rescheduled due to the unavailability of the interviewee in the prescheduled time slot.

Once the interviewee arrives at the designated place to participate in the semi-structured interview, I introduced myself and my background and the key aims of the research. Prior to the interview, an information sheet (Appendix 4b) and the background of the research (Appendix 5) is supplied to the informant. Interviewees are informed about their rights to withdraw from the interview, and the consent form is signed (Appendix 3) to obtain permission to record the interviews and assure confidentiality of the informants throughout the research project. Additionally, the contact details of the principal supervisor of this research is provided as a point of contact for additional queries and to communicate any potential conflict that may arise through the data collection procedure. The interviewees are given the option to speak either in English or their native language, Bengali. Most found it more comfortable in their native language, therefore the majority of the interviews are in Bengali. During the semi-structured interviews, the researcher used the questions prepared as Appendix 6a, based on questions asked in similar research (Appendix 6b). Detailed notes

of the interviewees' answers are taken by hand. Additionally, in some cases the interviewees also contributed to the notes if some concepts required visual representation. Once the interview is finished, interviewees are allowed to contribute additional comments or information as deemed important, and the researcher requests any supporting documents from the interviewees. On occasions interviewees showed the researchers confidential official documents on their laptops to support their opinions. Finally, contact details and visiting cards are exchanged for follow-up communication to validate and confirm the findings obtained from the interviews, as well as general findings about the participant organisation. All the interviewees are treated with respect and appropriate norms and behaviours.

After finishing all the interviews, the recorded interviewees are de-identified, and notes transcribed and translated by the researcher, and professional transcribers and translators, and communicated to the interviewees. However, not all the interviewees could offer their time to go through the interview transcripts, therefore frequent phone conversations and email communication were maintained to ascertain accuracy of the information and confirming the general findings of the studied cases. The data collection process took two months to complete before the researcher travelled back to his regular residence in Sydney, Australia.

All the recorded interviews are kept in the researcher's laptop, personal external hard disk, and internet-based cloud storage to avoid loss of data due to any technical failure. Extra caution is taken to ensure de-identification of the interviewees and organisations, and their products and services, to ensure privacy and confidentiality of the participants as required by ethical guidelines obtained during ethics approval. Interview data are also stored using QSR Nvivo software to develop a single case data file. Findings are also stored in MS Excel files and in word documents along with the original MP3 recording files. Collected data is organised using QSR Nvivo Software, as McLaren et al. (2011) note that this software assists in managing case study databases (Figueiredo & Brito 2010; Wu 2010) and analysing the data in their case study research.

4.2.4 Reliability and validity of the data

It is critical to ensure the validity and reliability of the case study. Silverman (2005) highlights two focal concepts to accomplish credibility in scientific research: validity and reliability. He further notes that it is a significant challenge for the case study researcher to ensure validity in their research findings. In order to explicate the essential elements of design quality of the case study, Yin (2003) also emphasises reliability and recommends

three types of validity: construct validity, internal validity, and external validity. He further notes that researchers need to convince themselves, and the reader, that findings are the result of critical investigation of all data, rather than selected examples from the findings. Therefore, the research design needs to consider validity and reliability as key aspects to ensure the highest quality. Next, construct validity, internal validity, external validity and reliability, will be discussed.

Gibbert and Ruigrok (2010) suggest two strategies to attain construct validity. First, the researcher needs to perform data triangulation through adopting multiple perspectives to view the same phenomenon, with different data collection strategies from various sources. The authors suggest that interview data, archival data, participatory or direct observation can be different data sources for triangulation. The authors further recommend that transcripts of evolving case studies can be reviewed by peers (examples: academics, members of the focal organisation) to achieve consistency and accuracy. Secondly, Yin (2003) suggests the researcher report evidence in a sequential manner so that the reader can reconstruct the process of the whole research from initial research questions to conclusion. Gibbert and Ruigrok (2010) recommend the disclosure of detail clarification of the planned versus the actual data collection processes, as well as a comprehensive discussion of the data analysis procedure, to provide future researchers with the clear chain of evidence of the case study.

Yin (2003) mentions that internal validity is very important for explanatory or causal case studies. Yin (1994) refers to internal validity as the logical strength of the causal relationships between variables and the results of the case study. Yin (1994) further mentions that internal validity is important during the data analysis phase in order to produce a convincing case study result. Gibbert and Ruigrok (2010) mention that external validity refers to the generalisability of the case study result beyond the research setting of the study. Although Lee (2003) argues that the case study method cannot deliver statistical generalisability over a population, Yin (1994; 2003) advocates, to address this, that the case study researcher performs an analytical generalisation based on empirical evidences and existing theory.

Finally, reliability is referred to as the absence of random error and ensuring that later researchers will find a similar insight if they follow the similar steps (Denzin & Lincoln 1994). Silverman (2005 p.210) defines reliability as '*the degree of consistency with which instances are assigned to the same category by different observers or different occasions*'. Silverman (2005) recommends researchers depict a detailed presentation of the data with

low personal inferences. Furthermore, he suggests carefully recording and transcribing interview data to maintain reliability. Gibbert and Ruigrok (2010), in a similar vein, advocate that the researcher prepares protocols for data collection, management and analysis to disclose the detailed procedures of conducting the case study, to give transparency to the whole research process, as well as allow future researchers to replicate a similar study.

4.2.5 Data analysis

Logic linking data to propositions, and criteria for interpreting the findings, are the fourth and fifth component of research design, and part of the data analysis phase of case study. The theoretical or conceptual framework serves as an anchor for the case study and bridges the design stage with the data interpretation stage (Gray 2009). In the case study method, it is recommended to identify the similarity in views of different participants through incorporating them into emergent themes and patterns (Creswell 2003; Miles & Huberman 1994; Robson 2002). Ekstein (2008) considers each interview independently within the case. The detailed discussion of the data analysis procedure adopted in this study is discussed in the below section. Silverman (2005) suggests three strategies for analysing case data. First, as recommended by Glaser and Strauss (1967), the constant comparative method recommended by the researchers is used to identify another case to verify the provisional hypothesis. Secondly, Silverman (2005) highlights the importance of utilising all the collected data during analysis, which the author calls a comprehensive data treatment. Finally, Silverman (2005) stresses the importance of identifying any deviant case that does not fit within the theoretical framework. Additionally, Hartley (2004 p.330) recommends the researcher verify the case findings with the participants to increase the validity. To verify case results, Capron and Mitchel (2007) conducted a workshop with the highly knowledgeable informants to verify their findings, interpretations and conclusion. Therefore, the findings are cross-checked with the participants for validation through follow-up interviews, phone calls, emails, video conferencing and face-to-face follow-up interactions.

Data analysis protocol followed in this study

To facilitate the data collection and analysis, a conceptual framework is developed in the conceptual model chapter. At the same time, the definition of the different building blocks of the conceptual models is also discussed. Considering the extant literature, and detailed elements of the building blocks of the conceptual models, a list of questions is prepared to carry out the interview processes. The list of questions is written in a non-technical way so

that the interviewees can understand the questions without having a prior knowledge of the underlying theories of this study. Appendix 3 provides an overview of the questions used during the semi-structured interviews with the senior managers of ICT companies in Bangladesh, based on the extant literature.

During data collection, detailed notes are taken following Figueiredo and Brito (2010) and a keen attention given to identifying any new concepts or themes provided by the interviewees. Same questions were asked to all informants to achieve consistency of facts on different events and projects that are outlined by informants (Figueiredo & Brito 2010). Snowballing and cross checking with a third interviewee (Figueiredo & Brito 2010) played an important role in overcoming any discrepancies and obtaining details of any specific organisational initiative to demonstrate dynamic capabilities. If a new concept, idea, or theme emerges during the interview the informant is requested to offer additional insights and evidence to provide a deeper understanding about the newly introduced perspective. Moreover, the new themes, ideas and concepts are further verified and validated by the following interviewees.

Yin (2013) states that in the case study method, data analysis actually starts with the data collection process, which was certainly the case during this piece of research. Whilst conducting interviews, the researcher actively tried to evaluate responses in terms of how they related to the research questions. When new themes, ideas or perspectives were presented by interviewees, they were highlighted in interview records for incorporation into subsequent interviews. Audio recordings of each interview were studied afterwards to clarify knowledge and understanding. Any statements made, or information presented which required further clarification were promptly addressed either with interviewees themselves or through other credible sources. This process was carried out consistently throughout the data collection period.

Once sufficient interviews had been conducted for a saturation of common findings across the cases to emerge, data collection was considered to be completed. The second phase of data analysis based on interview transcripts then began. Interview transcripts were cross-checked with respondents to ensure greater accuracy, as suggested by McLaren et al. (2011) and Figueiredo and Brito (2010) before coding of interviews began. To analyse the findings, the researcher listened to the recorded interviews and repeatedly read the transcripts to identify common themes in each case, and across the cases, in an inductive manner through selective coding (Ellram 1996; Andrade 2009). Once the key themes identified in each case became repetitive, a deliberate attempt was made to construct the answers to the research

questions, reflecting emergent themes and ideas drawn from the analysis. The identified new themes were verified through studying the literature to identify the relevant stream within the literature. Then the new insights were reflected within the subsequent interview questions of the ongoing analysis.

The ongoing analyses were continuously compared across studied cases, informants, and adopted methods to add further insights on the conceptual model developed in chapter three, as suggested by Eisenhardt (1989) and followed in the case study by McLaren et al. (2011). The researcher has paid attention to the sequence of events in achieving certain milestones, processes, and phenomena, to develop a narrative that can reflect the managerial roles, routines, processes, or activities leading to dynamic capabilities building, and also considering multiple data sources such as office documents, reports or online news, following the case study of technological capability development conducted by Figueiredo and Brito (2010). Figueiredo and Brito (2010) acknowledge that it is difficult to obtain confidence in data of past events. To address this issue, in this study attempts were made to collect as much information as possible from diverse sources throughout the formal data collection and analysis process.

Through repetitive analysis, and reflecting on the extant literature, the first case study was prepared and offered rich insights to the conceptual model developed in the theory building chapter. Following McLaren et al. (2011) and Figueiredo and Brito (2010), informants were given the opportunity to highlight any inaccuracy within the case study via email communication to obtain objectivity, and to ensure the findings are supported by the evidences. Objectivity is further enhanced through frequent comparisons and matching patterns between theory and emerging themes (McLaren et al. 2011; Figueiredo & Brito 2010). Additionally, content validity is established by triangulation of multiple data sources, justification from previous study of the extant literature, and feedback on the outcomes of the findings from industry experts through personal connections. Reliability is strengthened through strictly following the protocols developed for data collection, management and analysis, maintaining a database of all the evidence and findings, and comparing the results from multiple respondents, as evident in McLaren et al. (2011) and suggested by Yin (2003), Strauss and Corbin (1998), and Eisenhardt (1989).

Finally, following Figueiredo and Brito (2010), the interviewees are frequently contacted throughout the data collection and analysis process to offer valuable insights on the emerging themes and perspectives that guided the data collection and analysis procedure. The key contact person from the participant organisation is contacted via phone and their

critical insights are incorporated to increase the validity and reliability of the prepared case studies. The prepared case report is shared with the researcher's supervisor and peers to obtain and integrate their valuable feedback on the clarity, readability, and academic soundness of the report. This process is then repeated to prepare the remaining three case studies, followed by a cross-case analysis.

The key purpose of this case study research is to add description and rich insights to the identified knowledge gap (Figueiredo & Brito 2010) and provide a deeper picture of the key underlying managerial practices to better explain the practice of dynamic capability building (Turner 2011), all guided by the conceptual model developed in chapter three. With four participant organisation this research aims to offer a midrange theory through the case studies (Eisenhardt & Graebner 2007; Eisenhardt 1989b). This research follows Eisenhardt and Graebner (2007, p.25) in '*recognizing patterns of relationships among constructs within and across cases and their underlying logical arguments*' through recursive cycling among the case data, emerging theory, and later, extant literature. Finally, through conducting multiple case studies, this research in particular aims to '*enable broader exploration of research questions and theoretical elaboration'* (Eisenhardt & Graebner 2007, p.27).

Key data sources considered for analysis in this study

In this research, semi-structured interviews of key managers are considered as key sources of information to reveal the answers of the research questions. Freeman and Sandwell (2008) suggest an exploratory case study follows a qualitative paradigm intended to explicate intensive rather extensive insights to construct meaning. On the other hand, Behrisch (2013) conducts case study to investigate the eco-design practice of four packaging companies in Australia. The author considers semi-structures interviews as the main data sources that are supplemented by additional materials such as company reports, documents, online news etc. whenever possible. The author further states that to reveal the true account of how a phenomenon occurred is beyond the scope of a researcher, but rather documenting and interpreting multiple perspectives is within the feasible scope of a researcher. Following Behrisch (2013), the below steps are considered to tackle this issue:

1. Information provided by the informants is cross checked with the clients, or ex-employees.
2. Requesting informants to state facts in a chronological manner to reduce the scope of omission of critical information.

3. Allowing informants to write, draw or participate through pen and paper to express or communicate that which is difficult to explain in words, such as the design of a new product.

4. Conducting follow up interviews to gain additional insights to fill any gaps arising during analysing the data.

4.2.6 Reporting case study findings:

Yin (2003) advocates reporting the case findings in a detailed manner so that the presentation will illustrate the findings in an engaging manner. This research attempts to remain unbiased by performing critical reflection on the data collected through the research. The case study findings are presented in individual case reports following the conceptual framework developed in the theory building chapter. Each case is prepared considering the individual merit and insights obtained through the data collection processes. New ideas and insights that appeared in one case are further investigated in the other cases. Moreover, frequent communication with the informants is maintained throughout the process of preparing the case reports to attain the objectivity and impartiality of the findings. Finally, a cross case report is prepared.

4.3 Ethical considerations

An approval from the Human Research Ethics Committee was obtained to ensure appropriate ethical practices throughout the research. This research has incorporated the input of senior managers of ICT companies in Bangladesh who express their knowledge of the process of dynamic capability building. As a result, this research has used the participants' knowledge through direct interaction or communication. Therefore, it is very important to follow appropriate ethical procedures when approaching the participants. The ethics guidelines for the higher degree research students provided by Human Research Ethics Committee Policy, UTS, played an instrumental role in following appropriate ethical procedures for this research. Moreover, the guidelines assisted me to avoid any unpleasant circumstances that might hinder the data collection procedure, and at the same time reduced the scope of negative situations that may arise due to the process of the research. Moreover, the ethics guidelines helped me in showing appropriate respect for the participants while conducting the data collection process. The identity of the informants is kept fully confidential and extra caution is taken to safeguard their safety regarding their present employment situation, and in relation to the organisations studied. Furthermore, any information that is indicative to identity any specific individual will not be disclosed to anyone other than the researcher.

Consents were collected from the participants regarding their willingness to participate in this research. Full details of the research purpose and my contact details and those of my supervisor were communicated if participants wish to know more about the research as attached in Appendix 4 and 5. Moreover, participants were notified that they could withdraw from the research at any time. The data collection commenced only once the research was reviewed and approved by HREC, UTS.

4.4 Risk and contingency planning

The political situation in Bangladesh is very unstable. Due to political unrest, violent activities are common in the capital city Dhaka. As most of the prominent ICT companies are situated in Dhaka city, the data collection process could take an unexpectedly longer time due to any political blockade or protest activities. One of the contingency plans for this potential risk was to take initial interviews through video conferencing such as Skype and to use face-to-face interactions only when the findings were more mature and cross-checked for validation and further information. There may be a potential lack of trust towards the researcher as I am an external to the company's identified, as well as having lived in Australia for last six years. To circumvent this, sufficient time (approximately one month) was given to gaining the confidence and trust of the interviewees before starting the data collection through interviews. It is important to keep alert for any potential risk while conducting the research so that an alternative plan of action can be executed.

Table 4.4 Potential risks, strategies and actions taken during data collection

Risk management strategies and actions
External factors - Political unrest - Unreliable public transport

Scope of impact	• Political unrest is common in Bangladesh and results in serious turmoil in day-to-day life. Political unrest can start in an unpredictable manner and may last for a long period. During the political unrest, it is very dangerous to use any kind of transportation • The data collection process will be time consuming because of the nature of the data collection methods. Unpredictable political unrest may disrupt the data collection process during the limited period of in-country visit, which may delay the time line of the research
Alternative strategies	• Attempt to identify and build relationships with the key informants before scheduled study in Bangladesh • Utilise time in Bangladesh to collect data rather using time to build the trust of the key informants • Keep open the option of technology-mediated tools such as Skype, Viber or other options to engage with the informants if it is unsafe to travel to pre-scheduled interviews
Actions taken during data collection	• No political unrest experienced during the time of data collection • Excessive traffic jams and unpredictable time requirement for transport negatively affected the scheduling process

	• Time constraints of overseas stays led to difficulties in conducting the case study in a sequential manner, rather all interviews conducted as/when approved by the informants
Internal factor: - Trust of the informants	• Informants may be reluctant to share important information considering the potential risk to their career
Alternative strategies	• Considerable time given to gaining the trust of key informants • Rights as research participants under Australian Law explained to give confidence re securing confidentiality of the collected data
Actions taken	• Involvement with the informants through social contacts to gain trust and confidence on confidentiality and protection of privacy
Internal factor: **Lack of availability of data**	• Recruited firms may not possess sufficient data, historical records or documents to construct case
Alternative strategies	• If the recruited company cannot deliver an excellent supply of data necessary to conduct the case study, that company will be omitted from the study • To avoid such circumstances extra caution was taken before starting research on a selected company
Actions taken	• Selected companies offered rich data to feed the research questions.

4.5 Methodological scope and limitations

In response to the critics' argument that the case study method suffers from a lack of scientific generalisation (Hartley 1994), Yin (2003a) argued that, in conducting the case study method, the goal of a researcher is analytical generalisation rather a statistical generalisation as case studies can be used to generalise theories rather than enumerating frequencies. As a result, extra caution needs to be taken before applying the findings of this study in formulating policies for the large population of ICT companies. Moreover, as the study is conducted only in one industry, the theoretical framework of managerial capabilities may not be applied in other industries or sectors. Finally, case study research demands rigorous capability from the researcher, as Yin (2003, p.1) mentions, '*using case studies for research purpose remains one of the most challenging of all social science endeavours*' which is a key challenge for an early career researcher like myself.

4.6 Summary

This research is conducted following a qualitative methodology using the case study method. The key objective in selecting the research method is to explicate rich insights on the previously unknown managerial roles and attributes in building dynamic capability in the context of the empirical enquiry. The case study method has been found highly useful in carrying out data collection and analysis processes. In the next chapter, findings of this research will be provided.

Chapter 5: Research context and findings

Chapter five presents the research context and findings of this research through examining the managerial roles in dynamic capabilities building in four ICT companies in Bangladesh. To understand the distinctive managerial roles in building dynamic capabilities, the organisational processes to address changes in the external environment, the decision-making processes, and the processes of transforming organisational resources, capabilities are thoroughly investigated. These findings provide rich insights in response to the research questions of this study, and the propositions offered in chapter three from the perspective of the context of the empirical enquiry.

Figure 5.1 outlines the structure of chapter five. First, the research context will be discussed, then an overview of the findings will be presented, then drawing from various data sources individual case reports on each company will be provided, finally a cross-case analysis will present the general findings across the cases. The summary of the chapter highlights the key findings to facilitate the discussion chapter.

Figure 5.1: Outline of chapter 5
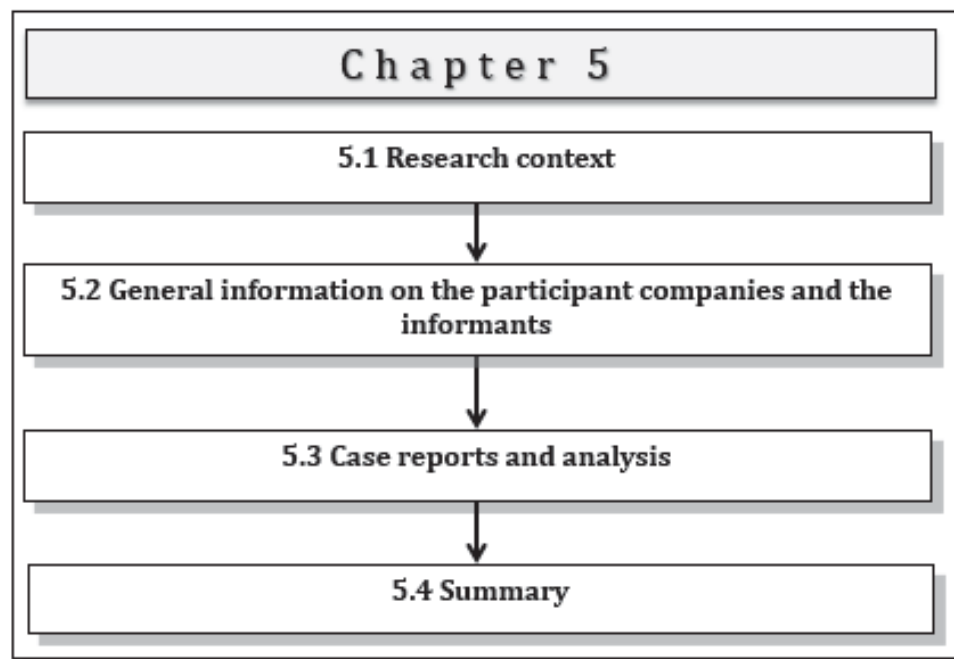
5.1 Research context

This section provides an overview of the research context. Section 5.1.1 illustrates a brief overview of the global ICT industry, section 5.1.2 offers a discussion on the ICT industry of Bangladesh and finally section 5.1.3 outlines seminal empirical studies on capabilities building in similar research contexts.

5.1.1 Overview of the global ICT industry

ICT-based services represent an increasing share in the GDP of European countries and the USA (Holzweber et al. 2012). In India, the ICT sector contributes 5.8% of GDP (Financial Year 2008-09) in comparison with other Organisation for Economic Co-operation and Development (OECD) countries where the contribution of the ICT sector in value added to business is 8% (Organisation for Economic Co-operation and Development 2010b). A growing trend of out sourcing and off shoring from western countries to Asian countries in the global ICT sector is evident. Outsourcing implies that a company contracts an external company for the completion of a job in a contractual manner, whereas off shoring means transferring the job to a company located outside of the country (Holzweber et al. 2012). The authors suggest that ICT services from a third-party service provider allow the client company to switch between service providers, thus giving greater flexibility (Holzweber et al. 2012). Additionally, apart from cheap labour and low production costs, the availability of the internet, decrease in technological costs, availability and expansion of technical knowledge, as well as literacy, are key drivers besides other socio-economic and political factors that foster outsourcing and off shoring from western countries to Asian and East European countries (Holzweber et al. 2012). Global ICT spending can be classified into two major groups: demand side and supply side. Table 5.1 illustrates the key countries from the demand and the supply side in ICT spending.

Table 5.1 Global IT spending (Holzweber et al. 2012)

Global ICT spending	
Demand Side	**Supply side**
USA (37%), Western European countries (35%) and Japan (14%) are key spenders and funding providers for outsourcing and off shoring	India, China, Malaysia and the Philippines, Israel, Ireland and Russia are major suppliers of ICT outsourcing services and major contributors to the development of the global ICT sector

India, China, Japan and Malaysia are among the most successful countries in the ICT sector in Asia. India leads Asian countries with a 30% global market share of the global offshore outsourcing industry (Ghosh & Ghosh 2009). Sam, Fazli and Hoshino (2013) state that ICT companies in China have experienced rapid growth and demonstrated the highest sales growth among the companies in these two economic regions, followed by Japan. Data from

July 2012 shows that China has 538 million internet users and the sharp rise of the ICT sector in China can act as an important foundation, as well as an important catalyst, for the effective acceleration of the development of other industries (Sam, Fazli & Hoshino 2013). However, in terms of profitability, indicators, such as return on shareholder funds, return on capital or return on asset, ICT companies in Thailand, the Philippines and Malaysia demonstrate impressive performance in recent years (Sam & Hoshino 2013). The ICT sector in India demonstrated significant growth in recent years through effective reorientation towards new product development and emerging markets (OECD 2010a).

Akman and Yilmaz (2008), through their empirical study on Turkish software firms, suggest delivering superior performance a lack of a skilled workforce, lack of technological capability, the need to foster greater customer orientation, and to build capability to react with changes in the external environment, are some of the key external challenges of software development companies in Turkey, an emerging economy.

5.1.2 Overview of the ICT industry in Bangladesh

The size of the ICT sector in Bangladesh stood at USD 3.1 billion in 2010 (KPMG 2012), whereas the size of the IT (Information Technology) industry within the ICT sector in Bangladesh is estimated at USD 400 million in 2012, having approximately 70,000 professionals employed in this sector (BASIS, 2012). There are over 800 IT and Information Technology enabled Services (ITeS) companies registered in Bangladesh, among them around 200 Bangladeshi IT companies serving the international market (BASIS industry statistics 2012). With the global offshore market reaching an estimated USD 252 billion in 2010, Bangladesh can take advantage of this opportunity, having a growing young labour force more amenable and adaptable to ICT technologies, along with the declining cost of computing and telecom services over the last decade (Hossain, Shinkai, Yunus & Bakht 2012). To date, Bangladesh has been capitalising on online outsourcing and data entry call centre business sectors. However, with the above recognised potential, Bangladesh can expand to deliver more ICT business services; estimated at one per cent of the country's GDP in the next five years (Bangladesh Association of Software and Information Services 2013). ICT companies in Bangladesh can provide up to 50% cost savings in outsourcing as the cost of skilled ICT professionals is significantly lower (Tija 2003). In Bangladesh, export of ICT-related products and services has been gaining momentum over the last decade. However, the software and ICT industry has not yet been able to perform according to its potential as export is still limited compared to other outsourcing countries in the region (Raihan & Shamim 2013). Industry experts have identified potential problems relating to the shortage of exports, falling below potential, including a lack of proper infrastructure,

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scarcity of ICT resources, the lack of international branding and marketing activities (Raihan & Shamim 2013) and finally lack of robust operational practices and guidelines on data and security protocols (Ahmed et al.2016) Performance against different indicators of the Bangladesh ICT sector is outlined in Appendix 7. Figure 5.2 decomposes the business specialisation of ICT companies in Bangladesh. Around 76.3 % of the respondents (BASIS member companies) catered to 'customised application development and maintenance', this category is followed by 'IT enabled services', 'ecommerce services' and 'product development' at 49.8%, 45.4% and 18.3% respectively (BASIS 2012).

Figure 5.2: Business specialisation (BASIS member companies) (BASIS, 2012)
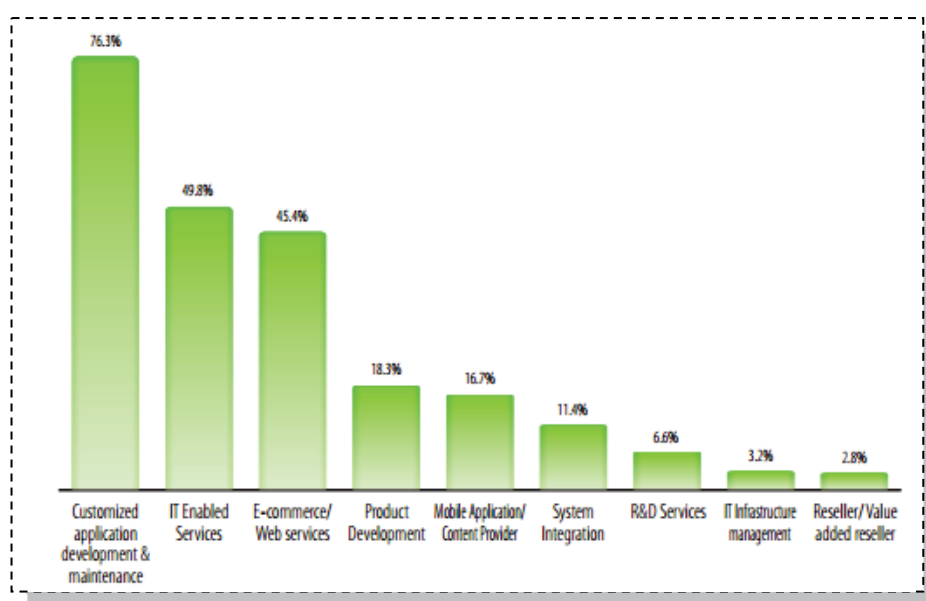
There are different factors that have contributed to the ongoing success of the ICT sectors in Bangladesh, India and Malaysia despite the challenges faced. Table 5.2 illustrates the drivers of growth of the ICT sector in these countries with, notably, supportive policy instruments remaining a key driving force behind the growth. A comparison of ICT related policies among Bangladesh, India and Malaysia is set out in Table 5.2.

Table 5.2 Positive drivers of growth in Bangladesh, India and Malaysia ICT industries

Bangladesh	- Promoting ICT investment by providing a 10-year tax holiday for investment in this area (GoB 2014) - Encouraging a public private partnership (PPP) model for such investment - A government-built high-technology and software technology park to facilitate the development of infrastructure required by companies outsourcing activities to Bangladesh (Nyenrode Business Universiteit 2014) - Establishment of Bangladesh Hi-Tech Park Authority (Opentoexport 2014a) - Initiation of online banking, currency transfer via mobile networks, launch of 3G, introduction of machine readable passports, online tax calculation and automation of public service organisations (Opentoexport 2014a).

	• Government of Bangladesh (GoB) to digitalise government organisations and implement e-governance across government organisations (Opentoexport 2014a).
India	• Availability of technical graduates with fluent English-speaking capacity • Leadership positions of significant numbers of Indian diasporas in western countries in IT and knowledge-service industries • Local entrepreneurs and business community proactively overcome challenges through working collaboratively with key stakeholders, creating the need for IT development, outsourcing and offshoring (Jacob 2006) • Government support plays an instrumental role in the development of IT service businesses and IT infrastructure (Raman & Chadee 2011) • Government initiatives such as promoting local software technology parks and using ICT as a tool to empower different communities such as farmers or artisans. • Global leadership role in ICT through effective initiatives in three fundamental pillars of the knowledge economy: education, innovation and ICT • Experimental projects to adapt ICT at the grassroots level (Ghosh & Ghosh 2009).
Malaysia	• The arrival of the internet in Malaysia in 1992 transformed the landscape of communication and cultural and social space, since then, technological innovations continued in a structured progression (Tan, et al. 2009) • High adoption of ICT in Malaysian public life • Government vision of competing alongside developed nations • Macro and micro level initiatives. The macro level focused on the Multimedia Super Corridor (MSC), which lies at the heart of ICT development in Malaysia. The MSC has a two-fold goal: to reinvest the service delivery, and to catalyse the development of ICT to emerge as the leading sector of the economy (Deka, Zain & Mahanti 2012).

Table 5.3: A comparison of the policy context in Bangladesh compared to India and Malaysia (Deka et al, 2012)

Bangladesh	India	Malaysia
Right to Information Act 2009 Telecommunication Act 2010 Information and communication technology Act 2010	Right to Information Act 2005 Information Technology Act 2008	Computer Crimes Act 1997 Digital Signature Act 1997 Telemedicine Act 1997 Communications and Multimedia Act 1998 Malaysian Communication and Multimedia Commission Act 1998 Optical Discs Act 2000 Electronic Government Activities Bill 2007

Local market represents a significant portion for the local ICT companies with approximately sixty-three percent companies focus only on the local market (Ahmed, Ameen, Uddin & Khan 2016; Hasan 2016). Ahmed, Ameen, Uddin and Khan (2016), mention that some barriers for software development companies in Bangladesh include persistent power supply, high speed internet connection, and affordable IT infrastructure. Additionally, there is lack of access to financial services by the ICT companies, insufficient measurement framework for measuring intangible assets and Government officials also lack sufficient knowledge on the fundamentals of information technology. Hasan (2014) mentions that a new trend of freelancing has emerged in Bangladesh where individual level professionals attempt to quire client through internet in areas such as mobile applications,

web design, graphic design, data processing, social media marketing or search engine optimisation.

Barker (2012) mention that quality of education is one of critical macro environment criteria identified by the investment Bank Goldman Sachs for becoming a large economy specially the countries that are labelled as Next 11. Bangladesh is considered as one of the countries within N11 due to her potential reflected by rapid economic growth. However, Barker, 2012, warn that it is important to devise appropriate and realistic macro strategies considering the current constraints to realise the potential for these countries. Hasan (2014) points that although Bangladesh has achieved significant achievement in the ICT sector through adopting the vision of 'digital Bangladesh', however, the country's performance in the global e-government index is not satisfactory which reflects a gap between the initiatives and the reality. Hasan (2014) concludes that ICT endeavours in Bangladesh requires more intimate supervision and effective coordination among the relevant agencies to develop a complete ICT-driven Governance in Bangladesh.

5.1.3 Research on capability building in the context of empirical enquiry

ICT companies in Bangladesh must improve their capabilities to increase their market share in the global ICT service industry (Mamun, Igel & Islam 2000). The standard of Bangladesh ICT companies has to rise to meet the superior quality of ICT services required by the clients of western countries (Raihan & Shamim 2013). Bangladeshi ICT companies also need to acquire accreditation by internationally reputed bodies that provide assurance of quality of service such as the ISO. Tija (2003) finds that high employee turnover is one of the key challenges of outsourcing in Bangladesh and reveals that to retain talented employees the project needs to be technologically challenging. The author recommends that ICT companies in Bangladesh should provide proper incentives, training and a better work environment to motivate employees to stay longer in the company. Additionally, managers of ICT companies need to focus on sales growth through new product development in the fast-paced technological marketplace (Sam & Hoshino 2013). Therefore, ICT companies need to focus on innovation through an emphasis on creating intellectual properties, service innovation and developing new mechanisms of effective and efficient service delivery considering the different constraints of the local market (Mamun, Igel & Islam 2000).

Past research suggests that individual companies engaged in delivering ICT services can potentially achieve superior performance through applying an understanding of dynamic capabilities (Holzweber et al. 2012). Scholars have already started investigating ICT companies in Bangladesh and their ability to pursue entrepreneurial actions (Mamun, Igel

& Islam 2000), ecommerce (Karim & Chowdhury 2014; Rana 2013; Jamil, Ahmed & Imran 2013), and software development processes (Ansari, Chowdhury & Mia 2014; Raihan & Shamim 2013). Empirical studies on the dynamic capability building processes in ICT firms in Bangladesh will enrich the understanding of capability-building processes in the context of Bangladesh, a developing country. The focus of this research is individual ICT companies rather than an industry-level analysis.

The Bangladesh ICT industry is in a growth phase and has experienced significant growth over the past few years. However, increased competition from both the local and international market, rapid technological changes, and changes in customers' preferences, put tremendous pressure on the local ICT companies to continuously upgrade their resource and capabilities, something that is often challenging for small and medium-sized ICT companies. It is important to clarify the definition of SMEs specially for the empirical investigation for this research. Chowdhury, Azam and Islam (2015, p. 52) states that

"The category of micro, small and medium-sized enterprises is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro.' Small and medium enterprises are thus defined as firms with 10 to 250 employees, and more than 10 million Euro turnover or annual balance sheet total."

According to the regulation of Bangladesh Bank, a medium sized company is categorised with maximum of US $ 2 million fixed asset with up-to 150 employees Chowdhury, Azam and Islam 2015).

This research limits its focus to only medium-sized ICT companies, and the findings based on the case study investigation are presented in the next chapter.

Next an overview of the research findings is presented.

5.2 General information of the participant companies and the informants:

Participant organisations of this research primarily operate their business in the information and communication technology (ICT) industry of Bangladesh. These ICT companies deliver products and services to clients in both local and international markets. The below table provides general information about these companies based on secondary sources (Secondary sources 2016); the original references of these sources are not included

in the reference list intentionally to maintain confidentiality of the participant organisations and interviewees:

Table 5.4: General information about the companies studied for this research

Name	Year established	Business	Yearly revenue	No of employees
Com A	2000	Internet-based service	US $4 million approximately	106 in year 2016
Com B	1997	Financial software development, services and solutions	Not revealed, more than US $2 million	IT employees approximately 165, IT operators approximately 4500 in year 2016
Com C	1998	Software development, services and solutions	Not revealed	150 IT employees approximately, IT operators approximately 1200 in year 2016
Com D	1999	Software development, services and solutions	US $1.3 million	54 employees in year 2016

The participant companies have strong footprints in their respective business domain and have a good reputation in the industry (Secondary source 2017). Additionally, successful continuity of excellent business performance for more than a decade in a rapidly changing ICT business industry suggests the possession of dynamic capabilities creating a strong rationale to select these companies as participants for this research. The below table reflects the key focus of this research within each company:

Table 5.5: Key focus for each case

Name	Key focus of this research
Com A	Managerial roles behind company's successful performance for over 16 years considering changes in customer preferences, increased competition and technological changes
Com B	Managerial roles in performing transition of the key product through various developments of programming language and technologies
Com C	Managerial roles in achieving operational fitness through a process-driven approach
Com D	Managerial roles in recovering sustained poor performance.

The key objectives of this research are to investigate managerial roles, as well as organisational factors, and consequences of dynamic capabilities.

The table below provides a detail breakdown of the interviewees of this research.

Table 5.6: Overview of the interviewees

Com A	Com C
Chief Executive Officer (CEO)	Director
GM, Sales and Marketing	Head of Microfinance and service
GM, Training	Manager, Process Improvement
GM, Finance and Accounting	Senior Software Engineer 1

Senior Manager, Content Development	Senior Software Engineer 2
Technical Lead Engineer, Network and Support	Senior Software Engineer 3
Senior Programmer 1	Manager, Product and Support
Senior Programmer 2	Deputy Manager, Implementation and Support
Ex-employee 1, 2, 3	Ex-employee 1, 2
Client 1, 2	Client 1
Com B	**Com D**
Managing Director	Chief Executive Officer (CEO)
Consultant	Chief Operating Officer (COO)
Deputy General Manager	Senior Manager, Business Development
Chief Software Unit and PM	Head of Finance and Company Secretary
Head of Training	Senior Manager, Business Development
Senior Software Developer 1	Acting Director, Technical Service and Software Development
Senior Software Developer 2	Senior Software Engineer 1
Branch Manager 1	Senior Software Engineer 2
Branch Manager 2	Software Developer 1
Ex-employee 1, 2	Ex-employee 1, 2

Different sources have been utilised to collect relevant data for this research including semi-structured interviews, company reports and documents, promotional content, corporate websites and media reports. The below table gives detail information about the data sources of this research:

Table 5.7: Sources of data utilised for this research

	Com A	**Com B**	**Com C**	**Com D**
Total interviews	13	11	11	11
Company reports	No	Yes	Yes	No
Project documents	No	Yes	Yes	No
Promotional content	Yes	Yes	Yes	Yes
Corporate website	Yes	Yes	Yes	Yes
Media reports	Yes	Yes	Yes	Yes
Search engines results	Yes	Yes	Yes	Yes

Semi-structured interviews are considered as the most important data source and the remaining data sources are used to triangulate the findings of the semi-structured interviews, if possible. The semi-structured interviews were first transcribed in collaboration with professional transcribers. Then, the researcher translated the interviews for analysis. During writing the individual case reports, the informants were contacted when responses demanded additional clarification and explanation for meaningful interpretation. Moreover, the informants' feedback was incorporated while preparing the case reports. Finally, the informants were contacted via telephone, email and social network sites to validate their responses and to validate and receive feedback on the respective cases as well as on the key findings of this research.

Next case reports and analysis are presented.

5.3 Case reports and analysis

This section will present the findings, based on the data collected, through presenting the emerging themes across the case, individual case reports, and finally a cross-case analysis on the common findings across the four cases. The individual case reports are constructed following the research questions to explicate the managerial roles in building dynamic capabilities, the effect of organisational factors such as organisational structure and culture in building dynamic capabilities, and finally to reveal the consequences of dynamic capabilities. The analysis of the data is started with the commencement of the data collection procedure. New themes or perspectives are verified as they emerged and cross-checked by other informants to confirm as well as to gain more insight. Once the data collection process is completed, the collected data is analysed inductively to identify emerging themes that reoccur across the four cases. Then, the data is coded selectively in a repetitive manner to construct meaningful answers to the research questions of the empirical enquiry.

The case reports are primarily prepared based on the information provided by the informants through semi-structured interviews. However, the information and ideas offered by the informants are cross-checked by multiple informants within the same case, and across the cases, to obtain validity of the data. Furthermore, the informants are apprised of the key findings within their respective case and allowed to offer additional insights, comments, explanation or justification regarding the findings. The case reports are constructed through an iterative process of data analysis against the prior themes and emerging themes based on the collected data to answer the research questions guided by the propositions. Each case report presents a detailed discussion on the findings related to the research questions, reflection on the extant literature and it concludes with a summary section that offers a brief discussion on the key findings of the studied case. Next, section 5.2.1 to section 5.2.4 will present individual case reports, and finally section 5.2.5 will offer the cross-case analysis. Next the individual case reports will be discussed.

5.3.1 Com A: Sustainable growth through customer-orientated dynamic capabilities, evidences from a successful online job portal
Background of the company

Com A is primarily a leading internet-based job portal and provider of corporate training in Bangladesh established by a group of entrepreneurs with just six employees during the year

2000 (Com A 2016, Secondary sources 2017). Through excellent delivery of service over the last seventeen years, the company has established itself as the most popular recruitment and professional training service provider in the country, with a strong online presence, that effectively connects job seekers with recruiters (Com A 2016). The company currently has approximately 12000 corporate clients and receives around 300 to 400 job posting orders every day with an annual turnover of around USD 4 million (Com A Int-04 2016). The company is valued at USD 17 million by a foreign company during the year 2014 (Secondary sources 2017) and has reported an approximate 40% profit in the last few years (Secondary sources 2017). The following table illustrates a brief overview of the company and the demography of the interviewees.

Table 5.8: Overview of the company based on corporate website, internal documents and reports (Com A 2016) and key research focus

Name	Year established	Business	Yearly revenue	No of employees	Current no of clients	Daily job posting	Daily online visitor
Com A	2000	Internet-based service	US $4 million (approx.)	100 (approx.)	12000 (approx.)	300 - 400	More than 100,000
Key research focus	Managerial roles behind company's successful performance over 16 years considering changes in customer preferences, increased competition and technological changes.						

Demography of the interviewees					
Management position	**Designation**	**Gender**	**Age (years)**	**Interview duration (minutes)**	**Interview location**
Top Management	CEO	Male	42	35	Com A HQ CEO personal room
Middle Management	GM, Sales and Marketing	Male	38	65	HQ conference room, Com A
	GM, Training	Male	37	51	Office training conference room, Com A
	GM, Finance and Accounting	Male	39	70	HQ conference room, Com A
	Senior Manager, Content Development	Male	33	45	HQ conference room, Com A
Operational Level	Technical Lead Engineer, Network and Support	Male	33	50	HQ conference room, Com A
	Senior Programmer 1	Male	27	40	Com A HQ IT floor, discussion room
	Senior Programmer 2	Male	28	40	Com A HQ IT floor, discussion room
	Ex-employee 1	Male	35	25	Via telephone
	Ex-employee 2	Male	37	22	Via telephone
Clients	Client 1 and 2	Male	42, 45	15, 19	Via telephone

A total of thirteen in-depth interviews were conducted, with one person from top management, four from middle management, three from the operational team, additionally two ex-employees and three clients were interviewed to gain insights. Moreover, data was collected and analysed from the company's corporate website, their marketing content, online media news, results from web searches, and scholarly databases to triangulate the insights gained through the interviews.

Evidences of dynamic capabilities building at Com A

Liao, Kickul and Ma (2009) argue that internet-based companies operate in a highly changing business environment and dynamic capabilities are very relevant to the context of the internet-based business. In line with the aims of this research, dynamic capabilities of interest include sensing, seizing, and reconfiguring, and these are explicated from the managerial practices in this organisation through investigating informally maintained processes, routines and managerial activities. This company presents evidences of dynamic capabilities in many ways. First, the company has kept itself updated, on an ongoing basis, with the latest technological developments through effective internal capability development. Secondly, the company has been successful in performing innovations though the introduction of new services to its customers. Finally, the company has achieved financial sustainability with an ever-growing customer base, despite increased competition in the market place. Com A has consistently delivered excellent performance, introduced new services as well as improving service offerings while experiencing external factors such as technological changes, changes in the customer preferences, and market competitiveness. For the last seventeen years they have won a majority of the market share as expressed by a manager, Com A: '*we have ninety percent market share and the market is growing since more people are using internet'* (Com A Int-2 2017).

The practice of managerial entrepreneurship is evident based on the empirical findings. Managerial entrepreneurship in this context refers to the managerial initiative to carry out the process of creating new products or services through successfully contemplating external stimuli, and then effectively performing the necessary configuration of organisational elements to deliver the new products that suit the requirements of customers, as one manager states: *'Product development is considered as an internal entrepreneurship at Com A'* (Com A Int-04 2017). Managers carefully monitor the external environment and act in an entrepreneurial manner to initiate organisational-level dynamic capabilities such as sensing, seizing and reconfiguring to identify, realise and monetise the potential advantage arising due to changes in the environment. The company does not have

an enterprise-level continuous reconfiguration process, rather reconfiguration initiatives are carried out with interventions through temporary allocation of resources as deemed essential. Table 6.6 outlines some managerial entrepreneurial initiatives revealed during the interviews.

Table 5.9: Evidences of managerial entrepreneurship at Com A

Managerial Entrepreneurship Initiatives	Enterprise Level Outcomes	Quotes
Introducing new service that offers advertisements for tender	New market, increased revenue	*'A lot of big companies now are posting work tender which I initiated to create a separate service for advertising job tender.'* (Com A Int-03 2017)
Introducing 'hot jobs' - a new service	Increased revenue	*'Customers don't want to understand that we are posting the hot job with their company logo in the homepage. Previously, we had only "hotjobs" and basic lifting. Then they asked if any other version is possible by updating some feature of basic lifting. To do the survey initially, we communicate informally with those organisations that have close contact with us.'* (Com A Int-04 2017)
Introducing a subscription-based model of the service	Increased revenue, cost reduction for the customers, increase the us	*'Most recently, there was yearly subscription package. If you subscribe for one-year package you can do unlimited job posting. This was under my leadership.'* (Com A Int-04 2017)
Introducing a Best Employer Award	Disseminating best practice across industry, increased brand image of the company	*Internal Entrepreneurship is not there like this. Product development is also an Entrepreneurship. We have internally developed the idea of awarding as 'Best Employer Award'.* (Com A Int-04 2017)

In the first example, one manager initiated a new service leveraging his experience in a different industry. The second and third examples illustrate how reconfiguration of an existing service portfolio can accommodate customers' requirements, and finally how the introduction of a best employer award created a stronger relationship with Com A's client base resulting in an improved brand image of the company.

At Com A, sensing capability is identified as a combination of several key managerial roles that are performed individually or collectively including stimulation, assessment, record, share, and finally escalation or engagement. The sensing process is initiated by the stimulation of managerial cognition through external stimuli, then the individual manager conducts an assessment of the external stimuli, records and shares this within functional teams, and finally facilitates the activation of the subsequent dynamic capability seizing through escalating the sensed external stimuli across the functional units for further consideration.

Seizing capability is performed as a combination of several key managerial roles that are performed individually or collectively before the managers of Com A undertake any changes within the resources and capabilities in the organisation. Primarily, once some external

stimuli are escalated then that are discussed for assessment and evaluation in a collective manner. Then if the idea or the identified scope is worth further initiative, a roadmap and an agenda is developed to commit resources to act on the identified scope with, generally, a pilot project. However, it should be noted that meetings with the senior management include other operational issues, and that senior management does not engage with middle and operational managers solely to assess the external factors, but rather to get informed on the issues faced by the managers. The company follows a systematic procedure to accept an opportunity, as stated by one manager:

> *'Before taking any initiative, we do think on it. Whimsically do not take it. We give a lot of time in commercialisation process. We do piloting that takes three months. Before that it takes two to three months in project phase. After that if the decision making is done then go for piloting to development.'* (Com A Int-2 2017)

Reconfiguring capability is evident at Com A as a process of managerial individual and collective actions with temporary resource commitment to carry out the necessary transformation within resources and operational processes. The reconfiguring process primarily has four major managerial roles: preparation, piloting, execution and termination. Managers at Com A take a keen interest in obtaining cost-efficient solutions for the problems they encounter during any transformation. Additionally, the overall cost of intervention is also optimised through the utilisation of slack resources. Finally, the company experienced mainly positive consequences as evident from the interviews and supported documents such as company reports.

The table below outlines the managerial actions in sensing, seizing and reconfiguring to accommodates changes arising in the external environment at Com A.

Table 5.10: Evidences of dynamic capabilities at Com A based on emerging themes

External Environment			
External stimuli	Technological change	Market competitiveness	Customer requirement
Sensing			
Perception	Identification scope of IT system	Aggressive marketing campaign by an online store to enter online job market noticed	Keeping an attention on customers' requirements
Assessment	Based on past managerial experience, manager assessed scope of new IT system.	Individual managers consider this campaign as a potential threat	Assessment of the requirement from existing product and service portfolio

Record and share	Shared and discussed with cross-functional team members	Discussed and shared within functional units	Recording and sharing with groups
Escalation	Escalated to top management	Escalated beyond functional unit	Escalating beyond functional units

Seizing

Assessment and evaluation	Potential advantage identified as smooth cross-functional coordination, rapid response time and increased new service introduction capability, trade-off between internal development and external vendor is conducted	Competitor's action assessed against the company's strength and strategic orientation and evaluated as not a significant threat for the company	Cross-functional assessment and evaluation
Execution roadmap	Develop in a best possible cost-effective manner using cross functional team members' slack	Strengthen customer relationship to defend market share through retaining existing customers	Assigning functional units to address the requirements, carry out pilot
agenda	Back-end technological platform reconfiguration		

Reconfiguration

Preparation	Cross-functional team coordination for resources commitment, or develop a resource strategy	Engage with customers	Conduct piloting and testing and assess viability
Piloting	Experiment with small-scale projects, carry out pilot	Receive feedback from customer	Receive early feedback from customer
Execution	Internal development of the IT system exploiting cross-functional teams' resources and past managerial experience on similar development initiative	Customer-facing employees deliberately emphasise customer orientation during interacting with the customer	Develop and final deployment
Termination	Not formally terminated and continued ongoing basis	Not formally terminated and continued ongoing basis	Terminate with final deployment

Consequences of dynamic capabilities

Flexibility in introducing new services, seamless connectivity across functional units, reconfiguration of service offerings	Defend existing customer base, avoid high capital investment on marketing campaign following competitor	Cross-functional assessment of advantage
Persuasion of growth, increased operational efficiency	Obtained cost savings of high capital investment for marketing campaign	Initiatives to exploit the advantage results in increased revenues, reduced operational cost or stakeholders' advantage

Next, managerial roles in building sensing, seizing and reconfiguring capability will be discussed.

Role of managers in building dynamic capabilities

This research brings rich insights about managerial roles regarding organisational-level dynamic capabilities building at Com A. Next, the role of managerial cognitive ability, human capital and social capital in building sensing, seizing and reconfiguring capabilities is discussed.

Role of managerial cognitive ability in building sensing capability

Managers play vital roles in intercepting variation occurring in the external environment through effective active attention and awareness. Middle managers keep an active attention and awareness on recent technological developments, customer requirements and competitive actions taken by the competitors that assist managers to perceive variation in the external environment. Pavlou and Sawy (2011) reveal that beside the top management level, lower level managers play vital roles in dynamic capabilities building through inter and intra firm business units. Further, Teece and Linden (2017) suggest that sensing happens at all levels of the organisation and operational-level managers provide important information about the development of the external environment. At Com A, the external environment orientation of the managers plays a vital role in facilitating sensing capability to identify the new requirements of the customers in a timely manner. Managers at Com A perform both a customer-led and customer-leading approach in addressing changes in customers' preferences in the marketplace, as suggested by Lavie, Stettner and Tushman (2010).

Table 5.11: Role of managerial cognitive ability in building sensing capability:

Cognitive ability		Sensing		Selected quotes
Themes	Sub themes	Frequency	Managerial roles	
Attention and awareness	Maintain awareness about new technological change, customer requirement change, competitive actions	4	Stimulation and assessment	'Business nature should be observed carefully. If you are an employer what is your demand to me? You have to search right candidate within a short time. Costing is not very important as organisation will pay. This is cheaper than to give an advertisement in newspaper like before. So, cost is not a concern. The main concern is to select the right person in right time. We work for its development. For job listing we are being paid but this may not be in future. In Australia "indeed" is doing only the posting which is free. These are job aggregator. There are many more sites like this that "SEEK" has bought. They are posting all jobs of the whole world. So, as a job seeker your advantage is that you can see all the jobs here.' (Com A Int-2 2017)

Role of managerial human capital in building sensing capability

Data reveals that managerial human capital such as the experience of an individual manager plays an important role in appropriately assigning emphasis to the identified variation in the external environment to share and escalate within or across functional units. Experience in a present job is identified as an important sub-theme within managerial human capital. Long tenure in a present job allows managers to build and nurture intimate relationships with customers that assists to harness critical information, as well as obtaining early feedback, regarding initiatives of new product or service development. As one manager states:

> *'Experience definitely worked. To begin with something new, some new ingredients are provided. I have been working with same thing for long time and 12,000 clients are with me. Most of them have no direct interaction with me. The need of the customer, their satisfaction to my work, what do they need or what facility can bring the 'wow factor' for them; these are developed by maintaining a long-term relationship with the customers.'* (Com A Int-02 2017).

Table 5.12: Role of human capital at building sensing capabilities:

Human Capital		Sensing		Selected quotes
Themes	Sub themes	Frequency	Managerial roles	
Experience	Duration and experience at present company	12	*Assessment*	*'There are employees who have been for 7-8 years in the team and have personal connections with the customer, whom they can survey through informal communication. Usually one employee makes around 20-25 conversation.'* (Com A Int-4 2017)

Experience in past roles assists managers to identify new opportunities at the early stage of their new position. One manager states that his experience of working at not-for-profit companies helps him to identify new opportunities. He elaborates that, at present, there is an increasing number of advertisements by different corporations that are not for recruitment, rather the nature of the advertisement suggest that they are for tender of various commercial projects. Based on his expertise in the NGOs, the manager suggested that top management create a new service to publish tender advertisements, which eventually became profitable. Additionally, experience assists managers to objectively assess the potential scope of external stimuli and evaluate which to prioritise to escalate within or beyond the functional units for further consideration, based on the expertise gained over the business domain. Finally, experience at a present job facilitates building social capital through assisting developing relationship with customers.

Empirical evidence suggests that the relationship with customers acts as the most important managerial social capital that managers can exploit to obtain valuable insights regarding changes in customers' preferences. The relationship with the customer is a frequently mentioned sub-theme within managerial social capital that assists managers to obtain valuable information from customers in a reliable and efficient manner. In the context of the service environment, Agarwal and Selen (2009) find evidence that customer facing employees can harness valuable information about new customer requirements that may aid service innovation. Long-term relationships with customers allow managers to develop a comprehensive understanding about the ever-changing customer requirements and to recognise changes in customers' preferences at an early stage. Moreover, a relationship with the employees from international companies of a similar domain is also a valuable source of novel information and ideas that may assist companies to cope with the external environment. Finally, engagement and participation with different expert forums is also regarded as an important source of receiving critical information regarding changes in the external environment.

Table 5.13: Role of managerial social capital at building sensing capabilities

Social capital		Sensing		Selected quotes
Themes	Sub-themes	Frequency	Phase	
Relationship with the customer	Relationship with the customer at present job	18	Stimulation, assessment, record, escalation, identification of new customer requirements	*'If customer suggests any change to our service, we carefully listen to their advice as well as take notes on their opinions which we discuss as a group in our monthly meeting.'* *'We took feedback from time to time to understand how we can make our service more helpful for them; we took feedback for designing our interface so that it reduces time for our clients to search the appropriate candidate.* (Com Int-4 2017)
	Length of relationship with the customers	16	Stimulation, assessment, record, escalation	*'Those of us who are in this company for over five years have a very strong relationship with our clients, that often allows us to receive informal feedback on our initiatives as well as valuable recommendations for change.'* (Com A Int-4 2017)
External Relationship	Relationship with internat-ional experts	23	Stimulation and assessment	*'Experts from international marketplace offer insightful knowledge on the service that are in use in other part of the world.'* (Com A Int-3 2017)

	Relationship with international companies in same domain	15	Stimulation and assessment	*'We regularly receive information about new services from our international partner seek.com, due to demographic difference these ideas about new services are often not suitable but often contains stimulating aspects that we may consider experimenting in our local market.'* (Com A-Int-5 2017) *'Collaboration is not done. Resource mainly is in knowledge and capital. Top level personals that mean CEO and operational head attend the conference. It is continuing professional connection. Online forums are created from the conference.'* (Com A Int-4 2017)
Online social network	Facebook network	3	Stimulation, assessment, record and escalation	*'We mainly maintain our Facebook page for engagement purpose but sometimes we receive valuable insight regarding how customers are reacting or responding to our services.'* (Com A Int-5 2017)
	LinkedIn	0	None	*'I have a LinkedIn profile but not that active, I have lot of professionals in my connections but never attempt to communicate with them.'* (Com A Int-4 2017)
	Online Forum	3	Stimulation and assessment	*'Very often we receive critical idea from online forums where employees from international companies from same business domain share their experience.'* (Com A Int-2 2017)

The senior managers of Com A engage in online forums and groups focusing on online job recruitment with participation of managers from international competitors, and are able to gain valuable insights about their business, as one manager pointed out:

'This is not an innovation. Only the matter is localising. Like that we will not copy from other country model, just will localise. There is something that is not relevant to our market. For example: in Australia, it is an employer market. But in my place for one circular 10,000 CVs are submitted by candidates. Among them, to select 10 is a challenging task for us. That's why needing to localise. The collaboration with SEEK provides a dynamic opportunity.' (Com A Int-02 2017)

Com A managers mention that they often exchange messages and communicate with managers from different part of the world within the online recruitment industry to learn insights on services that are being used in other parts of the world to assess the potential scope introducing those service in the context of Bangladesh. Agarwal and Selen (2009, 2011) find empirical evidence that collaboration allows companies to access valuable resources from the partnering organisation, which otherwise would be difficult to access. Collaboration with an international partner, SEEK, provides several opportunities to Com

A, including financial strength, expert knowledge on services, and business opportunities from learning about services performing well around the world. As one manager states:

'*So long we were poor bank. There was no strong competition. But, when we go with SEEK in 2014 we understand the global situation of this market with the interaction of their innovation partner – Brazil, Mexico etc. Resource mainly is in knowledge and capital. Top-level personals that mean CEO and operational head attend the conference. It is continuing professional connection. Online forum is created from the conference.'* (Com A Int-2 2017)

Role of managerial human capital in building seizing capability

Educational background helps managers to create their own instrument to evaluate and assess the business opportunity during the seizing phase. One manager mentioned that his educational background in sociology assisted him to understand his customers in a more insightful manner: '*to develop relationship sociology also plays a role. If you don't understand society, it will not work. In this case, the role of sociology is more important than MBA*' (Com A Int-4 2017). The manager further mentioned that he devised an effective tool which he termed a 'quick survey' to receive feedback from the customers (Com A 2016). When he

Table 5.14: Role of managerial human capital at building seizing capability

Human Capital		Seizing		Selected quotes
Themes	Sub-themes	Frequency	Managerial roles	
Education	Relevant educational qualification	14	*Evaluation, assessment, agenda*	'*Those who are of non-business background face problems to be habituated with many business terminologies. Secondly, it is difficult to understand the business report or financial report for non-business background. To work with marketing, pricing, and costing you need to complete an MBA.*' (Com A Int-4 2017) '*At the beginning of working in Com A, I led various teams. When I was manager there were two persons under my supervision but now more than 30 people work under me. The knowledge in sociology help a lot in leading employee, fulfilling company goal, achieving company goal.*' (Com A Int-2 2017)
Experience	Experience at present company	18	*Evaluation, assessment, road map and agenda*	'*My long experience at this company equipped me with comprehensive business domain knowledge about our product and services as well as the understanding about the changing nature of customers' business proves to be essential when we try to prioritise or attempt to initiate a new product or service or consider discontinuing an existing service.*' (Com A Int-3 2017)

identifies any business opportunity he systematically carries out an informal survey among the key customers to incorporate their feedback. He also engages his team to conduct this survey and bring valuable insights about the potential idea. In the quick survey an employee informally initiates a conversation with the customers about a new service and accumulates their feedback. This process provides a faster response by avoiding protocols and proved to be more effective because customers tended to express their view more authentically in informal conversation than in formal customer surveys. Experience, on the other hand, assists managers in making better decisions through evaluating and assessing the external stimuli in order to develop an agenda to consider.

Table 5.15: Quick survey as a tool to facilitate seizing capabilities (Com A Int-04 2017)

Process name: quick survey	Specific skill required by managers	Related theoretical linkage	DC linkages	Outcomes
Perform informal conversation with up-to 100 customers to acquire feedback regarding an intended new service.	Ability to initiate and carry out informal conversation to receive feedback regarding a new service concept	Focus group discussion learned from sociology educational background	Sensing, seizing,	Faster, reliable and practical feedback regarding a service concept without significant capital investment

Role of managerial social capital and cognitive ability in building seizing capability

Managerial social capital and cognitive ability plays a valuable role during the seizing capability. The relationship with the customer is the most dominant sub-themes within managerial social capital that aids managers to obtain valuable feedback from the customers regarding the intended initiatives. Moreover, connection with external experts from the internal marketplace within similar business domain assists managers to develop their expertise to evaluate and assess the initiatives, design a road map and develop an agenda, during the seizing capability.

In response to increased competition, Com A leveraged their managers' rich relationships with the customers to further strengthen the relationship with their customers as a competitive action in response to the intense marketing campaign of a new entrant. Leveraging relationships with customers eventually helped the company to further strengthen their customer engagement, maintain and retain the customer base, and overcome competitive challenges by their competitors, as explained by one manager:

'Competition cannot be beat except [through] service, that is, the relationship with the customer. Competitors have done many 'advertising post' and you have also done, but all this will not work. For example – Bikroy.com (a new entrant) jobs are doing huge advertising. They don't lack shortage of budget. But, if I want to beat them in the same way

that will be foolery. The thing that I have tried is to hold my market by ensuring my service. If the customers are happy they will not switch due to add thousands of consumers through advertisement. (Com A Int-02 2017)

Table 5.16: Role of managerial social capital at building seizing capability

Social capital		Seizing		Selected quotes
Themes	Sub themes	Frequency	Managerial roles	
Relationship with the customer	Relationship with the customer at present company	19	*Evaluation and assessment, feasibility assessment, dynamic agenda*	*'We try to maintain close engagement with the customers that seriously help us to decide the appropriateness of a new idea or scope of change within our service portfolio, we deliberately initiate informal discussion to obtain critical customers' perspective on our initiatives that help us to identify the commercial viability of the idea.'* (Com A Int5 2017)
	Length of relationship with the customers	15	*Evaluation and assessment, feasibility assessment, dynamic agenda*	*'We have customers who are taking our service for over ten years and we have a very strong relationship and understand their requirements and preferences, before making a decision to change we always take feedback from long standing customers.'* (Com A Int6 2017)
			Evaluation and assessment	*'We introduced internet job strongly that was totally unknown in Bangladesh. It is already in abroad. Hot job is very popular in Bangladesh but in Australia nobody understands it. Everything is lifting.'* (Com A Int3 2017)
Online social network	Facebook network	4	*Evaluation and assessment*	*'We promote our service on our Facebook page, we carefully manage the page and if any feedback is posted that carrying some importance we always bring it to the management.'* (Com A Int-7 2017)

Through engaging with international online forums and networks of online recruitment companies, senior management bring valuable knowledge to assess and evaluate ideas about new services within Com A. However, it is noted that operational employees and middle managers at Com A are not active on their LinkedIn accounts: *'I am not active in LinkedIn due to time constraint. But for professional purpose I have to remain active in Facebook for a long time.'* (Com A Int-02; 04, 5, 6 2017). Nevertheless, the managers are members of related groups on Facebook and maintain an active connection through exchange of messages with their friends and ex-colleagues, and these offer a valuable source of external knowledge and information to aid decision making regarding any initiatives triggered by external stimuli during the seizing process.

Smith and Tushman (2005) posit that frequent interactions within and across the functional teams is one of the key factors for successful product or service innovation. At Com A, managers discuss their ideas directly with the top management around new services or

changes in requirements. One manager states, '*at any time we can discuss with the CEO*' (Com A Int-4 2017). Moreover, a periodic group discussion among the functional teams is held which encourages team members to contribute to the identification, assessment and evaluation of the suggested change proposals brought by different team members for the improvement of existing services and scoping new services. Ideas that are considered worth escalating are presented to the top management for further consideration and evaluation.

The management of Com A follows a collaborative approach in applying dynamic capabilities with intimate engagement with the middle managers to guide selected paths. The collaboration happens through regular cross-functional team discussion and discussion with the top management: '*learning is done through brainstorm among us [and] we learn through frequent communication*' (Manager, Com A Int-2 2017)*.* The middle managers maintain a close relationship with the customers and gain valuable feedback about their products and services on a regular basis. Collaboration with competitors and other external experts is limited in building dynamic capabilities (Com A 2016). Feedback from customers is the critical source for sensing an opportunity, which is later brought to the attention of top management for further action once escalated. One manager states:

> '*We carefully maintain all the customer change requirements across the departments from sales, technical and marketing and we periodically discuss to decide about the change actions. It is a collective effort to decide regarding the exact change initiatives.*' (Com A Int-2 2017)

Decisions regarding a new capability or service introduction are made through collaborative discussion and close engagement with the top management: '*in product meeting there is CEO along with product team/internal product forum, with whom a review meeting is organised in every month*' (Com A Int-2 2017). Financial viability and specialisation in the business domain are considered when accepting a new opportunity within the business. Reconfiguration is carried out through an intervention without compromising resources from existing capabilities. However, the practice of external collaboration with local ICT companies is not evident, even in the situation where Com A lacked the necessary capacity to undertake an opportunity.

Managerial cognitive ability plays valuable roles during seizing capability building at Com A through delivering and maintaining keen attention and awareness in identifying various alternative options to carryout reconfiguration in a cost-effective manner to obtain the intended outcomes.

Managerial problem-solving ability is evident as key managerial cognitive ability to foster reconfiguration capability, especially within the execution phase. Managers maintain close contact with the top management to select among the alternative options. It is important to note that managers take ownership when they come across some problems that cannot be solved within existing resources and capability. In many occasions managers encounter novel problems that originate outside the organisational boundary. These require serious attention because the persistence of these problems may be detrimental to the business operation or profitability. As Eisenhardt, Furr and Bingham (2010) suggest, during environmental dynamism managers should attempt to develop the simplest solution through being cognitively sophisticated. Managers try to recognise these problems at the early stage, initiate dialogue with the top management and continue to follow up with different solutions. Collected data suggests that top management and middle management work closely together to solve problems that arise during intervention.

Table 5.17: Role of managerial cognitive capability at building reconfiguration capability

Cognitive ability		Reconfiguring		Selected quotes
Themes	Sub-themes	Frequency	Managerial roles	
Problem solving skill	Ability to develop solution to operational problem	7	*Preparation and execution*	*'I can solve a problem very quickly, that help me a lot during working with cross-functional teams to develop new products, I have this ability to accept a challenging problem, I develop this attitude from my childhood which is still nurturing and getting benefit every day job.'* (Com A Int-3 2017)
	Ability to develop solution to new problem	6	*Execution*	*'We often encounter new problems during the implementation of a new product or service, we often need to think in a creative manner to tackle the problem, we engage with the top management to allow their experience and attention.'* (Com A Int-5 2017)

Role of managerial human capital in building reconfiguring capability

Managerial experience is the most important sub-theme within managerial human capital that aids reconfiguration capability to develop and deploy solutions that are cost effective and appropriate for the customers of the company through accumulated business knowledge and expertise.

Table 5.18: Role of managerial human capital at building reconfiguring capability

Human Capital		Org Reconfiguration		Selected quotes
Themes	Sub-themes	Frequency	Managerial roles	
Experience	Duration and experience at present role	18	*Preparation and execution*	*'As a long term employee at this company I have deep knowledge on the current resource and capability of the company, current constraints, our priority and challenges that we are currently facing to manage our customer base, these knowledge help me and my organisation when we carry out a process of technological upgradation or new product develop to identify the capability gap and develop appropriate strategy for preparation such as if the gap is very high we prefer to recruit someone with proven experience in case technical project, if the gap is low we try to train our staff before looking external resources.'* (Com A Int-02 2017).
		9	*Appraisal and monetisation*	*'We made the structure so that the revenue may not hamper and decided how the job pricing or purchases will be done. The calculation of growth comes later. Many organisations want to post 800 jobs by paying only 25000 BDT (US$ 400). For them it was a huge challenge for us. To post 800 jobs need 2-2.5 lac BDT (US$ 3000) which they were offering only at 25000 tk. To make that client agree with new system is a great challenge.'* (Com A Int-4 2017)
Technical skill	Training	4	*Preparation and execution*	*'Before I joined that training started. How far I know there were no arrangement for training on the job that time to upgrade the system, so that the organisation can be benefitted. This thought lead to the training process.'"* (Com A Int-4 2017)

One manager mentioned that his experience helped him to develop and carry out an IT system upgrade-building capability internally:

> *'Since I joined the company I worked together with the IT person to upgrade our accounting system. I shared my knowledge and experience of working at a multinational company as well as my knowledge on accounting, based on my education and training, to develop an in-house accounting system that complied perfectly with our unique way of doing business. At that time, there were several accounting packages in the market place, however we decided to develop in-house because it would allow us to bring necessary customisation quickly; we can have only the function that we need and most importantly taking external vendor would require high price. It took around six [to] seven months to develop that system in which my contribution was critical.'* (Com A Int-2 2017)

Role of managerial social capital in building reconfiguring capability

Managerial social capital assists in performing reconfiguration capability in several ways. First, a strong relationship with the customers assists managers to ensure an appreciation

of the newly introduced services by the customers through engaging, motivating and communicating the advantage of the new service over the pre-existing ones. Moreover, to identify and deploy the cost-effective solutions, managerial social capital with internal and external stakeholders plays a vital role in navigating the company towards a successful transformation that produces positive outcomes for the company.

Table 5.19: Role of managerial social capital at building reconfiguring capability

Social capital		Reconfiguration		Selected quotes
Themes	Sub-themes	Frequency	Managerial roles	
Relationship with the customer	Relationship with the customer at present job	15	*Preparation, execution*	'*To say that they help is whenever we want to do anything new, quick survey we do it by interaction with them professionally.*' (Com A Int-4 2017) '*Because of excellent customer support and reliable information regarding the job we have been receiving very good feedback from our clients from the beginning. These two elements have favoured us a lot to create a strong reputation regarding our quality of service in the market which we still committed to maintain. We need to ensure reliability and quality of our service to both job seeker and the clients.*' (Com A Int-4 2017)
Online social network	Online forum	8	*Preparation and execution*	'*We make the engagement there. To throw any message we use it, so that the news may spread quickly. Like, the events that are organised or the new products are launched there. There 280,000 members and we do it for marketing purpose.*' (Com A Int-4 2017)

Contextual managerial ambidexterity and its role in building dynamic capability

Managerial ambidexterity at Com A is two-fold: firstly, senior managers play an active role in exploring new business lines and domains to further expand the business. Examining the corporate profile of the company shows that the top management attempt to attain a balance between new business lines and existing business, through structural changes (Com A 2016). The top management maintained the product division business structure to separate the new business line with the newly established ones (Com A 2016). A newly established product division has a complete division with its own hierarchy to carry out and control operations (Com A 2016). This approach allows the newly established division to set its own goals, objectives and strategic priorities with newly established KPIs and measurements to assess the performance.

Secondly, at the middle-management level, the balance between exploration and exploitation is managed not in a highly structured way but based on informal practices or

principals. For example, employees are not given an extra workload outside their regular office hours. Senior managers allow time for learning new technologies within office time, identifying their availability based on the work schedule.

As noted by one manager:

'When we developed our in-house accounting system we used our IT technical personals whenever they are free or have less pressure, in that way the in-house development did not affect the ongoing operational pressure. It took more time but ensure smooth operational routines' (Com A Int-4 2017).

Table 5.20: Findings on contextual managerial ambidexterity

Contextual managerial ambidexterity			
Exploitation	*Frequency*	*Outcomes*	*Selected Quotes*
Utilisation of slack resources	4	Cost-effective development	*'When we developed our in-house accounting system we used our IT technical personals whenever they are free or have less pressure...'* (Com A Int-4 2017)
Maintaining profitability and obtaining new venture	2	Stability	*'We do not allow our existing performance to compromise when we initiate a new service or carry out any changes.* (Com A Int-5 2017)

However, senior managers have visibility of their team members schedule for a limited time only and resource slack can be utilised due to the proximity of the functional teams and communication across managers. The company maintained its practice of utilising employees' free time to develop new capability since its inception and this reduces the financial cost of new capability development, and increases capacity utilisation, ensuring a positive linkage between dynamic capabilities and the performance outcomes of the company.

Organisational-level factors affecting dynamic capabilities building
Role of organisational structure in building dynamic capabilities

Organisational structure plays an important role in facilitating dynamic capability building at Com A. The company adopts a product division organisational structure (Com A 2016). The product division organisational structure allows the division dedicated for that product to focus on the resources and capabilities that are required to address the changes in that domain. Moreover, the company can leverage the resources across the division to facilitate ongoing sustainability. Due to the intimate supervision and engagement of the top management, middle managers can exercise their delegated authority to carry out entrepreneurial initiatives with top management's involvement and, at the same time, the guidance of top management assists early termination of an initiative if it is not financially

viable. However, it is also pointed out that middle managers are not developing sufficient maturity to take effective decisions independently: '*We do not have dependable middle management which is serious constraints for growth*' (Com A Int-01 2017) and demands close operational engagement by the top management.

Collaborative discussions, facilitated by the organisational structure incorporating members from different levels of the organisational, assist managers to realise the potential of their entrepreneurial initiatives at the early stage. One manager clarified:

> '*We did not have any bindings from the top management that we have to inform them before initiating any change. We have a freedom to make decisions. This freedom reduced the response time and provides good result at the early stage of this company. Since 2010 we have been receiving less change request so whenever we receive any change request we have a group discussion and before final action we take the permission of our MD*' (Com A Int-02 2017).

Some managers also pointed out that the company needs to be more proactive in acknowledging the entrepreneurial contribution of the managers, as argued by one manager:

> '*We try to contribute to the benefit of the company with offering innovative ideas which are sometimes accepted and implemented by the senior management; however, we often do not receive any monetary benefit for this contribution which is sometime demotivating*' (Com A Int-03 2017).

Table 5.21: Role of organisational structure in dynamic capabilities building

Organisational structure		
Sub-theme	*Frequency*	*Selected quotes*
Nature of organisational structure	5	*'It is not that much organised, that's why we can do so many things very fast.'* (Com A Int-4 2017)
Incentive mechanism	6	*'Very friendly, supportive, overseas visit, event management team arrange events for the employees locally and overseas.'* (Com A Int-5 2017)
Top management engagement	5	*'If there is any decision making related to Com A within the company the senior management play an important role though everything is not done formally. When to take a decision, our chairman suggest us to do a market survey. Multinational companies such as Banks use big companies like PWC but in our place, it is doe in an informal way.'* (Com A Int-4 2017)
Delegation of authority	5	*'We did not have any bindings from the top management that we have to inform them before initiating any change. We have a freedom to make decisions...'* (Com A Int-2 2017)

An absence of a robust knowledge-management infrastructure compels managers to request information from other members, leaving scope for conflicts. The company also

does not have a comprehensive systematic process to store organisational knowledge produced through its daily operations and, over the period since inception, this has created a reliance on the tacit knowledge of the employees (Com A 2016).

Role of organisational culture in building dynamic capabilities

Organisational culture at Com A is a collaborative one that allows the company to nurture learning and sharing information. Managers play an active role in nurturing this culture through interventions, whenever necessary. For example, if any team members are not following the cultural norms of the company, the middle managers usually go through a series of discussions to communicate the appropriate action with the team member. As the company has a very open and collaborative culture, the middle managers and operational employees can engage with the top management about their entrepreneurial ideas and can receive feedback. An open and collaborative culture supports active top management engagement with the middle managers that fosters innovation through managerial entrepreneurship. Managers are provided with sufficient resources, at the early stage of the idea generation, if the idea carries the potential of value creation. Additionally, the overall culture within the organisation is supportive, as one manager indicates: *'very friendly, supportive, overseas visit, event management team arrange events for the employees locally and overseas'* (Com A Int-2 2017). Gibson and Birkinshaw (2004) highlight the importance of constructing a well-designed organisational system, culture and process to enable simultaneous adaptability and alignment. However, the company strictly avoids engaging with any collaborative relationship with external companies and does not seek any resources or consultancy services from external organisations, or industry experts. This practice may result a path-dependant pattern in managerial entrepreneurial initiatives, and managers often decline to exploit an opportunity with high potential, if that falls beyond the existing capacity.

Table 5.22: Role of Organisational culture in building dynamic capabilities

Culture		
Sub-theme	*Frequency*	*Selected quotes*
Supportive culture	3	*'Strong team dynamics, good relationship with the customer, due to high quality customer retention is very high, customer never left.'* (Com A Int-2 2017)
Appreciating innovation culture	4	*'We have a strong culture for innovation with customer orientation. Top management always encourage for innovation and a new initiative is most of cases appreciated and approved for further consideration if it has merit.'* (Com A Int-7 2017)

Consequences of dynamic capabilities

Liao, Kickul and Ma (2009) found that internet-based firms with possession of dynamic capabilities continually build, renew and reconfigure their resource stock which results in positive performance outcomes for the company. Eisenhardt, Furr and Bingham (2010) suggest that managers need to focus on driving effort to attain efficiency and, at the same time, should allow flexibility for further development of new capabilities. It is the case that there is a clear intent to maintain a positive linkage with any transformation, or new capability-building initiative, and performance outcomes at Com A. Managers who are engaged with change initiatives assess and appreciate the outcomes immediately, and in longer term, as outlined by one manager:

> *'The in-house developed accounting system offered seamless connectivity with the sales and IT department regarding the information related to the clients which reduced coordination effort across department and allowed information sharing. This ultimately helped us to grow and offer our service to an ever-growing customer base despite of our small team size at the beginning. We increased our productivity through using that system which we have been using since then'* (Com A Int-2, 2017).

Table 5.23: Consequences of dynamic capabilities

Consequences of dynamic capabilities: Positive			
Sub-theme: Realised Dynamic Advantage	*Fitness*	*Readiness*	*Advantage*
Selected quote	*The in-house developed accounting system offers seamless connectivity with the sales and IT department regarding the information related to the clients, reduces coordination effort across department, allows information sharing.*	*Seamless connectivity reduced cross-functional coordination for managing client resulting decreased operational cost that make the company ready for pursuing growth.*	*Savings of operational cost if developed through external vendor, capability to introduce new service quickly.*
	Respond to customer requirement quickly, introduce new service in a rapid manner.	*In-house developed IT system helped us to grow and offer our service to an ever-growing customer base despite of our small team size at the beginning.*	*We increased our productivity through using that system which we have been using since then.*

The top management and middle management always assess the linkage between the change initiatives and the financial benefits of the company. The strong rationale to realise or appreciate the advantage created by the intervention and the incentive to monetise the advantage is clear, as outlined in Table 6.20. To clarify the monitoring process regarding the financial outcome, one manager explained:

'When feel that the trail is moving to the negative side then take immediate action. It is not like that you cannot do anything before six months. After starting, if observed within one month that it is not working then I identify and take corrective measures. So, the amount of failure is less. We don't let the fail initiative to go for a long time' (Com A Int-02 2017).

If the linkage between the initiative and the financial outcome is remote, uncertain or broken, the top management insists on discontinuing the initiative to avoid a negative financial impact. As a result, all the completed initiatives triggered by changes in the external environment maintain a positive performance outcome for the company. Com A successfully exploited the first mover advantage (Secondary sources 2016) and maintained the leading position for more than sixteen years in a rapidly changing online-based business environment. Wernerfetlt (1984) highlights that experience leakage results in stronger competition that eventually affects the profitability of the first mover. In the case of Com A, internal capability development supported by comprehensive in-house training facilities, and successful retention of experienced employees, plays a vital role in maintaining competitive advantage over a long period of time.

Summary

Com A middle management keeps an intimate engagement with the top management regarding new capability-development decisions, or any new initiative linked with addressing changes in the external environment. The long-tenured managers assist the company to understand the changing needs of customers in a more comprehensive manner. Long job duration within the company also creates the scope of stronger relationships with customers which is an important element for building dynamic capabilities. As the company has a small operational team, ambidexterity is maintained through utilising slack effectively to safeguard operational performance from the detrimental impact of new capability-development processes. The organisational structure of the company is also appropriate for a rapidly changing business environment and, at the same time, the company has a supportive culture that fosters internal collaboration among the employees for effective diffusion of knowledge. Finally, the company maintains an ongoing evaluation about the linkage of change initiatives and financial outcomes to avoid negative bottom line impact. The below figure offers an overview of dynamic capabilities practices at Com A in response to technological change, market competitiveness and changing customer requirements.

Figure 6.3: A framework of managerial roles in building dynamic capabilities at Com A

External environment
Technological change, customer preference change, competitive actions

Individual level

Managerial attributes

Cognitive ability
- Awareness and attention
- Problem solving skill

Human capital
- Experience and duration at present company
- Education
- Technical skill

Social capital
- Relationship with customer
- Relationship with internal stakeholders
- Online social network
- International relationship

Managerial roles

Contextual managerial ambidexterity
- Utilisation of slack resources across functional units
- Strong focus to maintain and defend current operating performance

Organisational level dynamic capabilities

Sensing
- New business opportunity
- New customer requirement
- Identify technological change
- Idea of new product/service
- Competitors action

Reconfiguring
- Carry out transformation in resources, capabilities or routines
- Integration and coordination of resources and capabilities
- Monitoring

Seizing
- Determine agenda
- Identifying cost effective options

Organisational level factors

Organisational structure
- Nature of organisational structure
- Top management engagement
- Delegation of authority
- Incentive mechanism

Organisational culture
- Collaborative and supportive culture
- Innovation orientation

Findings: Com A

Consequences
- Advantage for the stakeholders
- Technical fitness
- Operational fitness
- New service introduction
- Increased flexibility
- Customer readiness
- Improve customer loyalty
- Increased revenue
- Reduced operational cost
- Growth

Next, the findings from Com B are presented.

5.3.2 Com B: An advantage-seeking approach during external dynamism
Background of the company

Com B, established in 1994, is a not-for-profit organisation and a sister concern of one of the leading micro-finance organisation of Bangladesh, Bank Y. The company specialises in providing complete ICT services to more than 6500 branches of more than 120 local and international micro-finance organisations and institutes including Bank Y (Com B 2017; Com B Int-3 2017, pers. comm., 10 November). The company currently has more than 1400 ICT educated employees, among them 90% are working as IT enabled services (ITES) resources and 10% as IT resources such as software, hardware and network engineers (Com B 2016; Com B Int-1 2017). Around 40% of the company's revenue comes from export: destinations are the US and India (Com B 2016).

The following two tables include a brief overview of the company and the demography of the interviewees.

Table 5.24: Overview of the company based on the corporate websites and reports (Com B 2016) and key research focus

Name	Year established	Business	Yearly revenue	No of employees	Current no of clients
Com B	1994	Software development IT enabled service and solution	Not revealed	More than 100 (approx.)	Proximately 120 including local and international
Key research focus	Managerial roles behind company's successful performance over 16 years considering changes in customer preferences, increased competition and technological adaptations.				
Demography of the interviewees					
Management position	Designation	Gender	Age (years)	Interview duration (minutes)	Interview location
Top management	Managing Director	Female	53	35	MD's room
Middle management	Deputy General Manager	Male	49	45	DGM's room
	Deputy General Manager	Male	48	50	DGM's room
	Head of Training	Male	46	40	Conference room
	Head of Software Project Management	Male	37	60	Conference room
	Research Consultant	Male	41	60	Conference room
	Senior Programmer	Male	40	45	Employee's desk
Operational level	Programmer	Male	31	35	Employee's desk
	Programmer	Male	28	30	Employee's desk
	Branch IT professional 1	Male	31	30	Client's branch office

	Branch IT professional 2	Male	27	40	Client's branch office
Client	Senior Officer of Bank Y	Male	29	30	Client's office

Evidences of dynamic capabilities building at Com B

Com B has successfully transformed its flagship product 'Ybanker' with the latest programming language since it started development 23 years earlier with Fox Pro programming language. The product has been successfully upgraded into different programming languages and has been delivering the intended service effectively and efficiently since its introduction. Additionally, the company has successfully addressed changes in customer preferences through effectively upgrading their resources and capabilities on different occasions. Finally, the company has experienced sustainable growth and has maintained a leadership position in the marketplace in providing IT services and solutions to micro-finance organisations.

Over a long operating period, Com B has faced various challenges posed by the external environment where middle managers have played a vital role in carrying out initiatives to continue sustainable growth. The Dynamic Capability View (DCV) is particularly applicable for this company as the company has access to sufficient resources being a sister concern of a major micro-finance organisation. One manager explains this:

> '*There are no problems with the resources, that means resources are available and enough, currently there is no problem with the resources.*' (Com B Int-2 2017)

This highlights the necessity to build and transform resources and capabilities in accordance with changes in the external environment. As the company mainly serves only one major client, it does not face significant changes in customer requirements but rather customer requirements are addressed incrementally, or as part of the service-level agreement. The company mainly exercises dynamic capabilities in identifying, integrating and adapting the appropriate technology and technological solution to create advantage for the client, as well as to solve client's operational problems. One manager states:

> '*Our main problems are with our task which we face in our working period and we are working on it to find the proper solution and we fall in troubles at the beginning. We start a trial process in the in-house and we research on it, design it and trying to find the way how to do the work. First design was a fault design, it can be happened because we have no such a cumulative resource in our hand*' (Com B Int-2, 2017).

Interviews, and analysis of information provided and collected during the investigation, reveals a semi-structured process for technological upgrades. One manager termed this as not having a systematic approach to procedures: '*there is no formal process for technology*

upgradation. Without any systematic way it is normally done in a cumulative manner' (Com B Int-1, 2017).

However, a senior manager contradicted this perception, stating that there were detailed procedures:

'*It is not that we do not follow any process. It means what is happened for us, suppose in case of technical upgradation, the technology we are using – our research running just to proof that technology ... we are working with hardware, working with software. Hardware has got its specialist; there are also specialists for software, they are continuing. It means that, how it is running in the market, what is the market trend, the trend that the matter of business of my organisation? It has happened for making the technology upgradation to fit that business means it is done having with systematic process*' (Com B Int-4 2017).

The below table provides a brief overview about the managerial response towards technological factors in the external environment.

Table 5.25: Overview of emerging findings of dynamic capabilities to address technological changes at Com B

	External dynamic factors			
	Technological changes			
Scope of technological change	Change of backend technology; e.g. programming language	Adoption of available technology	Adoption of alternative or superior technology	Technological infrastructure; ex electricity as constraints, internet as opportunity
Nature of managerial response	Ambidextrous adaptation	Advantage seeking behaviour	Managerial entrepreneurial initiative	Creative managerial entrepreneurship
Response, actions and interventions	Learning new programming language in collaboration with the external trainer	Continuous assessment to justify the cost of deployment, operational cost and maintenance	Experiment with pilot	Deliberate attempt to invent or innovate tailored solution
Advantage	Low resource commitment, maintain service level, uninterrupted operation, low cost, access to external expertise	Adoption of widely available solution	More effective or efficient or both	Greater control over the solution, scope to further improve
Disadvantage	Slow and lengthy process, difficult to assess the effectiveness of training, may not be appropriate for	Cost ineffective, operating and maintenance cost	Lack of availability, lack of suitability	Resource commitment, may deviate managerial attention

	preparing large-scale project			
Necessary conditions	Low competitive and customers' preferential pressure	Availability of the technology and solution	Scope to integrate	Strong managerial commitment and sense of ownership
Explicit strategic preference	No new recruitment, low resource commitment, rely on previous learning mechanism	Obtain best available market price	Feasibility to rollout with scalability	Solve or control problem, or optimise the negative consequences of the problem in a cost effective and sustainable manner

The Com B case study shows that its managers carry out individual assessment to identify the potential merit of identified changes in the external environment, then they share and finally engage with the senior or top management to receive feedback. The managers usually engage with the top management to decide about any new initiative. Seizing capability, primarily maintained at the top management level, is manifest when a feasibility assessment is carried out, with a prospective execution roadmap and a proposal to conduct a pilot project to further investigate the opportunity. Finally, reconfiguration is performed in an intervention basis to transform internal resources and capabilities when an effective result becomes evident from the pilot initiatives. During intervention to transform internal resources and capabilities managerial roles such as preparation, execution and assessment of the intervention are performed with individual and collective effort. Managers try to maintain keen attention to optimise the cost associated with the intervention through sharing resources across cross-functional units and utilising slack resources. Additionally, managers attempt to address the novel problems during the transformation process through maintaining simultaneous persuasion of creative, configurative and market-based approaches, and often allow multiple solutions to co-exist. Finally, while the company experienced mainly positive consequences, it also experienced negative ones, including currently those flowing from a difficulty in transforming their existing desktop software packages into online-based services. Next, the managerial roles in building dynamic capabilities are discussed.

Role of managers in building dynamic capabilities

To maintain the not-for-profit identity, Com B is restrained from engaging any kind of self-promotional activity (Com B Int-1; 2; 4 2016). Top management of Com B does not actively encourage middle managers to initiate entrepreneurial activities that are not aligned with the existing business, rather it provides the necessary support to initiatives that are aligned with the existing business of the company. However, with limited resource commitment,

managers have demonstrated some entrepreneurial initiatives that have become successful within the business domain of the company.

The company maintains an openness for potential collaborative relationships if approached with a potential idea for commercialisation. Through this approach, this company has successfully attained a good number of entrepreneurial projects with external collaborators from local and international marketplaces. This collaboration also creates an opportunity for creating new products or services in a new market that may deliver significant financial advantage to the company.

Table 5.26: Evidences of managerial entrepreneurship

Managerial Entrepreneurial Initiatives	Organisational-level outcomes	Selected quotes
In-house customised IPS development	Operational continuity and cost-effective solution, growth, scale-up	*'I initiated to develop an inhouse IPS'* (Com B Int 5 2016)
New market creation	New revenue	*'I sold YBanker to new clients through individual initiative* (Com B Int-2 2017)

This research brings rich insights about managerial roles at organisational-level dynamic capabilities building at Com B.

Next, the role of managerial cognitive ability, human capital and social capital in building sensing, seizing and reconfiguring capabilities are discussed.

Role of managerial cognitive ability in building sensing capability

At Com B, managers exploit their experience and relationship with the customers to capture changes in the external environment, in particular the changes in customers' preferences and technological changes. A clear customer led approach (Lavie, Stettner & Tushman 2010) is evident as managers primarily maintain a keen attention to the requirement changes of their existing client and also assess the changes from the perspective of existing resources, capabilities or product portfolio of the company, as one manager stated:

> '*I heard about MongoDB, but after learning that this is a technology for unstructured dataset, I decided not to learn further on that because it does not have any application in our products*' (Com B Int-6 2017).

Role of managerial human capital in building sensing capability

Experience and duration in the present role offer instrumental value in identifying new opportunities through interacting with the customers and having a comprehensive understanding about the relevant domain knowledge. Brahm, Tarzijan and Singer (2017)

suggest that when an employee stays in a particular company for around five years most of the learning takes place during the first year of the experience, and they further suggest that learning and operational experience promote resource sharing. At Com B, long operational experience equips managers with superior task performance skills that encourage further learning for improvement.

Table 5.27: Role of human capital at building sensing capabilities

Human Capital		Sensing	Selected quotes
Themes	Sub-themes	Frequency	
Experience	Duration and experience in present role	12	*'The main challenge a new employee if assigned to my position will be to understand the business, it's matter of intelligence and he must know about the client's business process. For example, you need to know all aspect about the client.'* (Com B Int-1 2017) *'To gain knowledge I relied on my learning capability, but people have to be curious to learn.'* (Com B Int-3 2017)

Role of managerial social capital in building sensing capabilities

At Com B, managers primarily maintain a close relationship with their customers. Close relationships with the existing customers assist the managers to understand changing customer requirements. Relationships with external stakeholders are less evident. Senior managers occasionally engage with the stakeholders, however strong intent to exploit the external relationship is not evident. Only one manager mentions that his good relationship with the senior managers of external companies assists him to obtain new clients which is a successful evidence of utilising personal contacts developed through external networks to gain access to new customers (Mueller & Siemens 2013).

Table 5.28: Role of social capital in building sensing capabilities

Social capital		Sensing	Selected quotes
Themes	Sub-themes	Frequency	
Relationship with the customer	Relationship with the customer at present job	18	*'We maintain close engagement with the customers and it help us to receive any change request immediately and we try to address them as quickly as possible.'* (Com B Int-6 2017)
Online social network	LinkedIn	0	*'I am not active in LinkedIn.'* (Com B Int-2 2017)

All the managers have online social media accounts with websites such as Facebook and LinkedIn but this relationship capital is not utilised to benefit the company. Some managers claim that they have notable industry experts in their business domain in their LinkedIn

profile, but these contacts are never accessed for any purpose related to organisational benefit. New employees occasionally engage with their past colleagues, when they come across any technical problems, if they worked together in the past, but for most of the managers there is little evidence of maintaining a relationship with the past colleagues for the benefit of the company. This is due to fact that most of the managers have been working at Com B for a long period of time. Relationships with the employees from competitor companies is also not evident.

Role of managers in building seizing capability

Managers at Com B leverage their human capital, social capital and cognitive ability in building seizing capability. First of all, experience at present organisation assists managers to leverage their extensive experience during decisions regarding new capability building, similarly relationship with the customers and keen attention and awareness assist managers to cultivate feasible agenda to carry out reconfiguration within resources and capability.

Role of managerial cognitive ability in building reconfiguring capability

The cognitive ability of senior managers proves to be vital to develop novel solutions for problems arising due to building new capabilities. Managers attempt to apply their creative thinking ability to solve problems arising during the time of a reconfiguration process. One manager demonstrated significant dedication to address the shortage of electricity supply through initiating an individual initiative without sufficient resource commitment from the top management. This is similar to the situation described by Turner, Maylor and Swart (2013) where managers may develop a sense of ownership and expansion of their regular roles as a response to a critical incident that demands communication and coordination beyond the regular scope of responsibility. Moreover, attention and awareness are leveraged to intercept any changes in the external environment. For example, managers at Com B identified Mongo dB as a new emerging database management technology through their informal communication and searching the internet.

Table 5.29: Role of managerial cognitive capability at building reconfiguration capability

Cognitive ability		Recon	Selected quotes
Themes	Sub-themes	Frequency	

Problem solving skill	Ability to develop solution to new problem	3	*Whenever I took ownership responsibility about the matter I always think that I need to solve the problem. But people are requesting to solve the problem from the management side or call supporting team to solve it. That moment I was member of the management. We sent a product as experimental. It was working for a while. First one worked 4/5 hour. Although it run 4-5 hours, but quality was very poor, and it was not working well. When charge is full rate that time it could continue but when electricity is not available, and charge also fall in trouble'* (Com B Int-2 2017).

Role of managerial human capital in building reconfiguring capability

At Com B human capital is a key factor behind the company's successful transformation during occasions when the company faced serious pressure to address changes in the external environment. Com B is fully committed to developing the necessary skill set of the company's human resources, as well as individual capabilities of the employees. Senior managers continually engage in different skill development and training programs to upgrade their skills and capabilities on an ongoing basis. More importantly, training programs play a critical role in successful transformation of the existing resources and capabilities following changes in the external environment. The company has developed a distinctive kind of training program to diffuse new capabilities as required by changes in the external environment (Com B 2016). For example, when the company transformed their flagship product YBanker from VB to the latest programming language, a training program was initiated. The company has a clear pattern of training programs which has remained unchanged over the years, as mentioned by one manager: '*we take training or hire a trainer and [the] trainer help us to learn the desired technology*' (Com B Int-2 2017).

The training program incorporates external industry experts who train a selected number of employees for a few months with practical tasks that are related to the transformation processes. Once these trainees reach a certain maturity in the intended capabilities, they start to train other members of the company who join the team. The advantage of this approach is that it exploits the expertise of industry experts which ensures the learning process maintains accuracy and reflects the latest development in that technology. However, the disadvantage of this approach is that it is time consuming and relies on the existing employees' learning capabilities rather than pursuing the recruitment of experienced professionals. Helfat and Martin (2015) suggest that professionals from the industry with prior experience in the intended change direction of the focal company may leverage their individual knowledge structure in a diverse context and that this may reduce uncertainty or aid in preparing for challenges through envisioning at an early stage. Investigating the biotechnology industry, Brahm, Tarzijan and Singer (2017) further reveal that hiring stimulates organisations through a renewed knowledge base, as well as resisting

obsolescence. The authors further suggest that, with age, organisations may become more rigid and resistant to change, therefore through hiring employees the organisation may foster learning through outside knowledge, disruption of routines and the facilitation of socialisation, which in effect may reduce cost of structuration of task execution and formalisation (Zollo & Winter 1999). So, in brief, the company prefers an internal capability development approach through hiring industry experts for temporary periods. This approach is consistent with Warnerfelt (2013) that larger sized firms are more likely to internalise more functions through hiring experts. At Com B, however, the experts are pursued as consultants to train the intended technology, rather than being employed on an ongoing basis. The training program plays a critical role during the transformation process to diffuse the new capabilities among the employees, which is an important element for performing dynamic capabilities.

There is significant heterogeneity of human capital at Com B as the managers have a diverse range of educational and professional backgrounds. This diversity proved to be highly useful in building dynamic capabilities (Doving & Gooderham 2008). The diverse educational background and heterogeneity provided a strong grounding to identify new opportunities, as well as in identifying an unconventional and diverse range of solutions to problems during reconfiguration, for example, the company successfully developed different software packages through effective diversification (Doving & Gooderham 2008). For example, when the company first deployed the Ybanker to a small number of branches of Bank Y, due to a high volume of transactions it was difficult for one employee to complete entry for all the transactions. To tackle the problem external experts recommended allocating two employees instead of one (Com B Int-5 2016), however, doubling the number of employees at the client site would increase the operational cost significantly. The effective solution came from an employee with a social science background rather than a computer science background. The proposed solution only required the entering of the variation of entries, and contained auto filled data, which significantly reduced the workload for one employee by 75%; as a result, one employee could manage two branches instead of one; doubling the productivity and further facilitating the initial roll out program across all Bank Y branches (Com B Int-5 2016).

Table 5.30: Role of managerial human capital in building reconfiguring capability

Human Capital		Org Recon	Selected quotes
Themes	Sub-themes	Freque ncy	

Experie nce	Duration and experien ce at present role	14	'With my 10 years of experience I obtained a sound knowledge about the business domain as well as comprehensive insights about client's requirements. I help my client my for-information base, in addition, Pilot, New feature and never-ending process.' (Com B Int-1 2017) 'We can do the work very quickly because we are usually work on it and we have a huge domain, and our team is so experienced. Especially in microcredit level, we are very handy.' (Com B Int-5 2017) 'I have lots of experiences and I work so much to make circuit because I have the capability. Gradually, I developed my skills through the knowledge of circuit. Whenever I entered into the work I wanted to learn it very clearly.' (Com B Int-4 2017) 'All the work became easier through the experience. When I explored the problems now it becomes your problems because you have responsibility. You know the better through your experience and certainly more capable to solve the problems because you are also an experienced management.' (Com B Int-4 2017)
Educati on	Relevant educatio nal qualifica tion	5	'Yes, my educational background became fruitful here, although there are new electrical engineers, but they are very poor in their practical ground they could not understand the all aspects. I was in number 1 position in lab test.' (Com B Int-2 2017)
Technic al skill	Training	4	'Yes, we receive training for developing the product, we work so I already mentioned the MBC system which way we maintained the quality. When we get training that time trainer brings the coding with perfection. Yes, we take coding from the teacher when he teaches us the process and also, we receive feedback. Trainers not only takes classes but also, they are taking the responsibility to provide the quality. Specially, it is maintained in the MBC.' (Com B Int-5 2017)

The company has an experienced board of directors with rich educational background (Com B 2016) and leadership capabilities. These qualities proved to be useful on many occasions in resolving various problems that the company encountered during reconfiguration processes.

The company operates in a micro-finance industry in which they are considered a leading company (Com B 2016). Moreover, the micro-finance industry is also at an early stage and is continuously changing in the light of the requirements of different contexts and customer requirements. The different aspects of the micro-finance products are very complex and require a comprehensive understanding of the business processes.

Role of managerial social capital in building reconfiguring capability

At Com B, a manager who was involved with developing solutions for electricity shortage used his extensive network of companies from diverse industries to simultaneously pursue a creative solution through his own extensive knowledge and problem-solving skills and also a market-oriented and configurative approach through accessing information about latest products in the market (Com B Int-4 2017). This entrepreneurial initiative clearly demonstrates boundary-spanning behaviour of both inside and outside-oriented

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interactions (Vollery, Mueller & Simens 2013), knowledge-brokering behaviour of cross fertilisation of ideas across the industry (Hargadon & Sutton 1997) and was later proved to be useful in maintaining multiple solutions to identify the most cost-effective solution, as recommended by Eisenhardt and Martin (2000) during uncertainty in the external environment.

Managers at Com B rarely utilise the professional networking site LinkedIn, however they use Facebook ascertain responses to any particular change initiative with one a manager mentioning that he uses social media to receive useful feedback regarding any change initiative. Engaging fellow colleagues through the social media network assisted him to capture more intimate reactions regarding decisions made during transformation processes, and these assisted in pursuing the intended change in a more effective manner.

Table 5.31: Role of managerial social capital at building reconfiguring capability

Social capital		Recon	Selected quotes
Themes	Sub-themes	Frequency	
Social capital	Relationship with companies from different industry	2	*'I worked with companies from diverse industries as they had installation problemstr, but vendors of these companies did not like me at all. Because, If I solve the problem they cannot sell product to the company. But I did not demand anything from them.'* (Com B Int-2 2017) *'Some companies within electrical and power industry are known to me. I made good relationship with them and frequently they asked for help. I also respond them quickly and solve their problems so that they became happy and our relation became stronger.'* (Com B Int-2 2017)

Furthermore, Rogan and Mors (2014) suggest that internal informal ties among employees supports cross fertilisation of resources and ideas within the organisational boundary, as evident at Com A where its rich sense of organisational community fosters resource sharing among employees, which is particularly helpful in learning. As one manager states: '*If problems are beyond my capacity then ask help from others then seek help from seniors*' (Com B Int-1 2017).

Contextual managerial ambidexterity and its role in building dynamic capabilities

Strong orientation towards ambidexterity can be traced through the persistent focus on cost savings during all the capability-building initiatives. In terms of ambidextrous practices, managers of Com B do not pursue a structured approach with clear specifications, rather the balance is managed informally. A first specific effort linked to attaining balance between exploration and exploitation is the unique approach of managing knowledge diffusion or

training new technologies. In the case of Com B, instead of giving general training for all the technical employees, senior managers identified and recruited only few employees to receive training in recent technology from an expert external trainer. These employees are then responsible for training other employees, and this process is repeated until the expected number of employees has achieved the expected standard of learning outcomes. This process helps the company to maintain productivity during the learning stages of a new technology. In contrast, the process is identified as slow and less efficient when a big overhaul is needed, such as transforming the whole of Ybanker from a desktop application to a web-based service through C# net programming language. A second specific effort linked to attaining balance between exploration and exploitation is middle managers engaging in collaboration practices with external training providers, or partners, to reduce the effort needed for internal development, and to share resources and the risk of new initiatives.

Table 5.32: Findings on contextual managerial ambidexterity

Contextual managerial ambidexterity			
Themes	Frequency	Outcomes	Selected quotes
Exploitation			
Balance between learning new skills and improving present ones	3	Cost-effective but time consuming	'*Trainers provided the training to the one group and the group will train up to others. That means you have the capability to teach the proper training.* (Com B Int-6 2017)

Organisational-level factors affecting dynamic capabilities building
Role of organisational structure in building dynamic capabilities

The company follows a mixed structure with a hierarchical and a product division structure. The hierarchical structure increases the decision-making lead time and complexity, however as the top management are closely engaged with the middle managers, the current structure is not impairing the company's ability to address changes in the external environment effectively in a significant manner.

However, a more aligned business structure, considering the nature of the business activities, would be more appropriate to achieve a better fit between the business environment and the internal organisational structure. Additionally, top management need to maintain motivation towards the middle management, as it is difficult to specify the nature of coordination and communication that would be necessary across the business units prior to the time of rapid changes. Therefore, managers who can demonstrate discretionary positive initiate in linking organisational resources and capabilities to pursue

a successful transition to a superior fit with the external environment, should be rewarded and promoted (Taylor & Helfat 2009).

Table 5.33: Organisational structure at dynamic capabilities building

Organisational structure		
Theme	Frequency	Selected quotes
Nature of organisational structure	1	*'How could I explain it to you, you know, domain-related problems are raising after the tasks have done. There are so many issues to relate to the domain, after finishing the jobs we have to work again for it betterment. We face the 'top-down process' problem though these problems are solved by us internally.'* (Com B Int-4 2017)
Incentive mechanism	1	*'There is no incentive for carrying out entrepreneurial or innovative initiatives.'* (Com B Int-3 2017)
Top-management engagement	7	*'We can engage with the top management very frequently.'* (Com B Int-2 2017)
Delegation of authority	2	*'I think there is the vital issue is, management does not listen us and authority doesn't care about our raising points.'* (Com B Int-6 2017)

Role of organisational culture in building dynamic capabilities

The company has a supportive culture towards its employees. It considered a long-time retention strategy to nurture various needs of the employees that also support to develop a collaborative culture where everyone attempts to help each other. The company offers less salary than the standard ICT market but offer various other incentives to retain its employees which are proved to be effective.

Table 5.34: Organisational Culture at dynamic capabilities building

Culture		
Sub Theme	Frequency	Selected quotes
Knowledge sharing culture	7	*"We always share knowledge and try to diffuse knowledge through communication."* (Com B Int-6 2017)
Supportive culture	5	*"We work in a very supportive culture, everyone here tries to help each other very much."* (Com B Int-4 2017)
Appreciating failure	1	*"Top management primarily risk averse and does not want to commit any resource unless any practical benefit is demonstrated."* (Com B Int-3 2017)
Appreciating innovation culture	4	*"Innovation is not that much encouraged and not supported, a manager has to carry out initiative independently to pursue an innovation, it is rare here."* (Com B Int-2 2017)

Consequences of dynamic capabilities

The company exhibited both positive and negative relationships between dynamic capabilities and financial performance. Most of the initiatives addressing changes in the external environment have a clear intent to bring advantage for the clients, and it is always perceived that if advantage can be delivered to the client then the advantage would eventually return to the company in terms of increased revenue or demand for services

from the client. Dynamic capabilities have contributed significantly to create advantage to the client company and significantly reduced the operational costs. Therefore, the linkage between dynamic capabilities and the firm performance are always established in an indirect manner. On one occasion, as reported, the company experienced loss due to an investment decision made by the managers to establish a battery factory which was not related to the core business, and neither did the company have any previous expertise to enhance capability building in that line of business. This negative performance may also be attributed to managerial commitment, or discretion, as the decision was not triggered by any external factors, rather individual managerial preferences. Therefore, it is important to appreciate the difference between the external stimuli and individual managerial discretionary choices in pursuing any new initiatives. Moreover, this experience of negative performance by Com B also reinforce the importance of managerial experience in the related business domain during the transformation initiative. The negative financial performance of the intended project was promptly discontinued following the suggestions made by the top management, that highlights the fact that in the context of empirical enquiry middle managers need to maintain engagement and need to exchange the opinion of the top management before making a final decision on any new initiative that they have limited knowledge or expertise. Therefore, managers need to be careful and should incorporate suggestions from different layers of the organisation before making a commitment in a new venture with limited experience.

A negative consequence which is yet to be realised by management or stakeholders is the company's inability to exercise dynamic capabilities to transform their current product. These findings offer a new perspective in assessing the consequences of dynamic capabilities as a company with successful performance during environmental dynamism on previous occasions may fail to execute similar performance in a different environmental context. One of the key explanations for this phenomenon could be a failure to execute dynamic capabilities in a different environmental context, therefore the impact of failure to execute dynamic capabilities require appropriate recognition to identify the consequences of non-executing dynamic capabilities. In the case of Com B, managers started to realise the impact of not executing dynamic capabilities in a timely manner, in other words the negative consequences of not being able to transform their flagship product to have internet capability only became evident to managers after key competitors introduced the service. Finally, due to a strict non-commercial philosophy, the company did not continue monetising its in-house innovation.

Table 5.35: Consequences of dynamic capabilities

Consequences of dynamic capabilities			
Sub-theme: ***Realised Dynamic Advantage***			
Fitness	*'There are many places where electricity is not available. So, what is to do, we have bought some computers from market that have consumed less electricity, that are called E Box PC. With that we can run our back-up service without electricity, power back up service has been made.'* (Com B Int-2 2017)		
Readiness	*'This variation in repayment data means for each and every branch a computer operator had to make entry of 2,000 transactions every day, in fact that was not possible for a single operator whatever might be his experience or expertise. Then what would be the way of making it simple and easy? We started thinking to make it easy, and then it is known previously to us how much the instalment is for each and every borrower, if we could make sort out that who is not paying or pay less than if these systems has been included then there would find no problem. System has been got running.'* (Com B Int-4 2017)		
Advantage	*Operational continuity, scalability, cost advantage*		
Sub-theme: ***Monetised Dynamic Advantage***			
Sub-themes	Return on fitness	Rapid on readiness	Return on advantage
	Increased operating profit due to reduced operating cost	Rapid growth	Resources can be diverted to high priority areas
Consequences	*Positive and negative consequences due to non-execution of dynamic capabilities*		

Summary

Due to its not-for-profit nature, managers of Com B perceived the external environment without considering the competitive dimension. The company primarily keeps its priority as the main client, Bank Y, and maintains a high commitment to continue an excellent service level through promptly responding to the day-to-day requests from the employees of Bank Y, and at the same time it always attempts to identify scope to create advantage for the key clients through adapting to new technologies, or solving the operational problems of Bank Y. The major intent in pursuing dynamic capabilities is to create advantage for the client, which if realised, results in positive performance outcomes for the focal company. The company demonstrates a different kind of approach in pursuing dynamic capabilities.

In response technological change, the company predominantly follows an adaptive approach. As the client is slow in terms of technology adaptation, Com B generally attempts to adapt with the technological development, more specifically, the back-end technological development. On the other hand, to address the client's operational problem with appropriate solutions, managers demonstrate an adaptive approach to exploring and exploiting available technology, and a proactively entrepreneurial approach to creatively developing innovative solutions that may deliver operational advantage to the client. Customer requirements are addressed in a responsive manner to ensure a rapid resolution

and flexibility. Managers purposefully avoid a competitive mindset and ignore the competitive landscape of the business ecosystem. Additionally, managers did attempt to integrate commercially-motivated initiatives into the not-for-profit approach through emphasising the relationship over profitability. Clearly, an advantage-seeking behaviour is evident by the managers rather than the opportunity-seeking managerial behaviour in the for-profit organisations. Absence of a competitive mindset, and readiness to perform competitive actions, has resulted in a new entrant in the core business domain of micro-finance solutions with superior functionalities and capabilities that offer not only complete online real-time business transactions but also has introduced a micro-finance solution in a mobile application. The adaptive approach has fallen short in maintaining the competitiveness of the core product. Moreover, a lack of institutional support for managerial entrepreneurship has reduced organisational effectiveness in capitalising on opportunities arising in the external environment, such as the development of a nationwide internet infrastructure.

The company has a supportive culture that encourages knowledge sharing and rich informal communication. However, the organisational structure should offer the scope for career progress for the technical personnel to utilise their rich business domain knowledge and understanding about customer requirements. Finally, the company has experienced both positive and negative performance outcomes in pursuing dynamic capabilities. Positive outcomes are generated indirectly through creating advantage to the client's operational processes, whereas negative consequences result from allowing managers to pursue initiatives without considering their sustainability. Mitigating this, negative consequences are promptly identified and discontinued.

The below figure offers an overview of dynamic capabilities practices at Com B in response to technological change, market competitiveness and changing customer requirements.

Figure 6.5: A framework of managerial roles in building dynamic capabilities at Com B

External environment
Technological change, customer preference change, competitive actions

Individual level

Managerial attributes

Cognitive ability
- Awareness and attention
- Problem solving skill
- Creativity

Human capital
- Experience and duration at present company
- Technical skill
- Education
- Business domain knowledge

Social capital
- Relationship with customer
- Relationship with internal stakeholder
- Online social network
- Relationship with companies from different industry
- International relationship

Managerial roles

Contextual managerial ambidexterity
- Strong focus to maintain and defend current operating performance
- Utilisation of slack resources across functional units
- Strong orientation to identify cost efficient solution

Organisational level dynamic capabilities

Sensing
- New business opportunity
- New customer requirement
- Identify technological change
- Idea of new product/service

Reconfiguring
- Carry out transformation in resources, capabilities or routines
- Integration and coordination of resources and capabilities
- Monitoring and evaluation

Seizing
- Determine agenda
- Identifying cost effective options
- Timely decision making

Organisational level factors

Organisational structure
- Nature of organisational structure
- Top management engagement
- Delegation of authority
- Incentive mechanism

Organisational culture
- Collaborative and supportive culture
- Innovation orientation

Findings: Com B

Consequences
- Advantage for the stakeholders
- Technical fitness
- Operational fitness
- Customers' readiness
- Access to new customer base
- Improve customer loyalty
- Increased revenue
- Reduced operational cost
- Growth

Next the findings of Com C will be discussed.

5.3.3 Com C: A methodological approach in building dynamic capabilities
Background of the company

Com C is one of the leading IT companies in Bangladesh with a strong reputation for quality and customer services. It is the first company in Bangladesh to achieve CMM5 accreditation (Daily Star 2016; Com C 2016). The company, established in 1998, has been successfully delivering ICT solutions, most notably port management solutions and banking solutions, and recently the company has successfully entered the micro-finance industry (BASIS, 2017 Com C 2016). Since its establishment, Com C has successfully served both corporate and public service organisations at home and abroad with cost effective and innovative solutions (Com C 2017).

The following two tables illustrate a brief overview of the company and the demography of the interviewees based on the secondary sources (Secondary source, 206):

Table 5.36: Overview of the company based on corporate websites and company reports (Com C 2016) and key research focus

Name	Year established	Business	Yearly revenue	No of employees	Current clients
Com C	1998	Technological solutions and IT services	3.9 Million	300	A number of Fortune 500 companies and offering mission-critical public services
Key research focus	Managerial roles behind company's successful performance considering changes in customer preferences, increased competition and technological changes.				

Demography of the interviewees					
Management level	Designation	Gender	Age (yrs.)	Interview duration (minutes)	Interview Location
Top Management	Director	Male	45	45	Conference room
Middle Management	Head of MicroFin	Male	37	60	Conference room
	Head of EPG	Female	38	65	Shared room
	Senior Project Manager	Male	32	50	Conference room
	Project Manager	Male	28	40	Customer service room
	Customer Service Manager		36	45	Customer Service room
Operational level	Developer/ Programmer	Male	29	35	Conference room
	Programmer	Male	29	35	Conference room
	Programmer	Male	27	35	Conference room
	Customer service employee	Male	26	40	Customer service room

Evidences of dynamic capabilities building at Com C

The ongoing successful performance of Com C has offered an important source for explicating managerial roles in successfully addressing changes in the external environment. Com C demonstrated a proven track record of integrating the latest state-of-the-art technologies to successfully develop new products and services and upgrade existing products and services. Moreover, Com C possesses a forward oriented approach and relentlessly builds capabilities in emerging technologies such as the Internet of Things (IoT), augmented reality (AR), virtual reality (VR) portfolio, artificial intelligence (AI), machine learning etc. (Com C 2017). The company has maintained a strong customer focus and has achieved sustainable growth through effectively and efficiently serving companies from a diverse range of industries (Com C 2017). Therefore, the company presents a strong rationale for investigating dynamic capabilities to reveal managerial roles in contributing to sustainable growth and positive organisational performance.

Table 5.37: Emerging evidences of building dynamic capabilities at Com C

External Factors	Technological changes		Competitive actions	Customer requirement	Regulatory
Scope of change	Nation-wide internet infrastructure	Emergence of mobile application	Related diversification to exploit competitors' weakness	Engagement of customers in learning IT process	Incentive for CMM accreditation
Nature of managerial response	Opportunity seeking behaviour, Entrepreneurial	Entrepreneurial	Entrepreneurial	Creative	Opportunity-seeking behaviour
Response and transformation	Introduced online micro-finance solution with real-time transaction capability	Initiated an experimental project to create a mobile app version of MicroFin	Resource allocation and commitment	Introducing examination after the training, recording and producing the result to the management	Settled with strategic agenda to accomplish CMM accreditation to increase efficiency and competitiveness
Advantage	New revenue stream, leadership position with state of art functionalities that appreciate latest technological development	New skill development for the team members, new service and product offerings for the customer, new value proposition	New revenue stream, exploitation of existing capabilities	Faster knowledge diffusion, stability on the customer service department, maintain morale of team	Defined processes with measurement that aids optimisation of performance
Disadvantage	None	None	None	None	Increased quality requirement

Necessary conditions	Identified strategic gap and risk-taking behaviour by top management, top management commitment	Clearly identified slack and visibility within the projects	Prior experience on finance and banking industry	Individual managerial commitment, creativity and willingness to take responsibility	Top management commitment, resource commitment without compromising current operations, long term orientation
Explicit strategic preference	Develop and offer micro finance industry an internet-enabled solution	New capability development	Related diversification	Stability and control	Operational fitness to achieve scale

Sensing capability is practised in both top down and bottom up procedures. Operational employees and middle managers carefully assess and record the identified scope to further share with the team members. If the idea is proved to be valuable, it is escalated and discussed by the cross-functional team members. Team members may engage with the top management at this stage to receive early feedback and incorporate top management's knowledge and expertise to assess the identified scope. This procedure matches with the recommendations of Teece and Linden (2017) to maintain a bottom up approach in accumulating external variation through incorporating the rich environmental observation of the operational employees.

Seizing is practised in a collective manner. The escalated idea goes through a 'quarrel' of the team members from functional teams whose expertise and experience are relevant to identify the possible processes for execution. The discussion aims at attaining objectivity through integrating unbiased measurement. If the idea successfully passes through the cross-functional team members debate then, in association with the top management, the alignment of the newly found scope with the existing product, service and capability portfolio is assessed, followed by a feasibility assessment and development of an execution roadmap to finally produce the proposal for carrying out the intended transformation.

Reconfiguring capability is evident at Com C as a process of managerial individual and collective actions with temporary resource commitment to carry out the necessary transformation within the resources and operational processes. Reconfiguration which is performed based on intervention, primarily, has five major managerial roles that are performed individually and collectively: preparation, piloting, execution and appraisal and monetisation. Managers strictly pursue a cost-effective approach through utilisation of slack resources to carry out the intervention. Novel problems are addressed in both a

creative and configurative manner through maintaining engagement with the senior management. Zott (2003) The company experienced positive consequences of dynamic capabilities practices through maintain careful evaluation and monitoring of ongoing projects.

Top management encourages managers to engage or initiate entrepreneurial initiatives. To manage the managerial entrepreneurship in a systematic manner, Com C has developed a process to evaluate, recognise and appreciate entrepreneurial initiative with negotiated incentives and profit-sharing contracts with the employees. A monthly meeting is regularly held to share innovative proposals and improvement recommendations from the operational employees for the feedback of top management which has resulted a regular positive impact of obtaining ambidextrous behaviour, as Volery, Mueller and Siemens (2013, p. 4) explain:

"*Behaviourally integrated top management teams can serve as a forum in which senior managers can exchange contradictory ideas, resolve conflicts and create a set of shared perceptions openly and freely, thereby facilitating the firm's development of ambidexterity.*"

Additionally, an annual event is held to institutionalise the recognition and appreciation process of entrepreneurial initiatives, and the innovative ideas of the employees, that have significant business potential. The company commits to investment in selected ideas (Com C 2016).

Table 5.38: Evidences of managerial entrepreneurship

Managerial entrepreneurial initiatives	Enterprise-level outcomes	Quotes
MicroFin solution	Increased revenue	*'This product allows us to obtain a growing source of revenue which was completely untapped previously.'* (Com C Int-2 2017)
MicroFin mobile app	Increased customer satisfaction, cost saving for customers, increased mobility to the customers	*'A lot of customers have appreciated the app as it allows them to maintain control while being away from the office and some clients are relying on the mobile app that reduce the setup cost dramatically.'* (Com C Int-3 2017)

Role of managers in building dynamic capabilities

This research brings rich insights about managerial roles regarding organisational-level dynamic capabilities building at Com C. Next, the role of managerial cognitive ability, human capital and social capital in building sensing, seizing and reconfiguring capabilities is discussed.

Role of managerial cognitive ability in building sensing capability

The attention and awareness of managers helps them to recognise emerging patterns or new technologies that have just surfaced in the industry through informal social conversation, browsing the internet and discussion with similar-minded people. Middle managers at Com C play the role of technology champions, as outlined by Wu (2010) through exemplifying the entrepreneurial roles of middle managers of Huawei in envisioning customer demand faster than the competitors within a rapidly changing telecommunication industry. AT Com C, a manager mentioned that he along with his team successfully developed a mobile app version of their online-based financial product in a proactive attempt to exploit the emerging popularity of mobile applications and the growing number of smart phone users in the country. The manager and his team members proactively attempted to identify an opportunity that aligned with their existing product portfolio to exploit the emerging mobile application industry. This is evidence of creative scope alignment of the opportunity arising due to technological changes.

Table 5.39: Role of managerial cognitive ability in building sensing capability:

Cognitive ability		Sensing	Selected quotes
Themes	Sub-themes	Frequency	
Attention and awareness	Searching, scanning, keeping attention	12	'*We always maintain keen attention to identify what new technology has emerged and how we can integrate that within our capability portfolio.*' (Com C Int-5 2017)

Role of managerial human capital in building sensing capability

Managerial human capital plays an important role at Com C to address changes in the external environment. Experience, educational background and training and professional qualifications are critical components of human capital that assist managers in performing dynamic capabilities at Com C. First of all, experience helps managers to possess deeper insight about the technical domain which is instrumental to identify the new opportunities arising due to technological change. Moreover, experience in a similar business domain helps managers to identify the scope of improvement within the existing products and services. As outlined by one manager who had experience in a multinational company, he successfully carried out restructuring of the MicroFin360 in a systematic manner through leveraging his prior experience in user-requirement analysis and design at Nokia in England.

Table 5.40: Role of human capital at building sensing capabilities

Human Capital		Sensing	Selected quotes
Themes	Sub-themes	Frequency	
Experience	Duration and experience at present role, experience at multinational, experience abroad	12	*'My work experience at Nokia helped me a lot to identify scope of improvement in MicroFin* (Com C Int-4 2017)

Role of managerial social capital in building sensing capabilities

Managers prefer to discuss it internally when they encounter an operational problem. Managers are not active in their LinkedIn profile in exchanging ideas or requests for resources to the experts within their domain. However, one top-level manager mentioned that he exploited the LinkedIn network to create new business and suggests that this professional network is effective in making appointments with busy and high-profile corporate leaders in an informal manner, bypassing formal processes.

Table 5.41: Role of managerial social capital at building sensing capabilities

Social capital		Sensing	Selected quotes
Themes	Sub-themes	Frequency	
External relationship	Relationship from local industry experts	5	*'We have good contact with the industry expert who often offer us valuable insight on the new scope with the industry in terms of technology, customer preferences or competitiveness.'* (Com C Int-2 2017)
	Relationship with international companies in same domain	6	*'We maintain close connections with the experts from similar domain that help us to remain up to- date with lot of new tools, technologies and new capabilities that have emerged in the industry.'* (Com C Int-8 2017)
Online social network	LinkedIn		*'I have a profile but not active in LinkedIn.'* (Com C Int-4 2017)
	Online forum	8	*'I try to solve the problem through my own accord. And if problem has occurred there I make enquiry running. Then I could tell that in case of being faced by the problem you are getting help mainly from these two-link forum, stackoverflow.'* (Com C Int-6 2017)

Role of managerial cognitive ability in building seizing capability

Ability to overcome bias assists managers to make objective decisions. Managers try to remain objective in participating in collective decision-making processes regarding an innovative or new initiative. Moreover, managerial attention and awareness on available cost-effective solutions assist the seizing process to consider a diverse range of options to contribute to identifying the effective and efficient roadmap.

Role of managerial human capital in building seizing capability

The managerial experience, educational background, training and their tenure at Com C helps them to make better decisions. Additionally, managers at Com C attempt to make informed decisions in an objective manner, rather than relying on individual perception or bias. If required, managers at Com C use expert industry panels to incorporate expert opinions. The managers try to remain objective in a rapidly changing external environment, and the decisions are also reviewed periodically (Com C 2016). Although experience within the ICT business industry plays an important role, the managers at Com C are given comprehensive trainings and offered assistance to carry out individual capability and skill development activities (Com C 2016). As the skill and capability of an individual employee is defined and measured, this is very useful in identifying capability gaps when pursuing a project or initiative. In addition, duration in the present role allows rich insights about changing customer requirements. Managers from top management also bring their rich experience in contributing to the quality of decisions made to pursue the dynamic capabilities. Interestingly, the managers believed that formal education adds less value due to a lack of alignment of ICT education and industry standards. The lack of acknowledgment of formal tertiary education system may due to fact that in Bangladesh, there is a significant gap between the University curriculum and the demand of the professional industry which is a significant impediment for the supply of high-quality professionals for the ICT industry (Ahmed et al. 2015).

Table 5.42: Role of managerial human capital at building seizing capability

Human Capital		Seizing	Selected quotes
Themes	Sub-themes	Frequency	
Education	Relevant educational qualification	5	*'My educational background and as a professional in Bangladesh IT industry; the case in Bangladesh, there has kept no alignment. What is running at the industry, it means how could they deliver a project, how could they manage it or how could they develop it. Higher educational authority is not fully alert in making the curriculum up-to-date.'* (Com C Int-1 2017)

Role of managerial social capital in building seizing capability

Com C's managers heavily rely on their internal social capital to develop an objective decision followed by a process. In terms of decisions related to operational procedure optimisation, managers are supported by the methodological procedures facilitated by statistical tools that significantly aid managerial decisions-making processes (Com C 2016).

Table 5.43: Role of managerial social capital at building seizing capability

Social capital		Seizing	Selected quotes
Themes	Sub-themes	Frequency	
Internal relationship	Internal employee relationship	8	*'Quarrelling might occur among 3 numbers. Some might choose it before it is the interest of one's to learn. Some might like to work with it. Then we all got sit together to compare it or made analysis through on line by using evaluation criteria. Through evaluation criteria we write some criteria at one side on the other side we write the weight age. By adding one with another we have placed the result of template those are the criteria a—b—c here it is found the significant differences. We have made set these differences, by setting we got the weight age, total performance. We evaluate it then the alternatives which had been from where core has been arriving based on discussion having proper participation of all if there the victory on the core in fact based on having coordinator.'* (Com C Int-3 2017)
External relationship	Local experts	10	*'If we face any problem that we do not have internal expertise we are always open and interested to learn from the industry experts. We just initiate a focus group discussion to obtain knowledge from the experts as well as to verify our decisions, we consider their opinion very seriously, their opinions always help us to maintain objectivity through overcoming bias and individual preferences over certain technology or capabilities.* (Com C Int-6 2017)

Role of managerial cognitive ability in building reconfiguring capability

Managers encounter various novel problems that cannot be resolved by the prior experience of their past roles. Superior problem-solving skill plays an instrumental role in developing cost-effective solutions for the novel and complex operational problem. Additionally, attention and awareness assist managers to maintain an openness towards alternative cost-effective approaches to tackle the problem. Managers are often required to deploying their problem-solving skill in a creative manner in the case of a newly-emerged problem that was not anticipated.

Role of managerial human capital in building reconfiguration capability

Better educational backgrounds assist the team members and managers to undertake a structured approach to scan the external business environment. However, it is revealed by the senior managers that the quality of education was not of a high enough standard in Bangladesh and internal training played a crucial role in updating their skills and capabilities to the professional level. Com C has a procedural approach to manage the skill of the individual employees. The skills of individual employees are measured across company-wide institutionalised standards, and these measurements assist to increase the skill level and close the capability gap between existing and desired standards. As one manager outlined:

'If he has possessed any skill gap … If there we have found gap, then we make arrangement for training. As example, here we found training has got necessary for a boy. This is controller/5.5, controller for this role was required 3 but he possessed rating 2, as a result he had been provided with a training' (Com C Int-5 2017).

Therefore, training plays a vital role in assisting the reconfiguring capability by building the necessary capabilities, as highlighted by one manager: '*These trainings are the base of my carrier. There are so many trainings*' (Com C Int-3 2017). The training is provided when expressed the interest by the manager: '*I express it, as per the training report, a test is taken, he has been given the training and provided for training within two weeks*' (Com C Int-5 2017). During the reconfiguration, human capital, especially their knowledge of their business and technical domain, is gained through experience.

Table 5.44: Role of managerial cognitive capability at building reconfiguration capability

Cognitive ability		Reconfiguring	Selected quotes
Themes	Sub-themes	Frequency	
Problem solving skill	Ability to develop solution to operational problem	12	*'My role is to identify the problem. There are so many that could not able to find out the root cost. In fact, the problem is not yet identified. For such case, we have got a method of calculating the probability to finish on a certain date. As a project manager, you are being observed through monitoring the probability it would be easy to realise.'* (Com C Int-6 2017)

Experience and training in the present roles assist managers to identify cost-effective solutions that can be executed in the most effective and efficient manner. Collected data suggests that knowledge of the software development life cycle, and project management, are of most importance in conducting an ICT business in a successful manner. This knowledge, in combination with the organisational systems and processes, helps managers to optimise the existing business processes during the time of reconfiguration. One manager summarises this as: '*we could express that aspect of human capital development is very strong*' (Com C Int-4 2017).

Table 5.45: Role of managerial human capital at building reconfiguring capability

Human capital		Org Recon	Selected quotes
Themes	Sub-themes	Frequency	
Experience	Duration and experience	11	*'Long duration and experience obtained from the present role assisted me to understand the customers' requirement, business domain and process very well that help me to identify which change will work and which will not. At the same time, being here*

Education	Relevant educational qualification	5	*'Education helps me to gain the breadth of the knowledge of the field, unfortunately our higher education does not offer up to date knowledge on the relevant field, that cost us a lot of time after the graduation, it takes almost 7 years after graduation in Bangladesh to create an effective leader who can undertake responsibilities to carry out a transformation within the business.'* (Com C Int-5 2017)
Technical Skill	Training	13	*'In fact, after getting 5/6 trainings from here I have got role as a project manager. The trainings are counted as my T.D.'* (Com C Int-1 2017) *'I express it, as per the follow in training report test is taken he has been given the training and provided for training within two weeks.'* (Com C Int-1 2017)

Role of managerial social capital in building reconfiguring capability

Online social networks may allow managers to obtain valuable insights to solve a problem, however, managers need to apply their own judgement to select the best possible options among those offered by the members of an online forum. Managers heavily rely on their internal social capability to carry out the reconfiguration processes.

Table 5.46: Role of managerial social capital at building reconfiguring capability:

Social capital		Recon	*Selected quotes*
Themes	Sub-themes	Frequency	
Online social network	Online Forum	6	*'I did not want any resource from them but the discussion that had been discussed with me and from that discussion so many matter would get to be known though I did not want those to know directly. I have achieved links in this way.'* (Com C Int-5 2017) *'Suppose I have got to face a problem. Think I have got victim with falling in a deadlock. For the matter, I media post to forum and told, forum means through LinkedIn, yes, I expressed that I have faced this problem and need suggestion to get rid of the problem. So many suggestions have arrived from various person and from those I have taken the best one.'* (Com C Int-4 2017) *'It means you try to solve the problem through our own accord. And if problem has occurred there you make enquiry running. Then I could tell that in case of being face problem you are getting help mainly from these two-link forum, stakoverflow.'* (Com C Int-6 2017)

Contextual managerial ambidexterity and its role in building dynamic capabilities

A manager at Com C demonstrated an operational optimisation process that assists in achieving a cost-effective project on monitoring and control by the different layers of management. The engagement of top management in solving problems proved to be more effective if the problem is produced at early stage, with a proposal for potential solutions.

Moreover, ambidexterity is achieved through utilisation of slack effectively and efficiently, utilising resources through a multitasking environment and through convincing the team members to undertake innovative projects with emerging technologies through exploiting free time. Moreover, an organisational robust knowledge management system, and an internal information system and measurement system, play critical roles in supporting initiatives related to external changes.

Table 5.47: Findings on contextual managerial ambidexterity

Contextual managerial ambidexterity			
Themes Exploitation	Frequency	Outcomes	Selected quotes
Utilisation of slack resources	4	Cost-effective development	*'We use our free resources during any new initiative, we did it when we entered into CMM program as well as whenever we carry out some innovative we do not withdraw from operational resources, rather utilise the free time.'* (Com C Int 6 2017)
Obtaining new venture and optimising scope of change	2	Stability and control	*'We do not have major change frequently, but we do lot of testing. If we find any error, we fix that quickly. It has been four years since we have a major change.'* (Com C Int-4 2017)
Dynamic project portfolio management	8	Managing multiple projects with profitability and optimisation	*'In achieving adjustment with technical changes, basically adjustment process is done as we need all the time the project belongs to us which would go should possess with new technology, just new is not enough there should be kept some feasibilities, primary advantages, the best we would to take. For that what we have done is DAR. Please look the sheet DAR Decision Analysis contribution. We have planned analysis; we compare current technology for completing our project. With which we would work, at first, we have taken co dignity. The alternatives that we have chosen.* (Com C Int-1 2017) *'These are the advantages of large companies. All are kept with a process. You would not get confused or loaded at any rate. This is one of our techniques. That is used as pre-requirement to achieve level 5 of CMM. Passing a stage project has become slow /17.20. After 60% design after having renewed 20% design to complete my project target had been 400 and 50%. I would complete it within 15 days but at that period for 3rd 20 level PDM we used performance model from that we found how is the 3rd quality/27.51 to meet the project?'* (Com C Int-3 2017)

Organisational-level factors affecting dynamic capabilities building

Role of organisational structure in building dynamic capabilities

Com C has adopted a supportive organisational structure in accordance with its business processes. The company operates with a product division organisational structure that supports the ongoing development and support needed for a product (Com C 2016). The engagement of the top management with the middle management also proved to be highly effective in navigating the company during various reconfiguration initiatives triggered by

external environment. The company maintains a very flat structure that that foster episodic communication as stated by one manager:

Table 5.48: Organisational structure and dynamic capabilities building

Organisational structure			
Theme	Outcomes	Frequency	Selected quotes
Nature of organisational structure	Flexibility, engagement with the top management	5	*'We have a very flat structure, and our top management is very proactive to engage with us, willing to discuss when we experience any challenging problems and whenever we need resources to act effectively.'* (Com C Int-5 2017)
Incentive mechanism	Appreciation and retention of employees	3	*'We are always very active in encouraging our employees to innovate and act in an entrepreneurial manner. To keep the momentum running we always try to offer very attractive incentives to appreciate the innovative outcomes. We run the annual innovation Olympiad kind of event that foster a strong culture of innovation orientation within the company as well as creates an avenue for identifying the right person for incentivise. Additionally, we offer various incentives such as transport, overseas visit etc.'* (Com C Int-8 2017)
Top-management engagement	Decision making flexibility, quality of decision	7	*'Our senior management always prefer early engagement, this engagement is proactively managed through system-driven processes using monitoring and control mechanism that allows visibilities across the operational processes, on the other hand, the nature of our organisational structure and approach of top management towards the operational teams and middle managers also foster this engagement across different management level within the company.'* (Com C Int-3 2017)
Delegation of authority	Innovation, faster decision	9	*'We can make our decisions as long as it does not hurt the operating profitability, we can also inform the top management and discuss with them, the turnaround time here is very fast and we do not have to wait for a long to discuss with the top management about our decisions taken. Most of the time, at the middle management level we try to make decisions collectively so that we attain some degree of objectivity and at the same time we take feedback on our decisions immediately so that top management is aware of our decisions and take part in any consequences.'* (Com C Int-6 2017)

Role of organisational culture in building dynamic capabilities

The company has a culture that supports the poor performer and appreciates failure. A periodic event that recognises the entrepreneurial ideas fosters a company-wide innovative culture. Moreover, the company has a strong internal collaborative culture to foster knowledge sharing, learning and innovation across employees, with less evident practices of collaboration with other ICT companies in the industry. The company has a strong culture to share problems within the organisation that produces a quick resolution and identification of potential solutions internally. This practice also dictates the nature of interactions with the external stakeholders, such as competitors and complementary service providers, as managers keep their conversations limited to informal discussions. Informal discussion with peers and colleagues helps the managers to identify recent trends

and new technologies arising in the industry, as emergence of mongo dB has been identified by the managers of Com C through informal discussion.

Table 5.49: Culture of dynamic capabilities building

Culture		
Theme	Frequency	Selected quotes
Supportive culture	8	*'Yes, now it is held on monthly basis previously it had been weekly. In-fact weekly did not bring much result. We discuss on idea, new technology whatever one has possessed or kept., we have made discussion on idea/brief idea.'* (Com C Int-1 2017)
Appreciating innovation culture	12	*'We have told like tyranny do the work with this. I am habituated with this. Look this process is it episodic. The frequency is like this, suppose selection of technology is a project has been taken for once only. It means while the project is appearing then it happens. Now suppose there has been a project after six months then by getting defeat the coordinator would become separate model.'* (Com C Int-1 2017)

Consequences of dynamic capabilities

The company exhibits a positive relationship between dynamic capabilities and the firm performance. One of the key reasons behind this positive relationship is that top management and middle management place a strong emphasis on financial performance and regularly assess linkages between the intended capabilities or the reconfiguration initiative and the financial performance of the company. As Smith and Tushman (2005) argue, sustained organisational performance results from the organisational ability to develop innovative products, and the same time sustain existing products, in other words maintaining exploration and exploitation in a simultaneous manner. At Com C, middle managers always maintain an ambidextrous approach during the time of the capability reconfiguration processes with keen attention given to achieving low cost solutions and utilising slack resources. Moreover, if the probability of financial contribution of any initiative becomes weak or remote, the initiative is immediately discontinued.

Table 5.50: Consequences of dynamic capabilities

Consequences of dynamic capabilities			
Sub-themes themes	Fitness	Readiness	Advantage
Selected quote	*'CMM3 helped us to have our all processes defined and measured. To achieve CMM3 took a lot of effort but immediately we achieve CMM3, we obtain an operationally fit processes and internal system that positively help us to gain excellence operationally.'* (Com C Int-3 2017)	*'CMM5 offered an internal infrastructure with heavily defined processes, resources and activities, this allows us to identify the scope of improvement and growth.'* (Com C Int-7 2017)	*'We started getting advantage of the CMM journey since CMM3 as we have every component of our internal infrastructure and when we achieved CMM5 we now can optimise our processes and ongoing projects that has increased our profitability as well as managing internal processes more effectively and efficiently.'* (Com C Int-8 2017)
Sub-themes	Return on fitness	Return on readiness	Return on advantage

Selected Quote	'The internal fitness helped us to grow faster than ever in a well-managed manner, now we can manage the variation and violation in a predictive and proactive manner.' (Com C In-3 2017)	'We now can take more projects, we can utilise our slacks more efficiently, we now become more profitable in managing our projects and also our teams now can perform better than the historical performance, we are now can perform a task and solve problems better than the past, this creates a positive influence to our performance, we are now more confident and the credibility has increased in the market.' (Com C Int-4 2017)	'Increased profit, scope of market, more effective multitasking behaviour, scalability can be considered some of the critical return on our assessment of CMM accreditation.' (Com C Int-6 2017)
Outcome	**Positive**		

At Com C this research does not reveal any negative consequences of dynamic capabilities. This is due to the strict monitoring of new initiatives as well as episodic evaluation of financial viability of the ongoing innovative projects. Additionally, superior operational procedure and excellent managerial control mechanisms to measure the ongoing operational performance also enabled the managers at Com C to assess the viability of their entrepreneurial projects or initiatives with more insights Moreover, when managers intervene in operational processes to address an external stimulus, improved procedures can help them achieve operational stability and obtain financial benefit more quickly. Therefore, this case offers an important perspective on the relationship between operational excellence and dynamic capabilities that contends the suggestions made by scholars that dynamic capabilities are more important than operational capabilities to sustain the organisation during changes in the external environment. This research asserts that possessing superior operational capabilities can act as a catalyst to achieve success in achieving the goal of transformation initiative applying dynamic capabilities.

Summary

There are strong evidences of systematic approaches to dynamic capabilities management at Com C. Managers are appreciated and rewarded for their entrepreneurial initiatives and top management has a clear intent to develop and retain the existing talent, as well as being open to recruiting talented and experienced employees. The middle management has a strong ambidextrous approach so that financial performance is not compromised during the reconfiguration processes. The organisation has a supportive structure and collaborative culture to foster learning and innovation. Finally, dynamic capabilities have resulted in positive performance outcomes and significant advantage to the company.

Com C demonstrated dynamic capabilities in both an adaptive and entrepreneurial manner. The company has upgraded its back-end technology and at the same time attempted to

create new products, services and markets with significant success. Dynamic capabilities practices have been evident as bidirectional top-down and bottom-up communication is evident. The company follows a customer lead approach (Lavie, Stettner & Tushman 2010) in addressing the changes in the external environment through exploiting the scope of leading technological development within the functional domain of the product. Seizing is performed in a collectively manner with a staged approach considering alignment with existing resources and capabilities and product portfolio, cost effectiveness, capability gap, scope of organisational advantage, and certainty of financial outcomes. The managerial attempts to carry out transformation strictly follows an ambidextrous approach with a keen focus on minimising cost, utilising slack resources and non-compromising the existing revenue stream. The positive outcomes of dynamic capabilities are ensured through carefully monitoring the linkage between financial performance and transformation initiatives with an episodic bi-annual evaluation process of exiting portfolios to determine continuity or discontinuation.

The company has successfully constructed a supportive culture that fosters knowledge sharing, appreciation of failure, encouraging entrepreneurial initiatives and innovation. The organisational structure also plays a facilitating role in allowing the scope of institutionalisation or deinstitutionalisation as necessary during or after the transformation. However, the lack of scope for middle managers to progress in the long term within the organisational structure is a key concern expressed by the managers and exposes a contradictory position taken by the middle managers and the top managers. Middle managers identify top management as the responsible authority to deliver initiatives with sufficient resources to be effective, whereas top management outlined their initiatives to retain their key talents in the middle management positions. Finally, middle management has identified top management as risk averse, and less committed towards diversification and rapid growth, which is necessary in the ICT industry. The below figure offers an overview of dynamic capabilities practices at Com C in response to technological change, market competitiveness and changing customer requirements.

Figure 6.6: A framework of managerial roles in building dynamic capabilities at Com C

External environment
Technological change, customer preference change, competitive actions

Individual level

Managerial attributes

Cognitive ability
- Problem solving skill
- Awareness and attention
- Creativity

Social capital
- Relationship with customer
- Relationship with internal stakeholders

Human capital
- Experience and duration at present company
- Technical skill &Education
- Business domain knowledge

- Online social network
- International relationship

Managerial roles

Contextual managerial ambidexterity
- Strong orientation to identify cost efficient solution
- Strong focus to maintain and defend current operating performance
- Utilisation of slack resources across functional units
- Perform alignment and adaptation

Organisational level dynamic capabilities

Sensing
- New business opportunity
- Idea of new product/service
- New customer requirement
- Identify technological change
- Competitors' action

Reconfiguring
- Carry out transformation in resources, capabilities or routines
- Integration and coordination of resources and capabilities
- Monitoring, evaluation
- Appraisal and monetisation

Seizing
- Determine agenda
- Timely decision making
- Identifying cost effective options

Organisational level factors

Organisational structure
- Nature of organisational structure
- Top management engagement
- Delegation of authority
- Incentive mechanism

Organisational culture
- Collaborative and supportive culture
- Innovation orientation
- Appreciation to failure

Findings: Com C

Consequences
- Technical fitness
- Operational fitness
- Increased flexibility
- Customers' readiness
- New service introduction
- Advantage for the stakeholders
- Alignment with existing resources and capabilities, business domain
- Increased revenue
- Reduced operational cost
- Growth

Next, the findings from Com D will be presented.

5.3.4 Com D: can dynamic capabilities improve operational performance when inferior practices prevail?

Background of the company

Com D started its operation in 1999 as a sister concern of Bank Y (Com D 2017). The company has been operating in the marketplace and has a very good reputation (Secondary sources 2016). The company has undergone several strategic changes over the years of operation (Com D Int-3; 4; 5; 7; 8 2016). The company has a strong capability to deliver complex projects and has an excellent track record of developing products. Long-term negative financial performance has significantly challenged the organisation as a going concern in recent times and this addressing this has received high priority within the strategic agenda of the top management and the shareholders. However, the causes of the poor performance have remained unexplained and the company has failed to deliver profitability despite its very good reputation in the industry (Com D Int3; 4; 6; 7 2016). This research aims to reveal the underlying causes of ongoing poor performance in the context of dynamic capabilities, with a focus on the managerial roles in lifting organisational performance.

Table 5.50: Overview of the company based on corporate websites and company reports (Com D 2016) and key research focus

Company name	Year established	Business	Yearly revenue	No of employees	Current clients
Com D	1998	ICT projects, outsourcing, products, staff augmentation	Not reveled	45	Government and overseas
Key research focus	Managerial roles in building dynamic capabilities considering changes in customer preferences, increased competition and technological changes and investigating the negative performance from the light of the dynamic capability view.				
Demography of the interviewees					
Com D	Designation	Gender	Age (yrs.)	Interview duration (minutes)	Interview Location
Top Management	Head of Finance	Male	45	75	Conference room
Middle management	Software Architect	Male	38	60	Conference room
	Senior Project Manager	Male	35	60	Conference room
	Senior Project Manager	Male	35	60	Conference room
	Senior Programmer	Male	32	60	Conference room
	Marketing Manager	Male	36	60	Conference room
	Senior Database Manager (Ex-Employee)	Male	37	60	Ex-employee's office

Operational Level	Programmer	Male	27	30	Conference room
	Programmer	Male	28	25	Conference room
	Project Team member	Male	27	30	Conference room
Client	Deputy manager of a client company	Male	47	60	Client's office

Evidences of dynamic capabilities building at Com D

Com D has experienced sustained poor performance in terms of profitability, despite its high reputation regarding the quality of its services and products. This company is selected to verify the findings of the previous cases and to conduct in-depth investigation of the managerial roles, dynamic capabilities and negative performance outcomes. The company has demonstrated dynamic capabilities through successful transformation of resources and capabilities on many occasions. However, the company has yet to monetise the outcomes of dynamic capabilities to deliver shareholders the intended financial return. This case aims at investigating this phenomenon considering the research questions on understanding the managerial roles in building dynamic capabilities.

Table 5.51: Evidences of dynamic capabilities at Com D

	External dynamic factors			
	Technological Factors	Competitiveness	Customer requirement	Regulatory changes
	Emerging technology	Low cost local competitors	Frequent scope change	Incentive
Scope of change	New database tool	Pressure on competitiveness	Impact on operating profit	Announcement of incentive for CMM accreditation
Nature of managerial response	Adaptive and opportunity seeking behaviour	Non-innovative	Non-innovative	Opportunity seeking behaviour, entrepreneurial
Dynamic Response and actions	Identified the emergence, advise team members to learn	Reconfiguring target market segment	Delayed engagement with the top management, increased pressure on team members, accept project delay	Resource commitment, mobilisation and persuasion
Advantage	Increase efficiency in future projects	Better operational control	Project completion	Reputational
Disadvantage	Increased workload for team members outside regular working time	Reduced potential market	Financial loss, failure to meet time and budget, poor financial performance	Increased documentation required, increased cost, adversely affect current operational performance, discontinuity to CMM5 hurts employee morale

Necessary conditions	Learning capabilities and learning strategy, exemplar	Established reputation and credibility	Team members' acceptance of extra pressure, top management's acceptance of financial loss, customers' approval	Required resources, top management commitment
Explicit strategic preference	Future capability development for cost reduction	To identify and acquire premium market	To retain customer and reputation	Increased credibility and reputation, increased operational performance

Organisational-level sensing capability is informally evident at Com D with no institutional approach or processes to integrate individual employees' assessment of the external environment. Rather, sensing happens based on a top-down approach as senior managers pursue building capabilities in emerging technologies based on anticipation of future projects on that technology or are intent on reducing cost through deploying efficient new technological approaches. There is no routine collaborative or collective discussion among teams to share new ideas or scope. Rather, sensing processes are driven from the top management to pursue the development of capabilities into any new capabilities or ideas, then to assign middle managers to carry out the strategic agenda. Evidence does not clearly confirm neither a customer-led nor a customer-lead approach (Lavie, Stettner & Tushman 2010) in addressing changes in the customers' preferences in the business environment, as all initiatives exemplified that the informants demonstrated top management's discretionary intent to pursue the specific change initiatives. In this case customers are perceived as value destroyers as opposed to the co-creators of value (Michel, Vargo & Lusch 2008) due to frequent scope changes, and competitors are perceived as unfair with unacceptable competitive offerings while technological changes are perceived as individual challenges to learn and apply effectively in upcoming future projects.

Seizing capability is primarily led by the top management as the top management assigns middle managers to carry out the feasibility assessment of their strategic agenda. Normally, the feasibility assessment is positively conducted, and top management encourage team members to enrol in the team for the project that will translate the strategic agenda. Finally, a project team is normally finalised and the project activated at the last stage of 'seizing' to pursue reconfiguration by the execution of the initiated project.

Reconfiguring capability is evident at Com D as a process of managerial individual and collective roles with temporary resource commitment to carry out necessary changes within resources and operational processes. Reconfiguration primarily has four major

managerial roles which are preparation, execution and appraisal, and monetisation. There is a serious absence of a cost optimisation approach in the company, and they carry out transformation that result in excessive cost at the post-transformation stage. Managers pursue an individualistic approach to addressing problems arising during transformation, conduct only a narrow search, and attempt a costly pathway of approaching a problem that may result abandonment of the initiative. Finally, the managers of the company create ambiguity in communicating the consequences of dynamic capability with the top management. The company has experienced negative consequences due to practice of dynamic capabilities.

Role of managers in building dynamic capabilities

Successful entrepreneurial initiatives by the middle managers are limited as top management does not proactively encourage managers to engage or initiate entrepreneurial initiatives. Middle managers suggest that top management often listen and appreciate their ideas, however those ideas are never translated into action. As one manager suggests:

> '*The space for managerial entrepreneurship is very low here. They encourage you to be entrepreneur but do not provide the resources. Resource leverage is not happening.*' (Com D Int-4 2017)

Lack of support from the top management regarding the entrepreneurial ideas of the middle managers results in individual initiatives to commercialise the identified opportunities, as one manager who failed to receive adequate support from the top management states:

> '*Customer strike is the major market holder. Without any professional marketing, I developed it. I worked with green IT. Along with that I am going to work with health sector and doctor management and prescription system to make it handy for individual doctors. I will make the doctors understand the pain points here; like – the prescription provide to the patient is hard to understand for the handwriting and they may give the wrong medicine from the pharmacy. But this concept will save cost and doctors will get the record of the patient individually and can guide individually along with the calculation of income and appointment. They are getting all in one package. It has been developed. I have a small team of three members. Although my company is small but I always make profit.*' (Com D Int-5 2017)

There little evidence of middle managers' opportunistic behaviour assisting the company to access new markets or to capitalise on ideas for new products. Overall, managerial

entrepreneurship, especially at the middle management level, is less prevalent in this company based on the evidences collected.

Table 5.52: Evidence of managerial entrepreneurship at Com D

Initiatives	Outcomes	Selected quotes
New product ideation, project initiation and client acquisition	Revenue generation, new product development, new market development	*'For example, I initiate a hospital management software and start journey for automating Dhaka CMH, Right that project later converted into a product. Nope, not only that but also I was initiator of the product that means after identifying the pain point I convinced the client that they must need it.'* (Com D Int-5 2017)
		'Kurmitola Golf Club (KGC) is our client, so we create the need for club management system project for the client, then we initiate the project then convert the project into a product. All the steps my role was vital to progress the project. And we brought out some categorised product from here. Club management though it was implemented in golf club domain but we can customise and tune it to any club.' (Com D Int-3 2017)

Next, the role of managerial cognitive ability, human capital and social capital in building sensing, seizing and reconfiguring capabilities is discussed.

Role of managerial cognitive ability in building sensing capability

Managers of Com D possess strong attention to, and awareness of, the latest development of technologies. For example, senior managers, and team members, became aware of the new technology 'Mongo db' at the same time as the managers interviewed for the other case studies of this research. When a new technology is noticed by the senior managers, they perform an assessment individually to realise the scope of the new technology for the company. As the company undertakes IT projects with uncertain technical requirements, senior managers often maintain an open approach towards learning new technology.

Table 5.53: Role of managerial cognitive ability in building sensing capability

Cognitive ability		Sensing	Selected quotes
Themes	Sub-themes	Frequency	
Attention and awareness	Scanning new technological development, scope of new product development, market competitive-ness	8	*'Recently I came to know about Mongo DB, I will check whether it has some potential for the future projects.'* (Com D Int-3 2017) *'Domain selection. We need to select domain first, suppose, we consider the domain as an automating restaurant around the Dhaka city and it's a target. It is hospitality domain which is classified from the service. Hospitality, telecommunication & health sectors are under the domain's classification. We select such domain in broad aspect. I feel comfortable to do my work where the natural potentiality is, gap or fewer competitors so that I can make my space smoothly.'* (Com D Int-6 2017) *'In a competitive market, we should go to market with the below stage price so that we can achieve the target.'* (Com D Int-3 2017)

Role of managerial human capital in building sensing capability

Long experience assists managers to develop rich insights on the business processes and, at the same time, it helps managers to identify the scope from the external environment.

Table 5.54: Role of human capital at building sensing capabilities

Human capital		Sensing	Selected quotes
Themes	Sub-themes	Frequency	
Experience	Duration and experience in present role	12	*'While had been at Bank developed meeting/reporting. I have given idea on database/BBA/ reporting tool expert. I had tried business gathering with these banks.'* (Com D Int-1 2017) *'The ways we research the market and there is another issue with domain that before selection of the domain we research the market.'* (Com D Int-2 2017)

Managerial social capital in building sensing capabilities

Collected data suggests that managers are less engaged with their past colleagues regarding changes in the external environment. All managers maintained a social network profile, however, exploiting online relationship capital to bring advantage to the company is not strongly evident: *'At present I have made the post less. Not get active with LinkedIn* (Com D Int-2; 3; 4; 5; 7 2017). Nevertheless, managers tend to maintain engagement within their existing social network: *'Usually I [do] not move out of my circle'.* Engagement with the competitors' employees and external stakeholders is not evident. The managers mentioned that they thought the fact that the top management of the company resided in US was a great advantage for acquiring new clients from abroad through utilising this relationship. Over all, the intent to exploit social relationships for the company is less evident in this company.

Table 5.55: Role of managerial social capital at building sensing capabilities

Social capital		Sensing	Selected quotes
Themes	Sub-themes	Frequency	
Online social network	Facebook network	8	*'I am a member of different similar-minded groups where I can obtain information regarding new technologies and tools.'* (Com D Int-3 2017)
	LinkedIn	5	*'I have a profile on LinkedIn, sometimes I check it, I have lot of professional, but I never use for my job rather keep it to explore any professional opportunities that may arise from the network.'* (Com D Int-2 2017)
	Online forum	0	*NA*

Role of managerial cognitive ability in building seizing capability

Managers maintain less attention and awareness to cost effective and alternative solutions when attempting to develop a solution for a new problem. The initiative to maintain objectivity is less prevalent, and decisions often suffer with group thinking or individual preferences.

Role of managerial human capital in building seizing capability

Managers often lack necessary exposure to a comprehensive technical domain to identify or consider a wide range of alternatives for developing a solution for a problem. This is evident since all employees have come from companies which are smaller than the focal company, therefore their present experience primarily contributes to the decision-making capability of the managers, who may suffer from insufficient exposure to enable them to produce cost-effective and efficient solutions or approaches.

Table 5.56: Role of managerial human capital in building seizing capability

Human capital		Seizing	Selected quotes
Themes	Sub-themes	Frequency	
Education	Relevant educational qualification	4	*'Education helps me to make decisions in a more informed manner, being a graduate of computer science, I was exposed to wide range of concepts, tools and technologies and at the same time I had to learn and perform new technologies each semester, that assists me even now to evaluate and assess whenever I need to decide on a new technology for consideration.'* (Com D Int-5 2017)

Role of managerial social capital at building seizing capability

Managers do not engage with their past colleagues or outside personnel very often. There is more interest in participating in online forums to gain insights on a problem.

Table 5.57: Role of managerial social capital at building seizing capability

Social capital		Seizing	Selected quotes
Themes	Sub-themes	Frequency	
Relationship with the customer	Relationship with the customer at present job	8	*'My relationship with the customers helped me to identify scope of products for them that effectively serve their needs and requirement, I can do that because I know them for a while closely and actively I try to maintain my relationships with the customers.'* (Com D Int-6 2017)
	Length of relationship with the customers	9	*'Long relationship with the customers helped me to understand their changing business requirement and business processes.'* (Com D Int-7 2017)
Online social network	Facebook network	3	*'I use Facebook more over other network, I receive feedback sometimes.'* (Com D Int-3 2017)

Role of managerial cognitive ability at building reconfiguring capability

The senior managers adopt an individualistic approach to addressing problems arising from day-to-day operations and follow a collective approach to addressing problems arising during the transformation processes. Although one senior manager explains that he attempts to solve the all problems by himself, as this is his preferred approach. The

interviews revealed that a structured approach is not adopted to approaching problems within the operational domain, or at the tactical level. This practice delays the communication of the problem outside the team boundary and increases the likelihood of potential detrimental effect on the project performance.

Senior managers effectively identify a scope of potential problems during the transformation that may affect the original agenda of the transformation, however, group decisions lack an effort to comprehensively search for alternative cost-effective solutions for the identified problems. This often leads to poor-quality decisions in terms of cost and time required to develop the solution. For example, it is repeatedly mentioned by many senior managers, who were part of the CMM3 team, that due to complying with the requirements of CMM accreditation, the company needed to prepare the necessary documentation, as required by CMM, for every project. It was envisioned by the senior managers that the extra documentation requirement would make their bidding further unattractive in the local and international market. Senior managers of Com D were quick to agree on an internal project to develop a tool to automate the documentation required for CMM3. However, this approach eventually proved to be ineffective and inefficient as the expected time and resources required for the project were much higher than initially anticipated. Moreover, turnover of a key person among the initiators completely stopped the project approximately six months after initiation. This incident indicates a rigid approach in decisions making during transformation that does not allow competing ideas or solutions to maintain agility or flexibility. This behaviour may indicate symptoms of group thinking (Moorhead, Ference & Neck 1991) that prohibits individual employees from sharing any ideas that contradict the collective agreement.

Table 5.58: Role of managerial cognitive capability at building reconfiguration capability

Cognitive ability		Recon	Selected quotes
Themes	Sub-themes	Frequency	
Problem solving skill	Ability to develop solution to operational problem	12	*'I try to solve problem by myself, in my own way, I prefer to follow my own rule and procedure to solve problems.'* (Com D Int-5 2017)
	Ability to develop solution to problems due to external environmental factors	12	*'We try to discuss and come up with solutions to new operational problems.'* (Com D Int-4, 2017) *'Overview means the structure that organisation maintains, that is mainly, that is very different keeps in so deep of the gross level, some are found have not yet got entrance in the banking system, many of them could take the banking system but not have got able to find out combination of banking with IT. They could not able to match where are the*

			problems whether it is with the value of work, on back ground, with output or with back ground information.' (Com D Int-1 2017)
			'When Bangladesh Bank made obstacle, I had not received any support, I had made report engaging me and have made the work with an advanced state. There is no similarity with technical review to management review. So, there is found creation of a gap.' (Com D Int-1 2017)
			'Once the main spokesperson of the petty project to automate documentation left the job, the project was literally abandoned and then we never talk about it, as if it never happened.' (Com D Int-3 2017)

Role of managerial human capital at building reconfiguring capability

At Com D middle managers primarily rely on their experience in the present job to carry out the intended transformation as intended by the top management. The company provides training which plays a valuable role, and project management skills and software development skills also play a critical role.

Table 5.59: Role of managerial human capital at building reconfiguring capability

Human Capital		Recon	Selected quotes
Themes	Sub-themes	Frequency	
Experience	Duration and experience in present role	12	*'I have been around for more than five years now, I know the capabilities and resources of this company very intimately that significantly help me during any intervention initiatives. I can make an impact as I know what will work for this company and what no one will object including top management, I now better understand the top management and their approach.'* (Com D Int-2 2017)
Education	Relevant educational qualification	9	*"Yes, education helped me to follow a structured process with a systematic approach to plan and follow, however I must say that the quality of computer science education in our country needs a radical overhaul to produce quality graduates who can undertake big responsibilities immediately after graduation."* (Com D Int-1 2017)
Technical Skill	Training	9	*'During any change initiatives or enterprise-wide reorientation, we can undertake training, management is always positive to allow us to avail opportunity to receive training that are considered as necessary, we express our interest and management organise the trainers from the industry who are generally experts in the relevant area.'* (Com D Int-7 2017)

Role of managerial social capital at building reconfiguring capability

Managers rely on their internal social capital during the transformation initiatives. The evidences of exploiting external social capital are not evident. This practice often limits the scope of managerial ideas, and search for solutions, during transformation if a problem is encountered. Initiatives to interact with employees from competitors, or outside companies is not evident. Some employees mention that they maintain and seek help from their former colleagues if they encounter with a problem that belongs to the same technology area where

they worked together. All the respondents maintain an active profile on most of the popular online social media platforms, however, there is no initiative to exploit this network if a situation arises.

Table 5.60: Role of managerial social capital at building reconfiguring capability

Reconfiguration		Selected quotes
Themes	Frequency	
Relationship with the employees	6	*'I have been working at Com D for 4, 5 years, it helped to develop a good relationship with the employees here as well as with the top management that is very valuable during the time of any change initiatives.'* (Com D Int-3 2017)
Relationship with the customer	0	N/A
Online social network	3	*I do LinkedIn but not so much. Not active with LinkedIn. In Facebook, all my posts are related to either religion or politics. At present, I make less post. From the point of resource, it is Facebook and from corporate point of view it is LinkedIn. Facebook is more effective. Usually I have not move out of my circle.'* (Com D Int-1 2017)

Contextual managerial ambidexterity and its role in building dynamic capabilities

The managers at Com D fell short in attaining ambidextrous behaviours in balancing exploration and exploitation simultaneously while performing reconfiguration initiatives, the interviews revealed. The lack of ability to convert the reconfiguration effort into successful exploitation of renewed routines, resources and capabilities, affected negatively the bottom line performance of the company and the effort to recover the financial performance of the company. The poor performance in completing projects on time and within budget is the major operational challenge behind the company's sustained poor financial performance. All the managers agreed that the company cannot deliver their projects on time and within budget as agreed in their contracts. When conducting the case study of this company, a deliberate attempt was made to explicate the root causes of this operational problem, against the causes outlined by the managers.

'*Why did all the projects fail to meet deadline and budget?*' When asked this question, the most common response was blamed0 the repeated scope creep by customers. Senior managers believe that customers frequently change their mind, and this influences the top management to accept unreasonable change within the scope of the project, which significantly affects performance. In answering the question: '*Why you fail to manage the customers' scope creep?*' The typical answer was that, because of the absence of C level executives at the company, senior managers often fail to negotiate with the top management of the client side who may be able to exercise more influence over the clients. In most situations, the senior managers accept the scope change despite the financial loss in order to maintain a healthy relationship with the customers, and to maintain the reputation of the company in the marketplace. When asked why customers regularly change their scope?

most senior managers pointed out that customers or clients in Bangladesh lack the necessary knowledge of IT services and features. This means that they slowly realise new requirements once the project is already started. The senior managers insisted on a lack of customers' knowledge as a key reason that persistently has been impairing their ability to deliver projects on time as well as on budget. To solve this problem, one manager suggested government-level initiatives to disseminate IT knowledge among business people.

A further reason for poor performance, revealed in the interviews, is that local competitors engage in unfair competition to win projects. The clients, who lack of IT knowledge, often accept the low-cost bidding by 'poor quality' software companies and this makes the market non-profitable. On the other hand, senior managers of Com D have a mindset that, as the company is highly reputable and well established with a long track record, it costs them more to deliver a project ensuring the standard quality measures. It was clear from the interviews that senior managers were fully convinced of the operational excellence of the company and believed the poor performance of the project portfolio management is caused by external factors, coupled with the absence of their C level executives.

Informants were then asked at what time during project did the senior managers or project managers engage the top management to initiate any attempt to recover performance. It was stated that the senior managers tried their best to regain control of the project until the end, and when they realised it is not possible to finish the project on time and within budget they inform the top management to liaison with the clients for extension of time. The project managers considered they should work hard, along with the team members, to maintain a reasonable timeline for the project. There is a clear focus on human and technical aspects in managing projects, as outlined by one project manager: *'I have focus on manpower and new technology. If I could bring it to the new technology by training up, then resource will be saved up to 30-40%.'* (Informant 2 Com D). No evidence was found to indicate that the company defined the measurement of employees' skills, rather team members usually needed to work harder, and longer than the regular work hours, to compensate for poor performance, for the benefit of the company.

Table 5.61: Findings on contextual managerial ambidexterity

Contextual managerial ambidexterity			
Themes	Frequency	Outcomes	Selected quotes
Exploitation			
Utilisation of slack resources	4	Cost-effective development	*'When it is the project deadline, all the leaves will be cancelled. The company that is serving may mention the deadline properly but the unlimited pressure that the developer is taking results him not to serve for a long time.'* (Com D Int-5 2017)

			'Yes, I must work extra hours to learn a new technology. I am accepting that only for the benefit of the company. But me extend is increasing. I am doing the sacrifice. I had to learn. In that case my expectation was not fulfilled but the from the managements part was done.' (Com D Int-4 2017)
Maintaining profitability and obtaining new ventures	2	Stability	N/A

Discussion with the head of accounts also confirms these findings, that an inability to deliver projects on time and budget is the foremost reason behind the company's sustained financial distress. He also confirms that, considering the nature of Bangladeshi IT market, and due to increased competition in the international market, it has been no longer profitable to continue working on projects. A senior manager stated that a new strategic change was underway to address the problems outlined. Top management is considering staff augmentation as a potential strategic move, where only infrastructure and employees will be provided to the clients, and the clients will need to manage their own projects. It is believed that this will solve the issue permanently. To triangulate these suggestions, discussion with some ex-employees who now work in a better-performing company, were carried out. The root causes behind this sustained phenomenon were clarified as below:

Table 5.62: Root causes for sustained poor operational performance

Root causes	Quotes
Wrong judgement about customers' capability and skill in IT	'There are so many smart customers. They have possessed so much knowledge. They also have tried from development side, through commercial side, development side as less as it could take more. They couldn't able to measure that the software has possessed a value or it could have such value indeed, but the development work has possessed so much load.' (Com D Int-4 2017)
Poor cost estimation	'I think there is the fault with their cost estimation. So, it should be sealed.' (Com D Int-7 2017) 'I worked with that company for two times, once when there kept the software, and again once without having software. While there had been the software with Com D then there found some profit. Difficulties have arrived mainly for lack of requirement collection, they got fail in estimating the length of work even they could not get able to find out the cost.' (Com D Int-7 2017) 'Acute lack of person having idea about costing there had been found no domain at all.' (Com D Int-7 2017)
Project control, absence of robust statistical control	'Again, another difficulty I have found your statically product model that is shown productivity by this time. There might the core then if the BAR model gets 80% less it is bad. Whether the project has got finish by this time within budget/within time it has shown a probability if got down to a level 80% then it should be extremely bad. If it remains on above 80% you can make it run whenever you like or feel, if it gets down to less than 80% it will need tuning again or you must find another option. So, both estimation and prediction is to be needed." (Com D Int-5 2017) 'Monitoring, estimation these are very simple matter. First it will be measured, the fixation of time. Without keeping basement, it will not be possible.' (Com D Int-4 2017)

Absence of C level	*'Moreover, there is an issue of monitoring. Difficulties have arrived for absence of C level.'* (Com D Int-7 2017)
Overall management	*'It is also about overall management, there is another kind that is those who deal with the business.'* (Com D Int-2 2017) *'One of MD in the past had got the lacking on how to handle IT.'* (Com D Int-3 2017) *'I think there is no focus of the management. Management has got no focus.'* (Com D Int-5 2017) *'Here is a matter in our IT management keeps huge influence. For any organisation, there we find an effort to reduce expenses. IT always needs to make the expenses less. So, it is needed to handle the matter with single hand. It is found difficulties in managing these terms.'* (Com D Int-7 2017)

Senior managers have a different approach to managing the learning of new technologies by the team members. When a new technology has emerged, which might be beneficial for the company for future projects and to gain efficiency, project managers assign the team member to learn the new technology within a negotiated deadline. However, project managers do not allocate specific times during office hours for this learning initiative, rather the team members must study the assigned technology after hours. Discussion with the team members revealed that this practice creates extra pressure for them, and also impacts their regular performance. Moreover, it was also mentioned that program managers generally do not offer any guidance or learning strategies for the new technology, and there is a lack of a knowledge-sharing culture within the company. This compels the team members to leverage their own time to familiarise themselves with the assigned technology. The senior managers and program managers mention that they explain the future benefit of the technology and explain how learning this new technology will add value to the skill portfolio of the team member, with some hope of salary increment. However, an increment in salary or monetary benefit is rare for learning new technologies, rather team members see the benefit in terms of personal value.

Finally, the lack of ambidextrous behaviour by the middle management affects the company negatively in maintaining a healthy financial position in a highly dynamic business environment.

Organisational-level factors affecting dynamic capabilities building
Role of organisational structure in building dynamic capabilities
Organisational structure and changes in the strategic direction of the company, has raised serious concerns. The organisational structure was not redesigned in accordance with the strategic changes of the company and this has seriously hindered the effective realisation of the potential benefit of the reconfiguration processes. For example, when the company shifted its focus from project to product development, to continue ongoing development of

the product, particular divisions or organisational units should have been institutionalised. The absence of such a division or organisational unit restrained the appropriate management of the product life cycle and caused the company to fail monetise newly developed product portfolios. Moreover, due to an absence of C level executives, middle managers often struggle to negotiate effectively with their clients, are deprived of critical support from the top management when it is needed. A common belief is that organisational structure needs to be re-arranged, re-aligned or re-structured in accordance with the strategic re-orientation of the company. The incentive mechanism also requires realignment in accordance with the expectation of the internal talent. One manager outlined the management's attitude towards internal resources as:

'*Everyone has an expectation to the management. Management never provide what you want and they always provide less than your expectation. So, whatever you want management will give you less, not the whole.*' (Com D Int-2 2017)

Moreover, the present organisational structure with top management residing abroad seriously hinders the ongoing operational effectiveness of the company due to the difficulty in deploying a stringent monitoring and control mechanism across the company. Although the top management maintain regular communication through video conferencing technologies that updates performance of the ongoing operational routines, it is prominent from the case that engagement mediated via technologies may offer a plausible solution to the coordination problem across two different geographic location, the distance negatively affects to construct a collective perception about a phenomenon.

Table 5.63: Role of organisational structure in building dynamic capabilities

Organisational structure		
Theme	Frequency	Selected quotes
Nature of organisational structure	8	'*We do not have any executive at the C Level, there is no top management resides here at the office, they operate from being at US, this creates a problem, we do not find them when we need, sometimes it is not possible to contemplate an issue through Skype, or telephone.*" (Com D Int-3 2017) '*Then it is very difficult for us to continue life cycle of the product till the end. How long the customer is surviving here, up to last data you need to continue for life cycle and manage the life cycle and continue for the future. For the reasons, these are not possible for further versioning and it will face crisis at any stage. It gets tougher to support the existing users. Then we need to train up the support team newly and it is a big problem though product line up can be bigger.*' (Com D Int-5 2017) '*If the product portfolio and resource increased then product line up will increase too.*' (Com D Int-4 2017) '*Our resources can be down fall anytime then product quantity will be decreased. For example, there are three support team members but two are left the jobs so that we fall in resource down fall: we could not continue the*

		product because of lacking resources. Optimum resources are not main matters here. We need the sustainability. If we consider regarding on it that time we were not that much organised. Gradually we are changing it into a process organisation. I hope that If we continue the process so that product life cycle will not face trouble though there will be changing of the employees.' (Com D Int-7 2017)
Incentive mechanism	8	*'We do not receive any incentive for learning a new technology, we have to deliver our effort to learn it with our own way and outside office hour, it significantly adds additional workload, but we cannot do anything about it because if I can learn it will help me to grow my career, I can take the advantage here or outside this company, in some other company.'* (Com D Int-4 2017)
Top-management engagement	5	*'They are less interested to engage or to provide the solution.'* (Com D Int-6 2017) *'The chairman is not playing an active role here in GSL. My MD is not going to him for any suggestion and he is not attending the brand meeting for last one and half years. He is not interested to hold the position of a Chairman in GSL because it is a dead concern to him.'* (Com D Int-3 2017)
Frequent change in top management	6	*'There keeps the matter of top management negotiation. They have also not made negotiation in a proper way. Rather, they hope to find the CEO has got changed for after each 2-3-year interval.'* (Com D Int-6, 2017)
Conflict in top-management team	7	*'Yes, there keeps the management politics. The new Mr X while he had arrived, he was a very talented person., He provided the idea that he would work for BDT 1 and while work has been done he will make improvement of BDT 100. So many caucus and conflicts were arisen with Y regarding this matter.'* (Com D Int-6 2017) *'Yes, for this reason he did not make any CEO remain in charge, rather made the CEO change, here with us Person A had been, he had got the lacking on how to handle IT, as a result CTO positioned have been demolished.'* (Com D Int-6 2017)
Delegation of authority, monitoring and control	6	*'We have the authority, but we need more resources to make a quality decision.'* (Com D Int-7 2017) *'I will come by my own way and go by my own means and will do work by my own system. But the thing here is, some company give you responsibility and some are not. GSL is giving that but it's being misused. Some employees are misusing it. The way to tackle misuse here is to ignore it. Management is not pressurising because they think if pressurised I will not be refused and they will not get this type of qualified employee. Or we have economical lacking.'* (Com D Int-7 2017)
Scope of career growth and turnover of middle managers	5	*'Career growth scope is limited as the company is already declining.'* (Com D Int-5 2017) *'Yes, middle managers move more. What is going at present bank business is in a bad condition, facilities of banks get less, and promotional issue is also a cause. Those who have sound experience and worked for more than seven to eight years often move to client side from the development environment, it is more rewarding financially, less stressful as you primarily manage the vendors and also banks or large companies can offer a career path that our IT companies cannot offer, lack of willingness to give a very good salary package is often the key factor, plus some time the IT industry struggles financially that creates uncertainty, whereas big companies operate with greater certainty that assures middle managers and encourage to switch, we lose lot of good personals, some of them again come back and some never back again as they flourish and achieve growth.'* (Com D Int-1 2017)

Role of organisational culture in building dynamic capabilities

The company does not have a distinctive culture that fosters collaboration among employees. It is noted that employees often hesitate to request assistance for learning new skills or capabilities; there is a lack of a knowledge-sharing culture. At the time of this

research, the morale of the employees was perceived as very low due to the sustained negative financial performance of the company. Moreover, the company also started to lose the strong identity and reputation it had as a market leader. Overall, the company does not have a dynamic culture (Bowen & Eisenhardt 1999) that supports poor performers and appreciates failure in order to encourage innovation.

Consequences of dynamic capabilities

The performance outcomes of dynamic capabilities are mainly negative for this company, '*Only one time there has [been] revenue … Manager is to take attention on this matter.*' (Com D Int 5, 206) No clear linkage with the financial performance is established, monitored or critically assessed during a strategic transformation. Rather, all the initiatives are mentored and advocated by the top management, and often they are reoriented before the benefit of the changes can be fully realised and monetised. Moreover, due to the absence of middle managers' understanding regarding operational problems, and problems that arise due to changes in the external environment, transformation often fail to deliver the intended result. Additionally, middle managers did not communicate their inability to solve the problems with the top management, rather they attributed various external factors such as competitors' action as root causes of the partial success of the transformation. This behaviour leads to an ambiguity of consequences of dynamic capabilities. Furthermore, middle managers did not attain an ambidextrous approach during reconfiguration, and that also contributed to the negative financial performance of the company. Additionally, middle managers' perception regarding the operational excellence of the company restricts any attempt at a comprehensive operational overhaul to overcome critical bottlenecks affecting operational performance leading to poor financial results. The consequences of the CMM program was not communicated with the senior management in an objective manner, rather managers proposed external factors as potential causes of the failure of that program. This approach offers a novel insight on the consequences of dynamic capabilities that can be considered as an ambiguous relationship, where managers purposefully impose ambiguity on the consequences of dynamic capabilities to explain negative consequences.

Com D is an important case for obtaining a rich insight about the nature of dynamic capabilities, managerial roles and the linkage of dynamic capabilities with the performance outcomes, particularly, in this case, poor financial performance outcomes. Evidences have revealed an entrepreneurial approach from the top management to pursue dynamic capabilities, however, the company is yet to deliver a positive organisational performance. The company is considered as a cost centre by the parent company and perceived as a financially struggling corporate entity within the ICT industry, as stated by the employees

of this company. During its twenty years of operating history the company has undergone change in the top management in an episodic manner that follows a strategic transformation led by the newly appointed top management.

Interestingly, despite its poor financial performance the company has maintained a very good reputation in terms of capability to deliver complex projects. The company also has acquired many valuable accreditations such as ISO, and more recently CMM3, that clearly demonstrate the effectiveness of the organisational-level dynamic capabilities to transform internal resources and capabilities in accordance with a strategic agenda. Based on the insight offered by Teece (2009), the company demonstrates sensing, seizing and reconfiguring capabilities with effective results to obtain the initial strategic aim or objective. More clearly, the company has demonstrated many capabilities branching options as outlined in Helfat and Peteraf (2003) such as retrenchment or retirement. The management, in general, fall short in capitalising on effectively converting the advantage of the transformation procedure into monetary benefit to obtain positive financial performance.

Top management acted as the primary advocate of the strategic change initiatives. The top management retain ownership and control over the strategic agenda and engage middle managers to carry out the execution. It should be noted that the top management mainly reside in United States of America, a significant distance from the primary workplace resulting in top management's reliance on remote management procedures to monitor and control the transformation initiatives. Top management heavily rely on the middle managers to carry out the execution process through overcoming operational challenges encountered by them. Therefore, middle managers' human capital, social capital and cognitive ability play a major role during the execution or transformation process to construct effective and efficient solutions for novel and complex operational problems. Middle managers cannot bring rich human capital as their experience is primarily based on the present company, or companies that are smaller than the present one. Additionally, in attempting to exploit social capital and cognitive ability to address the novel and complex operational problems, middle managers suffer from the individual bias, commitment or group thinking behaviour. To address this, middle managers often attempt to be part of a strategic reconfigurations to gain more experience in the performance of existing portfolios, and top management allow this inclusion to make the process resources that reduce the risk of failure. However, this practice makes the transformation heavily costly, negatively affects current performance and creates more pressure on the company's financial performance. Middle managers demonstrate less keenness to identify the most cost-effective solution,

often do not perceived the scope accurately, apply individualistic approaches over methodology to pursue a goal when it seems unrealistic, and delay engagement with the top management to inform it about problems. In response, top management normally rely on the middle managers' explanation of the issues and consequences due to distance between the top management and the operational base. This long geographical distance requires more stringent coordination to reduce the gap between top management and middle management. Although, top management in this case maintains regular communication via video conferencing technologies, it is apparent that geographical distance continues to create an obstacle in obtaining cognitive proximity. Top management's compromise with the current corporate performance often results in a transformation with a greater cost, and, paradoxically, top management also expects immediate financial performance improvement after the transformation. Top management clearly failed to produce any positive firm performance throughout the transformation.

Dynamic capabilities require a process of realising and monetising the advantage that has been generated through transformation into positive financial performance. Realisation of advantage requires managers, team leaders, and line managers to appreciate the benefit produced from transformation as compared to the original agenda. Then middle managers need to follow a series of initiatives to monetise the realised benefits into performance outcomes. The monetisation process may necessitate structural adjustment to institutionalise the reconfiguration. Failure to promptly realise and monetise the advantage is often considered as a failure of dynamic capabilities that have been proposed and established by the middle managers. That eventually triggers another strategic reconfiguration by the top management and this cycle repeats leaving the poor financial performance of the company sustained.

Table 5.64: Consequences of dynamic capabilities at Com D

Consequences of dynamic capabilities			
Sub-theme: **Realised Dynamic Advantage**	Fitness	Readiness	Advantage
Selected quote	*'CMM made us less competitive, reduced our market and increased additional documentation to comply, these further reduced our operational efficiency to maintain project within budget and*	*'We discontinued with CMM and now there is no companywide practice, we try to capitalise on the reputational advantage, but we have gained nothing from process perspective from CMM journey.'* (Com D Int 5, 2016)	*'We finished CMM3 without having a system to make the documentation process efficient, eventually we realise that we cannot follow the required protocol, we start bending the CMM guidelines and now we do not follow the CMM processes as it hurts our price and therefore our top management discontinued CMM journey and withdraw from CMM5 project. CMM3 project affected our organisation*

	cost.' (Com D Int 3, 2016)		*negatively in so many ways, first it withdrew resources from ongoing projects making them loss projects, secondly accreditation made our market smaller and increase our costing to reduce competitiveness, now we are using CMM accreditation only for highly reputed clients, we are not following CMM across the organisation as it is not practical for a market like Bangladesh where customer do not want to pay, appreciate or even understand the importance of quality in IT projects.'* (Com D Int-3 2017)
Sub-theme: **Monetised Dynamic Advantage**	Return on fitness	Return on readiness	Return on advantage
Selected quote	*'After doing CMM and value addition if you have any small project you cannot beat. Can't you beat with CMM as too small? That's why I say that we will have to focus on product that are very good in strategic domain, like- digital menu for restaurant, sell for 20,000 for each restaurant. Though it's a small application; just bring this concept.'* (Com D Int-4 2017)	*'Ultimately the company is losing its revenue. From some resort, the revenue is coming and from somewhere it's not coming. If the number of products increase it is not possible to allocate the resources for each product so that some products can be lost. Because the engaged resource might switch to another project or product development so new products were not possible to continue further in life cycle.'* (Com D Int-6 2017)	*'Parent Company Y is uninterested to explore self-advertising. But in the process of commercialisation you have some constrains for those organisation that are not promoting the advertising. So, for commercialisation we need work out more but we are unable to do for the company.'* (Com D Int-6 2017)
Consequences	***Negative, ambiguous***		

Summary

The middle managers of this company supported the top management's intent of strategic reconfiguration on many occasions, however, the company failed to realise benefit out of these strategic reconfigurations because of a lack of time given to harnessing benefit out of the reconfiguration, poor operational processes, and the absence of the intimate engagement of top management with the middle management. The company also fails to attain an ambidextrous approach during building new capabilities contributing to poor bottom line performance. The organisational structure and culture are also not aligned with the strategic changes that have been made, in many instances. Finally, this company exhibits a negative relationship with dynamic capabilities and financial performance due to the absence of an established linkage with the dynamic capabilities and the organisational performance.

The below figure offers an overview of dynamic capabilities practices at Com D in response to technological change, market competitiveness and changing customer requirements.

Figure 6.8: A framework of managerial roles in building dynamic capabilities at Com D
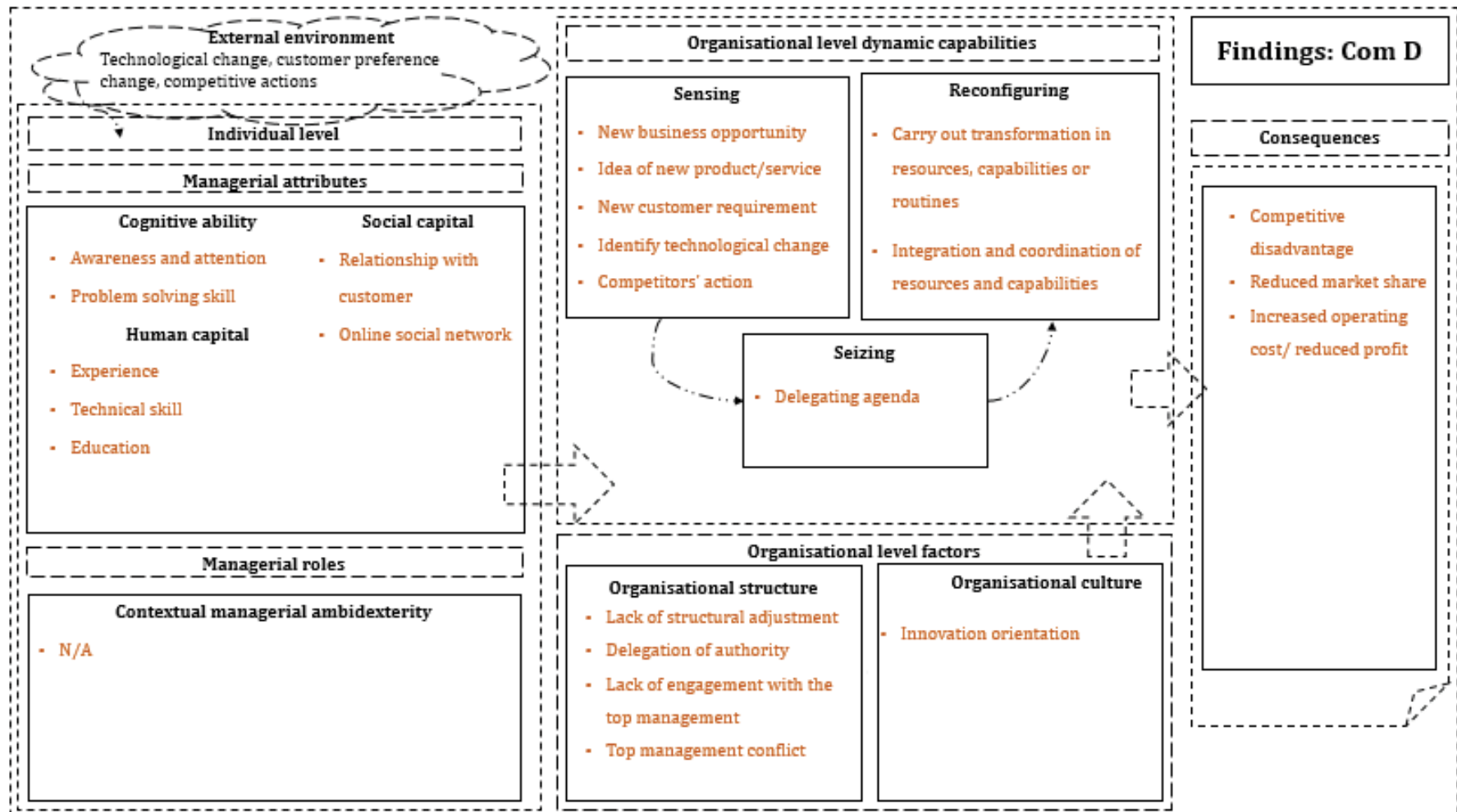
Next, a cross-case analysis will be presented.

5.3.5 Cross case analysis

Cross-case analysis of this research will present the general findings across the cases, considering the research questions. Previous sections outlined the rich insights obtained through empirical investigation in the four case reports. This section will present cross-case analysis across the four cases to outline the dominant and emergent themes identified within the empirical enquiries. The overall research findings provide valuable insights on the influence of managerial attributes such as cognitive ability, human capital and social capital, and ambidextrous managerial roles in building sensing, seizing and reconfiguring dynamic capabilities, as well as the impact of organisational factors in building dynamic capabilities. Finally, an analysis is given on the consequences of dynamic capabilities as evident in these four cases discussed, based on the evidences obtained in this research.

Figure 6.9: A framework of managerial roles in building dynamic capabilities based on cross case analysis
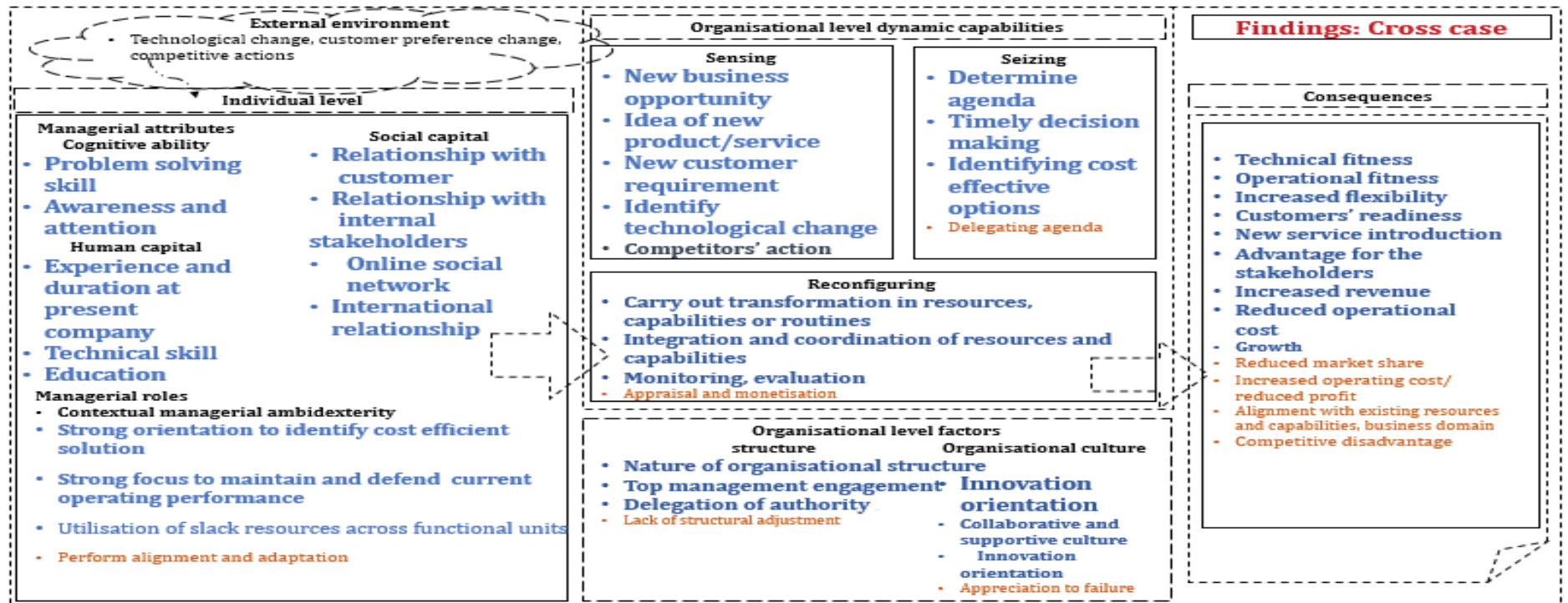
Legend:

No of occurrences	One	Two	Three	Four
Explanation	Theme occurs only once	Theme occurs twice	Theme occurs three times	Theme occurs in all four cases
Font style	Cambria	Cambria bold	Cambria bold	Cambria bold
Size	12	12	14	16
Color	Orange accent 2 Darker 25%	Blue grey	Blue accent	Dark blue

Next, based on the above findings the dominant themes obtained through cross case analysis are discussed.

Dominant themes cross four cases
Managerial roles in building dynamic capabilities

The dominant findings related to individual factors suggest that attention and awareness, and problem-solving skill are essential elements of managerial cognitive ability. Secondly, experience, business-domain knowledge and technical skill are found to be the key elements within managerial human capital. Thirdly, within social capital, the relationship with customers, internal stakeholders, online use of a communication network, and relationships with external companies play a critical role in building dynamic capabilities. Finally, ambidextrous managers are able to utilise organisational slack resources, identify cost-effective solutions, attempt to safeguard the operational performance, and continually assess the alignment between desired and existing resources, operational routines, or capabilities. Table 5.67 outlines the dynamic capabilities in the four cases and table 5.68 outlines the dominant themes concerning managerial roles and attributes in building dynamic capabilities.

Table 5.65: Dominant themes on dynamic capabilities through cross case analysis

Sensing	Seizing	Reconfiguring
- New business opportunity (Com A, Com B, Com C, Com D) - Idea of new product/service (Com A, Com B, Com C, Com D) - New customer requirement (Com A, Com B, Com C, Com D) - Identify technological change (Com A, Com B, Com C, Com D) - Competitors' action (Com A, Com B, Com C, Com D)	- Determine agenda (Com A, Com B, Com C, Com D) - Timely decision making (Com A, Com B, Com C, Com D) - Identifying cost effective options (Com A, Com B, Com C, Com D) - Delegating agenda (Com A, Com B, Com C, Com D)	- Carry out transformation in resources, capabilities or routines (Com A, Com B, Com C, Com D) - Integration and coordination of resources and capabilities (Com A, Com B, Com C, Com D) - Monitoring, evaluation (Com A, Com B, Com C, Com D) - Appraisal and monetisation (Com A, Com B, Com C, Com D)

Table 5.66: Dominant themes on managerial attributes and roles in building dynamic capabilities

Cognitive ability
- Problem solving skill (Com A, Com B, Com C, Com D)   - Attention and awareness (Com A, Com B, Com C, Com D)
Human capital
- Experience and duration at present company Com A, Com B, Com C, Com D)   - Technical skill Com A, Com B, Com C, Com D)

• Education Com A, Com B, Com C, Com D)	
Social capital	
• Relationship with the customer (Com A, Com B, Com C)	
• Online social network (Com A, Com B, Com C)	
• Relationship with the internal stakeholder (Com A, Com B, Com C)	
• Iinternational relationship (Com A, Com B, Com C)	
Contextual managerial ambidexterity	
• Develop cost efficient solution (Com A, Com B, Com C, Com D),	
• Maintain and defend current operational performance (Com A, Com B, Com C, Com D)	
• Utilisation of slack (Com A, Com B, Com C)	
• Perform alignment and adaptation (Com C).	

The findings also reveal the dominant themes of the key dynamic capabilities that are focus of this study namely sensing, seizing and reconfiguring. The findings on dynamic capabilities are consistent with the literature suggesting managers find new business opportunities, technological changes or changes in the customer requirements through leveraging their attention and awareness, then promptly act to make appropriate decisions to exploit the opportunity during seizing capability and finally attempt to reconfigure resources and capabilities to carry out necessary changes to obtain the intended outcomes (Teece 2017; 2009; Teece, Pisano & Shuen 1997). These dominant themes are discussed below:

Cognitive ability

The theme of problem-solving skill appeared during the data collection process as a dominant theme. As the interview questions primarily focus on the individual managerial roles, managers articulated different problems they faced and their roles in addressing these problems. The problems that are mentioned by the managers are novel in nature and managers had not faced them previously. The managerial problem-solving skills to address these distinctive kinds of problems are often vital in the successful transformation of resources or capabilities. Managerial attention and awareness assist managers to facilitate sensing capabilities through identifying new scopes of opportunities and, at the same time, allows managers to search for cost-effective paths to address the identified scope, and to identify cost-efficient solutions for problems that may arise during transformation processes.

Human capital

Long experience assists managers to acquire comprehensive knowledge about the focal company's resources and capabilities, products or services and at the same time obtain deep knowledge about the customers. Long experience also assists managers to establish close

relationships with customers to aid in harnessing critical advantage for dynamic capabilities building.

Social capital

Relationships with customers play a vital role in harnessing deep knowledge of the business processes of the customer and at the same time sound understanding about the requirements of customers. This assists managers to identify the changing customer requirement more swiftly and accurately to promptly act to arrange the necessary changes within the resources and capabilities of the organisation.

Contextual managerial ambidexterity

In delivering ambidextrous roles, managers demonstrate evidences of utilisation of slack resources (Com A, Com C), strong orientation to identify cost-efficient solutions (Com A, Com B, Com C), strong focus to maintain and defend current operating performance (Com A, Com B, Com C) and performing alignment and adaptation (Com A, Com B, Com C). Ambidextrous roles of managers assist them to maintain a balance between dynamic capabilities practices and ongoing operational efficiency. Managers at Com C, on one occasion, demonstrated evidence of creative alignment of scope identified from the emergence of mobile application development technologies.

Organisational factors

Top management engagement is identified as a dominant theme to enable middle managers to carry out the initial scope identified from the external environment. Close and frequent interaction with the top management enables managers to pursue valuable insights on the identified opportunities, as well as gain feedback about the possible outcomes of the scope if implemented (Com A, Com B, Com C). Adjustment of the organisational structure after the transformation process is also a critical factor to obtain positive outcomes from the dynamic capabilities. A collaborative and supportive culture, and innovation orientation, are dominant themes of organisational culture to foster dynamic capabilities within the organisational boundary.

Table 5.67: Dominant themes on organisational structure

Organisational factors
Organisational structure   Top management engagement   Adjustment of organisational structure (Com A, Com C)
Culture   Collaborative and supportive culture (Com A, Com B, Com C)   Innovation orientation (Com A, Com C)

The findings reveal that the advantage generated through intervention needs to be realised and later monetised through appropriate institutionalisation processes to generate dynamic rent, rather than static rent (Teece 2009; Teece, Pisano & Shuen 1997), an above-average financial profit, and a regular ongoing operating profit. Based on the findings, the dynamic capabilities may have many kinds of consequences including positive, negative or no relationship. This research considers the outcomes or the consequence of dynamic capabilities as dynamic advantage. Dynamic advantage refers to the advantage generated by dynamic capabilities through effectively considering external stimuli and instituting necessary changes across the organisational boundary to create advantage for the stakeholders. More specifically, dynamic advantage is the direct or indirect result of dynamic capabilities, triggered by dynamic stimuli and applied across the organisational boundary to be realised and appreciated by the stakeholders. Dynamic advantage can be of different forms and nature.

Once the transformation process is finished it is important to conduct an appraisal to assess the potential advantage generated through the transformation initiatives, which is considered as realised dynamic advantage in this research. Finally, it is necessary to perform monetisation initiatives to convert the advantage into financial returns, that is perceived as monetised dynamic advantage in this research. The realised dynamic advantage can be in the form of any fitness achieved, readiness of the customers or the focal companies to carry out some innovative initiatives, or advantage realised by the stakeholders or the focal companies such as cost reduction. The monetised dynamic advantage is the return of this advantage in financial values.

Table 5.68: Dominant themes on consequences of dynamic capabilities

Consequences of dynamic capabilities		
Realised dynamic advantage		
Sub-themes	*Fitness*	*Readiness*	*Advantage/ Disadvantage*
Monetised dynamic advantage		
Sub-themes	*Return on fitness*	*Return on readiness*	*Return on advantage*

Next the emergent themes across the four cases are discussed.

Emergent themes cross the four cases

The three themes that emerged through the cases are intervention, dynamic problems and cost. These are discussed below.

Intervention

The findings suggest that medium-sized ICT companies carry out transformation processes through initiating projects (up to one year) or programs (more than one year) that are supported by temporarily allocated resources to obtain the intended outcomes. This approach can be considered as an intervention to respond to external variations, rather than maintaining an ongoing reconfiguration process of dynamic-capability building. To distinguish the intervention of interest here, it is important to distinguish it from other interventions that are not triggered by external variation. For this research, these distinctive interventions are termed as 'dynamic intervention'. In this context, dynamic intervention is identified as an organisational action consisting of projects, programs, temporary resources, and routines to transform internal resources, routines, and capabilities in pursuit of securing business advantage from variations arising from the external environment. To maintain the underlying micro foundations of dynamic capabilities, medium-sized companies cannot commit organisational resources on a permanent basis, hence firms are implementing interventions as a practical alternative to reconfiguring resources to address changes arising from the external environment. Managers in all four case companies play a vital role in achieving intended performance outcomes through these interventions.

The dynamic intervention process is triggered by an external stimulus perceived by an employee or a group of employees from one or multiple functional units. Then, a scope is developed or found to address the changes, followed by a process of collaborative decision-making procedures with engagement with the top management to create an agenda to pursue an intervention to the resources, capabilities, or routines. Next, an intervention is carried out to obtain the intended agenda. Finally, managers try to assess the advantage generated by the intervention and, in a few instances, purposeful attempts are made to monetise the advantage to generate revenue. In most of the situations where dynamic capabilities resulted in positive consequences, the interventions heavily utilised organisational slack, referring to a practice which can be termed as ambidextrous dynamic intervention.

Capability renewal initiatives by Com D and Com C can be considered appropriate evidence to exemplify distinct aspects of managerial roles to perform intervention within these two companies. Both companies responded positively to the proposed incentive by the Government of Bangladesh to undertake the CMM accreditation process. The government offered to compensate 60 per cent of the cost of this initiative and the incentive will be given to a consortium of eight companies so that the cost of CMM consultants can also be shared.

Additional motivations for both companies include increased credibility in the eyes of the prospective customer, possible strategic advantage in international markets and achieving operational excellence.

Com D had been experiencing poor operational performance for a long time, so top management expected that CMM accreditation would elevate the operational performance whereas Com C top management aimed at obtaining scalability of operational process through adopting superior operational practices of CMM. Both companies identified the opportunity as being timely and decided to act on this opportunity to improve operational process and performance. Both companies needed to engage in collaboration with seven competitors, expert consultants, and Government officials to continue with this initiative.

The first milestone was to accomplish CMM level 3, within a duration of about 18 months. Successful accomplishment of level 3 which is definition stage would create an avenue to pursue towards CMM level 5 which is optimization and the final stage of CMM framework. The first step to carry out this initiative was to form a team who would oversee and navigated the organisation and engaged with the internal and external stakeholders during this long journey toward successful completion. An external consultant provided expert support to guide the individual companies to fulfil different aspects of CMM guidelines. The internal team's responsibility was to carry out the normative procedure within the organisation as prescribed by the consultants and attain acceptance and cooperation of the internal stakeholder to adopt the practices of CMM3 across the organisational boundary.

These two companies clearly differ in terms of the size of team formed to undertake CMM 3 accreditation. Com D assigned eleven team members whereas at Com C assigned four team members among them only one team member was engaged fulltime. Of these, only two worked fulltime for the project and the other two participated based on their availability after other projects. Com D constructed a large team which satisfied many individual team members' personal goals of wanting to gain experience of the CMM accreditation process in the hope of improving career prospects. The size of the team and team member selection strategies used by these two companies suggests Com D managers did not consider the most cost-efficient approach, whereas Com C exploited slacks or buffer resources effectively to avoid additional cost. Moreover, the size of the team also reflects the high priority assigned by top management at Com D whereas managers of Com C appear to have considered this project as important but no more important than their ongoing operational routines. Com D top management committed resources for a considerable length of time; withdrawing valuable expert personnel from ongoing projects. This resulted in significant disruption to

the ongoing operational processes and reduced profitability in comparison to the previous year. However, managers at Com D continued with a slightly reduced team in the following year with an expectation that CMM accreditation would outweigh the loss.

Middle managers need to carry out intervention in their operational processes during rapidly changing external environments and successful intervention requires an effective managerial approach to fulfil the intended purpose. Interventions carried out by top management towards middle management, will be different in nature than the middle manager's discretionary interventions to their operational team. Top down intervention will have organisational sponsorship whereas middle manager-initiated interventions may fail to attract top management commitment. Interventions to pursue intended transformation may adversely affect the operational performance due to deviation of goals or agendas, resource commitment and disruption to ongoing operational processes.

Dynamic problem

Dynamic problems refer to the problems that firm may encounter during environmental dynamism that are originated due to changes in the external factors. In a dynamic business environment, problems originated due to variation in the external environment require distinguished approach to tackle effectively and efficiently. These problems are distinctive problems which constitute factors or elements of external environment that focal organisation may not possess sufficient resources and capabilities to solve, control or findings viable alternatives. Dynamic problems can occur due to dynamic variation triggered by some external factors, at the time of dynamic intervention or some changes in external environment may create dynamic problems for the focal company.

Evidences suggest that managers encounter various novel problems during the transformation process. These problems often originate outside the organisational boundary but may possess significant scope to impact the focal organisation's transformation initiatives or the sustainability of its operational processes. Managerial cognitive ability, social capital, and human capital as well as ambidextrous roles play critical roles in obtaining cost-effective solutions to these problems. Managers pursue creative, configuration and market-orientated approaches to address these problems. If no practical solution can be exercised, managers consider taking alternative steps through process innovation to avoid these problems in order to continue with the reconfiguration process. Findings suggest that in some companies such as Com A, middle managers engage the top managers at the early stage of problem recognition, and therefore top management closely maintains engagement throughout the lifetime of the problem. By contrast, at successful

companies such as Com C, managers pursue top management engagement with multiple alternative solutions and options, along with an understanding about the cost and benefit of these solutions. With a set of potential alternative solutions, middle managers engage the top managers to receive guidance to make decisions regarding selecting the appropriate option. In these companies' top management remain as an observer of the issue with, from time to time, seeking an update about the performance of the selected option. In this case, middle managers possess sound knowledge about execution of the solution. This practice proved to be more efficient and effective in utilising top management's experience, expertise and time, to obtain cost-efficient and effective solutions.

Managers need to identify cost efficient and effective solutions for these problems for ongoing operational concern and to realise advantage through intervention. Some managers may be courageous enough to take responsibility to address these problems. Top management at Com C took a cautious step when their manager attempted to develop a new power supply system to solve the national load-shedding problems. Eventually, this problem took a long time to resolve until the electricity supply became reliable. Managers needed to continuously evaluate their internally developed solution against the solutions offered at the market to identify the cost-effective approaches. In the case of CMM, project managers of Com D decided to develop the reporting modules by themselves before conducting a comprehensive search on alternative cost-effective solutions, whereas Com C employees leveraged their previous experience and expertise to identify a cost-effective approach to tackle the problem. Managers need to be careful about problems of this nature, and as middle managers are more intimate with the operational processes, sufficient support should be provided to identify and take necessary actions regarding these problems to achieve successful interventions.

Managerial problem-solving skills are tested when a dynamic problem is identified. Findings from Com A suggest that middle managers engaged with top managers at the early stage of problem recognition, therefore top management were closely engaged throughout the lifetime of the problem. Whereas in successful company Com C, middle management requested for top management's advice after completing cost and benefit analysis on multiple proposed solutions and options. With a set of potential alternative solutions, middle managers engaged the top managers to receive guidance to select the best option. Top management continued to monitor the issue with regular update about the ongoing performance of the adopted option to tackle the issue. In this case middle managers were delegated the authority as the alternative solutions are devised by them, so they possess

sound knowledge about execution of the solution. This practice proved to be more efficient and effective in utilising top management's experience, expertise and time.

Com B faced a similar problem when the company started their operation with the first client. The first problem was an of availability of electricity, which seriously hampered the company's ability to continue daily operational activities. According to the service level agreement, Com B would own the computer and the operators deployed at client's side, and the client will be responsible for ensuring a good supply of electricity for those computers. In a developing country such as Bangladesh power outages are a well-known phenomenon. In 1994, in most branches the electricity was supplied for only a few hours each day which was so insufficient that the client proposed cancellation of the computerization program. Middle managers of Com B at that time initiated a bold approach to address this problem which originated outside the organisational boundary.

At Com B, the middle managers, led by a senior manager, attempted to solve the problem of power outage with existing resources in an innovative manner and at the same time continued searching available existing alternative solutions. At that time the only alternative solution was to install generators which are costly and require fuel on a regular basis. The middle management along with top management decided to go with the generator installation, however an attempt to develop an alternative innovative solution continued to be undertaken by one enthusiastic middle manager. A few years after installation of the new generators as they failed, it became difficult to control the fuel usage and theft by the people in the branch. Maintenance of the generators also became costly. The manager took serious initiative and leveraged his own time, personal connections and skills to tackle the problem through an innovation approach. He along with his team developed a rechargeable IPS that can supply power to a computer for at least 12 hours if it is charged only for two hours which was the average availability of electricity supply. This solution was innovative and was not available at the time when deployed. This installed IPS created a new problem which was that the cost of battery and transportation were very high as it contains acid solution and requires special treatment during transportation. Therefore, two competing solutions were deployed simultaneously to address the problem and it took a long time to completely overcome this problem. This approach is consistent with the view of Eisenhardt and Martin (2000) who suggest that during rapidly changing external environment managers need to make decisions in a rapid manner which may result negative result, therefore it is important to accommodate competing solutions to address a problem to allow scope to switch to the more effective and efficient ones.

Com A faced similar problems to transfer software update file via email due to limited existing internet bandwidth capacity. The number of clients was also rising at a rapid rate making it inefficient to physically deliver the update files to each client. One alternative solution was to establish PC to PC connectivity. This was proposed by the managers but rejected by most of the clients due to privacy concern as it allowed Com A to access sensitive files of the client. Finally, managers of Com A initiated a new process where the update file would be uploaded to the Com A website and clients would be responsible to download and install it by themselves. This approach solved the problem and allowed the company to grow at a rapid rate without the constraints of internet speed.

Com C faced dynamic problems when the new users of their MicroFin solution did not attempt to learn the software processes despite comprehensive training. These results increased calls to customer services and customer service employees also faced challenges in navigating a user who is not willing to learn the basic operational processes. The manager who was responsible for MicroFin products developed an innovative idea to tackle the problem. Instead of only having a training session, he incorporated an assessment at the end of the training and advised that the result would be communicated to their employer. They also advised that a certificate would be awarded to everyone who successfully fulfilled the minimum performance requirements of the assessment. This initiative resulted in a positive outcome in learning of the basic process by the end users, therefore immediately reduced the number of calls to customer service as well as result increase in customer satisfaction.

Cost

There is significant variance in cost associated with dynamic capabilities practices. Managers with strong orientation to cost-efficient approaches utilise organisational slack during the reconfiguration process. The associated cost with reconfiguration of resources or capabilities possesses significantly impacts on the consequences of the reconfiguration initiative. Managers with a strong ambidextrous attitude look for cost-efficient approaches of resources and capability reconfiguration through utilising slack or free resources in pursuing building new capabilities. Additionally, the approach pursued to resolve the problems faced during the reconfiguration process also plays a vital role in achieving cost-efficient outcomes.

Consequences

Through the cases, two new types of consequences have emerged: these are ambiguous relationships and consequences due to the non-execution of dynamic capabilities. Table

5.59 presents the consequences of dynamic capabilities as evident from the findings. First, it is evident from the cases that there are consequences if a firm chooses to do nothing in response to an external stimulus or completely fails to identify an external change that may have a potential impact on the focal company. Gaveti (2005) articulates that the managers at Polaroid failed to act on time and this deprived the company from taking advantage of the digital photography industry. Similarly, Nokia due to an inability to act to integrate rigorously the internet technology within their mobile handset business caused a serious detrimental impact to the company. Therefore, non-executive dynamic capabilities can be evident when a company fails to deliver the necessary action in response to the variation in the external environment on time, as timely decision making as one of the key elements of dynamic capability (Barreto 2009). As a result, the consequences of dynamic capabilities are divided into executive and non-executive consequences as outline in Table 5.59. Then,

Table 5.69: Emergent themes on consequences of dynamic capabilities

Nature of relationship	Nature of outcome			
	Positive		Negative	
	Realised	Monetized	Realised	Monetized
Execution of dynamic capabilities				
Direct	NF	NF	NF	NF
Indirect	Com A, Com B, Com C	Com A, Com B, Com C	Com A, Com B, Com C	Com A, Com B, Com C
No relationship	NF	NF	NF	NF
Ambiguous relationship	NF	NF	Com D	NI
Non-execution of dynamic capabilities				
Direct	NI	NI	NI	NI
Indirect	NI	NI	Com B	NI
No relationship	NI	NI	NI	NI
Ambiguous relationship	NI	NI	Com D	NI

Table legends: NI: Not investigated; NF: Not found

within each category, following the literature, there can be three relationships. These are discussed in the conceptual model chapter and are: direct, indirect and no relationship. The findings suggest evidence of an ambiguous relationship with dynamic capabilities, such as the consequences based on the information provided by the informants of Com D, and this is added as a new category. Causal ambiguity is heavily discussed in strategic management literature. Recently, Vermeulen (2017) suggests that if there exists a causal ambiguity then a bad practice within a firm may persist over time. This is in line with the findings at Com D where repeated failure triggers repeated intervention, however, due to a causally ambiguous relationship established by the manger between dynamic capabilities and the

consequences, creates ambiguity about the consequences of interventions carried out to obtained intended transformation within resources and capabilities. Table 5.59 summarises this observation. The consequences refer to the consequences of the transformation process, as this research did not attempt to reveal performance outcomes of dynamic capabilities. The consequences that are outlined here may contain the subjective perceptions of managers and require further empirical investigation, which is beyond the scope of this research.

Contextual factors

This research reveals several interesting findings about the context of research context. First, there is a common conception that companies in emerging market are trapped with resources constraints which is true, however this is not the primary challenge of the ICT companies within the context of the empirical enquiry as explained in the added section. Secondly, a significant tension has been explored between the top management and the middle managers that creates a lot of obstacles for the ICT companies to carry out the transformation effectively across the organisational boundary. Thirdly, migration of talented workforce to the developed world is already a known phenomenon, this research reveals that a considerable number of competent middle managers change their jobs to the client-side companies such as financial institutions. Additionally, there is a range of interesting findings about the context of empirical enquiry may have significant potential to contribute to the understanding about the research context, specifically ICT industry in Bangladesh. It is revealed that within the context of empirical enquiry, high employee turnover, the migration of skilled workforce overseas, a lack of collaboration among ICT companies, the small size of the local ICT market, a lack of customer knowledge of ICT, and the inadequate quality of tertiary ICT education is some of the factors that may have a negative impact on building dynamic capabilities within the context of the research study.

This study did not attempt to investigate the external factors; therefore, these factors should be investigated further in future empirical studies.

Next, a combined overview is outlined based on the dominant themes on managerial roles in building dynamic capabilities, and the consequences of dynamic capabilities.

Combined findings on managerial roles in building dynamic capabilities based on dominant and emergent themes

The following table presents the dominant and emergent themes on managerial roles in building dynamic capabilities. This is exploratory research and the various phases within

dynamic capabilities are revealed after repeated attempts to construct meaning from these disjoint activities, which are performed, as evident within the cases, in either a regular or irregular manner to address the changes in the external environment. These emergent findings also need further empirical research for validation; however, inclusion here may aid future research on dynamic capabilities.

Table 5.70: Managerial roles in building dynamic capabilities based on emergent findings among the four cases of this research

Dynamic capabilities	Managerial attributes		
	Managerial attributes and roles based on dominant themes		
Managerial roles Based on emergent themes	**Cognitive ability**	**Social capital**	**Human capital**
Sensing			
Perceive external stimuli	Attention and awareness (Com A, Com B, Com C, Com D)	Internal social capital (Com A, Com B, Com C, Com D) Relationship with the customer (Com A, Com B, Com C) Online network (Com A, Com C, Com D)	Experience (Com A, Com B, Com C, Com D) Business domain knowledge of customer (Com A, Com B, Com C, Com D)
Assessment	Attention and awareness Creativity (Com A, Com B, Com C)	Internal social capital (Com A, Com B, Com C) Relationship with the customer (Com A, Com B, Com C)	Experience (Com A, Com B, Com C, Com D) Business domain knowledge of customer (Com A, Com B, Com C, Com D)
Record	Attention and awareness (Com A, Com C)		Experience (Com B) Business domain knowledge of customer (Com A, Com C)
Share		Internal social capital (Com A, Com B, Com C) Relationship with the customer (Com A, Com B, Com C)	Experience (Com A, Com B, Com C) Business domain knowledge of customer (Com A, Com B, Com C)
Escalation	Attention and awareness (Com A, Com C)	Internal social capital (Com A, Com B, Com C)	Experience, business domain knowledge of customer (Com A, Com B, Com C)
Engagement		Internal social capital (Com A, Com B, Com C)	Experience (Com A, Com B, Com C)
Outcome: scope	• New business opportunity (Com A, Com B, Com C) • Idea of new product/service (Com A, Com C, Com D) • New customer requirement (Com A, Com B, Com C) • Identify technological change (Com A, Com B, Com C, Com D) • Competitors action (Com A, Com B, Com C, Com D)		

Seizing			
Collective assessment	Attention and awareness (Com A, Com B, Com C) Problem-solving skill (Com A, Com B, Com C)	Internal social capital (Com A, Com B, Com C) Relationship with the customer (Com A, Com B, Com C)	Business domain knowledge (Com A, Com B, Com C) Customers' business domain knowledge (Com A, Com B, Com C)
Feasibility assessment	Attention and awareness, (Com A, Com B, Com C, Com D) Problem-solving skill (Com A, Com B, Com C)	Relationship with the customer (Com A, Com B, Com C)	Customers' business domain knowledge (Com A, Com B, Com C)
Alignment with existing products and service assessment	Attention and awareness (Com A, Com B, Com C) Creativity (Com C)	Relationship with the customer (Com A, Com B, Com C)	Experience (Com A, Com B, Com C) Business domain knowledge (Com A, Com B, Com C)
Execution roadmap	Attention and awareness (Com A, Com B, Com C)	Internal social capital (Com A, Com B, Com C)	Experience (Com A, Com B, Com C, Com D) Technical knowhow (Com A, Com B, Com C, Com D) Business domain knowledge, (Com A, Com B, Com C)
Develop agenda	Attention and awareness (Com A, Com B, Com C) Creativity (Com B, Com C)	Relationship with the customer (Com A, Com B, Com C)	Experience (Com A, Com B, Com C, Com D) Business domain knowledge, (Com A, Com B, Com C, Com D) Technical knowhow, (Com A, Com B, Com C)
Outcome: an agenda	Determine agenda (Com A, Com B, Com C, Com D) Timely decision making (Com A, Com C) Identifying cost-effective options (Com A, Com B, Com C)		
Reconfiguring - Intervention			
Preparation	Attention and awareness (Com A, Com B, Com C) Problem-solving skill, learning ability (Com A, Com B, Com C)	Internal social capital (Com A, Com B, Com C) Relationship with the customer (Com A Com B, Com C)	Experience (Com A, Com B, Com C, Com D) Technical knowhow (Com A, Com B, Com C, Com D) Business domain knowledge (Com A, Com B, Com C)
Execution	Problem-solving skill (Com A, Com B, Com C) Attention and awareness (Com A, Com B, Com C)	Internal social capital Relationship with the customer (Com A, Com B, Com C), Online network (Com A, Com D)	Experience (Com A, Com B, Com C, Com D) Technical knowhow (Com A Com B, Com C) Commitment, ambition, motivation (Com B, Com C)

Appraisal	Attention and awareness (Com A, Com B, Com C)	Relationship with the customer (Com A, Com B, Com C) Internal social capital (Com A, Com B, Com C)	Experience (Com A, Com C) Business domain knowledge (Com A, Com B, Com C)
Termination	Attention and awareness (Com A, Com B, Com C)	Internal social capital (Com A, Com B, Com C)	Business domain knowledge (Com A, Com B, Com C)
De/ Institutionalisation		Internal social capital (Com A, Com C)	Business domain knowledge (Com C)
Outcome: advantage/ disadvantage	Carry out interventions in resources, capabilities or routines, testing and piloting (Com A, Com B, Com C, Com D) Interventions are cost effective (Com A, Com B, Com C) Generate advantage (Com A, Com B, Com C, Com D)		
Nature of consequences	Positive Negative Ambiguous Consequences due to non-execution of dynamic capabilities		
Appraisal (realised dynamic advantage/ disadvantage)	Technical fitness (Com A, Com B, Com C) Increased flexibility (Com A, Com B, Com C) Obtain customers' readiness for technology adoption (Com A, Com B, Com C) Advantage for the stakeholders (Com A, Com B, Com C) Competitive disadvantage (Com D) Increase operating cost (Com D) Decrease market share (Com D)		
Monetisation (monetised dynamic advantage)	Increased revenue (Com A, Com B, Com C) Improve customer loyalty (Com A, Com B, Com C) Increased market share (Com A, Com B, Com C) Access to new customer base (Com A, Com B, Com C)		

Next the insights on the research propositions based on the research findings are discussed.

Insights on the propositions
Proposition 1

Individual managers a. social capital b. human capital and cognitive ability facilitate organisational sensing capability.

This research finds that managers foster sensing capability through effectively converting a perceived external stimulus into a potential scope of action and escalating that beyond the functional unit. Attention and awareness of managerial cognitive ability helps managers to intercept and recognise an external stimulus (Helfat & Peteraf 2015; Teece 2007), such as technological change, arising in the external environment. Managerial social capital, such as a relationship with customers, supports harnessing valuable information from the customers and is an add-on to building sensing capability. For example, the managers' relationship with their customers at Com A and Com B significantly assists their company

to harness valuable information regarding changes in customer requirements. The participation of managers in different social networks also allows them to identify variations in the external environment (Luo 2003; Borgatti & Cross 2003; Soh 2003). Additionally, through engaging in informal discussion with internal colleagues, managers get access to information about the latest technological developments. One instance is where managers at all participating companies learnt about MongoDB, a new database management tool, from various sources such as websites and social networks, and through informal discussion with their colleagues were able to consider its potential scope. Finally, managerial experience helps managers to effectively contemplate external stimuli and assess their scope for the company using rich business domain knowledge around the focal company and customers (Kor & Mesko 2013; Sambamurthy, Bharadwaj & Grover 2003). For example, managers at Com A contemplated the growing trend of advertisement of tenders as a scope for a new service, which was later introduced. These findings offer rich empirical insights on proposition 1.

Proposition 2

Individual manager's a. social capital b. human capital and cognitive ability facilitate organisational seizing capability.

It has been revealed that during the seizing process, managers of successful companies collaboratively assess the alignment and necessary commitment of resources and capability to exploit the identified opportunity on time. If the scope of work is proved to be worth considering, managers develop an agenda to consider the necessary reconfiguration of existing resources, routines and capabilities. Managerial cognitive ability, particularly attention and awareness, allows managers to perform a comprehensive scanning to find different alternatives (Helfat & Peteraf 2015). For example, managers at Com C identified open-source software as a practical option during exploring options for a project to automate documentation required for Capability Maturity Model (CMM) guidelines. Strong relationships with customers facilitated the incorporation of customers' valuable insights in order to set up a superior linkage with the financial outcomes. In addition, internal social capital fosters participative decision-making processes to obtain multiple views and perspectives (Zhao & Tang 2013). As evident at Com A, managers always involve key customers during assessing the feasibility of a new service to identify the potential commercial performance. Finally, experience and business domain knowledge assists managers to coordinate and perform the feasibility and the monetary return of an initiative more objectively (Luthans & Youssef 2004). For example, a manager at Com C effectively

exploited the emergence of a mobile application into a scope of developing a mobile application version of some of their online-based financial services: this was later commercially successful. These findings offer rich empirical insights on proposition 2.

Proposition 3

Individual managers a. social capital b. human capital and c. cognitive ability facilitate organisational reconfiguring capability.

The reconfiguration process within operational routines, resources, and capabilities is carried out through deployment of an intervention, as discussed earlier, to generate business advantage, within the context of this empirical enquiry. Evidence suggests that managers of successful companies closely monitor intervention projects or programs. Additionally, managers continuously evaluate the linkage between the interventions and the financial performance of the company, and finally conduct an appraisal process to evaluate the advantage or outcomes of the intervention for further monetisation across the organisational boundary. For example, the process for Com C and Com D to obtain Capability Maturity Model (CMM) accreditation consists of programs, projects, temporary routines and a team: this can be considered as an intervention. Additionally, Com A undertook an intervention to upgrade the backend technology of its flagship website by building a project team who carefully identified the gap between the existing and desired capability, and then recruited new experienced personnel within the project team to carry out the transformation effectively. This transformation contributed significant advantage to the company as it allowed the rapid roll-out of new services whilst capitalising on the technological changes in the external environment.

Managerial attributes are able to influence the carrying out of reconfiguration through intervention, as suggested by the evidence. Managerial problem-solving skills, especially the ability to solve novel problems, aids managers in tackling problems new to the organisation (Brown & Eisenhardt 1997). Moreover, attention and awareness assist managers to keep an open mindset enabling them to find superior approaches or solutions during interventions. Managerial internal social capital proved useful in overcoming internal resistance, while relationships with the customers helped engage them in the change initiatives (Helfat & Peteraf 2015; Chan, Hou & Lin 2013; Teece, Rumelt, Dosi & Winter 1994). These attributes helped managers to expedite the commercialisation process resulting from the intervention. Finally, managerial experience and domain knowledge play a vital role through reducing decisions errors and using practical knowledge to solve problems, to

guide the organisation towards a successful completion of the intervention. These findings offer rich empirical insights on proposition 3.

Proposition 4

Contextual managerial ambidexterity assists organisations to obtain alignment of innovation and maintain operational performance that will aid organisational dynamic capabilities to result in positive consequences.

The ambidextrous roles of managers aid the organisation to utilise the slack resources and maintain operational performance, while using the transformation of organisational resources, capabilities, or routines to exploit the opportunities arising in the external environment. For example, managers at Com A and Com C utilise cross-functional slack resources, such as labour hours, to carry out the development of new products which kept the initiatives cost efficient and at the same time avoided any negative impact on ongoing operational performance. Therefore, the ambidextrous roles of managers assist the organisation to optimise the cost of carrying out the reconfiguration process through intervention, while maintaining operational performance. These findings offer rich empirical insights on proposition 4.

Proposition 5

Organisational structure and culture may play a role of either facilitator or inhibitor during building organisational dynamic capabilities.

Organisational structure and culture play a vital role in building dynamic capabilities. Research findings identify that organisational structure needs to be adjusted or transformed through institutionalising new functional units, or by changing the nature of the organisational structure as appropriate, to exploit the renewed resources and capabilities. For example, one of the companies that participated in the CMM accreditation program, institutionalised the CMM project team once the company achieved CMM level 5 accreditation. The project team was later integrated permanently within the organisational structure as a functional unit called the Engineering Process Group (EPG) to manage organisational processes following the CMM guidelines. On the other hand, the relatively poorly performing company (Com D), despite a strategic shift from a project-oriented company to a product-oriented company, kept a project matrix structure as a preferred organisational form which significantly constrained the ongoing commercialisation of the products that the company developed. Organisations need to build and nurture a dynamic culture that supports a collaborative environment to foster innovation (Gulanic &

Eisenhardt 2001) through knowledge sharing, appreciating failure and encouraging entrepreneurship within organisational boundaries. For example, strong encouragement from the senior management and a positive culture of appreciating innovative initiatives significantly influenced the entrepreneurial initiatives by managers at two successful companies (Com A and Com C). These findings offer rich empirical insights on proposition 5.

Proposition 6:

Dynamic capabilities may have a. positive or b. indirect, c. no direct d. negative consequences on organisational performance.

This research reveals the consequences of dynamic capabilities, including positive and negative impacts, that result indirectly, in line with the findings of Pavlou and Sawy (2011) that the impact of dynamic capabilities on firm performance is indirect. For example, Com C achieved significant improvement in its operational performance after integrating the CMM level 3 guidelines within the operational processes, a positive consequence. However, Com D faced increased operational costs after its CMM level 3 accreditation, due to the added ongoing documentation needed for the CMM framework. The managers miscommunicated the effectiveness of the CMM program to their top management to avoid disclosing their decision errors while running the CMM program. This resulted in negative and ambiguous consequences triggering the company to completely opt out of the CMM accreditation program and incurred monetary loss due to the withdrawal of resources from existing projects. Evidence shows that, in order to obtain positive outcomes of dynamic capabilities it is critical to pursue cost-effective approaches, utilise slack resources and maintain an ongoing monitoring and evaluation during transformation, so that as soon as the connection between transformation initiative and monetary return becomes remote it is possible to terminate the initiative to avoid any negative consequences. It should be noted here that this research did not aim to measure or investigate the organisational performance, rather the consequences of dynamic capabilities were the primary focus of this research during data collection. These findings offer rich empirical insights on proposition 6.

5.4 Summary

This research has investigated four IT companies within the context of empirical enquiry to understand and explicate the managerial roles in building dynamic capabilities using a case study methodology. Additionally, the impact of organisational factors such as organisational structure and culture, as well as the consequences of dynamic capabilities, is also revealed.

David Teece's dynamic capability framework (Teece 2009) is used as the key theoretical lens in this research. The case studies revealed that medium-sized ICT companies carry out intervention to transform their internal resources, capabilities and routines due to the absence of an ongoing reconfiguration processes, which are evident in large multinational companies.

A summary of the research findings within the context of empirical enquiry is as follow:

1. Role of managers in building dynamic capabilities:

Managerial experience in the present job is the most important human capital that enables managers to acquire a comprehensive business-domain knowledge and deep insight into the customers' requirements. A relationship with the customers is the most important social capital that equips managers with critical understanding about the appropriateness of various alternatives during the different stages of dynamic capabilities. Problem-solving skill needs to be applied in a creative manner to identify the solution to novel problems that may arise during intervention, with an aim to carry out the necessary transformation. Managerial ambidexterity is important to optimise resource utilisation to maintain alignment with innovative initiatives and operational performance.

2. Impact of internal factors in dynamic capability building:

Managers require organisational support and close engagement with top management to translate identified opportunities into positive outcomes. Organisational structure needs to facilitate engagement with the top management, and organisational culture should foster and nurture collaboration among employees for effective knowledge sharing and building a cooperative community. Additionally, organisational culture should foster entrepreneurship and innovation through embracing failure. Supportive organisational structures and culture are essential to effectively perform dynamic capabilities.

3. The consequences of dynamic capabilities:

The consequences of dynamic capabilities are indirect through organisational operational processes, resources, routines or engagement mechanisms with stakeholders. The positive performance outcomes of dynamic capabilities require appropriate managerial appraisal and monetisation initiatives, with a clearly established linkage between the actions undertaken in response to external stimuli and performance outcomes. Managers may create ambiguity when negative consequences are experience. Additionally, if a company does not exercise dynamic capabilities, as evident at Com B, it may result in negative

consequences, without this being realised by the stakeholder or the management. Finally, cost and time associated with the intervention process proved to be a critical factor to considered to safeguard financial performance.

This chapter outlined detailed case reports that offered rich insights for the empirical enquiries, guided by the propositions of the conceptual framework. Following the logic of replication, the dominant and emergent themes are discussed. Due to the small number of cases, the findings of this research would benefit further from a larger population of data. This next chapter will provide a detailed discussion explaining the findings, based on the extant literature.

Chapter 6: Discussion

This research investigated four ICT companies within the context of empirical enquiry to understand and explicate the managerial roles in building dynamic capabilities using a case study method. Additionally, insights on the impact of organisational factors such as organisational structure and culture, and the consequences of dynamic capabilities, are revealed through empirical investigation. David Teece's dynamic capability framework (Teece 2009) is used as the key theoretical lens in this research, along with dynamic managerial capability (Helfat & Peteraf 2015) and contextual managerial ambidexterity (Gibson & Birkinshaw 2004) to answer the research questions. It is revealed that medium-sized ICT companies carry out intervention to transform their internal resources and capabilities rather than maintaining an ongoing higher-order reconfiguration capability. The previous chapter outlined the case reports that offered rich insights to the empirical enquiry. This chapter will provide a detailed discussion to explain the findings of the research questions, based on extant literature and analysis of the evidences.

Figure 6.1: Outline of chapter 6
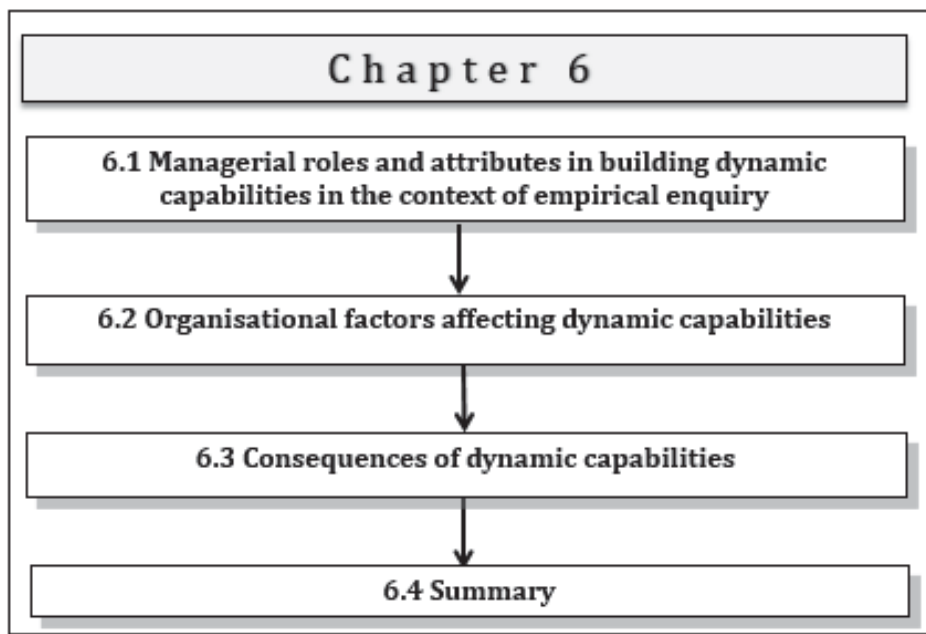
Chapter 6 is divided into five sections. Section 6.1 will offer a discussion on the nature of dynamic capabilities as evident based on the themes identified by the analysis. Section 6.2 will discuss the findings related to managerial roles in building dynamic capabilities, section 6.3 will discuss the impact of organisational factors, such as organisational structure and culture, on building dynamic capabilities and section 6.4 will outline a discussion on the

consequences of dynamic capabilities. Finally, section 6.5 will provide a summary on the discussion chapter.

Next, discussion on the nature of dynamic capabilities in the context of empirical enquiry is presented.

6.1 Nature of dynamic capabilities within the context of empirical enquiry

This research finds evidences of dynamic capabilities as both latent variables such as ability, capacity, or a facilitating device, as well as ingredients of processes, routines or behavioural patterns of organisations that shed light on scholarly disagreement regarding the nature of dynamic capabilities (Stefano, Peteraf & Verona 2009). In line with Stefano, Peteraf and Verona (2009) latent variables may include managerial cognitive ability, social capital and human capital, that actively perform or facilitate sensing, seizing and reconfiguring processes, and which become observable once they are performed, whereas organisational structure and culture can be considered as constituent elements that can be observed and traced. The empirical findings further echo the statement of Ambrosini and Bowman (2009) that to measure the application of dynamic capabilities on operational routines, it is important to complete the change process. Finally, as suggested by Helfat et al. (2007), this research connects the change process with operations, resources or routines through managerial action, as an intervention, that can be observed, measured and traced while in action.

The empirical findings reveal a common pattern of dynamic capabilities practices in the medium-sized ICT companies within the context of empirical enquiry. Medium-sized ICT companies in Bangladesh carry out intervention rather than maintaining ongoing reconfiguration due to the absence of the necessary underlying micro foundations suggested as necessary by Teece (2009): knowledge management, internal governance mechanisms, decision rules, co-specialisation, and availability of resources. The detailed process of carrying out interventions into operations, resources or routines, as outlined in the findings chapter, is aligned with Helfat and Peteraf (2009) and Zahra et al. (2006) that there is deliberate intent behind dynamic capabilities rather than luck or circumstance. It is revealed that interventions intend to address external stimuli, with an expected advantage as an outcome of the intervention. Depending on the nature of the external stimuli, and the scope and agenda of the intervention, the strategy, the underlying elements and nature of interventions are constructed. Strategy may include the detailed specifications of actions and tasks necessary to obtain the objectives of the intervention, while the underlying

elements may include the necessary resources, engagements, skills and capabilities necessary to carry out the intervention, and finally, the nature refers to the governance mechanism, duration, temporary routines etc. to carry out the interventions. The evidences of revealed interventions help to clarify the argument posed by Ambrosini and Bowman (2009) that dynamic capabilities carry specific intent to apply the resource base or operational routines of the organisation, and that this distinguishes changes initiated by dynamic capabilities from a strategic change initiative with change initiatives to operational process to resolve operational issues. Finally, the interventions require ongoing evaluation, appraisal, termination, and disintegration once the goal has been realised.

Interventions are carried out as programs, projects, and temporary routines that temporarily act as a higher-order capability before termination and reintegration of the assigned resources within the operational processes. Gulanic and Eisenhardt (2001, p.1229) identified such change initiatives within operational practice to pursue reconfiguration as 'charter change' where the charter plays the key function of realigning matches between resources across divisions and developing new combinations of product market context for an evolving market. Intervention may interrupt regular operational processes and routines due to a withdrawal of resources. Fulfilment of the purpose of dynamic intervention may lead to termination of the intervention and the engaged resources will be discharged, and temporary processes and operational routines will either institutionalised or discontinued. Brown and Eisenhardt (1997) consider the chartering process as an important dynamic capability that creates scope of revision of corporate architecture through integrating divisional resources with the charter. Finally, in accordance with the findings of Brown and Eisenhardt (1997), this study also reveals a semi-structured process of formulating strategy related to external stimuli and demonstrates a sequential step process to facilitate building critical capability, in accordance with the changes in the external environment. Recently, Teece (2017, p.4) suggests

> '*Dynamic capabilities are underpinned in part by organizational routines and processes, the gradual evolution of which is punctuated by non-routine managerial interventions.*'

During the interventions, managers may face novel problems that demand a more innovative approach than the approaches usually undertaken to deal with operational problems. These problems are perceived as arising due to variation in the external environment and possess scope to impact the outcomes of interventions, as well as the focal

organisation. This research reveals a simultaneously-maintained creative, configurative and market-based approach to address the dynamic problems that allows competing solutions to co-exist, creating scope to compare the cost and benefit and, at the same time, maintain openness for a better alternative solution. Innovative and cost-effective solutions for these problems are instrumental for the success of interventions as well as generating dynamic advantage. Prahalad and Mashelkar (2010) articulate the approach of Indian managers to sponsor organisational change through encouraging the inflow of ideas from a diverse range of sources, following a screening process, to obtain a perfect match between the organisational capability and performance outcome. This change initiative contains similar characteristics of intervention as described in this research.

Prahalad and Mashelkar (2010) suggest that a '*jugaad*' driven approach to sponsor organisational changes encourages inflow of ideas from a diverse range of sources, followed by a screening process to identify the perfect fit with the organisational capability and performance objective, such as low cost. Finally, the cost associated with the dynamic capabilities has a serious impact on the performance outcomes of the studied companies. Managers apply cloud sourcing and information platforms to solve small problems using simple design tools, whereas big problems are broken down into smaller problems to solve with a similar approach. In medium-sized ICT companies in Bangladesh, with limited functional units, intervention can support both an adaptive and proactive approach in addressing changes in the external environment, as evident based on the findings. The empirical findings suggest that managers need to leverage their social capital, human capital and cognitive ability to carry out the interventions effectively and efficiently with an ambidextrous mind-set. Organisational factors such as governance mechanisms and culture are important factors and, finally, the consequences of these interventions need to be realised as well as monetised.

6.2 Managerial roles and attributes in building dynamic capabilities in the context of empirical enquiry

In this section managerial roles at building dynamic capabilities will be discussed.

6.2.1 Critical elements of managerial attributes and roles
Managerial human capital

Managerial human capital consists of managerial skills set and knowledge accumulated personal and professional experience, and education, as suggested by Castanias and Helfat (2001). This research reveals that experience at the present workplace is the most important element that equips managers with the necessary expertise and domain

knowledge of the focal company and their customers' business, to promptly identify, assess and act on changes in the customers' preferences. Work experience in previous organisations does not offer significant value, in the studied context, because most interviewees previously worked in smaller companies than the present one. Quality of educational institution and a challenging study environment is an important factor that allows managers to acquire new knowledge in a more effective manner, however most of the interviewees suggest that there is a significant gap between the curriculum of IT graduate programs and professional practices which is echoed by Ahmed et al. (2016), therefore it is imperative to invest in developing human capital through training.

As evident from the collected data, all companies pursue training to offer their employees an opportunity to upgrade their skill, and, except at Com D, all the companies have their own training facilities. Riley, Michael, and Mahoney (2017) find empirical evidence that a firm's investment in training employees can positively influence its financial performance. However, investment in human capital is more effective when coupled with investment in the complementary assets of R&D, physical capital and advertising. Jain (2016) discusses based on the data of biotechnology industry of United States (US) which suggests that to renew adaptive potential an aging firm may consider 'learning by hiring' or hiring employees with distant knowledge followed by facilitating socialisation. This mechanism helps organisations renew their knowledge base and reduce rigidity which improves responsiveness to changes in the external environment. Morris, Alvarez, Barney and Molloy (2017) find that when an employee commits firm specific investment, the employee is more likely to commit similar investment in the future. This gives a positive indication about the employee's willingness to invest in development of human capital. Employing such personnel should therefore be an important consideration in staffing decisions.

Finally, the successful companies maintain a heterogenous pool of educational backgrounds, which proved to be valuable in harnessing innovative approaches in times when the company faced uncertainty or challenges from the external environment. This aligns with Hatum and Pittigrew (2004) who suggest that diversity and heterogeneity of the background and experience of managers acts as a catalyst for organisations to adjust to a competitive environment and perform related diversification (Doving & Gooderham 2008). Professional certification such as CISCO, CCNA, and project management, offers comprehensive understanding about the relevant area but does not guarantee successful application of the knowledge learnt during a dynamic environment, unless coupled with practical experience and expertise.

Managerial social capital

Social capital is the resources obtained by the individual that are embedded into their social network (Adler & Kwon 2002; Lin 2001). Evidences reveal the process that managers pursue to access critical resources from their social connections for the organisation. This study found that managerial social capital comprises the relationship with various stakeholders including customers, internal employees, and online networks, and that these carry greater importance than relationships with past colleagues, suppliers and competitors. Middle managers do not possess relationships with government officials within the context of the empirical enquiry, contrary to Peng and Luo (2000) who found managers, in emerging market such as China, often engage with government officials which contributes to superior organisational performance. Except for a few managers at Com C, boundary-spanning managers, with rich social capital from a diverse range of personnel from a diverse range of industries, are not evident in this study among the middle managers. Additionally, in contrast to the findings of Acquaah (2007), based on the empirical study in Africa, that managers maintain ties with a diverse range of personal contacts – customers, suppliers, competitors, government and bureaucratic organisations, politicians, trade or employee associations, regulatory bodies, community institutions and organisations – in the studied context middle managers primarily maintain a stronger relationship with their customers, internal colleagues and online social contacts, in pursuing resources to address changes in the external environment.

This phenomenon may be due to the fact that middle managers have to maintain a strong engagement with the operational problem and the problem offers symptoms that demand additional effort. This means that the managers engage with the top management for support and resources and, at the same time, top management maintain a keen attention to keep these managers engaged with the operational duties, and any deviation from the core business processes is not encouraged. A number of studies find a positive relationship between a manager's external network and positive firm performance during change, through idea generation and implementation (Moran 2005), knowledge creation and new product and service development, new products and services introduced (Smith, Collins & Clark 2005), that results in increased sales and profitability (Davidsson & Honig, 2003). These studies obtained this result controlling for managerial education and experience (Helfat & Martin 2015), however, recently, Salvato and Vassolo (2017, p.1) identify interpersonal interactions and dialogues as a key mechanism of creation of dynamic capabilities with '*effortful social accomplishments emerging from individual employees' capacity to leverage interpersonal relationships conducive to productive dialogue'.*

Managerial cognitive ability

Attention and awareness, and problem-solving skills are found to be the most vital part of cognitive ability to receive and contemplate external stimuli to facilitate organisational-level sensing and seizing, while problem solving skills and creativity play a critical role when carrying out interventions, which is consistent with the suggestion of Helfat and Peteraf (2012). Shepherd, Mcmullen and Ocasio (2017) confirm that exploiting business opportunities is critical for competitive advantage and find that how and where top managers allocate their attention significantly affects the identification and exploitation of opportunities.

Next, the findings of managerial roles in managing dynamic capabilities will be discussed.

6.2.2 Managerial roles in building dynamic capabilities

Distinctive managerial attributes and roles are critical to effectively address the variation in the external environment during a rapidly changing external environment. Managerial cognitive ability, social capital and human capital, and ambidextrous behaviours, have a critical impact in building dynamic capabilities such as sensing, seizing and reconfiguring capabilities (Helfat & Peteraf 2015) as evident in the empirical findings. Next, the impact of managerial roles and attributes in dynamic capabilities will be discussed, based on the findings and literature.

Sensing capabilities
Role of human capital in building sensing capabilities

Evidence suggests that long work experience in the focal company allows the managers to gain deeper understanding about the business-domain knowledge, technical scope and operational processes that play a valuable role in sensing. This finding is consistent with Sambamurthy, Bharadwaj and Grover (2003), who state that experience enables managers to anticipate potential emerging technologies and competitive actions, and Kor and Mesko (2013) who suggest that managerial skill-set and specialised knowledge play a positive role in perceiving, interpreting and evaluating the specific business environment. Within the context of empirical enquiry, long tenure allows managers to develop a stronger relationship and engagement with customers and this allows a rich domain knowledge of customers' business which plays a valuable role in acquiring insights into the customers' perspective of potential scope for new services. Holzweber et al. (2012) found a similar tendency in leading Indian companies to maintain an intimate connection with the client's business processes. Finally, in line with Kor and Mesko (2013), experienced managers can

convert the external stimuli into strategic priority through their rich understanding of the existing resources and capabilities, and customers' requirements.

Role of social capital in building sensing capabilities

The findings reveal that the most important element of social capital is the relationship with the customer. Intimate relationships with the customer over a long period of time assists managers to identify changes of customer preference in an accurate manner. Moreover, managers with long-term and intimate relationships with customers may identify the preferred customers' changes more quickly and accurately, contributing to aiding sensing capabilities. It is found that managers with long-term relationships with the customers are also able to craft more effective mechanisms to obtain valuable information from the customers, which is consistent with Soh (2003) who suggested the relationship with customers provides opportunities to learn new methods of obtaining customer demands and to receive strategic information (Borgatti & Cross 2003).

Managers obtain valuable information regarding technological changes from their colleagues through informal conversion or group discussion. Mintzberg (2009) highlights informal conversation with friends or colleagues, within or outside of the organisational boundary, assist managers to capture appropriate internal and external stimuli, as well as to obtain more insights to generate logical outcomes. The research reveals insights into exploiting online-based social capital in creating organisational advantage during a rapidly changing external environment. Managers are less active in the LinkedIn network but are more active on, and prefer to use, the social network site Facebook. Detailed questioning revealed that managers are not fully aware of the scope of value creation through exploiting online social networks, beyond the comfort zone of their own social connections. Managers preferred to remain within their existing social network of friends and past colleagues rather than attempting to extend the network among local and global industry experts.

Social capital can be a source of novel information (Luo 2003), new information related to superior performance (Pedersen & Lyles 2008) and enable firms to act on identified opportunities (Dow 2006). Data suggests that LinkedIn is considered as a trusted professional social media site yet very few senior managers engaged with external experts through this forum, although it would be a quicker way to do so than a more formal procedural approach. However, middle managers within the context of empirical enquiry, perceive LinkedIn as professional network to explore professional opportunities through connecting with senior managers who cannot be contacted otherwise. Middle managers being members of different technology-focused groups on Facebook and online forums,

participate in discussions with experts from diverse locations and often receive valuable insights about alternative solutions to problems encountered. Among all online platforms, Stack Overflow is rigorously used by all the managers, and solutions obtained from this forum are identified as effective. Similarly, some online forums managed by vendors also proved to be useful. However, informants also mentioned that responses from online sources may require individual judgment and expertise to select the most appropriate solution.

An online forum of an international competitor provided an opportunity to explore services offered by companies in different countries, that may aid sensing capability. Despite this international instance, relationships with local competitors are rarely mentioned. One manager at the deviant case study, Com D, stated that they used to have a CTO who always could bring in people through his social contacts to tackle problems that existing employees could not handle. However, there is no evidence of the other companies leveraging social contacts to address internal issues, rather they pursued enduring experts, training institutions or considered recruitment of experienced personal, when they failed to address operational issues that may arise during an intervention, or due to other internal or external factors.

Role of cognitive ability in building sensing capabilities

Managerial cognition plays an important role in building sensing capabilities. It is revealed that, through maintaining awareness and attention, managers identify any new opportunities arising due to technical changes or other environmental changes during their interactions with their colleagues or other peer network. Attention and awareness also assist managers to capture changes in the customers' preferences through interactions. Literature also suggest that during rapidly changing customers' preferences, and technological changes, managers need to perform cognitive learning (Zollo & Winter 1999). Teece (2007) reaffirms that individual cognitive capacities significantly influence the scope of opportunity discovery. Finally, Levine, Bernard and Nagel (2017) suggest that strategic intelligence is a critical managerial cognitive ability that assists managers to anticipate competitors' behaviour and construct appropriate responses with effective pricing strategies. Such competitive responses may eventually result in superior firm performance and competitive advantage.

Seizing

Experience and rich business-domain knowledge play a valuable role in identifying appropriate decisions, aiding the seizing process as evident across all four companies. Managers mention that their relationship with the customer assists in availing critical opportunity to assess the viability of the identified scope under consideration. Furthermore, rich internal social capital positively contributes to human capital development, as well as reducing errors in decision making (Luthans & Youssef 2004). It is evident that at Com A and Com B middle managers' engagement with the top management plays a critical role in pursuing sponsorship of senior management for an innovative initiative, which is consistent with Zhao and Tang (2013) that managerial ties with top management can facilitate business model innovation and assist in convincing stakeholders of the new business logic and business models. Managers at Com C creatively assess the scope of mobile application development, and identified MongoDB for further consideration, although the technology did not directly relate to their existing product and services. However, managers at Com B and Com A reject any possibility for MongoDB as it does match with their existing products and services. A possible explanation could be, as Kor and Mesko (2013) suggest, that the managerial ability to construct perception and formulate meaningful interpretation about the external environment helps them to determine feasible goals and actions. Finally, attention and awareness indirectly influence the seizing process through allowing managers to search for a cost-effective approach to carry out the intervention.

Role of managerial human capital in building reconfiguring capability

Experience is useful during intervention to identity cost-effective solutions. Qian, Agarwal and Hoetker (2012) mention that commitment becomes very important in cases of building new capability, when an organisation lacks pre-existing experience. To pursue an organisational-level renewal program: Com A recruits experienced personnel with expertise in the chosen technology; Com B engages expert trainers; and Com C relies on its internal training, takes expert opinion, or conducts focus group discussion. Indian companies do not hesitate to recruit talented skilled personnel from any part of the world to acquire capabilities to manage complex business processes (Garud & Kamaraswami 2005). Heterogeneity and continuous development of human capital play a positive role in applying dynamic capabilities to internal development that results in related diversification of service offerings in Norwegian small accounting companies (Doving & Gooderham 2008). The capability gap between the desired and existing skill level of an employee can be measured when the company has a mechanism to define and measure all its resources and capabilities, as evident at Com C. However, the remaining three companies do not have this

capacity to measure the skill of their employees and the capability gap. The remaining companies rely on managerial judgment to understand the learning requirements and outcomes of their employees. This absence constraints these companies in pursuing learning new technology in an effective and efficient manner. As evident in the case of Com B, which relied on its learning mechanism, and is facing tremendous challenges upgrading their key product into C# net programming language because their learning mechanism is significantly time consuming and the employees are already heavily occupied with the complex and evolving business-domain knowledge of the customer.

Zollo and Winter (1999), therefore, suggest continuous re-evaluation, reorientation and recombination of learning routines to accommodate rapid technological changes in a highly competitive environment. Cohen and Levinthal (1990) explain the problem of core rigidities that Com B may experience if it fails to reconfigure organisational learning patterns. While long experience equips managers at Com B with rich business-domain knowledge, it also hinders the ability to learn new technology. Com B does not have a comprehensive knowledge-management infrastructure, thus converting tacit knowledge into explicit knowledge through codification may facilitate the internal capability-development process, however, this also involves direct costs such as time, resources and managerial attention, and indirect costs such as increased organisational inertia against formalisation (Zollo & Winter 1999).

Project management skill is one of the critical skills that enables managers to manage project portfolios successfully. To optimise a project's performance, managers need to deploy sound knowledge of the software development life cycle, or software engineering principles, coupled with necessary project management skills. Collected data suggests that managers in ICT companies in the studied context seriously lack a combination of these two skills. In the light of this, it is important to consider the idea of dynamic project portfolio management (Killen & Hurt 2010) to effectively maintain internal capability of effective and efficient project completion, considering the changes in the external environment.

Role of social capital in building reconfiguring capability

Relationships with customers and internal colleagues are the most valuable, as identified within the context of empirical enquiry. Insights obtained from the data shows that interaction with customers plays a valuable role in taking appropriate action that many satisfy customer needs. Com B maintained an informal process of responding to the change request of the customers, Com A gradually adopted a process in attending to change requests of the customers, and Com C developed a procedural approach to respond to

customers' change request. Moreover, managers may leverage their customers' engagement to receive valuable feedback about proposed actions to further refine proposed decisions during intervention stage. Finally, strong customer relationships may allow managers to enrol customers in the intervention process at an early stage to maintain ongoing viability of the overall intervention process incorporating customers' perspectives. Managers' internal social capital plays a critical role in carrying out transformative initiatives, as noted by Chan, Hou and Lin (2013) who found that relationships at different management levels assist in overcoming barriers to change. Integrating both external and internal knowledge (Teece 2007), creation of knowledge-sharing practices, learning mechanisms, and matured routines of knowledge integration are valuable for business performance (Chesbrough 2003; Teece 2007).

Role of cognitive ability in building reconfiguring capability

Attention and awareness influence search initiatives undertaken by managers to identify cost-efficient solutions for the problems arising during the intervention process. Some problems may require a creative approach to produce innovative or improvised solutions for novel problems. These elements capture specific aspects of managerial cognition that can be leveraged for organisational dynamic capabilities. Zollo and Winter (1999) suggest that to create a range of options, and explore innovative ideas, managerial cognitive ability plays a significant role, and behavioural mechanisms play critical roles in integrating and replicating new tasks within current routines, through overcoming the resistance to change (Helfat & Peteraf 2012).

During the reconfiguration process, managers often face novel problems with no prior individual and organisational experience. If the company delves into a fully innovative business initiative, that problem may be completely novel within the industry, therefore managers must produce innovative solutions and implement the solutions to address the problem. This research distinguishes the problems arising during dynamic capabilities building than the operational problems that originate from the operational routines. Alternative solutions for operational problems can be produced through experience or industry best practices or previous projects. Typical operational problems in the ICT companies studied are managing projects on time and on budget, and problems during dynamic capabilities building arise beyond the organisational boundary such as the shortage of electricity experienced by Com B at the time of their automation project at Bank Y that may require attention and awareness to carry out comprehensive search effort and creativity to develop novel solutions.

Contextual managerial ambidexterity

The contextual ambidexterity view advocates managers deliver maximum value to the current customers of their functional area while maintaining a keen attention on the external environment for any changes requiring immediate response (Prasertsakul 2013). Managerial ambidexterity plays a key role in obtaining balance between organisational exploration and exploitation initiatives. Data collected in this research obtained valuable insight on how managers perform alignment and adaptability through utilising organisational slack resources. Lavie, Stettner and Tushman (2010) found that experience, risk averse behaviour and performance feedback, are key ingredients to perform a balance between exploration and exploitation. Collected data from Com C and Com D reveals that project managers need to continuously upgrade the skills of their team members to prepare for future projects. A request from a project manager for a team member to learn or develop a new skill, for future potential benefit, without providing proper direction, is considered stressful by the team member. Without proper guidelines and methodology to develop a skill in the advised technology, the team member may struggle to identify an effective and efficient way to learn.

Operational performance may be affected adversely if team members must meet their learning objective outside regular working hours. In a successful company, such as Com C, a project manager may attain the future learning objective through carefully utilising the slack time with a new project that involves application of intended new technology. This practice not only gives the team members some variation in work tasks but also has the potential to scope new product development, which may be commercially valuable. The project managers at Com C exemplify this with the mobile app that was developed through the team members' collective effort using slack time to learn the mobile application development, which was completely novel to the company. After the development of the mobile app, top management appreciated the product and commercialised it, with very good customer response. Such practice can be an effective mechanism to exploit the organisational slack into a productive operational routine, with new skill development which delivers ambidextrous performance.

Alignment and adaptation of current operational processes with the emerging technologies is critical to pursuing contextual ambidexterity (Prasertsakul 2013). At the deviant case, Com D, the top management do not follow a path-dependent approach and always attempt to build capability or products without an alignment with existing business. This practice restraints the company from achieving the advantage of lowering operational costs through achieving maturity in a certain business domain. On the other hand, the top management of

Com C periodically assesses the alignment of their new projects with existing capabilities and business-domain specialisation. At the same time, the financial viability of the entrepreneurial projects is continuously monitored and assessed. This practice is also evident at Com A where the managers pay keen attention to the financial viability of any ongoing projects. However, managers at Com A often reject projects that are even slightly beyond their existing capacity, which indicates a risk-averse tendency, whereas Com C top management embrace the risk of accepting a project that is slightly beyond the existing or past track record. Com C's ability to accept the risk can be explained through its ability to measure the capability gap and identify the required resources and skills to attain the desired performance. The remaining company do not have an information architecture with appropriate information to measure the capability gap that results in risk-adverse behaviour.

A manager from Com C exemplifies that a sound combination of both project management and software engineering knowledge enables him to identify innovative approaches and alternative methodologies whenever he faces challenges such as reduced probability of on-time and on-budget completion. He demonstrated this with an example that when one of his projects was suffering from a very low probability, he changed from a waterfall development model to rapid prototyping model that not only improved the probability of completion on time and on budget but, in fact, helped the project to finish earlier than the deadline. However, without having sufficient exposure to the various software development methodologies, managers with project management skills may pursue efficiency through assigning extra workload to the team members, resulting dissatisfaction and lower productivity.

Finally, top management must attain ambidexterity through managing the business domain. They must make appropriate decisions regarding moving into a new domain that will not hurt the profitability of the company at the present, but that will become profitable in the future. Additionally, top management must provide clear guidance to middle management on the trajectory of future capability development. If the top management does not diversify the business, new capability will eventually become extinct, as is evident in the findings on Com D. At Com D, the top management does not possess adequate ambidexterity to maintain the balance between exploration and exploitation. The company faces sustainable financial loss, and one of the key reasons behind this phenomenon is that top management quickly moves into a new opportunity that adversely affects existing projects.

Next, the consequences of dynamic capabilities will be discussed.

6.3 Organisational factors affecting dynamic capabilities

Organisational structure and culture are one of the key organisational factors that possess capacity to affect dynamic capabilities building within the organisational boundary. The findings here reveal that organisational structure should be considered for necessary adjustment or transformation to effectively obtain the advantage of the intervention within the organisational boundary. Similarly, a supportive organisational culture is instrumental to nurture dynamic capabilities within the organisational boundary. This section will discuss the findings related to organisational structure and culture reflecting the findings of the extant literature.

6.3.1 Organisational structure

Absence of structural adjustment after a strategic shift is a major constraint to realising the benefit of the reconfiguration. Eisenhardt and Martin (2000) recommend maintaining modularity within the organisational structure to maintain capability to successful transform. Com A is an example of adopting an appropriate organisational structural for attaining sustainable organisational performance in harnessing the advantage of dynamic capabilities practices. Holzweber et al. (2012) suggest that to adopt a new organisational structure or process, organisations may need to perform innovation within business processes or carry out administrative innovation.

Holzweber et al. (2012) echo this, stating that to initiate innovation within the business processes, administrative innovation may be necessary to allow the adoption of a new structure and processes. For example, while Com D experienced several strategic shifts, the company has neither rearranged their organisational structure nor accommodated or initiated any changes within their business processes, resulting in most of their strategic shifts being ineffective. More specifically, the company once transformed itself as a product-based company from a project-oriented company, however it continued with the project organisational structure, leaving functional units to continue the further development and commercialisation of those products. Both Com A and Com C adopted a product division structure which allows the managers to focus on their own products and services, make rapid decisions and continue ongoing development.

In suggesting the appropriate organisational structure during environmental dynamism, Teece (2009) insists in allowing greater autonomy to the managers in a decentralised organisational structure, however Hatum and Pettigrew (2004) found that, in an emerging market, namely Argentina, companies with a centralised structure outperformed in conducting innovative activities. The findings in this research suggest that a

decentralisation approach delivers effective results when middle managers make decisions with close interaction with the top management, and integrate the suggestions provided by the top management who are more experienced and risk-averse in the studied context. It is revealed that, regardless of the nature of organisational structure, middle managers' engagement with top management plays a critical role in the practice of dynamic capabilities. In the deviant case, Com D, as top management resides abroad, middle managers get less opportunity to engage with the top management to consult on any entrepreneurial activities or initiatives necessary to respond to changes in the external environment; this hindered dynamic capability building in the company.

The mechanisms for managerial engagement with different levels also need to be designed carefully to support dynamic purposeful interventions. Evidence confirms that middle managers' intimate engagement with the operational processes, and deep knowledge about the functional capabilities and resources of the company, allows them to identify and experience the scope and nature of environmental change within the company more intimately than the top management. However, middle management certainly possesses less exposure to uncertain and complex decision-making situations within the context of this empirical enquiry. The middle managers studied in this research are project managers, a head of the product division and a senior solution architect, and attained their positions through their track record of sound technical capabilities, therefore this middle management has limited exposure to performing strategic roles in the rapidly changing external environment. Excessive top management engagement may negatively affect a middle manager to become a competent strategic decision-maker, and unsupervised authority may result, potentially, in avoidable bias or decision errors. Therefore, top management should maintain a balance between engagement and authority delegation to middle managers to nurture them appropriately for the rapidly changing environment.

The top management of these studied firms are not proactive in expanding their market base to attain growth, rather there is a clear stagnation of strategic diversification resulting in a lack of organisational growth. This creates serious obstacles for top management to accommodate the high performing middle managers and promote them within the organisational structure, as there is a significant gap within the organisational structure. Bennett and Levinthal (2017) suggest that through creating opportunities for promotion, firms can motivate employees to try harder which can generate economic advantage through pursuing rapid growth. Finally, Bennett and Levinthal (2017, p.2005) suggest "growing quickly can credibly promise to reward their most innovative employees with promotions" while established or more slowly growing organisations have fewer such

opportunities, giving employees less incentive to go   above and beyond. This can mean rapid growth can reinforce a firm's competitive advantage.

Top management of most of the organisations (except Com B) are found to be conservative in defending their market positions, rather than taking risks. This is evident because these companies have existed for more than 15 to 20 years but have remained organisations with less than 200 core employees, if the computer operators that work on the client side are not included. The top management pointed out, on the other hand, that the key cause for inability to grow is, *'we do not have dependable middle managers … we still need to engage in the detail of the operations every day'* (CEO Com A). Once a manager has gained considerable experience, there is significant turnover to multinational, overseas or client-side companies offering higher salaries. *'Because we cannot afford to offer that much, our market is small'* (CEO of Com C)*.* However, this view is challenged by the middle managers with one pointing out: *'top management do not want middle [to] grow the business and there is limited opportunity for the future'* (Com D, 2017)*.* This is an important issue in the relationship between top management and middle management which requires serious attention within the context of empirical enquiry. As Teece (2009) points out, incentive systems are a critical component, along with organisational structure, decision rules and autonomy of the managers to foster entrepreneurial activities.

6.3.2 Organisational culture

Galunic and Eisenhardt (2001) advocate creating dynamic communities by linking architectural modularity through combining economic and social logic to co-evolve with changes in a high-paced technological marketplace. The authors further recommend fostering and nurturing an environment that helps the weak performers as well as rewards high preforming performers in a fair manner. The findings also suggest that a collaborative and supportive community within an organisation, such as in Com A, Com B and Com C, encourages organisational members to accept challenges and risk, and helps them develop a mindset prepared to embrace failures. The organisation needs to establish a supportive culture to encourage effective knowledge sharing among employees. As Brahm, Tarzijan and Singer (2017) reveal, when employees learn from their own and other's experience, operational friction reduces in an environment of dissimilar products. Com D primarily operates in project-based business practice environment that exposes employees to recent technologies and knowledge, thus knowledge sharing is critical to obtain smooth operational performance. Moreover, to encourage entrepreneurial initiatives, it is also important to appreciate success as well as failure in order to create a supportive culture for innovation. Appropriate organisational culture can positively impact in dynamic

capabilities and, alternatively, non-collaborative and non-supportive cultures may negatively impact the dynamic-capabilities management processes. Finally, in line with O'Reilly and Tushman (2008), it is critical to allocate resources supporting a culture of openness to build competitive intelligence that may enable an organisation to address changes in the external environment.

6.4 Consequences of dynamic capabilities

Sustainable competitive advantage is one of the key strategic imperatives in pursuing dynamic capabilities (Teece 2009). Eisenhardt and Martin (2000) suggest that to sustain competitive advantage firms need to continuously create temporary advantage. This temporary advantage can be in form of advantage on the operational unit (Helfat et al. 2007), strategic advantage as competitive advantage (Martin 2011), stakeholder advantage, as the evidence suggests that dynamic capabilities result in reduced operational costs for the customer (Holzweber et al. 2012), and environmental advantage through creating favourable environmental conditions such as increased market demand (Martin 2011). Firstly, if dynamic capability is applied on the operational unit, operational units may benefit through improved operational performance, effectiveness, or efficiency gained directly or indirectly, as evident in the case of Com C when the company went through the CMM accreditation process. Pavlu and Sawy (2011) validate that dynamic capabilities have an effect on the organisational performance in an indirect manner which can be obtained through reconfiguration of operational capabilities with superior fitness with the external environment. Technical fitness (Helfat et al. 2007; Martin 2011), and improved operational performance (Agarwal & Selen 2009) are considered an advantage realised through operational units due to the application of dynamic capabilities. Moreover, after CMM accreditation Com C could perform its projects in a more effective and efficient manner which can be considered as evolutionary fitness as it equipped the firm with superior performance through successful task completion. Strategic advantage can be realised through advantage gained over competitors. Finally, stakeholder advantage refers to the advantage that dynamic capabilities may bring to the internal and external stakeholders including employees, shareholder, customer and other stakeholders.

Zollo, Minoja and Coda (2017, p. 11) define customer advantage as "the degree to which the needs of the firm's customers are comparatively satisfied through its offer vis-à-vis the offer of competitors present on the same product markets." The advantage refers to the value that a firm delivers to its customers in excess of the price the customers pay compared to the value for money produced by the competitors (Forbis and Mehta, 1981; Ghemawat,

1991). On the other hand, stakeholder (other than customers) advantage refers to the level to which stakeholders are satisfied by a firm's engagement proposals or prospects in comparison to those offered by other firms in the same resource market, or the benefits they receive with respect to their opportunity costs (Harrison & Wicks, 2013). Zott, Amit and Massa (2011) suggest that it is important to institutionalise novel business models to appreciate the value generated by the focal firm in association with external partners. Finally, Zollo, Minoja and Coda (2017, p. 12) state

"*Hence, keeping the notions of customer and stakeholder advantage separate might facilitate future theoretical and empirical developments, helping scholars to focus, for instance, on potential trade-offs or positive synergies among the different strategic choices considered, as they might impact in significantly different ways product and factor markets.*"

According to the insight offered by the managers of successful companies in this research, to appropriately manage dynamic advantage, it is important to undertake a systematic approach to generate, recognise, realise and monetise the generated dynamic advantage across the organisational boundary. The potential scope of dynamic advantage needs to be articulated within the agenda of intervention. The linkage of advantage generated through dynamic capabilities and the monetisation process should be clearly established to address the financial viability of the intervention to pursue any reconfiguration. This linkage requires careful assessment throughout the intervention to avoid unexpected variation and may insist on early termination of the intervention if the linkage becomes weak or remote.

It is revealed, from the findings, that excessive proactive behaviour at the top management level may adversely affect the financial performance of the company. It may occur if there are frequent changes at the top management level due to poor financial performance, as evident at Com D. New top management often changes the initiatives taken by the previous management and attempts to shift the company in a new direction without proper collaborative discussion with the rest of the organisational members, and this may result in loss of efficiency in existing projects due to withdrawal or deviation of critical resources from the ongoing projects, resulting financial distress. Tarafdar and Gordon (2007 p.372) therefore, recommend ICT service companies become ambidextrous through developing an ability to identify the strategic importance of innovation through maintaining long-term evaluation criteria. The authors further found that top management applies intuitive criteria for approving innovative projects and possesses a long-term goal to remain at the edge of technological development. Top management needs to give sufficient time to realise the benefit from a new capability development initiative. At the same time, exploration for

the future should not compromise the efficiency of the present. Conflicts in the top management team also can contribute to inferior performance of interventions, as evident at Com D.

Collected data suggests that, in a rapidly changing business environment, managers demonstrate opportunity and advantage-seeking behaviour to create dynamic rent. However, if the solutions for the problems identified during interventions, and the cost of carrying out the intervention, outweigh the value of dynamic rent the process of sensing an opportunity, seizing the opportunity and undertaking interventions may outweigh the delivered value, as evident at Com D. Moreover, resources and time utilisation during this response time will also incur additional cost. Therefore, Ambrosini and Bowman (2009) recommend formulating strategic courses of action in a cautious manner to select appropriate choices during environmental uncertainty. Finally, Rahmandad and Reppenning (2016), in trying to build a simulation-based theory, explicate that erosion of a firm's capability may occur in situations the authors call an 'adaptation trap' where managers intentionally search locally for the optimal workload balance. This eventually overloads the organisation, however, and can lead to an erosion of its capability. The authors refer to an adaptation trap as a set of dynamics that produce a vicious cycle of diminishing productivity of the development team.

Based on the collected data, it is identified that project-based companies (Com C, Com D) pay keen attention to learning emerging technologies anticipating benefit in technological choice in future projects. Dynamic capabilities often do not produce an immediate impact on the revenue, as the existing customers need to appreciate new technologies as compared to the potential advantage. As affirmed by Teece (2007), the return of value from a certain technology may not only depend on the possession of technologies and their products, but also on the technology strategies of the market participants. On the other hand, at the early stage of a new technology the cost and risk of development is usually higher due to unavailability of experienced personnel. Therefore, product-based companies (Com A, Com B) follow an adaptive approach through carefully assessing the technological gap and capability gap and wait for the appropriate time for transition to a new technology as a cost effective and least-risk option. This research reveals this approach in Com A and Com B. This finding is also in line with Zollo, Minoja and Coda (2017) who state that firms develop adaptive change capabilities to effectively match its products to the needs of customers in a reference marketplace and may redeploy these capabilities to achieve superior alignment with the needs of other stakeholders of the market. The authors warn that performing these

processes with low levels of intentionality may result in pre-adaptation to unexpected changes in stakeholder expectations or environmental conditions.

The negative consequences of dynamic capabilities demand more discussion. Important insights have been revealed regarding the negative consequences of dynamic capabilities. First, managers should maintain the linkage between the original external stimuli and the intervention initiatives. As a result, once the intervention is completed the original intent can be accomplished. Secondly, transformation initiatives should not disrupt the ongoing operational performance. At the same time, firms need to be careful when introducing new products or categories in response to environmental changes, as this initiative may adversely affect the operational performance in short term. As Brahm, Tarzijan and Singer (2017, p. 2121) state:

"*When the firm offers few additional categories, productivity grows, but as the number of categories rises, the costs of executing the operational routines increase rapidly and productivity falls. The negative effect on productivity increases if the added product category is more dissimilar to previous ones and decreases with learning from operational experience.*" On the other hand, firms may face negative consequences through building a new capability. As Hodgkinson and Healey (2011) suggest, firms may incur excessive costs building new capability that may not generate an equally significant financial return.

Thirdly, managers need to maintain adequate transparency during the transformation processes to ensure they make objective decisions and select appropriate solutions for any unforeseen problems. Com D exhibits ambiguous consequences as outlined by Vermeulen (2017) that managers may not able to identify their poor operational practices due to ambiguity; in this case, the middle managers purposefully create this ambiguity. Moreover, Helfat and Peteraf (2011, p. 98) suggest that "*a firm might not use a dynamic capability that it possesses, the dynamic capability may have poor technical fitness*". Thirdly, managers need to maintain adequate transparency during the transformation processes to make objective decisions to select the most appropriate solution for any unforeseen problems. Com D exhibits ambiguous consequences as outlined by Vermeulen (2017) that managers may not able to identify their poor operational practices due to ambiguity; in this case, the middle managers purposefully create this ambiguity. Moreover, Helfat and Peteraf (2011, p. 98) suggest that "a firm might not use a dynamic capability that it possesses, the dynamic capability may have poor technical fitness, and even with high technical fitness, a dynamic capability still may not lead to high firm performance in terms of evolutionary fitness." Finally, the transformation initiative should be comprehensively examined to identify the

benefit and subsequently monetise the generated benefit supported by positive culture and appropriate organisational structure to avoid experiencing negative consequences.

Next, the conclusion chapter will be presented.

Chapter 7: Conclusion

This chapter provides a summary of this research and is structured into three sections. Section 7.1 provides an overview of the research findings, section 7.2 outlines the research contribution, limitations, and future research and section 7.3 offers the concluding remarks of this study.

Figure 7.1: Outline of chapter 7
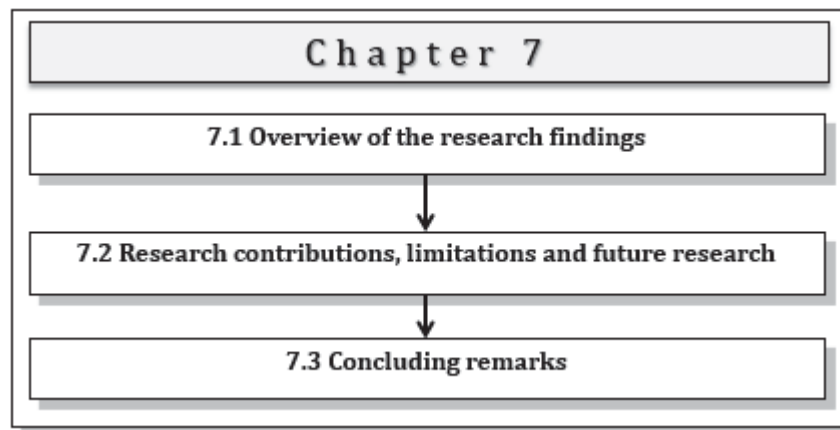
7.1 Overview of the research thesis

This thesis has investigated the managerial roles in managing dynamic capabilities in ICT companies of Bangladesh. A case study method was applied to gain rich insights to answer the research questions of this study. Semi-structured interviews of managers were analysed to formulate four case studies that provided an understanding about the current managerial role in building dynamic capabilities in the studied context. This research has explicated how managers address external changes such as technological changes, changes in customer preferences, and competitive actions, from the theoretical lens of the Dynamic Capability View (DCV).

Chapter 2 provided detailed discussion of the theoretical underpinning of this study through examining different dominant themes within the DCV. The beginning sections of the chapter outlined the rationale for selecting the DCV as a theoretical lens, the underlying theories of the DCV, a critique of the resource-based view, characteristics of a rapidly changing business environment, and discussion on the prominent definitions of dynamic capabilities, along with related topics. The remaining part of chapter 2 reviewed the literature on the DCV with discussion on four dominant themes within this theoretical framework, as below.

First, the dynamic resource-based view (Eisenhardt & Martin 2000) focuses on the resource configuration of firm to address changes in the external environment. This perspective considers a firm's ability to assimilate resource configuration, considering changes in the business environment as dynamic capabilities, rejects the existence of sustainable competitive advantage in the rapidly changing external environment, and recommends creating a sequence of temporary advantage, in an ongoing basis, to sustain competitive advantage.

Secondly, the learning perspective (Zollo & Winter 2003) emphasises the firm's ability to reorient the learning process in accordance with changes in the external business environment. This perspective advocates that firms need to reconfigure their learning mechanisms, considering changes in the external environment.

Thirdly, the ambidexterity view (Tushman & O'Reily 2005) focuses on achieving a balance between explorative and exploitative activities of a firm. This stream of literature aims to identify the appropriate organisational structure that can deliver the optimum balance between these two activities, with inconclusive answers. A rich literature has examined this research question and later scholars consider ambidexterity as a dynamic capability to emphasise the importance of pursuing reconfiguration initiatives without compromising operational performance.

Finally, David Teece's highly-cited framework of the Dynamic Capability View encompasses three key organisational dynamic capabilities, namely sensing, seizing and reconfiguring and these are discussed, along with their relevant micro foundations, to address changes in the external environment (Teece 2009). Teece (2009) places an emphasis on managerial entrepreneurship to pursue the necessary reconfiguration of resources and capabilities in a decentralised organisational structure and recommends dynamic capabilities as necessary organisational capabilities to sustain competitive advantage and avoid zero profit scenarios.

A discussion on the consequences of dynamic capabilities based on the literature is presented to analyse the current debates regarding the relationship between dynamic capabilities and organisational performance. Chapter 2 ends with explicating research gaps in this theoretical perspective from the literature.

Chapter 3 presented a critical review of the managerial roles in building dynamic capabilities based on the existing literature to develop a conceptual framework to aid the empirical investigation. This chapter critically discussed the notions of 'dynamic managerial

capability' (Adner & Helfat 2003; Helfat & Peteraf 2015, Helfat & Martin, 2015) regarding David Teece's Dynamic Capability View and 'contextual managerial ambidexterity' (Gibson & Birkinshaw 2004) to develop a conceptual framework on the managerial roles in managing dynamic capabilities. The notion of 'dynamic managerial capability' (Adner & Helfat 2003; Helfat & Peteraf 2015) argues that managerial cognitive ability, social capital and human capital play a pivotal role in facilitating sensing, seizing and reconfiguring activities. Contextual managerial ambidexterity (Gibson & Birkinshaw 2004), on the other hand, emphasises managerial roles in pursuing exploration and exploitation activities simultaneously. This conceptual framework acted as a theoretical instrument to select and carry out an appropriate methodology and method and finally assisted the data analysis processes to contemplate the research findings. The consequences of dynamic capabilities and organisational factors such as organisational structure and culture are explicated to outline their impact on the dynamic capability management process of an organisation. This literature review highlighted the research gap in the following three research questions:

The key research questions for this study involve exploring:

> ***'How do managerial roles and attributes influence organisational dynamic capabilities building in a rapidly changing external environment?'***

Underpinning the key research objectives laid out in the previous section are the research questions, and sub-research questions, for this research:

1. How do managerial attributes and roles influence building organisational dynamic capabilities?

> *1.1 How does managerial cognitive ability influence the building of organisational dynamic capabilities in ICT companies in Bangladesh?*

> *1.2 How does managerial social capital influence the building of organisational dynamic capabilities in ICT companies in Bangladesh?*

> *1.3 How does managerial human capital influence the building of organisational dynamic capabilities in ICT companies in Bangladesh?*

> *1.4 How does managerial ambidextrous roles affect organisational dynamic capabilities building in ICT companies in Bangladesh?*

2. How do organisational factors influence organisational dynamic capabilities building?

> *2.1 How does organisational structure influence organisational dynamic capabilities building?*

> *2.2 How does organisational culture influence organisational dynamic capabilities building?*

3. What are the consequences of building dynamic capabilities?

The conceptual framework developed in this chapter aimed at addressing these research questions to fill the void in the literature.

Chapter 4 presented a discussion on the case study as the selected methodology for this study with detail illustration of various aspects of the methodology including case selection criteria, informant's identification strategy, data collections procedure, potential questions for semi-structured interviews, the data analysis process and disclosing the steps taken to comply with the requirement of ethical obligation of this research, as recommended by the UTS ethics committee. This chapter also outlined the resources required, and the time frame, of this study.

Chapter 5 presented the findings of this research. First, a brief overview of the context of the empirical study is outlined. Then, through reporting four case studies to explicate managerial roles from individual companies, a cross-case analysis is done to extract the common themes across the four cases. A total of forty-three semi-structured interviews of senior managers were undertaken, transcribed, translated and analysed. Besides the semi-structured interviews, internal documents, corporate websites, news articles, marketing brochures and reports were considered as valuable sources of data to triangulate and validate the findings. Additionally, close contacts were maintained throughout, and after, the data analysis processes to obtain reliability of the findings and analysis. The findings suggest responses to the research questions, as follows:

1. How do managerial attributes and roles influence building organisational dynamic capabilities?

How does managerial cognitive ability influence the building of organisational dynamic capabilities in ICT companies in Bangladesh?

1. a. How does managerial cognition facilitate sensing?
Attention and awareness components of managerial cognition help to identify recent developments in their related business domain, mostly through informal conversations with their peers. Managers identify useful technological tools through maintaining active attention and awareness through participating in different online social networking platforms. For example, senior managers in all four companies, through informal conversations, identified 'Mongodb' as a new technology to consider.
Attention and awareness also play an important role in creating and maintaining close relationship with customers to obtain valuable feedback regarding the scope of

improvement or modification of existing services, as well as the potential scope of new products and services.

Problem-solving skills play a critical role in addressing various challenges during the reconfiguration process.

1. b. How does managerial cognition help seizing?

Managers demonstrating strong attention and awareness when trying to identify effective and efficient alternatives, may be able to develop more appropriate solutions than the managers undertaking more narrow searches. For example, to identify an appropriate solution for CMM3 reporting automation, managers from better performing companies were able to identify open-source software that was ready to deploy with some modification. In contrast, managers from a poorly performing company failed to identify this least costly option and decided to develop the software program from scratch internally which later proved to be costlier, and more complex, than anticipated and the initiative was abandoned by the managers without considering any alternative approach. Secondly, strong problem-solving skills assist managers in developing the appropriate approaches and tactics for the problems that may arise during the reconfiguration processes carried out on operational units, resources or capabilities.

1.c. How does managerial cognition help the reconfiguration process?

Reconfiguration is carried out through intervention. During the intervention process problem solving skill proves to be very critical. The intervention process may originate different kinds of novel problems triggered by the external factors that may necessitate innovative and creative problem-solving skills. Failure to develop and deploy innovative and creative solutions effectively and efficiently may adversely affect the intervention processes to obtain intended advantage. For example, the manager who included assessment and certification at the end of a training session for users to increase learning outcomes and to reduce unnecessary calls to customer service about functional aspects of the program, not only increased the commitment of the trainees to perform better in the training, but also immediately reduced the workload of the customer service unit. This creative approach safeguarded the team member, against whom the client's employee had complained, maintained team integrity, and successfully solved the problem at the very early stage of identification. Strong problem-solving skills also positively support managers to undertake challenging problems that may require intensive cognitive engagement and strong commitment.

1.2 How does managerial social capital influence the building of organisational dynamic capabilities in ICT companies in Bangladesh?

1.d. How does social capital help sensing?

The study revealed that the relationship with existing and potential customers is the most important element in managerial social capital in identifying new opportunity, new business ideas or scope of new services. For example, a manager at Com B created a pool of customers through his personal engagement with the prospective customers. Similarly, managers at Com A identified the scope of change within the product portfolio due to strong and long-term relationships with their customers. Evidences suggest that, within the context of empirical enquiry, managers have limited interaction with their past colleagues. This is because most of the managers in the successful companies had stayed with that company for more than three years. Very limited activity in the Linkedin network is revealed. Most of the interviewees have a profile on Linkedin, however, only two senior managers mentioned that they used LinkedIn effectively to initiate new business initiatives. However, the managers are more active in social network sites such as Facebook and receive valuable information from being members of different targeted groups. There are limited interactions with the employees from competitors, or with complementary service providers, and no evidence was found of any relationships with government officials.

1.e. How does social capital help seizing?

A strong relationship with the customer helps managers to gain important feedback regarding the financial viability and feasibility of the new services, or the scope of improvement which eventually assists them to make timely and informed decisions. For example, use of a 'quick survey' to accumulate insight about intended new services from a selected group of customers using informal conversation assisted managers to make better decisions in a rapid manner at Com A. Online forums of similar minded companies also seems useful as managers of Com A identified different ideas of new services through an online forum within companies in the same business domain in different parts of the world.

1. f. How does social capital help intervention (reconfiguring)?

Managers prefer not to discuss any problems arising during the intervention stage with personals contacts external to their organisation. Managers often receive useful assistance through online forums such as stackoverflow.com or a forum maintained by the vendor of a specific technology. If an employee from the vendor is on a social network site such as Facebook, exchanging a short message through this service can get a faster response than the more formal channel of email, where the technical expert from the vendor side might

want to avoid giving the wrong advice. Communication via social network allows the technical expert from the vendor side to be more open, creative and experimental than in email communication. Managers ultimately need to apply their own judgment to select the viable options received from online platforms.

1.3 How does managerial human capital influence the building of organisational dynamic capabilities in ICT companies in Bangladesh?

1.g. How does human capital help sensing?

Long tenure at the focal company helps managers to better understand changes in customer preferences to identify the scope of changes for the existing products and services. Prior experience was found to be useful during the initial phase of a new job as managers attempt to apply their recent knowledge and experience from previous roles to immediately identify the scope of opportunity. For example, a manager at Com A initiated the advertisement of tenders based on his experience at NGOs in his previous roles. The superior quality of the educational background of managers helps them to obtain a breadth and depth of understanding of changes in their technical domain. Managers from all the companies mention that their education in computer science was highly useful in performing their day-to-day roles when starting their job, however the significant gap between the curriculum of tertiary ICT education and the practical field is also confirmed. Although relevant education proves to be useful at the beginning, ability to learn becomes the key afterwards.

1.h. How does human capital help seizing?

Experience in similar kinds of technology helps managers to make superior quality decisions. For example, in selecting technical solutions for an automating reporting system of CMM, the relevant experience of managers in open source software assisted them to quickly identify a cost effective and efficient solution. On the other hand, due to the absence of sufficient experience, managers at a poorly performing company opted for internal software development that proved ineffective and not feasible. Educational background helps managers in making better decisions, for example, an educational background in electrical and electronics engineering positively assisted a manager at Com B to undertake a comparative assessment of alternative solutions to the shortage of electricity supply.

1.i. How does human capital help intervention (reconfiguring)?

Exposure to similar technology proved to be useful in undertaking technical upgrades, and long work experience in the same organisation assisted in developing comprehensive knowledge regarding the business domain, customer preferences and internal resources useful in obtaining appropriate asset orchestration. Heterogeneity among human capital

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offers a better response to novel problems during the reconfiguration stage. Quality education assists the adoption of a systematic approach to undertake a change initiative. Individual aim, desire to achieve superior individual performance, degree of motivation and commitment play critical roles in enabling managers to undertake challenging initiatives under constraints.

Training proved to be very useful for the reconfiguring stage, it allows managers to a gain deeper, practical knowledge about the scope and application of the intended technological development. It has been revealed that knowledge of the software development life cycle and project management are very critical for operational excellence in the ICT companies.

1.4 How does managerial ambidextrous roles affect organisational dynamic capabilities building in ICT companies in Bangladesh?

1.j. What is the influence of contextual managerial ambidexterity on dynamic capabilities management?

Managers in better performing companies utilise organisational slack more effectively than others. Managers utilise the slack to facilitate learning new technologies, whereas at the poorly performing company managers assigned team members to learn a new technology outside the regular office hours creating stress for the team members.

Managers from high performing companies manage their business domain expertise in an aligned manner to exploit their experience and expertise to maximise the return for the company, while the managers from the poorly performing company attempted to develop many capabilities that were not aligned with the existing domain expertise. Understanding of business domain management is critical for exploitation and obtaining a balance between exploration and exploitation contributes to maximising return, as well as cost reduction.

2. How do organisational factors influence organisational dynamic capabilities building?

2.1 How does organisational structure influence organisational dynamic capabilities building?

Appropriate organisational structure is important to address changes in an effective manner. Product division or business domain division seems more effective than the traditional structure as it allows managers to focus on their product or business domain. Career prospects of senior managers need to be carefully addressed to retain long-serving senior managers as well as reduce turnover of highly experienced senior managers. Structural adjustment should be considered after the renewal processes for effective institutionalisation of the temporary routines or newly-developed capabilities.

2.2 How does organisational culture influence organisational dynamic capabilities building?

Organisational culture has an impact on facilitating learning and knowledge sharing. Organisational culture should be able to appreciate failure and encourage appreciation of superior contribution. Culture is a facilitator for retaining employees.

3. What are the consequences of building dynamic capabilities?

The narrow search for cost-effective solutions, quick decisions without a comprehensive effort to identify an efficient solution, lack of consideration of customer engagement during the decision-making phase, and lack of creative problem-solving skills by the managers, may lead to increased cost and time in carrying out interventions, and this may lead to the creation of disadvantage or negative performance outcomes. If unresolved, operational problems are sustained after the intervention, and this carries significant impediments for achieving operational excellence. Excellence in operational performance is a critical factor in realising the benefits of dynamic capabilities management and should not be compromised or confused with the performance of the dynamic capabilities.

Chapter 6 offered a discussion on the research findings based on the extant literature to address the research questions.

Next research contribution, limitations and potential scope of future research will be outlines followed by a concluding remark to end this thesis.

7.2 Research contributions

This research offers three theoretical contributions to the strategic management literature and two practical contributions for managers and policy makers as discussed below.

The first theoretical contribution to the literature on the DCV is explicating the role of managers in building dynamic capabilities in medium-sized ICT companies. Extant literature identifies the role of top management in building dynamic capabilities in large organisations, while the influence of specific managerial roles and attributes in building dynamic capabilities remains under-researched (Helfat & Peteraf 2015; Martin 2011; Gibson & Birkinshaw 2004). This research extends the notion of dynamic managerial capability by incorporating the notion of managerial ambidexterity combined with managerial attributes such as managerial human capital, social capital and managerial cognitive ability with the organisational level dynamic capabilities. The findings of this research offer valuable insight into cost-effective reconfiguration initiatives by managers.

The research confirms that managers develop path dependency which creates inertia to propel them toward changes as outlined by Stefano, Peteraf and Verona (2009). Findings from Com B reveal that managerial experience has a significant positive influence upon transformation initiatives if managers possess experience in similar technologies or business domains. Additionally, this research confirms the findings of Agarwal and Selen (2009) that relationships with the customers play a significant role in contributing sensing, seizing and transforming capabilities. Managerial cognitive ability plays an important part in the pursuit of solutions to novel problems which is critical to the success of the transformation initiatives, however previous studies have not considered problem solving skills as being integral to dynamic capability. Further, the empirical evidence contributes rich insights around managerial actions in pursuing the necessary transformation of internal resources and capabilities, supported by appropriate organisational structures and a supportive culture, to address changes in the external environment. The rich insights of this research assist in building a theoretical understanding of individual managerial roles in dynamic capability building in medium-sized ICT companies.

The second contribution to the strategic management literature focuses on the consequences of building dynamic capabilities in medium-sized companies. The empirical findings of this research provide evidence on indirect relationships between dynamic capabilities and operational performance (Eisenhardt & Martin 2000), negative relationships (Ambrosini & Bowman 2009) along with positive relationships between dynamic capabilities and operational performance (Agarwal & Selen 2009). This research further extends the possible consequences of dynamic capabilities through offering insights on an ambiguous relationship between dynamic capabilities and performance outcomes and negative impact due to non-execution of dynamic capabilities in the following five ways:

1. It contributes to the Dynamic Capability View through offering rich insights on the process and stages of building sensing, seizing and reconfiguring dynamic capabilities, which indirectly contributes to firm performance through redefining operational routines, resources and capabilities.

2. The empirical findings on several interventions undertaken by the participant companies provides supportive evidences on the theoretical arguments of Ambrosini and Bowman (2009) that it is important to complete the organisational transformation process to measure the application of dynamic capabilities (sensing, seizing and reconfiguration) on the operational routines.

3. This finding will aid superior measurement of dynamic capabilities in future studies. Moreover, evidence on managerial attempts to purposefully create

ambiguity in the causal relationship between dynamic capabilities and operational performance provides a new perspective on understanding the consequences of dynamic capabilities.

4. The notion of realised and monetised dynamic capability introduced in this research supported by empirical findings shed light on the fact that the advantage generated by the transformation process carried out by applying dynamic capabilities require timely appraisal. The appraisal process needs to be followed up by a process of monetisation to generate dynamic rent.

5. Finally, failure to apply dynamic capabilities demonstrates negative consequences through developing core rigidities and increased inertia against reconfiguration. These rich insights extend scholarly understanding on the consequences of dynamic capabilities.

The third theoretical contribution is within strategic management literature through extending the dynamic capability view (DCV) (Teece 2009; Teece 2017; Teece, Pisano & Shuen 1997) to medium-sized companies. Teece (2009) suggests that the applicability of this theoretical perspective is suitable for large multinationals who can ensure ongoing resource commitment to support the underlying micro foundations of dynamic capabilities. Through explicating empirical evidence this research offers rich insight on the application of DCV in medium-sized ICT companies (where there are limited empirical findings on the process of dynamic capabilities building) to uncover the process of reconfiguring their internal resources and capabilities. This research partially addresses this gap through identifying evidence regarding the process of carrying out interventions to pursue internal reconfiguration through temporary allocation of resources from operational routines. Further, this research provides in-depth knowledge on the systematic approach to applying dynamic capabilities in a cost-effective manner in medium-sized ICT companies through utilising slack resources. Hence, the research extends the scope of the DCV into medium-sized ICT companies with rich empirical evidence on interventions carried out by the participant companies operating in resource constrained environments.

In addition, the research offers two practical contributions for organisational managers and policy makers. Firstly, evidence of implementing effective and cost-efficient interventions will help managers carry out interventions in similar external environmental contexts in an effective and efficient manner. Managers may obtain valuable insight to construct teams with appropriate personnel to carry out necessary internal transformation initiatives to address the changes in the external environment. Secondly, managers need to adjust the organisational structure to support the transformation of resources and capabilities to

pursue the strategic intent of building dynamic capabilities effectively. These insights may aid in developing managerial skills and capabilities that would ensure superior utilisation of the resources of medium-sized ICT companies when transforming, in accordance with the changes in the external environment.

The below table outlines the managerial implication of this research:

Table 7.1: Managerial implications of this research

Managerial Implications		
Research Question	**Themes**	**Considerations for managerial actions**
Research Question 1	Managerial roles in building dynamic capabilities	It is important for managers to identify and address the external stimuli that are relevant for their organisation. In order to keep track of changes in customers' preferences it is important to construct an information channel to manage the insights contributed by the customer facing employees. Moreover, managers with long term experience within the focal company need to maintain engagement with their customers to obtain critical information about the changes in the requirements of the customers.

To address the technological changes, managers need to carefully identify the gap between the existing technology and the intended technology at the beginning. Then a team needs to be constructed with sufficient number of team members who have considerable knowledge and expertise on the intended technological paradigm. If this experienced personal cannot be found from the internal workforce, in case of significant gap between the existing and intended technology, managers need to recruit experienced personals in parallel with the internal capability development initiatives. Learning of innovative technology should be promoted with clear scope of monetisation.

Managers need to maintain attention to perceive accurately the external stimuli and at the same time, it is important to deploy superior cognitive effort to track the competitors' actions and act appropriately to respond the competition in the marketplace. The transformative initiatives through intervention should be pursued following an ambidextrous approach through utilising organisational slack to obtain |

		efficiency and minimal disruption on the existing operational performance.
Research Question 2	Role of organisational factors such as structure and culture in building dynamic capabilities.	Managers need to carefully revisit the existing organisational structure to identify any required adjustment within the organisational structure to support the transformation initiatives. Organisational culture should be always monitored to identify and rectify any symptoms that may create resistance to maintain a supportive dynamic organisational community.
Research Question 3	Consequences of dynamic capabilities	In order to harness the advantage from building dynamic capabilities managers need to perform objective appraisal followed by initiatives to monetise the realised advantage within the organisational boundary. In order to generate rent through dynamic capability building managers may need to perform monetisation in a creative manner through applying innovative business models.

Organisational policy makers will be able to make better decisions around developing effective policy instruments to provide support to medium-sized ICT companies, and equip them with necessary resources, skills, and capabilities. Emerging economies offer unique challenges to managers of ICT companies. Although those in emerging economies share several similarities in terms of operational processes with their counterparts in developed countries, the contextual differences create unique issues which require similarly unique management approaches. Previous literature suggests scarcity of resources within companies in emerging economies (such as Bangladesh) as the most significant constraint faced in pursuing superior organisational capabilities. This research contends this observation and suggests that the most significant performance constraint facing medium sized ICT companies in emerging economies is a lack of superior managerial skills and capabilities. New policies reflecting the insights offered in this research will foster corporate sustainability, especially during periods of rapid change.

7.3 Research limitations

This research is not free from limitations. First, Yin (2003a) mentioned that a case study researcher carries out analytical generalisation over statistical generalisation, therefore the findings of this research need to be carefully considered before applying them in a different context or a larger population of ICT companies. Additionally, due to the limited size of the cohort, all from a single industry within a single context, the dynamic capabilities framework presented here regarding managerial roles may not be appropriate in a different

industry context. On the other hand, the findings of this research should be theoretically confirmed from different theoretical perspectives to address the shortcomings of scholarly understanding on dynamic capabilities. In order to obtain more validity this research should be carried out in different countries within and beyond emerging economies.

Secondly, interviews are conducted under very tight schedules offered by the participants which limits the potential for more deeply into the underlying phenomenon associated with building dynamic capabilities procedures. Moreover, due to time constraints, interviewees also face difficulties contemplating their insights or reflecting upon their experience in relation to dynamic capabilities building. As dynamic capabilities are relatively new within the academic literature, limited awareness of dynamic capabilities by the practitioners is also affected the data collection procedure through diverting a portion of the allocated time for interview in exchanging the understanding of dynamic capabilities to construct a consistent understanding about the concepts among the researcher and the informants. Finally, as this research primarily intends to explicate the process of building dynamic capabilities through incorporating the past phenomenon, the ability of individual informant to recall distant events with accuracy is realised as a limitation of this study.

Next the suggestions for future research is discussed.

7.4 Future research

Dynamic capability view offers much potential to effectively explain the success or failure of organisations experiencing environmental dynamism. However, in order to effectively develop the predictive capacity, this theoretical perspective needs to undergo scholarly enquiry in diverse research contexts using robust research instruments. Future research should consider the process of investigating dynamic capabilities from a functional perspective through designing and integrating distinctive functional units to foster, nurture and harness the dynamic capabilities within organisational boundary. In the context of absence of micro foundations of dynamic capabilities, this research has proposed institutionalising 'Dynamic Process Group' (DPG) as a functional unit which requires further in-depth empirical validation. Moreover, through integrating the systematic procedure of a learning maturity model such as the Capability Maturity Model (Garud and Kumaraswamy, 2005) or the Project Portfolio Maturity Model (Killen and Hurt, 2010) to continually monitor and manage the maturity of dynamic capabilities of the focal organisation, the Dynamic Maturity Model (DMM) is proposed for consideration in future research. As both negative and positive consequences of dynamic capabilities have been observed in this research, it can be assumed that maturity, rather than possession of dynamic capabilities,

will lead to corporate sustainability. This assumption should also remain within the agenda of future researchers of dynamic capabilities to pursue development of maturity-based view of firm. In line with this research call, more stringent empirical investigation into both micro-foundations based dynamic capabilities and intervention-based dynamic capabilities should be considered. This would aid understanding of the process of institutionalising the micro-foundations and identifying specific organisational settings that may enhance execution of dynamic capabilities during environmental dynamism occurring in a different time.

Future research should consider rigorous methodological application including quantitative investigation, and mixed-method research, to obtain robust results that will aid measurement of the various constructs within dynamic capability-building practices revealed in this research. Further research should attempt to operationalise the constructs presented in this research in a large sample of participant companies. Moreover, future research should consider longitudinal study to capture the essence of the transforming organisational resources and capabilities in a more intimate and accurate manners as well as in other countries, be they emerging or advanced nations.

Finally, the conceptual model presented in this research should be applied in different industrial and empirical contexts to explore further insights on managerial roles and attributes in building dynamic capabilities. Distinctive managerial roles and attributes that may be able to contribute to development of those capabilities require an ongoing empirical investigation to maintain relevance with the continuous changes in the external environment. At the same time, it is important to continue to investigate the origin and sources of dynamic capabilities linking managerial roles and attributes to obtain effective replication of appropriate capabilities in different contexts of change. Moreover, performing comparative studies between companies in emerging economies and developed countries may help scholars understand the process of dynamic capability building in the context of emerging markets. At the same time, the process of internationalisation of the ICT companies in emerging markets should be investigated from the theoretical lenses of dynamic capability. Finally, future research should consider empirical investigation into the relationship between dynamic capability building and corporate sustainability in a rigorous manner, not only within large enterprises but also within start-ups, SMEs and companies experiencing rapid growth.

7.5 Concluding remarks

This research has started an empirical investigation in an area that was previously under-researched, specifically in the context of medium-sized Bangladesh ICT companies. Additionally, this research elicits rich micro level insights within the context of empirical enquiries through applying the dynamic capabilities perspective to untangle individual managerial-level interactions within organisations that may aid the scholarly quest to understand individual managerial roles in building dynamic capabilities. The research found that middle managers play a vital role in building dynamic capabilities and they need support from senior management to carry out transformative initiatives to address challenges resulting from changes in the external environment. Finally, but importantly, it was found that dynamic capabilities may generate both positive and negative results, therefore appropriate processes of realising and monetising dynamic capabilities should be adopted to harness the benefit through the practice of dynamic capabilities, as well safeguarding against the dynamism of the external environment.

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Appendix

Appendix 1: Script of Email correspondence to individual informants

Script of email or telephone conversation that forms the initial contact with individual participants/informants once participants have been identified:

Dear (Addressee),

REFERENCE: "Role of managers in building dynamic capabilities in ICT companies in Bangladesh"

Your (Organisation name) has agreed to participate in a case study for the purpose of Doctoral research (MDG, University Technology Sydney) in the area of "Dynamic capability building". In line with this agreement you have been identified as a potential participant whose contribution is of great significance to this research - "It's your insight, experience and knowledge that counts…."

Please find attached information sheet and consent form for this research. Information sheet outlines detailed information about the research. You are required to sign the consent form at the time of the interview if you agree to participate in this research.

It would take approximately 45 minutes to 60 minutes to conduct an interview. This email is to request you to kindly allocate a maximum of one hour timeslot for this purpose if you agree to participate in this research.

If you agree to participate in this research please choose an appropriate day and time that fits with your schedule and confirm an appointment via phone: (will be included later) or via email: .

Your participation in this research will be greatly appreciated. I would like to thank you for your time and effort in helping towards this PhD research.

Yours Sincerely,

Name and designation of the researcher

Ethics of this survey: The ethical aspects of this study have been approved by the UTS Ethics Committee (Human Research). If you have concerns about the research you may contact principal supervisor Dr Renu Agarwal, UTS Business School, UTS Business School, Building 8, 18/78 Ultimo Road, Ultimo, email: If you would like to talk to someone who is not connected with this research, you may contact the Research Ethics Officer at University of Technology Sydney by phone to +610295149772 or by e-mail to Research.Ethics@uts.edu.au, and quote this reference number: **UTS HREC REF NO. 2014000646**

Appendix 2: Consent form Organisation

Consent Form (Organisation)

Our organisation,

Agree to participate in the research project to investigate managerial roles in building dynamic capabilities in ICT companies in Bangladesh being conducted by Mr. Shahriar Sajib at University of Technology Sydney. We understand that the purpose of the study is to examine managerial roles in building enterprise level dynamic capabilities in ICT companies in Bangladesh.

We understand that we have been asked to participate in this research because we have been working in ICT industry for more than seven years.

We understand that our participation in this research will potentially involve informal conversation and sound recording.

Confidential documents or information will not be requested or provided.

We are aware that, if we have any questions about this research, we can contact:

Principal supervisor Dr Renu Agarwal, UTS Business School, Building 8, 18/78 Ultimo Road, Ultimo (email: and phone: or local contact person Mohammed Shahjahan, Consultant Government of Bangladesh, House no 55, Sonargaon Janapath, Sector 7, Uttara Model Town, Dhaka, Bangladesh, email: mdshah050@gmail.com and phone:

We also understand that we are free to withdraw our participation from this research project at any time we wish, without consequences, and without giving a reason.

We agree that the UTS researchers may publish findings of this research in books, articles and creative works.

 (Circle one of the following choices)

- We do not wish to participate in this research.
- We accept participation in this research.

Organisation Name: _____

Authorised Person Name: _____

Signature: _____

Email: _____

Phone Contact: _____

NOTE:

This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your

participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: +61 2 9514 9772 Research.Ethics@uts.edu.au), and quote the UTS HREC reference number. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

Appendix 3: Consent form Interviewee

I,

Agree to participate in the research project to investigate managerial roles in building enterprise level dynamic capabilities in ICT companies in Bangladesh being conducted by Mr. Shahriar Sajib at University of Technology Sydney. I understand that the purpose of the study is to examine managerial roles in building enterprise level dynamic capabilities in ICT companies in Bangladesh.

I understand that I have been asked to participate in this research because I have experience about ICT companies in Bangladesh.

I understand that my participation in this research will potentially involve up to one hour recorded interview.

Confidential documents or information will not be requested or provided.

I am aware that, if I have any questions about this research, I can contact:

Principal supervisor Dr Renu Agarwal, UTS Business School, Building 8, 18/78 Ultimo Road, Ultimo (email: or local contact person Mohammed Shahjahan, Consultant Government of Bangladesh, House no 55, Sonargaon Janapath, Sector 7, Uttara Model Town, Dhaka, Bangladesh, email: and phone:

I also understand that I am free to withdraw my participation from this research project at any time I wish, without consequences, and without giving a reason.

I agree that the UTS researchers may publish findings of this research in books, articles and creative works.

 (Circle one of the following choices)

- I do not wish to be recorded at all
- I accept that I may be recorded but do not wish to be identified in any use of the material

Signature: _____Date: _____

Organisation Name: _____

Phone Contact: _____

Signature (Researcher or delegate): _____ Date: _____

NOTE:

This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your

participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: +61 2 9514 9772 Research.Ethics@uts.edu.au), and quote the UTS HREC reference number. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

Appendix 4a: Information sheet for participant organisation

WHO IS DOING THE RESEARCH?

My name is Mr. Shahriar Sajib and I am a PhD student at UTS.

WHAT IS THE RESEARCH ABOUT?

This research is to investigate managerial roles in building dynamic capabilities in ICT companies in Bangladesh.

IF SAY WE YES WHAT WILL INVOLVE?

I will ask at least ten employees from your organisation to take part in an interview. The interview will be up to one hour and will be audio recorded. It will be at a place of their preference.

ARE THERE ANY RISK/INCONVENIENCE?

Your employees may feel uncomfortable talking about their experience. But I have taken every effort to minimize any discomfort.

WHY WE HAVE BEEN ASKED?

Your organisation has been asked because your company operates in ICT industry in Bangladesh.

DO WE HAVE TO SAY YES?

You don't have to say yes.

WHAT WILL HAPPEN IF WE SAY NO?

Nothing, I will thank you for your time so far and won't contact you about this research again.

IF WE SAY YES CAN WE CHANGE OUR MIND LATER?

If you have concerns about the research that you think I can help you with, please feel free to contact me, Mr Shahriar Sajib email: phone: or principal supervisor Dr Renu Agarwal, UTS Business School, Building 8, 18/78 Ultimo Road, Ultimo, email: , phone +) or local contact person Mohammed Shahjahan, Consultant Government of Bangladesh, House no 55, Sonargaon Janapath, Sector 7, Uttara Model Town, Dhaka, Bangladesh, email: and phone: +

WHAT IF WE HAVE CONCERNS OR COMPLAINT?

If you have concerns about the research feel free to contact me on + or shahriar.sajib@uts.edu.au or you may contact principle supervisor Dr Renu Agarwal, UTS Business School, Building 8, Mary Anne St, Ultimo (email: renu.agarwal@uts.edu.au) or local contact person Mohammed Shahjahan, Consultant Government of Bangladesh, House

no 55, Sonargaon Janapath, Sector 7, Uttara Model Town, Dhaka, Bangladesh, email: and phone: +. If you would like to talk to someone who is not connected with the research, you may contact the Research Ethics Officer at the University of Technology Sydney on +61 2 9514 9772 or by e-mail to Research.Ethics@uts.edu.au, and quote this reference number: **UTS HREC REF NO. 2014000646**

Appendix 4b: Information sheet to Interviewee

WHO IS DOING THE RESEARCH?

My name is Mr. Shahriar Sajib and I am a PhD student at UTS.

WHAT IS THE RESEARCH ABOUT?

This research is to investigate managerial roles in building enterprise level dynamic capabilities in ICT companies in Bangladesh.

IF SAY YES WHAT WILL INVOLVE?

I will ask you to take part in an interview. The interview will be up to one hour and will be recorded. It will take place at your convenient premises.

ARE THERE ANY RISK/INCONVENIENCE?

There are no risks; however you may feel uncomfortable talking about your experience. But I have taken every effort to minimize any discomfort.

WHAT I HAVE BEEN ASKED?

You have been asked because you have experience about ICT companies in Bangladesh.

DO I HAVE TO SAY YES?

You don't have to say yes. Participation in this study is optional.

WHAT WILL HAPPEN IF I SAY NO?

Nothing, I will thank you for your time so far and won't contact you about this research again.

IF I SAY YES CAN I CHANGE MY MIND LATER?

If you have concerns about the research that you think I can help you with, please feel free to contact me, Mr ShahriarSajib with principal supervisor Dr Renu Agarwal, UTS Business School, Building 8, 18/78 Ultimo Road, Ultimo (email: shahriar.sajib@uts.edu.au phone: +61 413 421 895 or renuagarwal@uts.edu.au and phone +61 419 463 953) local contact person Mohammed Shahjahan, Consultant Government of Bangladesh, House no 55, Sonargaon Janapath, Sector 7, Uttara Model Town, Dhaka, Bangladesh, email: mdshah050@gmail.com and phone: +8801943701890.

WHAT IF I HAVE CONCERNS OR COMPLAINT?

If you have concerns about the research you may contact principal supervisor Dr Renu Agarwal, UTS Business School, UTS Business School, Building 8, 18/78 Ultimo Road, Ultimo email: renu.agarwal@uts.edu.au. If you would like to talk to someone who is not connected with the research, you may contact the Research Ethics Officer at the University of Technology Sydney on +610295149772 or by e-mail to Research.Ethics@uts.edu.au, and quote this reference number: **UTS HREC REF NO. 2014000646**

Appendix 5: Research background supplied to informant prior interview

This research aims to investigate the managerial roles in building dynamic capabilities in ICT companies in Bangladesh. In present business environment ICT companies in particular have to face changes in customer preferences, high competition, changes in regulatory environment and rapid technological changes. Ability to sustain superior performance will heavily depend on the ability of ICT companies to address these changes successfully. Dynamic capabilities are special kind of organisational capabilities that equip companies to address changes in the business environment. Dynamic capability view as a theoretical lens provides valuable insight about the process of reconfiguring organisational tangible and intangible assets to address the changes in the business environment. Manager's roles in fostering dynamic capabilities will be the primary aim of this research.

This research considers dynamic capability building as a process consisting three key capabilities which are sensing, seizing and reconfiguring. Sensing involves identifying opportunities from the business environment, seizing refers to the process of prompt decision making and reconfiguring refers to the process of reconfiguring organisational tangible assets such as infrastructure, technological assets and intangible assets such as knowledge assets, patents, knowledge on business operations, technological knowhow to develop new products or carry out innovation. Organisational learning is another key aspect of dynamic capabilities that helps organisation to integrate knowledge from external sources. Managerial roles are critical to perform these capabilities successfully in a highly competitive business environment.

Managers of ICT companies play valuable roles in building dynamic capabilities through leveraging their personal contacts, education background, experience, technological know-how, problem solving capabilities and attention to the changes in the business environment. Moreover, in ICT company's managers may carry out entrepreneurial initiatives to contemplate their ideas into value creating business process that may deliver significant value to the companies to sustain superior performance. On the other hand, companies need to ensure that they maintain efficiency in their matured capabilities and at the same time carry out exploring new capabilities in present business environment. Managerial roles are critical in performing dynamic capabilities which will be the key objective of this research.

Under the above background this research aims to apply the understanding of dynamic capabilities in the context of Bangladeshi ICT companies. Bangladesh has significant

potential in ICT sector which is already evident through excellent performance of some of the ICT companies; however, as ICT industry faces rapid changes dynamic capabilities will be highly important for the ICT companies of Bangladesh. This research aims at investigating how managers of medium sized ICT companies are addressing the changes in business environment from dynamic capability theoretical lens.

Appendix 6a: Semi structured interview questions based on literature

Themes	Semi Structured Interview questions
External environment	Adopting from (Pavlou and Sawy, 2011) How rapid changes in the technology effect your business? Do you follow any systematic process to forecast the future development in information technology? Adopting from (Zhou and Wu, 2010) What are the competitive issues you have to face to conduct IT business in present business environment? How the local market condition and infrastructure affect your business operation and how you attempt to overcome those?

Themes	Semi Structured Interview questions
Managerial Cognitive capability	Adopting from (Helfat and Peteraf, 2015) Do you have strong problem-solving capability that helps you to perform your role in your organisation? Do you have strong attention that helps you to address changes in the external environment? How you leverage your attention to bring advantage for the organisation? How you use your communication and social cognition to perform your role?

Themes	Semi Structured Interview questions
Managerial Social Capital	Based on (Kazienko and Mushia, 2011) and (Acquaah, 2007) How you utilize your social capital in identifying new business opportunity? Do you have range of alliances with external complementary service providers? How you manage these relationships?

Themes	Semi Structured Interview Questions
Human capital	Based on Doving and Gooderham (2008) Does your previous experience, education help your company to identify new business opportunity? Do you have intention of seeking out new markets or launching new services? Based on Ravichandaran and Lertwongsatien (2005) Does your IS staff have very good business knowledge and business priorities and relationships, organisational technologies and business processes and knowledge about firms procedure?

Themes	Semi Structured Interview questions

Sensing	(Pavlou and Sawy, 2011) Do you follow any systematic process to scan the business environment regularly? If you do please explain. How you incorporate your managers in this process? Do you continuously review your existing process considering the changes in the external environment? If you do please explain.
Seizing	Adopting from Eisenhardt and Martin (2000) How your organisation makes decision regarding capability building decisions? What is the decision-making cycle time? Adopting from Barreto (2010) Does your organisation can make timely decision? Explain how. Does your organisation make market oriented decision? Explain how.
Learning	Adopting from (Pavlou and Sawy, 2011) How your organisation manages learning in fast paced technological changes? Is there any systematic pattern you follow, or it is an ad hoc basis? How you move from one technological paradigm or platform to another one such as .Net to Java, how you manage this shift?
Reconfiguring	Adopting from Pavlou and Sawy (2011) How your company can successfully reconfigure resources to come up with new productive assets? How your company engage in resource recombination to better match product-market areas and our assets. How your company perform this and what role managers contribute to do this. Adapted from Hawass (2010) How your company integrate internal and external technologies to perform innovation? Adapted from Zhou and Wu (2010) How your firm redefining product strategies in terms of which products the firm intends to offer and how your firm redeploying organizational resources effectively to support the firm's intended product strategies?

Themes	Semi Structured Interview questions
Firm performance or consequences of DCs	Based on Drnevich and Kriauciunas (2011); Human and Naude (2009); Capron and Mitchell (2009); Verdu´-Jover, Go´mez-Gras, Llore´ns-Montes (2006) How your firm createnew capabilities? Share your experience in this firm. How your firm manage technical capability gap? How your firm manage to fit of targeted capabilities with internal systems? How you manage social acceptance of targeted capabilities?

Appendix 6b: Questions asked that are similar to the actual semi structured interviews

External environment

Do you follow any systematic process to forecast the future development of technology within your organisation?

What are the competitive issues you have to face to conduct ICT business in present business environment?

Managerial Cognitive capability

How your individual problem-solving capability helps you to perform your role in your organisation?

Do you have a strong attention to detail? If you do please using an example explain how organisation is benefitted from this.

Managerial Social Capital

How do you utilize your personal contacts in identifying new business opportunity?

Do you have a range of alliances or partnerships with external complementary service providers? How do you manage these relationships? Describe using an example.

Human capital

How your previous work experience and education help your organisation in identifying new business opportunities?

Do your employees have good business knowledge on organisational technologies and business processes?

Sensing

Do you follow any systematic process to scan the business environment regularly? If you do please explain using an example.

Do you continuously review your existing processes considering the ongoing changes in the external environment? If you do please explain using an example.

Seizing

How does your organisation make decisions regarding capability building? Is capability building important to your organisation?

What is the decision making cycle time? How often do you review them?

Learning

How do you move from one technological paradigm or platform to another, such as .Net to .Java platforms, how do you manage this transition when shifting paradigms?

How does your organisation manage learning amidst fast paced technological changes? Is there any systematic process you follow or do you manage changes on an ad hoc basis? What triggers this change process?

Reconfiguring

How does your organisation integrate internal and external technologies, systems and processes to perform innovation? What managerial roles/capabilities are important to perform this integration?

How does your organisation successfully reconfigure resources to come up with new productive assets? What managerial roles/capabilities are involved in this reconfiguration process?

Firm performance or consequences of DCs

How does your organisation create new capabilities? Share your experience in this firm.

How does your firm manage technical capability gap and what steps does it take to bridge these gaps?

How does your firm manage targeted capability building and how does it align its capabilities with internal systems and external environment?

How do you manage social acceptance of targeted capabilities?

Note:

Use signposts in between

Summarise key findings at the end

Appendix 7: ICT indicators of Bangladesh

The World Economic Forum's (WEF) Networked Readiness Index (NRI) measures the propensity for countries to exploit the opportunities offered by ICTs. The NRI assesses the impact of ICT on the competitiveness of nations. The NRI Index comprises of three components: the environment for ICT offered by a given country or community (market, political and regulatory, infrastructure environment), the readiness of the community's key stakeholders to use IT (individuals, businesses, and governments), and finally the usage of ICT amongst these stakeholders (A2i and GoB, 2013).

Following table depicts the basic ICT indicators of Bangladesh. It can be seen that Bangladesh has made substantial progress in mobile phone subscription. This should not come as a surprise as the telecom business in Bangladesh is booming. The growth in telecom sector is significant as with less than 1 person (per 100 people) having mobile connection in 2000, the number stands at 63 at 2012.

Table: ICT indicators of Bangladesh

Year	Fixed broadband Internet subscribers (per 100 people)	Internet users (per 100 people)	Telephone lines (per 100 people)	Mobile cellular subscriptions (per 100 people)
2000		0.07	0.37	0.21
2001		0.13	0.42	0.39
2002		0.14	0.44	0.78
2003		0.16	0.53	0.98
2004		0.20	0.59	1.97
2005		0.24	0.75	6.29
2006		1.00	0.78	13.21
2007	0.03	1.80	0.81	23.47
2008	0.03	2.50	0.91	30.17
2009	0.21	3.10	0.83	34.35
2010	0.27	3.70	0.85	44.95
2011	0.31	5.00	0.64	55.19
2012	0.39	6.30	0.62	62.82