

**The Influence of Organisational Culture and  
Knowledge-Sharing on Business Systems Success:  
A Case of Saudi Arabian Firms**

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A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE AWARD  
OF THE DEGREE OF

**DOCTOR OF PHILOSOPHY**

by

**Mohammed Ibrahim Ali Alattas**

Faculty of Engineering and Information Technology  
University of Technology Sydney

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## **Certificate of Original Authorship**

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.

Signature of Student:

Date: **17/May/2016**

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## List of Publications

The following research articles were produced to publish some concepts and findings from the work undertaken by the author during the course of this PhD research study.

### Referred Conference Papers

**Al Aattas, M.I. & Kang, K and Sohaib, O.** 2016, 'Impact Factors for Business System Success' 20<sup>th</sup> *Pacific Asia Conference on Information Systems (PACIS)*, Taiwan

**Al Aattas, M.I. & Kang, K.** 2015, 'The Relationship between Organization Culture and Knowledge Sharing towards Business System Success' *Australasian Conference on Information Systems (ACIS)*, Adelaide Australia

**Al Aattas, M.I. & Kang, K.** 2013, 'Success Factors Affecting New Business Systems in Saudi Enterprise', *Proceedings of the 22nd International Business Information Management Conference*, The International Business Information Management Conference (22nd IBIMA), IBIMA publishing, Rome, Italy, pp. 1948-1955

### Referred Journal Publications

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**Al Aattas, M.I. & Kang, K.** 2015, 'Cultural Impact on the Success of New Business Systems in Saudi Enterprises', *Asian Journal of Information Technology*, Vol. 14(4), pp. 129-134

## **Abstract**

The purpose of this study is to investigate the impact of organisational culture and knowledge-sharing on business systems success in Saudi Arabian firms. Understanding the factors that contribute to business systems success has been a challenging process for both public and private organisations in Saudi Arabia. Saudi Arabia has managed to attract a workforce from all over the world, and this has enabled it to merge varied cultures. Organisational culture is measured as a significant aspect supporting knowledge-sharing between employees. Based on the competing value framework (CVF) (Quinn and Spreitzer, 1991), this research shows how various dimensions of organisational culture influence knowledge-sharing and business systems success, particularly the organisational and individual impact.

In order to answer the research questions and test the hypotheses, this study applied a mixed-method research methodology that incorporated both quantitative and qualitative approaches. Phase 1 of the research study employs a quantitative method, with data collected from a survey of employees from Saudi Arabian firms. A qualitative research method (case study) is then carried out as the second phase of the research, which was used to support the validity of the quantitative results. 330 responses were used for quantitative data analysis, and 10 interviews were conducted with employees from two firms in Saudi Arabia for the quantitative data analysis. The results show a positive relationship exists between organisational culture (such as development, group, hierarchy and rational culture), knowledge-sharing and business system success in Saudi Arabian firms.

The findings show that organisational culture has a strong impact on business system

success through knowledge-sharing. On the basis of this study's findings, it is argued that to achieve better business system outcomes (such as organisational and individual impact), it is important to influence organisational culture and knowledge-sharing. Moreover, the knowledge must be made available to all stakeholders involved in the ongoing use of business systems.

This study has made a noteworthy contribution to the body of knowledge in that it is the first to investigate the relationship between organisational culture, knowledge-sharing and business system success in the Saudi Arabian context. In terms of practical implications, managers in Saudi firms should not pay attention on only one cultural type but should focus on all four cultural types (development, group, hierarchy and rational culture) to form a well-balanced culture to achieve business systems success in terms of organisational and individual impact.

## Table of Contents

|                                                                         |            |
|-------------------------------------------------------------------------|------------|
| <b>Certificate of Original Authorship .....</b>                         | <b>ii</b>  |
| <b>Acknowledgement.....</b>                                             | <b>iii</b> |
| <b>List of Publications .....</b>                                       | <b>iv</b>  |
| <b>Abstract.....</b>                                                    | <b>v</b>   |
| <b>List of Tables .....</b>                                             | <b>x</b>   |
| <b>List of Figures.....</b>                                             | <b>xi</b>  |
| <b>CHAPTER 1 : INTRODUCTION.....</b>                                    | <b>1</b>   |
| 1.1 Research Background .....                                           | 1          |
| 1.2 Purpose of the Study .....                                          | 4          |
| 1.3 Research Questions.....                                             | 5          |
| 1.4 Significance of the Study .....                                     | 5          |
| 1.5 Scope of the Study .....                                            | 6          |
| 1.6 Research Plan .....                                                 | 7          |
| 1.6.2 The Development of the Research's Theoretical Model .....         | 9          |
| 1.6.3 Development of Questionnaire and Data Collection .....            | 10         |
| 1.6.4 Data Analysis .....                                               | 10         |
| 1.6.5 Validation of the Data .....                                      | 11         |
| 1.6.6 Discussion and Recommendations.....                               | 11         |
| 1.7 Thesis Layout .....                                                 | 11         |
| <b>CHAPTER 2 : LITERATURE REVIEW .....</b>                              | <b>15</b>  |
| 2.1 Organisational Culture .....                                        | 15         |
| 2.1.1 Impact of Organisational Culture.....                             | 18         |
| 2.1.2 Organisational Culture in a Saudi Arabian Context .....           | 27         |
| 2.2 Impact of Knowledge-Sharing in Organisations .....                  | 29         |
| 2.2.1 Knowledge-sharing among Management Levels .....                   | 40         |
| 2.2.2 Knowledge Sharing in a Saudi Arabian Context.....                 | 44         |
| 2.3 Defining Business Systems .....                                     | 46         |
| 2.4 Business Systems History .....                                      | 49         |
| 2.5 Business Systems Success Factors .....                              | 51         |
| 2.6 Chapter Summary .....                                               | 61         |
| <b>CHAPTER 3 : THEORETICAL BACKGROUND AND CONCEPTUAL MODEL       62</b> |            |
| 3.1 Overview .....                                                      | 62         |
| 3.2 Organisational Culture .....                                        | 64         |
| 3.3 Knowledge-sharing .....                                             | 66         |
| 3.4 Business Systems Success.....                                       | 67         |
| 3.5 Conceptual Model.....                                               | 70         |
| 3.6 Revisiting the Research Questions.....                              | 73         |
| 3.7 Hypothesis Development.....                                         | 73         |
| 3.7.1 Organisational Culture .....                                      | 73         |
| Businesses system success .....                                         | 77         |
| 3.8 Chapter Summary .....                                               | 78         |

|                                                                 |            |
|-----------------------------------------------------------------|------------|
| <b>CHAPTER 4 : METHODOLOGY .....</b>                            | <b>79</b>  |
| <b>4.1 Research Design .....</b>                                | <b>79</b>  |
| <b>4.2 Phase 1: Quantitative Data Analysis.....</b>             | <b>83</b>  |
| 4.2.1 Research Instrumentation/Measures.....                    | 83         |
| 4.2.2 Instrument Translation .....                              | 84         |
| Forward Translation.....                                        | 85         |
| Subjective Evaluation.....                                      | 85         |
| 4.2.3 Sample and Sample Size.....                               | 85         |
| 4.2.4 Data Collection.....                                      | 86         |
| 4.2.5 Quantitative Data Analysis Approach .....                 | 87         |
| 4.2.5.1 Descriptive Data Analysis.....                          | 87         |
| 4.2.5.2 Measurement Scale Analysis.....                         | 88         |
| 4.2.5.3 Structural Equation Modelling (SEM).....                | 88         |
| <b>4.3 Phase 2: Qualitative Data Analysis.....</b>              | <b>90</b>  |
| 4.3.1 Case Study Design .....                                   | 90         |
| 4.3.2 Data Collection.....                                      | 91         |
| 4.3.3 Qualitative Data Analysis Approach .....                  | 92         |
| <b>4.4 Ethics Consideration.....</b>                            | <b>93</b>  |
| <b>4.5 Chapter Summary .....</b>                                | <b>93</b>  |
| <b>CHAPTER 5 : DESCRIPTIVE QUANTITATIVE DATA ANALYSIS .....</b> | <b>94</b>  |
| <b>5.1 Questionnaire Survey .....</b>                           | <b>94</b>  |
| <b>5.2 Participants' Profiles .....</b>                         | <b>95</b>  |
| <b>5.1 Verifying Data Characteristics.....</b>                  | <b>102</b> |
| 5.1.1 Missing Data Analysis and Assessment of Normality .....   | 102        |
| 5.1.2 Standard Deviations and the Mean.....                     | 102        |
| <b>5.2 Preliminary Data Analysis .....</b>                      | <b>103</b> |
| 5.2.1 Organisational Culture .....                              | 103        |
| 5.2.2 Knowledge-sharing.....                                    | 104        |
| 5.2.3 Business System Success.....                              | 105        |
| 5.2.4 Individual and Organisational Impact .....                | 105        |
| <b>5.3 Reliability Assessment .....</b>                         | <b>106</b> |
| <b>5.4 Chapter Summary .....</b>                                | <b>109</b> |
| <b>CHAPTER 6 : MEASUREMENT SCALE ANALYSIS .....</b>             | <b>110</b> |
| <b>6.1 Exploratory Factor Analysis .....</b>                    | <b>110</b> |
| <b>6.2 Measurement Model .....</b>                              | <b>114</b> |
| 6.2.1 Confirmatory Factor Analysis .....                        | 114        |
| 6.2.2 Model Fit.....                                            | 118        |
| <b>6.3 Structural Model Testing.....</b>                        | <b>119</b> |
| 6.3.1 Organisational Culture .....                              | 119        |
| 6.3.2 Knowledge-sharing.....                                    | 121        |
| 6.3.3 Businesses System Success.....                            | 122        |
| 6.3.4 Model Summary .....                                       | 123        |
| <b>6.4 Chapter Summary .....</b>                                | <b>125</b> |
| <b>CHAPTER 7 : MULTI-CASE STUDY.....</b>                        | <b>126</b> |
| <b>7.1 Qualitative Validation of Research Model.....</b>        | <b>126</b> |
| <b>7.2 Company A Background.....</b>                            | <b>127</b> |
| <b>7.3 Company B Background.....</b>                            | <b>129</b> |
| 7.3.1 Business Systems in Company B.....                        | 130        |
| <b>7.4 Staff Perspectives on Business System Success .....</b>  | <b>130</b> |
| 7.4.1 Organisational Culture Dimensions .....                   | 130        |
| 7.4.2 Knowledge-sharing.....                                    | 135        |
| 7.4.3 Business System Success.....                              | 137        |

|                                                                                           |            |
|-------------------------------------------------------------------------------------------|------------|
| 7.5 Chapter Summary .....                                                                 | 139        |
| <b>CHAPTER 8 : DISCUSSION AND CONCLUSION .....</b>                                        | <b>140</b> |
| 8.1 Revisiting the Research's Aim and Objectives, Research Questions and Hypotheses ..... | 140        |
| 8.2 Discussion of the Research Findings .....                                             | 142        |
| 8.2.1 Findings on Organisational Culture .....                                            | 142        |
| 8.2.2 Findings on Knowledge-sharing .....                                                 | 145        |
| 8.2.3 Findings on Business System Success .....                                           | 147        |
| 8.3 Contribution and Implications of the Study .....                                      | 148        |
| 8.3.1 Theoretical Implications.....                                                       | 148        |
| 8.3.2 Practical Implications .....                                                        | 149        |
| 8.4 Conclusion .....                                                                      | 150        |
| 8.5 Limitations and Recommendations for Future Research .....                             | 153        |
| 8.6 Chapter Summary .....                                                                 | 154        |
| <b>REFERENCES.....</b>                                                                    | <b>155</b> |
| <b>APPENDIX A: SURVEY QUESTIONNAIRE .....</b>                                             | <b>166</b> |
| <b>APPENDIX B: INTERVIEW QUESTIONS.....</b>                                               | <b>166</b> |

## List of Tables

|                                                                                                   |     |
|---------------------------------------------------------------------------------------------------|-----|
| Table 3.1: Description of key factors .....                                                       | 72  |
| Table 4.1: Adopted factors .....                                                                  | 84  |
| Table 5.1: Gender .....                                                                           | 95  |
| Table 5.2: Participants' age .....                                                                | 96  |
| Table 5.3: Participants' education .....                                                          | 97  |
| Table 5.4: Participants' work experience .....                                                    | 98  |
| Table 5.5: Participants' job level .....                                                          | 98  |
| Table 5.6: Participants' department .....                                                         | 99  |
| Table 5.7: Business systems and use frequency in each department .....                            | 100 |
| Table 5.8: Organisational culture descriptive statistics .....                                    | 103 |
| Table 5.9: Knowledge-sharing descriptive statistics .....                                         | 104 |
| Table 5.10: Business system success descriptive statistics .....                                  | 105 |
| Table 5.11: Individual and organisational impact descriptive statistics .....                     | 106 |
| Table 5.12: Organisational culture reliability assessment .....                                   | 107 |
| Table 5.13: Knowledge-sharing reliability assessment .....                                        | 108 |
| Table 5.14: Business system success reliability assessment .....                                  | 108 |
| Table 5.15: Individual and organisational impact reliability assessment .....                     | 109 |
| Table 6.1: Kaiser-Meyer-Olkin and Bartlett's test of sphericity .....                             | 111 |
| Table 6.2: Summary of parameters used during EFA .....                                            | 112 |
| Table 6.3: Total variance explained and reliability of the factors .....                          | 112 |
| Table 6.4: Cross loadings .....                                                                   | 113 |
| Table 6.5: Factor loading of organisational culture .....                                         | 116 |
| Table 6.6: Reliability and discriminant validity of organisational culture .....                  | 116 |
| Table 6.7: Factor loading of knowledge-sharing .....                                              | 117 |
| Table 6.8: Factor loading of business system success and individual and organisation Impact ..... | 117 |
| Table 6.9: Reliability and discriminant validity of KS, BSS, IM and OM .....                      | 117 |
| Table 6.10: Model fit .....                                                                       | 118 |
| Table 6.11: Organisational culture hypothesis testing .....                                       | 120 |
| Table 6.12: Knowledge-sharing and business system success hypothesis testing .....                | 121 |
| Table 6.13: Summary of hypotheses results .....                                                   | 125 |
| Table 7.1: Information about interviewees at Company A .....                                      | 127 |
| Table 7.2: Information about interviewees at Company B .....                                      | 129 |
| Table 7.3: Summaries of case companies in relation to organisational culture .....                | 133 |
| Table 7.4: Summaries of case companies in relation to knowledge-sharing .....                     | 137 |
| Table 7.5: Summaries of case companies in relation to business systems .....                      | 139 |
| Table 8.1: Revisiting the research aim and objectives, research questions and hypotheses .....    | 141 |

## List of Figures

|                                                                                     |     |
|-------------------------------------------------------------------------------------|-----|
| Figure 1.1: Research Design .....                                                   | 8   |
| Figure 1.2: Thesis Outline.....                                                     | 14  |
| Figure 2.2: Business systems process model (adapted from Monk & Wagner, 2006) ..... | 48  |
| Figure 2.4: Critical success factors (Shaul & Tauber, 2011, p. 362) .....           | 56  |
| Figure 3.1: Overview of existing studies .....                                      | 63  |
| Figure 3.2: Organisational culture (Denison and Spreitzer, 1991) .....              | 65  |
| Figure 3.3: D&M IS Success Model (DeLone and McLean 1992) .....                     | 68  |
| Figure 3.4: Conceptual model .....                                                  | 71  |
| Figure 4.1: Research activities .....                                               | 81  |
| Figure 5.1: Participants' gender .....                                              | 96  |
| Figure 5.2: Age.....                                                                | 96  |
| Figure 5.3: Education .....                                                         | 97  |
| Figure 5.4: Work experience .....                                                   | 98  |
| Figure 5.5: Participants' job level .....                                           | 99  |
| Figure 5.6: Participants Department.....                                            | 100 |
| Figure 5.7: Business systems .....                                                  | 101 |
| Figure 6.1: Organisational culture path testing .....                               | 120 |
| Figure 6.2: Knowledge-sharing path testing .....                                    | 121 |
| Figure 6.3: Conceptual model path testing.....                                      | 125 |
| Figure 7.1: Business systems at Company A .....                                     | 128 |
| Figure 7.2: Business systems in Company B .....                                     | 130 |

# **CHAPTER 1 : INTRODUCTION**

The purpose of this study is to investigate the impact of organisational culture and knowledge-sharing on business system success in Saudi Arabian firms. Understanding the factors that contribute to business systems success has been a challenging process for both public and private organisations in Saudi Arabia. This research shows how various dimensions of organisational culture influence knowledge-sharing and business systems success, particularly the organisational and individual impact.

The chapter begins with the research problem statement and outlines the motivation for undertaking this research. The purpose of this research, including the research aim and objectives, is then presented. Following that, the research questions and significance of the research are provided. Finally, an overview of research method and the layout of this thesis are outlined.

## **1.1 Research Background**

Organisational culture is critical to the success of business systems. Studies in business success have found that organisation culture is critical to the success of business systems. The academic debate on the role of culture within the business environment highlights the crucial role of culture as a way of improving business systems (Juntiwassarakij 2008). Stakeholders need to ensure that the culture of the organisation is well understood, in particular in the Saudi context, which is often challenging (Eid and Nuhu 2011; Adlan and Have 2012; Al-Adaileh and Al-Atawi 2011). The cultural background of Saudi Arabia is Arabic and primarily made up of Muslims. Saudi Arabia has a unique culture and inheritance, which has been conserved since its origin (Eid and Nuhu 2011).

Visitors to Saudi Arabia are subjected to the same Islamic law as Saudi citizens. For that reasons, various organisations in Saudi Arabia are impacted by the cultural aspects of the Saudi community to some extent. When it comes to recruiting staff in Saudi organisations, there is a clear requirement that people, whether of Saudi citizenship or otherwise, will be directed by similar policies and will follow similar requirements in their organisations. Differences in culture exist in Saudi enterprises, and these differences in values, beliefs and customs will affect the diverse employees' experiences in the work environment.

The use of technology in the Saudi Arabian business world has an interesting history. As the country did not adopt formal education until the 1930s, the adoption of technology was delayed in all spheres of the economy. While western countries began aligning their business activities with information technology (IT) much earlier, Saudi society was still experimenting with its application in the 1970s and '80s.

Understanding the success factors in implementing business systems has been a challenging process for both public and private organisations in Saudi Arabia. Business systems are complex in nature as they connect the functional departments of an entire firm, may take several years to be successful and require committing a significant amount of money and other resources (Raymond et al., 2005). According to Pabedinskaitė (2010), business systems are complex not only because they incorporate the entire company but also because their use is affected by other technical and non-technical factors, such as the organisational culture. Organisational culture has been recognised in the literature as one of the most important success factors that must be looked at in order to increase the business system success rate (Gou 2014).

Knowledge-sharing within an organisation is also considered an important factor that affects the overall performance of an organisation (Boehm 2012). Knowledge-sharing is one of the most important factors for the success of modern organisations, as it can help them to ensure they have the most robust mechanism available to them (Alston and Tippet 2004).

Knowledge-sharing needs to occur within the organisational employees for a firm to have a competitive advantage (Crow & Hartman 2002). Therefore, it is important for organisational managers to have a clear understanding of the needs of the organisation and the success of business system, which is increasingly important for the organisation (Liu et al. 2007). The business systems of Saudi organisations need to improve considerably. To do this, organisations must ensure knowledge-sharing can be enabled (Alston and Tippet 2004, 2009; Beauregard 2011). Such as by assessing information system success (Popovič et al. 2012), with the DeLone and McLean (1992) multidimensional information success model for organising the concept of information system success as being one of the most often used works.

The focus of research related to business systems is mainly based on the implementation and adoption stages (Umble et al., 2003). Existing research evaluates business systems' success by whether the system is employed within budget and on time. However, existing research ignores that the main goal of business systems usage is to produce business value and improve an organisation's business performance (Shao et al. 2012). For that reason, organisational culture is considered to be one of the most important factors promoting knowledge-sharing for business system success (Shao et al. 2015).

Since business systems incorporate several business functions, employees should be aware not only of their own tasks and responsibilities, but also work together closely

with other employees on the organisation's essential business processes.

The employees need to experience a thorough learning practice to fill the gap between what the business system needs them to know and what they do know (Ke and Wei, 2008). Organisations need to overcome the cultural issues and develop an organisational culture that enables knowledge-sharing (Jones 2005; Jones et al. 2006). Business systems usually consist of integrated modules across multiple business functions. Although some researchers have examined the relationship between organisational culture and knowledge-sharing (such as Jones 2005; Jones et al. 2006), and the relationship between business systems and organisational culture success (McGinnis and Huang 2007), no research has investigated the influence of organisational culture on knowledge-sharing towards business system success in Saudi enterprises. Saudi Arabia's workforce employs people from all over the world, and this has enabled it to merge various cultures. Therefore, it is critical to identify various factors of business systems for a successful outcome in a Saudi firm.

## **1.2 Purpose of the Study**

The purpose of this study is to provide insight regarding the impact of organisational culture and knowledge-sharing on business system success in Saudi firms. Therefore, the main aim of this research is to develop a model to describe how organisational culture and knowledge-sharing contribute towards business system success in Saudi enterprises, measuring the impact of business system success on both organisations and individuals.

Following on from this aim, the research objectives are

- To investigate the impact of organisational culture on knowledge-sharing and business systems success in Saudi Arabian firms.

- To investigate the impact of knowledge-sharing on the business systems' success in Saudi Arabian firms
- Propose a business systems success model for Saudi Arabian firms.
- To empirically validate the proposed model using a survey and case studies.

### **1.3 Research Questions**

The following research questions have been formulated to address the research gaps related to the current study.

1. How does organisational cultural (group culture, hierarchical culture, development culture and rational culture) impact knowledge-sharing and business system success in Saudi Arabian enterprises?
2. How does knowledge-sharing impact business system success in Saudi Arabian enterprises?
3. How does business system success influence organisational and individual impact in Saudi Arabian enterprises?

### **1.4 Significance of the Study**

Business systems are complex information systems that integrate organisation-wide operations. Prior studies have identified various factors that are critical to business system implementation success (Umble et al., 2003), but little research has empirically tested the relationship between organisational culture and knowledge-sharing on business system success. A review of literature found that no research examining this topic has been conducted in the Saudi context.

This research will be an important contribution to the body of knowledge by being the first to analyse the relationship between organisational culture, knowledge-sharing and business system success in the Saudi Arabian context.

This study will therefore bring new understanding regarding the success of business systems through the inclusion of organisational culture and knowledge-sharing in the success indicators of business systems in Saudi enterprises. From a managerial perspective, this study provides insights for Saudi organisations on how to focus on all four cultural types (development, group, hierarchy and rational) and knowledge-sharing.

The recommendations of this study will also assist in the more effective use of organisational culture and enable knowledge-sharing processes to facilitate business system success in Saudi Arabian organisations to increase employee confidence levels and consequently improve organisational performance. Hence, the outcomes of the study will be of great significance to Saudi enterprises in terms of business systems success. Thus, the result of this study will be relevant to both public and private organisations in the Kingdom of Saudi Arabia.

## **1.5 Scope of the Study**

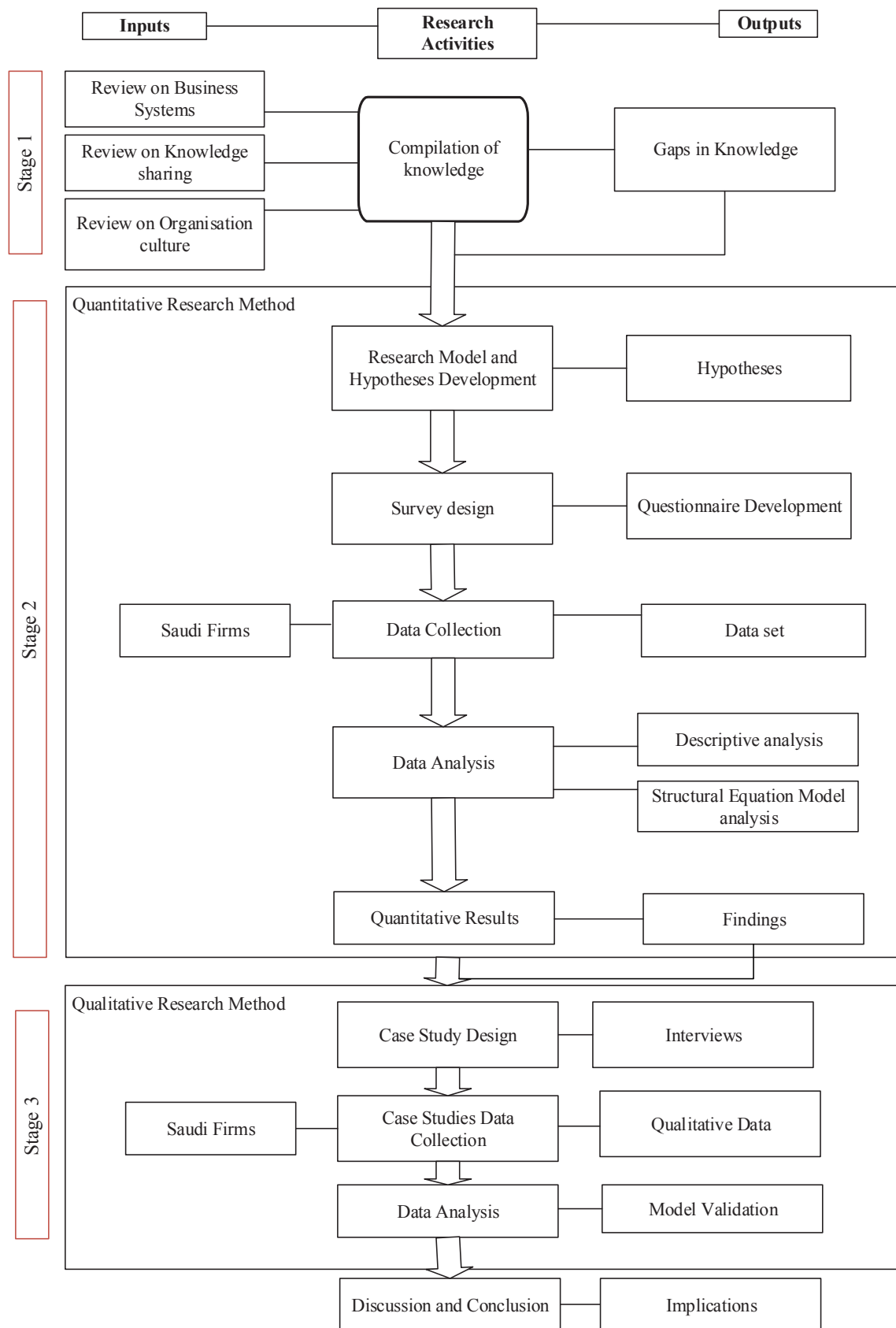
The case studies examined in this study are limited to Saudi Arabian firms. The primary reason for choosing Saudi Arabia was the convenience of working with a broad population of firms from different sectors and industries who have implemented and established business systems (such as SAP and Oracle) in their firms. The study was conducted within the following confines:

- The study examined organisational culture types based on the competing values framework (CVF) developed by Quinn and Spreitzer (1991).
- The study was limited to the context of Saudi Arabian organisations (the terms ‘organisation’, ‘firm’, ‘company’, and ‘enterprise’ are used interchangeably throughout the thesis).
- The study did not take into account national cultural factors and thus data was collected from both Saudi and non-Saudi employees in selected organisations in Jeddah, Saudi Arabia.

## **1.6 Research Plan**

This section provides a summary of research activities conducted for the current study.

Figure 1.1 shows the research design, which is presented in more detail in Chapter 4.



**Figure 1.1: Research Design**

### **1.6.1 Knowledge Compilation and Research Problems**

A literature review is an ongoing process that continues throughout the research's life cycle. The first stage of knowledge compilation for this study involved doing a broad literature review on the fields of organisational culture, knowledge-sharing and business system success. As the research project progressed, the literature review became more focused. This stage required defining the research borders clearly in order to investigate the influence of organisational culture based on the competing values framework (CVF), which categorises organisations into four types (development, group, hierarchy and rational); and knowledge-sharing on the individual and organisational impact on business system success.

Once the literature review was completed, it was clear that there were gaps in the knowledge and, specifically, that no research has been conducted in the Saudi context to explore the relationship between organisational culture, knowledge-sharing and business system success.

### **1.6.2 The Development of the Research's Theoretical Model**

Once the gap in the literature is identified and the research borders established, the research questions and hypotheses are developed. Previous validated models were examined in related fields, such as the information system (IS) model, the business systems success measurement model and organisational culture based on the competing values framework (CVF). A conceptual model was proposed and a hypothesis was developed that could investigate the research questions.

### **1.6.3 Development of Questionnaire and Data Collection**

A questionnaire instrument was developed as an approach or strategy for conducting research that involves a quantitative empirical investigation. After the survey was designed, data were collected in Saudi firms.

### **1.6.4 Data Analysis**

Specific statistical techniques were implemented to analyse the data gathered from the surveys. The first stage of the analysis procedure was compiling descriptive statistics of the demographic information to ensure that the data set was appropriately advanced, used statistical techniques and could be considered as a single data set. Then, a measurement scale analysis was employed to find Cronbach's alpha.

Correlation also involved performing exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) for each of the model constructs/variables to determine the reliability and the best factor structures, which led to the development and confirmation of valid model constructs. Structural equation modelling (SEM) was conducted to initially evaluate and uncover the significance of the relationships between the constructs of the study model. The data was analysed using variance-based SEM statistical techniques, such as partial least squares (PLS) path modelling using SmartPLS version 3 (Ringle et al., 2014), to examine the relationships between the different parameters of the research model.

### **1.6.5 Validation of the Data**

Following the quantitative analysis and refinement, a qualitative validation was sequentially conducted to determine whether the relationships illustrated in the model could be sufficiently explained by the actual phenomena among the selected Saudi Arabian firms. Achieving this needs an explanatory case study research, which focuses on addressing the hypotheses testing and answering the research questions. Case studies were conducted of two Saudi Arabian firms using semi-structured face-to-face interviews as the data collection technique.

### **1.6.6 Discussion and Recommendations**

The results were interpreted accordingly to test the hypotheses and answer the research questions. The theoretical and practical implications were provided and finally the study concludes.

## **1.7 Thesis Layout**

Figure 1.2 shows the thesis outline. This thesis consists of eight chapters. The current chapter, Chapter 1, outlines the problem statement, the purpose of the study, research questions, significance of this study and the scope of the study. An overview of the research method and an outline of the thesis layout are also provided.

Chapter 2 reviews the literature pertinent to the field of business system success, focusing on organisational culture and knowledge-sharing phenomena within organisations. This task includes a critical review of recent publications concerning business systems overview, theories of organisational culture and knowledge-sharing concepts that influence business system success in organisational settings.

Chapter 3 describes the construction of the conceptual model for the current study. An in-depth review is conducted of all related validated and tested models and frameworks on organisation culture, knowledge-sharing and business system success, therefore identifying the theoretical framework most suitable for the current research. A conceptual model based on the knowledge gaps discovered in the literature review and the highlighted research models and frameworks is developed. The research hypotheses are then associated with the causal relationships between the model's constructs.

Chapter 4 includes details of the research methodology, which addresses all of the issues related to the research approach, starting with the research design and relevant analytical techniques adopted in this study. Specifically, this part of the chapter describes the procedures of mixed-method research related to both the quantitative and qualitative analysis methods, which are integrated in one research design to validate and assess the current conceptual model.

Chapter 5 outlines the details and results of the descriptive analysis of the data collected from the questionnaires conducted with employees from Saudi Arabian firms. The profiles of the survey respondents are presented and the survey data is screened to ensure that it was suitable for the following multivariate statistical analysis. In addition, the descriptive statistics of each construct used in the study presents the standard deviation, mean and variance.

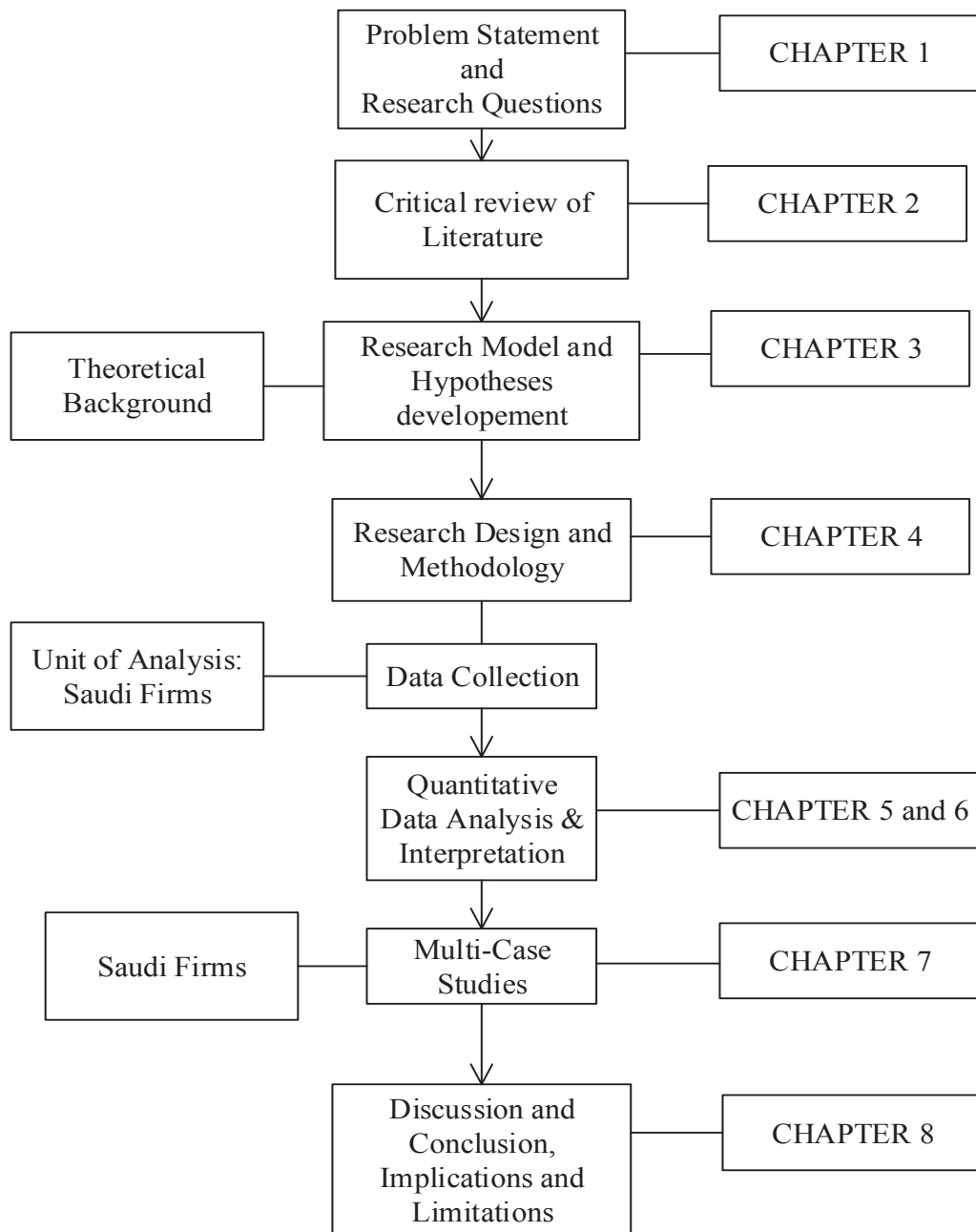
Chapter 6 provides the results of the measurement scale analysis. The exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) approaches are then listed and the results presented. The EFA helps to show the appropriate number of factors for each of the model's constructs, while the CFA confirmed the identified factor structures, thus further strengthening the validity of each construct and its factors. The chapter also conducts structure equation modelling (SEM) analysis to demonstrate the statistical

significance of the relationships between the constructs of the model and the acceptance or rejection of the hypotheses stated in Chapter 3.

Chapter 7 shows the validation of the empirically tested model discussed in previous chapters. In particular, this chapter details the qualitative research technique and outcomes based on explanatory case studies of two Saudi Arabian firms. The chapter validates the hypothesis results through analysis extracted from interviews with experts from Saudi Arabian firms.

The final chapter, Chapter 8, summarises the general outcomes of this research, identifying the contributions made by this study to the existing body of knowledge as well as the implications of the findings of this research for Saudi firms. It also suggests recommendations for future research and notes the limitations of the study.

Subsequently, the reference list, and the Appendices A through to C are provided.



**Figure 1.2: Thesis Outline**

## **CHAPTER 2 : LITERATURE REVIEW**

The purpose of this chapter is to provide a background on business systems, organisational culture and knowledge-sharing. The relevant literature is reviewed to introduce the existing theories, which are then used to build the research model in Chapter 3. Firstly, this chapter defines the term business system and presents an overview of business systems, then the existing literature on business system success factors, organisational culture and knowledge-sharing within organisations is examined.

### **2.1 Organisational Culture**

Previous researchers propose different conceptualisations, definitions and models for measuring culture, including at the national and organisational levels (Hofstede 1990; Schein, 1985; Quinn, 1991). This study concentrates on organisational culture, the fit between organisational culture and the philosophy embedded in a business system success is more important (Ke and Wei, 2008).

To conduct a study involving culture, the first challenge is to clearly define culture. There are many definitions, conceptualisations and dimensions that have been used to describe culture. Culture has been framed as implicit and/or explicit. For-example, Sackmann (1992) suggests that culture includes a clear set of beliefs, core values and the collective will. Some researchers suggest that culture should include explicit, observable artefacts like practices, symbols, languages, rituals, heroes and ceremonies (Hofstede, 1990). Many prominent views of culture propose that culture includes both explicit and implicit components. For example, Schein (1985) proposes a three-level model of culture that includes artefacts, values and basic assumptions.

Artefacts include the organisation's written and spoken languages and jargon, office layouts and arrangements, organisational structure, dress codes, technologies and behavior patterns. Hofstede (1980) argues the manifestations of culture range from symbols, heroes, rituals (also represented as practices) to values (where value serves as the core of culture). This frame of culture includes both explicit and implicit perspectives.

The most common view of culture uses definitions based on shared values. In these definitions, culture is based on values and is identified and described as a set of value patterns that are shared across individuals and within groups (Straub et al., 2002). For example, Trompenaars (1996) states that culture is composed of shared values. In summary, in this definition shared values are the core of a culture and these shared values are said to differentiate cultures.

Organisational culture has been defined in various ways and ascribed a number of identifiable value sets (Schein, 1985; Quinn, 1991), such as management styles, reward systems, communication styles, manner of decision-making, all of which help to define an organisation's character and norms (Straub et al., 2002; Scott et al., 2003). Schein (1985) defines organisational culture as a pattern of shared basic assumption learned by a group. This implies that organisational culture refers to practices, which are the more observable perspectives of culture.

The term “culture” has been defined as the collective behaviour of people within an organisational setting and the meanings they associate with actions (Fong and Kwok 2009). These shared mental assumptions by individuals in an organisation include norms, values and ways of thinking (Shepstone and Currie 2008). A number of authors contend that it is imperative that organisational needs be defined because the needs of

an organisation will determine the culture that best serves its needs (Shao et al. 2012). International culture is the standard set of beliefs and norms that are followed by organisations across the board.

The measurement models of organisational culture adopt either a typological approach or a dimensional approach. The typological approach assesses organisations as one of more types of organisational culture (i.e. the competing values framework). The dimensional approach, on the other hand, describes a culture by its position on a number of continuous variables (Fletcher and Jones, 1992).

The most influential typological model in the literature is the competing values framework (CVF). Developed by Quinn and Rohrbaugh (1981), this framework includes two dimensions: the first that considers internal emphasis and external focus and the second that considers stability/control and flexibility. This framework characterises organisational cultures as being group, developmental, rational or hierarchical. The group culture type emphasises flexibility and focuses on the internal organisation. The developmental culture type also pertains to flexibility and change but includes considerations of the external environment. The rational culture type has an external focus, but it is control oriented, emphasising goal achievement. The hierarchical culture type pertains to internal efficiency, coordination and evaluation. The focus is on the logic of the internal organisation and its stability (Cameron & Quinn, 1999).



Figure 2.1: Organisation culture (Quinn and Rohrbaugh, 1981)

In this study, organisational culture is based on the CVF. The CVF has been influential in studies of organisational culture and applied in many settings by other researchers and practitioners.

### 2.1.1 Impact of Organisational Culture

One of the challenges faced by companies is to keep up with the changing organisational culture in order to cater successfully to their customers (Luis Ballesteros-Rodriguez et al. 2012). Companies spend millions of dollars to conduct ongoing research on the changing culture and training their company's practices to satisfy external demands (Inazawa 2009). Stakeholders need to ensure the culture of the organisation is well understood, particularly in the Saudi context that is often problematic (Adlan & ten Have 2012; Al-Adaileh & Al-Atawi 2011; Eid & Nuhu 2011). Many researchers have established that organisational culture has a significant effect in an organisation. For these authors, organisational culture describes specific set of norms and values of an organisation. These norms and values are shared by the

employees of that organisation, either individually or in a group, to become the cultural identity of the particular organisation.

Ensuring information systems success in an organisation is typically a knowledge-intensive activity (Pee, Kankanhalli and Kim 2010). As such, understanding the association between organisational culture type and knowledge-sharing practices among employees is important to better coordinate the application of information technology (IT) with the skills and expertise of employees (Pee et al. 2010). To add to the research understanding of this phenomenon, Suppiah and Sandhu (2011) investigated the influence of the four CVF organisational culture types on employees' tacit knowledge-sharing behaviours. The data for their research was obtained via survey of 362 employees from seven organisations in Malaysia. They found that a clan (group) culture positively influences tacit knowledge-sharing behaviour among employees in an organisation. Indeed, the authors concluded that the existence of even a moderate level clan culture in an organisation would facilitate a positive modification in employees' tacit knowledge-sharing behaviors (Suppiah and Sandhu 2011). The study also found the market (rational) and hierarchal culture types contributed negatively to employees' tacit knowledge-sharing behaviours. Suppiah and Sandhu (2011) reported that statistically significant results could not be obtained on the impact of the adhocracy (development) organisational cultural type on employees' tacit knowledge-sharing behaviours. Notably, they also considered the impact that a mixed organisational culture environment may have on knowledge-sharing practices among employees. The authors inferred from the regression coefficients related to other measures that the influence of the mixed organisational culture on tacit knowledge-sharing behaviour would be positive if the clan culture was dominant, but negative if the clan culture was not dominant (Suppiah and Sandhu, 2011).

Tseng (2010) argues that there are a range of factors related to organisational culture that impact knowledge-sharing processes including but not limited to trust, common cultures, vocabularies, status and rewards, frames of reference, and tolerance for mistakes. As such, Tseng (2010) emphasises that organisations must create and foster the type of culture necessary to facilitate knowledge-sharing behaviours among employees.

An important challenge that arises for organisations is to clearly understand the needs of their organisation and change their norms according to their needs in order to succeed (Henk 2007). For example, Saudi Arabian organisations have employees from many different cultures (Alnather 2012). Hence, managers need to ensure employees follow a set of beliefs that are followed all around the world. This may result in Saudi Arabian companies being on a learning curve. Ifenedo (2007) argues that culture is not just the belief systems widely held by employees within an organisation, but something beyond that. Rather, the set of beliefs that employees follow are set by the leaders of the organisation (Ifinedo 2007).

Similarly, Tseng (2010) investigates whether organisational cultural types significantly promoted or hindered knowledge management initiatives, including knowledge-sharing in organisations. Knowledge-sharing behaviours were introduced into a research model to examine the correlations between organisational cultural type, knowledge-sharing and organisational performance outcomes (Tseng, 2010). As such, the author sought to examine how the outcomes of the organisation culture–knowledge-sharing relationship affected the performance of the organisation in terms of financial performance, market/customer relations, internal process, human resources development and future direction.

A questionnaire was designed and used to collect data on knowledge management outcomes including knowledge socialisation, knowledge externalisation, knowledge combination and knowledge internalisation. Tseng (2010) concludes that managers who develop an adhocracy culture are more easily able to create organisational settings where knowledge worker employees can improve organisational performance and enhance the organisation's value.

Hartnell and Kinicki (2011) conducted a study of the correlation between CVF types and organisational effectiveness. They applied the CVF to examine the relationship between organisational culture and organisational effectiveness. Specifically, three organisational culture types – clan (group), adhocracy (development) and market (rational) – were explored for their relationship to three major indicators of organisational effectiveness: namely, employee attitudes; operational performance (including innovation and product and service quality); and financial performance. The hierarchy organisational culture type was not included in the investigation by the authors.

Using a meta-analysis research design, the researchers examined the results from 84 empirical studies that included 94 independent samples of organisational culture. They found all three CVF cultural types studied were positively and significantly associated with organisational effectiveness in 23 of the 25 organisations represented in the empirical studies. As a result, the authors concluded that their findings in general support the view that organisational culture is a key organisational variable in the determining the effectiveness of an organisation (Hartnell and Kinicki 2011).

With regard to the three indicators of organisational effectiveness specifically, the results of the Hartnell and Kinicki's (2011) meta-analysis varied. In terms of employee

attitudes, the results focused primarily on job satisfaction and organisational commitment. Employee job satisfaction was significantly related to clan (group) culture, but only moderately related to adhocracy (development) and market (rational) cultures. Similarly, the variable employee organisational commitment was significantly associated with a clan (group) culture, but its relationship with market (rational) cultures was far less robust. In terms of the variable operational effectiveness, the results revealed clan (group), adhocracy (development) and market (rational) cultures all demonstrated moderate to strong associations with the effectiveness criteria of innovation and product and service quality. Regarding innovation specifically, the strongest association was demonstrated in organisations with rational cultures. The last organisational effectiveness variable, financial effectiveness, was measured according to three outcomes: profit, market performance and growth. Hartnell and Kinicki found a market (rational) organisational culture had the strongest positive relationship with all three of the financial effectiveness outcomes.

Naranjo-Valencia et al. (2011) examined the relationship between organisational cultural type and organisational performance. Specifically, the authors studied the association between organisational cultural type and innovation strategy; that is, whether a business would pursue innovation or imitation. They also linked innovation to the concept of organisational performance in the sense that it was regarded as a pathway to achieving competitive advantage through the launch of new products onto the market. Examining the practices of 471 Spanish companies, the authors found that the CVF cultural types can be identified as determinants of innovation strategy within an organisation. Specifically, the authors reported that adhocracy (development) cultures in an organisation are more likely to nurture innovation strategies, whereas hierarchical cultures were more likely to promote imitation cultures (Naranjo-Valencia et al. 2011).

The main conclusion drawn by Naranjo-Valencia et al. (2011) is that managers must consider carefully the values and norms they promote within the organisational culture. This is because the culture has the potential to significantly impact the market orientation strategy (i.e., innovation or imitation) they wish to pursue. The Tseng (2010) study found adhocracy culture types facilitate greater knowledge conversion and improve organisational performance compared to than clan and hierarchy cultures. Chinese-centric social, cultural and linguistic attitudes and behaviours were the focus of Tseng's study and, as such, countries with different sets of attitudes and behaviors may produce different results.

Organisational culture has been measured as an important aspect of encouraging collaboration between staff (Shao et al. 2012). According to Eid and Nuhu (2009), organisational culture affects employee collaboration, organisational functioning and even decision-making in organisational settings. Organisational culture is the factor that makes a business profitable by encouraging employees to acquire knowledge and develop innovative ideas (Hahn et al., 2013). The authors Hahn et al. (2013) conducted an empirical analysis and examined how organisations should design organisational culture to improve individual creativity according to employees' working styles in South Korean firms. Mueller (2014) investigated the cultural construct of knowledge-sharing between project teams and found that learning culture supports knowledge processes and employees see knowledge-sharing as a natural activity in their daily business. Škerlavaj et al. (2010) describe organisational culture as a difficult process that denotes the development of new knowledge and likely to change organisational and individual behaviour.

The core values of the adopting organisations' corporate culture can cause mismatch problems during the business systems implementation process and thus may also negatively influence the benefits from such systems (Soh et al., 2000, Krumbholz and Maiden, 2001; Ke and Wei, 2008). Similarly, the overall business system success is improved if there is a match between the organisational culture and the underlying logic of the system (Davenport, 2000).

Table 2.1 shows the previous research studies related to the impact of organisational culture on business systems success.

**Table 2.1: Summary of existing studies related to organisationing culture**

| Source                   | Method                                                                                                                  | Conceptualisation of factor “organisational culture”                                                                                                                                                                                                                        | Findings                                                                                                                                                  | Relation to this study                                                                                                                                    |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hahn et al., 2013        | Empirical analysis, questionnaires from team members in South Korean companies.                                         | Does organisational learning culture affect creativity by influencing an individual’s working style in system integration (SI) companies in South Korea?<br><br>SI companies conduct business by integrating, operating, maintaining, and repairing customers’ systems.     | Learning culture positively affects individual creativity according to employees’ working styles in South Korean firms.                                   | Organisational culture is the encouraging factor that makes a business profitable by leading employees to acquire knowledge and develop innovative ideas. |
| Škerlavaj et al., 2010   | Empirical analysis, data from 201 Korean companies employing more than 50 people.                                       | Does organisational learning culture improve innovativeness in organisations?                                                                                                                                                                                               | Organisational learning culture has a significant positive direct effect on innovations.                                                                  | Organisational culture affects innovation, and innovation is the most important factor that impacts business performance.                                 |
| Castro et al., 2012      | Empirical analysis, using a questionnaire to survey 251 Spanish high and medium-high technological manufacturing firms. | The moderating role of culture on innovation; how human and technological knowledge assets could play a crucial role in the technological innovations in high and medium-high technology manufacturing firms in Spain.                                                      | The results obtained show the positive and direct effects of human capital, technological knowledge assets, and innovation culture on product innovation. | According to the authors, “Innovation culture’ may be labeled as an Organisational culture”                                                               |
| Guo et al., 2014         | Empirical analysis, data from four firms in China                                                                       | (1) How do four cultural types (group culture, hierarchical culture, development culture and rational culture) impact ERP integration in the post-implementation stage?<br>(2) What specific cultural traits does an organisation need to exhibit in ERP integration phase? | The research findings provide guidelines for the firms to facilitate an appropriate organisational culture for the integration of ERP systems.            | To adopt coordination mechanisms as well as organisational learning culture to achieve business benefits with the integration of new business systems.    |
| Bourrie and Sankar, 2012 | A case analysis. HealthSouth Corporation, longitudinally during two periods (1997 to 2003 and                           | How ERP implementations are influenced by organisational culture.                                                                                                                                                                                                           | This paper provides valuable lessons to ERP practitioners on how ERP implementations are influenced by                                                    | Organisational culture impacted business system implementations in both positive and negative ways                                                        |

|  |               |  |                                                                     |  |
|--|---------------|--|---------------------------------------------------------------------|--|
|  | 2004 to 2007) |  | leadership from the top management team and organisational culture. |  |
|--|---------------|--|---------------------------------------------------------------------|--|

The researchers identified in Table 2.1 address key issues about how organisational culture has significant impact in the context of business systems. To examine these issues, survey and case studies were conducted at multinational companies to test the relationship between organisational culture and factors related to enterprise systems such as system implementation, performance or success. All researchers established that organisational culture determines how staff in a particular organisation interacts with each other and how they approach their assigned tasks. The most common definition of organisational culture used in these studies described it as the specific set of norms and values of an organisation (Guo et al. 2014). These norms and values are shared by the employees of that organisation, individually or in a group, and become the cultural identity of the organisation.

Authors have classified and define different types of organisational culture. The organisational culture prescribed in those studies is the appropriate behaviour for a member towards their colleagues at a particular organisation. This study extends the work of authors presented in Table 2.1 and responds to a call for further investigation.

### **2.1.2 Organisational Culture in a Saudi Arabian Context**

At the time of writing this thesis, there have been no studies that examine the impact of the four CVF organisation cultural types on business system success in Saudi Arabia. However, there are some studies of the Saudi organisational context that adopted a more generalised conceptualisation of organisational culture to investigate the relationship between organisational culture and knowledge-sharing. For instance, in their study of the impact of organisational culture on knowledge exchange in the Saudi Telecom context, Al-Adaileh and Al-Atawi (2011) found that organisations with cultures that privilege team cooperation more than individual achievements (e.g., group cultures) will engage in more knowledge-sharing.

Although Al-Adaileh and Al-Atawi (2011) did not apply the CVF organisational culture types specifically, one may infer from the study's findings that employee knowledge-sharing may be at lower levels in organisations with high levels of self-interest among employees. In turn, according to Jehanzeb, Rasheed and Rasheed (2013), this may have implications for the level of commitment employees show towards the organisation and should be addressed through suitable training and development programs.

Furthermore, Aldhuwaih, Shee and Stanton (2012) investigated the impact of the CVF organisational cultural types on the relationship between employee job satisfaction and turnover intention. Focusing specifically on the banking sector in the Saudi Arabian capital city, Riyadh, the authors argued that examining the link between organisation culture types, job satisfaction and turnover intention is valid for two reasons: studies show that an organisation's culture impacts employee attitudes; and the culture of a country may also influence the culture of an organisation (Aldhuwaih et al. 2012).

The authors collected data via questionnaire from 258 frontline employees from 12

banks in Saudi Arabia. Notably, Aldhuwaihi et al. (2012) found employees perceived the market organisational culture to be the dominant culture in Saudi banks, followed by hierarchical culture, the clan culture and finally the adhocracy culture. Additionally, the authors reported that employees' job satisfaction levels and turnover intentions varied across the four organisational culture types (Aldhuwaihi et al. 2012). All four CVF types were positively and significantly associated with employee job satisfaction; the strongest correlation showing for clan (group) culture, with adhocracy culture next strongest, following by hierarchy culture and then market culture. Only market (rational) organisational culture demonstrated a significant moderating effect on the job satisfaction–turnover intention relationship (Aldhuwaihi et al. 2012).

Aldhuwaihi et al. (2012) concluded from their findings that the way Saudi bank employees perceive the culture of their organisations is influenced by their perceptions of Saudi national culture (Aldhuwaihi et al. 2012). This conclusion has implications for organisational outcomes as employees' perceptions of the national–organisational culture relationship impacts employees' attitudes, including job satisfaction levels. The authors thus emphasise the importance of considering national culture when studying the impacts of organisational culture on organisational outcomes. As they note, this becomes increasingly complex, however, when studying employee attitudes and behaviours in multinational corporations (Aldhuwaihi et al. 2012).

## 2.2 Impact of Knowledge-Sharing in Organisations

Knowledge-sharing is defined as the set processes and activities that supports employees working together, empowering the knowledge give-and-take and enabling learning-oriented activities to enhance their ability to achieve individual and organisational goals (Dyer and Nobeoka, 2000). Gupta (2008) describes the free flow of knowledge in organisations as knowledge-sharing. Quinn (1996) highlights that knowledge-sharing activities cause the sender's information and experience and recipients to grow exponentially.

The following equation developed by the Arthur Anderson Business Consulting Group indicates that knowledge increases exponentially as knowledge-sharing develops within an organisation (Tseng et al. 2012):

$$K = (I+P)^S$$

where K: knowledge, I: information (the content of information in an organisation), +: technology (the structure and information technology of KM in an organisation), P: people (the capability of knowledge and skill owned by individual workers), and S: sharing (the degree of knowledge-sharing).

This formula expresses how the elements of knowledge-sharing interact to achieve its purposes, which include improving the quality of the knowledge base and developing the global organisational culture to embrace knowledge-sharing (Nonaka, 1994; Probst et al. 2000). Three mechanisms enable employees' knowledge-sharing within an organisation (Bartol and Srivastava, 2002; Lin, 2009; Tseng et al. 2012). These three mechanisms are:

- Input of knowledge to an organisational database

This means the identification, collection and classification of valuable knowledge, experiences, and documents into a single source that can be retrieved and searched easily by individual employees in the organisation. This will increase the benefits of knowledge in the organisation and may reduce the costs of maintaining redundant knowledge objects. Some organisations keep the document management system for storing individual employees' working content, daily work reports and records with varying mechanisms of technical and manual editorial control.

- Knowledge-sharing in formal collaborations within or across teams

This means a formal system to provide information and knowledge within an organisation, such as the reporting system. Having a formal system of information and knowledge delivery allows for the fast delivery of formal, official and accurate information. Most of the tacit knowledge of useful experiences can be transferred through this system. Though, the sharing efficiency is expertise in topic-specific conference and training courses. Therefore, it is very essential to have a suitable structure of topics, agenda, and time for enough opportunity to share knowledge.

- Knowledge-sharing in informal interactions among employees

This means that staff emphasise a particular topic of interest, which can be a physical or virtual network in an organisation. This is a common model in web-based communities, such as Facebook and blogs. For example, the "Frequently Asked Questions" section of a software program can be set for users to search related queries.

Knowledge-sharing is further divided into explicit knowledge-sharing and tacit knowledge-sharing. Teamwork is also critical for organisations. Employees continue to work together to improve their effectiveness and collaboration, as part of the culture of the organisation enables improvements in the efficiency of the organisation (Shao et al. 2012). Knowledge is the foundation of a firm's competitive advantage, and, ultimately, the primary driver of a firm's value (Kraaijenbrink, 2010).

There are studies that explore the relationship between knowledge-sharing and business systems success. Chou et al. (2014) examined the effect of knowledge-sharing on enterprise resource planning system usage. An important objective of the study was to identify the particular factors affecting employees' knowledge-sharing once the Enterprise system had been fully implemented. As such, significant focus was given to employees' perceptions of the corresponding rewards versus costs associated with the enterprise usage. The authors note that such rewards may emerge from extrinsic motivation sources, such as the receipt of recognition or some material benefit, and intrinsic motivation sources, such as a feeling of satisfaction or sense of accomplishment (Chou et al. 2014). 804 business systems users employed across 53 Taiwanese companies were surveyed. The primary aim of the survey was to measure the relationships between six variables: employee motivation (intrinsic and extrinsic motivation), enterprise system usage, user perceptions of self-efficacy, and knowledge-sharing. The main finding to emerge from the data analysis is that intrinsic motivation and self-efficacy were associated with the most significant impact on knowledge-sharing behaviours by employees (Chou et al. 2014). In terms of intrinsic motivation, the authors concluded that knowledge-sharing via enterprise systems helped employees to avoid workplace-related problems, build expertise, promote self-accomplishment and increase job satisfaction levels (Chou et al. 2014).

In relation to self-efficacy, the authors concluded that this variable was significant because it shapes employees' attitudes and behaviours and high-level self-efficacy is linked to enhanced employee capacity to increase involvement in task-related activities such as knowledge-sharing. The implications of the Chou et al. study for organisational managers relate to strategic human resource management initiatives. The results of the study identify how employees' confidence in their ability to successfully use a business system is inextricably linked to their intrinsic level of motivation to engage in knowledge-sharing. This highlights the importance of managers increasing the usage of business systems to increase user confidence levels and thus improve organisational performance.

The relationship between knowledge-sharing practices and organisational benefits is similarly reflected in a study by López-Nicolás and Meroño-Cerdán (2011) of the ways in which knowledge management strategies impact innovation and corporate performance. The use of codification and personalisation knowledge management strategies was measured for their impact on innovation and three organisational performance outcomes: financial performance, process performance and internal performance. The study found that both codification and personalisation positively impacts innovation capability and organisational performance directly across all three outcomes. Furthermore, the strategies impact organisational performance indirectly through increasing the organisation's innovation capability. The main conclusion drawn by López-Nicolás and Meroño-Cerdán from the study results is that knowledge management is integral to an organisation's capacity to be more. As a result, it is important for organisations to focus on both IT and human resources capabilities to enhance innovation and performance (López-Nicolás and Meroño-Cerdán 2011).

Further to the relationship between IT and knowledge-sharing in organisations, Choi,

Lee and Yoo (2010) examined the impact of IT and transactive memory systems (TMS) on knowledge-sharing and team performance. TMS refers to the cognitive processes engaged in by team members to encode, store and retrieve knowledge. Their study was developed from previous studies that demonstrated the significant investment in IT organisations make to enhance knowledge-sharing within organisational teams (Choi et al. 2010). Choi et al. sought to identify the precise role played by TMS in knowledge-sharing and overall team performance by collecting data from 743 employees active in 139 teams from two major organisations in South Korea.

The main finding to emerge from the study was that TMS significantly and positively developed in organisational teams when they were provided with IT support. In addition, both TMS and IT support were found to have a positive impact on knowledge-sharing and knowledge application. Contrary to the finding from the Al-Adaileh and Al-Atawi's (2011) study, however, Choi et al. (2010) found knowledge-sharing did not directly impact team performance. Rather, the impact of knowledge-sharing on team performance was intermediated by knowledge application (Choi et al. 2010).

These results have clear implications for our understanding of the relationship between knowledge-sharing and business systems performance. For instance, IT support, such as enterprise systems that can automate and integrate core business processes, can improve knowledge-sharing behaviours specifically and knowledge management more generally by significantly enhancing the TMS among teams. The results from the Choi et al.'s (2010) study demonstrated that TMS significantly mediated the impact of IT systems on knowledge-sharing and knowledge application. Thus, IT business systems to support effective knowledge management in organisations can clearly play a vital role in knowledge-sharing and knowledge application within organisational teams.

Hung et al. (2012) found a consultant's industry experience to have the most significant impact on the creation of a building a strong knowledge transfer climate during business system implementation. Siddique (2012) also emphasised the importance of management to encourage effective knowledge-sharing in organisations in order to improve business systems performance. As the author explains, organisations must undertake to integrate knowledge management initiatives into organisational strategies and mission statements to advance organisational performance. As such, the top management, who control resources and decision-making, must play a significant role in building organisation-wide awareness of knowledge-sharing practices and how they can contribute to system improvements (Siddique 2012).

Similarly, Hung et al. (2012) examine the impact of the knowledge transfer climate in an organisation and its relationship to bonding practices and knowledge-sharing during business system implementation. The particular knowledge-sharing context focused on in the study was that between the organisation implementing the business system and its enterprise systems consultants. The authors surveyed 174 respondents to measure the relationship between three factors associated with the implementing organisation (interdepartmental coordination, top management support and internal incentives) and three factors associated with the consultancy organisation (namely, industry experience, extent of project management capabilities and reward systems). They found top management support and internal incentives to be most positively associated with effective knowledge transfer during business systems implementation. To account for this finding, the authors point to the structural changes to procedures, work flows and systems during and resulting from the implementation. As a result, top management support is vital to reduce internal resistance during implementation. Hung et al. (2012) also identify the important role internal incentives play in increasing project staff

motivation and employee willingness to actively acquire and share new knowledge.

Further to the potential significance of a knowledge-sharing climate in an organisation, Tohidinia and Mosakhani (2010) evaluated the impact of different predictors of knowledge-sharing behaviour in organisations in the oil industry of Iran. The authors selected the oil industry on the basis of two key criteria: it is an industry in which knowledge-sharing is important; and it is an industry which has witnessed the development of appropriate IT infrastructures for knowledge-sharing. The authors utilised the theory of planned behavior (Ajzen, 1991; cited in Tohidinia and Mosakhani 2010) as the base for their model of knowledge-sharing behavior. This theory posits that an individual's attitude, subjective norms, perceived behavioural control and intention are the key determinants of behaviour. The authors surveyed 502 employees from 10 companies in the Iranian oil industry. The survey instrument sought to measure the impact of four potential factors of influence: anticipated reciprocal relationship, described as the employees' perceptions of the potential for improved relationships with other organisational members as a result of knowledge sharing; self-efficacy or employees' self-judgment regarding their ability to share knowledge effectively; expected extrinsic rewards, described as the employees' perceptions of the likely receipt of organisational rewards due to knowledge-sharing behaviours; and organisational climate, particularly the employees' positive or negative perceptions of the organisational environment. The key finding to emerge from the study was that employees' perceptions of self-efficacy and anticipated reciprocal relationships positively impacted their attitude toward knowledge-sharing. Employees' perceptions of expected extrinsic rewards did not reveal a significant relationship with attitude toward knowledge-sharing. Additionally, the organisational climate was found to have a positive impact on the employees' subjective norms about knowledge-sharing.

These findings have important implications for our understanding of the relationship between knowledge-sharing and the performance of an organisation. In particular, the authors conclude that employees are more likely to engage in knowledge-sharing practices if they thought they would “contribute to the achievement of desired outcomes” (p. 619) in the organisation. Additionally, employees are more likely to share knowledge if they perceive the anticipated reciprocal relationships to bring benefits to both them and the organisation.

Wang and Wang (2012) also contribute to our understanding of the relationship between knowledge-sharing and organisation performance. In contrast to the qualitative research conducted on the relationship between knowledge-sharing and the performance, the authors undertook a quantitative investigation on the relationship between knowledge-sharing, innovation and performance. The authors collected data from 89 high technology organisations in the Jiangsu Province of China to support their conclusions (Wang and Wang 2012). The authors found that knowledge-sharing practices – both the explicit and tacit forms – facilitated innovation and performance in an organisational context. In particular, explicit knowledge-sharing was found to significantly impact innovation speed and financial performance, whereas tacit knowledge-sharing was found to significantly impact innovation quality and operational performance. Not surprisingly, Wang and Wang (2012) draw attention to the implications their study findings have for the competitive advantages to organisations that may be derived from knowledge-sharing practices. In particular, they point to the benefits of knowledge to both innovation speed and innovation quality and to improvements to the organisation’s operations and financial performance.

Many studies indicate that a variety of social factors are more important than technical support in facilitating knowledge-sharing (Choi et al., 2008; Lin et al., 2006). For example, the authors found that in SMEs, the owner/manager plays a pivotal role in implementing knowledge management through both technology and cultural change, making the owner's understanding of the human factors necessary for knowledge management success very important.

Several social (human) factors that impact knowledge-sharing have also been identified. The most significant include organisational culture (Al-Alawi et al., 2007; Choi et al., 2008; Tseng et al. 2012). In a business environment, information remains a vital element in ensuring the optimal performance of the different entities within an organisation. This involves collaboration between departments, employees, management and all the internal staff of the company. Effective collaboration ensures these organs function as a single unit towards the achievement of similar goals and targets (Alhaqbani 2013). De Long and Fahey (2000) identify certain aspects of organisational culture that affect knowledge-sharing. These authors state that culture controls the relationships between the different levels of knowledge (such as individual, group and organisational) and it also creates the context for social interaction. Al-Alawi et al. (2007) find that certain factors in organisational cultures, such as trust, communication, organisational structure, affect the success of knowledge-sharing between employees. A similar study by Singh and Premarajan (2007) finds organisational culture heavily influences employees' capacity to trust coworkers and share knowledge in the workplace. Effective internal collaboration within companies ensures employees remain focused and engaged in delivering various organisational goals.

Notably, Wang and Wang (2012) conclude that the sharing of explicit knowledge across management levels is more impactful on the speed of innovation in and the financial performance of an organisation, whereas the sharing of tacit knowledge across management levels is more impactful on innovation quality and operational performance. For example, Chen et al. (2012) point to the widespread use of technological infrastructure in organisations to share explicit knowledge products such as technical reports, product specifications and operation manuals. Thus, the authors conclude that the method for knowledge-sharing across management levels in an organisation, whether it is based in technology or human interaction, will depend “on the type of knowledge and the core competence of the organisation” (Chen et al., 2012, p. 330).

However, Caya et al. (2014) note that improving operating efficiency and business processes cannot be achieved through the exchange of pre-formatted reports/documents in a technology system. The authors argue that what is also required is to complement the technology-based knowledge-sharing infrastructure with the promotion of shared understanding of the data through team meetings and face-to-face interactions (Caya et al., 2014).

**Table 2.2: Summary of existing studies related to knowledge-sharing**

| Source                 | Method                                                                                                                                                        | Conceptualisation of factor knowledge-sharing                                                                               | Findings                                                                                                                                                                                                                             | Relation to this study                                                                                                                                                                  |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dezdar and Ainin, 2011 | Empirical data were collected via a survey questionnaire. The questionnaires were distributed to selected managers of companies adopting ERP systems in Iran. | Enterprise-wide communication may influence the enterprise system implementation success in Iran.                           | Communication within all users in enterprise will ensure that they are able to use the system effectively and efficiently thus contributing to their satisfaction, which will subsequently influence the ERP implementation success. | Enterprise-wide collaboration among users can affect business system implementation success in Saudi Arabia.                                                                            |
| Mueller, 2014          | Empirical analysis, data from target group.                                                                                                                   | A cultural antecedent of knowledge-sharing between project teams becomes vital to organisation-wide learning.               | Time, structure, output orientation, and openness have positive effects on this specific knowledge process                                                                                                                           | Interesting relationships could be revealed regarding two cultural types for knowledge-sharing between project teams. For example, Saudi and non-Saudi employees in a Saudi enterprise. |
| Shao et al. 2012       | Empirical analysis, Data was collected from 115 IS executives and 413 enterprise system end users in 115 organisations in China.                              | The mediating effect of organisational culture and knowledge-sharing on transformational leadership and enterprise success. | Development culture has a direct impact on ERP success, while hierarchical culture, group and rational culture are indirectly related to enterprise system success, mediated by explicit and tacit knowledge-sharing                 | To facilitate appropriate organisational culture, so as to foster enterprise system knowledge-sharing and achieve business benefits with the assimilation of enterprise systems.        |
| Wang et al., 2007      | Empirical analysis, survey data of CIOs in Taiwan.                                                                                                            | In the enterprise implementation phase, knowledge-sharing is important for organisational members to integrate              | The knowledge transfer process leads to a better fit between ERP systems and organisational processes.                                                                                                                               | enterprise system adopting firms should build up their internal knowledge stocks in order                                                                                               |

|                    |                                     |                                                                                                                                                                       |                                                                                                                                              |                                                                                                               |
|--------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|                    |                                     | knowledge.                                                                                                                                                            |                                                                                                                                              | to stimulate the flow of knowledge transfer.                                                                  |
| Jones et al., 2006 | Multi-site case study of four firms | How enterprise system implementation teams are able to effectively share knowledge across diverse functions and perspectives during enterprise system implementation. | Findings suggest that enterprise system implementation teams are influenced by but not necessarily bound by existing organisational culture. | Future research should also investigate knowledge-sharing from a tacit versus explicit knowledge perspective. |

Table 2.2 summarises the relevant studies on knowledge-sharing. This summary shows the importance of knowledge-sharing in the context of business systems success. In these studies, surveys and case studies were conducted at multinational companies to test the relationship between knowledge-sharing and enterprise system success. All researchers in the table established that knowledge-sharing determines how the staff in an organisation share knowledge with each other.

### **2.2.1 Knowledge-sharing among Management Levels**

Cabrera and Cabrera (2005) sought to identify the employee management practices that best support knowledge-sharing. According to the authors, the key antecedents for knowledge-sharing include organisational culture, procedural justice and perceived support. In regards to organisational culture specifically, Cabrera and Cabrera (2005) argue that knowledge-sharing across different employee levels emerges from the creation of “strong social norms” (p. 728) that emphasise the importance of the practice of knowledge-sharing. Such norms must be based on a platform of trust whereby knowledge is transmitted through socialisation processes, storytelling and rituals (Cabrera & Cabrera, 2005). Thus, the authors conclude that effective knowledge-sharing is important across different levels of management. This conclusion is affirmed

by Hislop (2013), who asserts that the nature of intellectual work performed by employees increasingly demands managers endorse and practice a range of knowledge-sharing practices. Thus, in many ways the literature reveals a distinction between the sharing practices of implicit and explicit knowledge by managers. Wang and Wang (2012) explore this further, examining the mechanisms for the sharing of both explicit and implicit knowledge across different management levels. According to the authors, the sharing of explicit knowledge across employee levels is far more common than implicit knowledge-sharing, primarily because explicit knowledge is more easily captured, codified and transmitted (Wang & Wang, 2012).

Furthermore, Chen et al. (2012) posit that the sharing of tacit knowledge –defined as the internal knowledge of the mind – across management levels is very much reliant on the personal characteristics and interpersonal skills of the employees sharing and receiving the knowledge. In contrast, the sharing of explicit knowledge – defined as external concrete knowledge – across management levels is more strongly based on the use of technological infrastructures for the storage, capture, and sharing of knowledge (Chen et al., 2012). In some ways, the finding presented by Al-Adaileh and Al-Atawi (2011) of a relationship between managerial supervision practices and effective knowledge-sharing illustrates this point. In their study of knowledge management practices in the Saudi Telecommunications Company, the authors found that managerial supervision as a dimension of organisational culture has a clear impact on knowledge exchange (Al-Adaileh & Al-Atawi, 2011). The authors defined managerial supervision as the degree that managers make clear the job requirements to employees and support the implementation of mechanisms to achieve the job requirements.

Information technology systems are generally relied upon for the promotion of explicit knowledge-sharing among employees, whereas face-to-face interactions are the main methods for tacit knowledge-sharing (Wang & Wang, 2012). Al-bahussin and El-Garaihy (2013) adopt a similar position in relation to Saudi organisations. They argue that managers generally attempt to improve business systems and operating performance. Caya et al. (2014) focused their research on the use of technology-based knowledge-sharing infrastructure, specifically enterprise system infrastructure, across management levels in integrated business processes. The authors found the widespread use of such systems by managers to share large volumes of knowledge related to diverse organisational matters such as inventory, purchasing and pricing strategies, production schedules and demand management (Caya et al., 2014). According to Gupta et al. (2009), managers in co-located workplace settings tend to use a codification strategy for knowledge-sharing. That is, knowledge management becomes an “automated” process whereby information and communication technologies (ICT) are used to codify and store knowledge in databases. As such, the primary objective for managers in these settings is to ensure the codified knowledge can be reused in people-to-documents transitions (Gupta et al., 2009). Furthermore, in their study of knowledge-sharing across professional boundaries, Kimble, Grenier and Goglio-Primard (2010) posit that the way in which knowledge is shared across different management levels is always influenced by the circumstances in the organisation and the agenda of the employee. As such, the overarching argument is that the rules or principles for knowledge-sharing across management levels cannot be determined by one single actor and that it is fundamentally “an episodic rather than a continuous process” (Kimble et al., 2010, p. 437).

Another aspect of knowledge-sharing across different levels of management or organisational units explored in the literature relates to co-located (employees working on the same site) versus distributed (employees working at different sites) settings. Gupta et al. (2009) explore the different knowledge-sharing practices across management levels in relation to both settings. They found knowledge-sharing is characterised according to two main forms: through the production, storage and distribution of written documents (in paper or electronic format); and through direct contact between employees. As the authors explain, these two knowledge-sharing practices can be easily summarised as codification and personalisation knowledge-sharing practices (Gupta et al., 2009). Managers working in teams in distributed settings tend to adopt the personalisation strategy, whereby managers at different levels develop networks so that tacit knowledge can be shared via person-to-person interactions (Gupta et al., 2009).

A study by Mäkelä and Brewster (2009) affirms Gupta et al.'s (2009) findings, showing that knowledge-sharing among different management levels in cross-border contexts relies more on interpersonal trust and shared cognitive ground, whereas knowledge-sharing at the inter-unit and project group level within organisations relied less on these human elements and more on technological infrastructures (Mäkelä & Brewster, 2009).

Caya et al. (2014) argue that the use of technological infrastructures within enterprise system implementation can improve the flow of information within and across business functions and management levels when supported with interpersonal knowledge-sharing mechanisms. This is mostly because the two combine to support operational and business decision-making by the actors at each level. In turn, this is managed across different organisational divisions by combining information technology supportive aids, such as the intranet and information systems, with non-information technology

methods, including team meetings and research cooperation (Al-bahussin & El-Garaihy, 2013). Notably, Kimble et al. (2010) base their investigation on the view that different levels of management that regard themselves as part of a professional community within an organisation will share implicit knowledge related to their profession through informal meetings and working groups and explicit knowledge through technology-based infrastructures. However, the authors also point to the potential blockades to knowledge-sharing across management levels; namely, the reluctance to share knowledge that is professionally or politically advantageous to retain for oneself (Kimble et al., 2010).

In conclusion, knowledge-sharing among employees is recognised as important for organisational growth and learning. This literature review focused on vertical knowledge-sharing practices among managers in particular. The main finding revealed in this review is that a balance between technology-based infrastructures and non-technology based practices such as face-to-face interactions for knowledge-sharing remains integral to maximising the potential for business growth.

### **2.2.2 Knowledge Sharing in a Saudi Arabian Context**

There are few studies available on the effect of knowledge-sharing on business systems in the Saudi context. One study conducted by Al-bahussin and El-Garaihy (2013) explores the relationship between three elements of organisational performance: organisational culture, knowledge management and organisational innovation. Examining the relationship from a human resources management perspective, the authors surveyed 203 human resources managers employed in large organisations in eastern Saudi Arabia. They found a positive relationship between organisational culture, knowledge management and organisational innovation. In particular, the results

revealed Saudi organisations depended on organisational characteristics such as innovation capacity and organisational knowledge constructs for the creation of new knowledge (Othman et al. 2014). Additionally, the authors found organisational culture positively and significantly impacted knowledge-sharing (Al-bahussin and El-Garaihy 2013). The main conclusion drawn by Al-bahussin and El-Garaihy on the basis of their results was that human resource management practices that promote the interconnection between knowledge management, organisational innovation and organisational culture may improve an organisation's competitive advantage and increase their business systems' performance.

Eid and Nuhu (2011) examined the influence of social and technological factors, including learning culture and IT use, on knowledge-sharing among students at the King Fahd University of Petroleum and Minerals in Saudi Arabia. Although the authors' focus was on knowledge-sharing by university students, it nonetheless contributes to understanding knowledge-sharing in a Saudi business context because it provides insights into the attitudes towards knowledge-sharing and the types of practices of engaged in by the next generation of employees.

Working from the assumption that knowledge creation, sharing and dissemination are the core processes in knowledge management, Eid and Nuhu conducted a survey to collect data from 302 graduate, undergraduate or preparatory students. The results of the survey revealed a significant positive relationship between students' learning culture, IT use and the knowledge-sharing practices of the students (Eid and Nuhu 2011). These results have implications for managers of Saudi organisations who aim to use knowledge-sharing strategies to improve business systems. For instance, managers' efforts to enhance knowledge-sharing must include the attempt to combine a culture of learning in the organisation with increased investment in IT infrastructure (Eid and

Nuhu 2011). The findings showed that both learning culture and technology are important to knowledge-sharing. As such, promoting IT usage in an organisation may be as important as promoting a learning culture to enhance knowledge-sharing among employees.

Lastly, the study by Al-Adaileh and Al-Atawi (2011) of the Saudi telecom industry discussed above also included insightful findings regarding the relationship between national culture and knowledge-sharing behaviours in Saudi Arabia. The authors examined the influence of cultural attributes on knowledge exchange practices in the Saudi Telecom Company (STC). The results of the study revealed the cultural attributes of trust, innovation flow, supervision, and reward are significantly associated with effective knowledge-sharing practices by employees (Al-Adaileh and Al-Atawi 2011).

The knowledge-sharing within an organisation is a vital aspect that can affect the overall performance of an organisation (Boehm 2012). In essence, the practice of sharing information, experiences and resources is the key to future development and information systems have been shown to play a vital role in enhancing the level of collaboration (Alston and Tippet 2009; Boehm 2012). Although this may be a concept that is understood in private organisations, in many organisations in Saudi these factors are not well understood and this therefore can create a number of issues for organisational actors.

### **2.3 Defining Business Systems**

Business systems are those systems that organisations can use to improve their control over information both internally and externally (Hong and Kim, 2002, Markus et al., 2000). A business system is a framework that allows an organisation to formulate the set of actions most likely to generate economic benefit and ultimately benefit customers

(Frederick 1980). According to Davenport (1998), business systems provide a continuous assimilation of all the information flows in an organisation to eliminate cross-functional organisational issues in the business process. For example, business systems are used to consolidate decisions, activities and information flows across many different departments in an organisation (Koh et al., 2008; Basoglu et al. 2007). Some authors have defined a business system as a software-based system that enables organisations to integrate and manage their resources in a more effective manner (Woo, 2009). For example, Watson and Schneider (1998) describe a business system as a customised, integrated and packaged software-based system that handles the majority of a business requirement across all areas, such as human resources, accounting, finance, marketing, sales, and manufacturing. On the other hand, others have defined it as a set of activities that can work together to improve the organisational processes and integrate information across an organisation (Alvarez Gil et al., 2009, Gattiker and Goodhue, 2005). Business systems software, such as enterprise system, allows organisations to successfully manage information across all business functions because information can flow across the organisation through its business processes (Monk & Wagner, 2006).

Business systems are the primary approach to integrate business process management and information. Therefore, by applying a business system, an organisation can obtain benefits such as quick and accurate information-gathering that helps in decision-making and lowering inventory cost, and improved product quality (Umble et al., 2003). Rosemann and Wiese (1999) describe enterprise systems as “customizable, standard application software which includes integrated business solutions for the core processes (e.g. production planning and control, warehouse management) and the main administrative functions (e.g. accounting, human resource management) of an

enterprise”.

Alternatively, Zhu et al. (2010) define enterprise systems as “configurable information systems packages that integrate information and information-based processes within and across functional areas in an organization”. Sane (2005) describes business systems as multi-module application software packages that serve and support multiple business functions. According to Gable (1998), a business system is a “comprehensive packaged software solution seeking to integrate the complete range of business processes and functions in order to present a holistic view of the business from single information and IT architecture”.

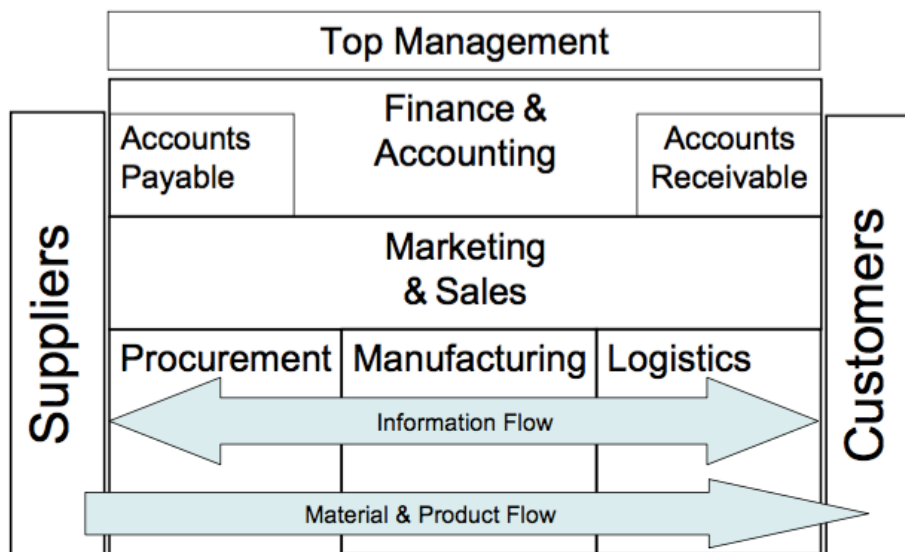


Figure 2.1: Business systems process model (adapted from Monk & Wagner, 2006)

Drawing from these definitions, in this study, a business system is defined as an integrated information system used to support the business functions by managing the whole organisation’s resources effectively and efficiently, leading to an increase in business system usage, subsequent user satisfaction and net benefits.

## **2.4 Business Systems History**

The evolution of business system dates back to the 1960s. At that time, an information system was designed to satisfy basic manufacturing planning and control and was called a material resource planning system (MRP). MRPs were used to schedule resources in different manufacturing processes (Umble et al., 2003; Law and Ngai, 2007). In the 1980s, the simple MRP system evolved to become manufacturing resource planning (MRP II) (Basoglu et al., 2007). The new MRP II systems integrated the management systems and financial accounting with the manufacturing and materials management systems (Umble et al., 2003; Basoglu et al., 2007). In the early 1990s, MRP II evolved to a totally integrated solution called enterprise resource planning (ERP). Enterprise Resource Planning is an updated MRP II software-based system that includes a graphical user interface, client-server architecture and relational database management (Basoglu et al., 2007). These systems enabled companies to increase competitive advantages through integrating business processes (Davenport, 1998). Primarily, these systems focused on back-office functions, but front-office functions such as customer relationship management (CRM) and e-business systems became integrated by using electronic data interchange (EDI) systems. Business systems such as ERP II, a web-based software program, were employed in the early 2000s. These systems are valuable for incorporating inventory data with sales, financial and human resource data (Markus et al., 2000, Basoglu et al, 2007). The business systems commonly in use currently are more incorporated solutions that allow employees, suppliers and customers to have real-time access to the system. These systems integrate organisational functions such as human resource management, supply chain management and other organisational functions to improve the effectiveness and efficiency of the organisation (Ehie and Madsen, 2005; Holland and Light, 1999).

As the use of information systems and technologies has increased, the challenge to streamline business processes and eliminate the data and operational redundancies for reliable availability of information to the managers has been increasing (Al-Turki, 2011). Initially, the trend of using business systems occurred primarily in large organisations; however, small and medium organisations now also use business systems to improve their results (Al-Turki, 2011).

Table 2.3: Summary of the evolutionary history of business systems.

| <b>Systems</b>   | <b>Primary business need(s)</b>                                                                                                                | <b>Scope</b>                                                                                                                                                        | <b>Enabling technology</b>                                                                                                                          |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| MRP              | Efficiency                                                                                                                                     | Inventory management, production planning and control                                                                                                               | Mainframe computers, batch processing, traditional file systems                                                                                     |
| MRP II           | Efficiency, effectiveness and integration of manufacturing systems                                                                             | Extending to the entire manufacturing firm (becoming cross-functional)                                                                                              | Mainframe and mini computers, real-time (time-sharing) processing, database management systems (relational)                                         |
| ERP              | Efficiency (primarily back office), effectiveness and integration of all organisational systems                                                | Entire organisation (increasingly cross-functional), including manufacturing operations                                                                             | Mainframe, mini and macro computers, mainframe networks with distributed processing and databases, data warehousing and mining knowledge management |
| ERP II           | Efficiency, effectiveness and integration within and among enterprises                                                                         | Entire organisation extending to other organisations (cross-function and cross-enterprise, for example, partners and suppliers)                                     | Mainframes, client server systems, distributed computing, knowledge management, Internet technology (includes web service, intranets and extranets) |
| Business systems | Efficiency, effectiveness and integration within and among all relevant constituents (business, government, consumers, etc.) on a global scale | Entire organisation and its constituents (increasingly global) comprising supply chain from beginning to end, as well as other industry and government constituents | Internet, web service architecture, wireless networking, mobile, knowledge management, grid computing, artificial intelligence.                     |

## **2.5 Business Systems Success Factors**

Based on the information system (IS) success model by DeLone and McLean (1992), researchers have suggested the various dimensions of business system success (such as Gable et al., 2003, 2008; Ifinedo, 2006, 2007; Sedera et al. 2004). Business system success is similar to IS success but different from such system implementation success (Gable et al., 2008). Thus, business system success refers to the use of such systems to enhance the achievement of organisational goals (Ifinedo et al. 2010).

A business system helps organisations to make accurate data available, reduce the overall costs and exchange information with customers and suppliers (Umble et al., 2003, Basoglu et al., 2007). Based on DeLone and McLean (2003), See-Pui Ng (2013) defines enterprise system success as “A package software system, with a robust system quality and information quality that meets the overall requirements of a client organisation, which leads to an increase in information system usage, subsequent user satisfaction, and net benefits (i.e., improvements in individual, business unit and/or organisation performance) to an organisation.”

Business systems adoption has been traditionally justified in terms of the financial and economic benefits it brings to an organisation (Law and Ngai, 2007). A number of authors are of the view that transaction cost reduction is one of the key advantages of adopting business systems (Daneva and Wieringa, 2008; Kusters et al., 2008; Plaza and Rohlf, 2008). However, research studies have demonstrated the business systems success within an organisation is not a straightforward process, as shown by DeLone & McLean’s IS success model, the business systems success measurement model (Gable et al., 2003; Sedera et al. 2004), the adoption theory model (Rogers, 1995) and the technology acceptance model (Davis, 1989).

However, evidence suggests that adoption of business systems is not only based on cost, as cost-saving is not the main purpose for the adoption of these systems by organisations (Gattiker and Goodhue, 2005; Law and Ngai, 2007). Other factors, such as user satisfaction, are critical to the success of business systems (DeLone and McLean 1992). Likewise, user satisfaction can be considered as an outcome of information systems for adopting organisations instead of a success factor (Gable et al., 2008).

A number of studies have established the economic benefits of the use of business systems in organisations. These include inventory reduction, personnel reduction, IT cost reduction, productivity improvements, reduction in procurement cost (Al-Mashari et al., 2003), improvement in order management (Xue et al., 2005), improvement in cash management, increased revenue and profit, on-time delivery, maintenance reduction and transport as well as logistics cost reduction (Kusters et al., 2008). Other authors have noted that business system can be applied to integrate inter-organisational supply chains, increase efficiency (Zhang et al., 2005), eliminate the use of manual and repetitive processes and significantly reduce the number of stand-alone systems as well as their associated costs while simultaneously reducing total lead or cycle times (Law and Ngai, 2007). Sedera et al. (2004) find that essentially the most significant business systems success dimensions are individual and organisational impact. Business systems are measured successful at the post-implementation phase, based on factors such as whether they improve potential benefits through firm cost reductions, increased customer satisfaction levels and higher operational productivity (Sedera et al., 2004).

When there is a discussion about success factors, researchers consistently refer to Rockart's 1979 research, because of its pioneering nature in identifying critical success factors in the IS realm (Moohebat, Asemi, & Jazi, 2010). In relation to business systems, one reason for such consistency is that success factors come after an

organisation's decision to adopt business systems (Abdelghaffar, 2012), which may escalate the tension of how business should undertake enterprise system implementation procedures. Therefore, understanding business system success factors is critical from a management perspective, since management sets up the regulations, policies and procedures that ensure the successful implementation of business systems (Hong & Kim, 2002). Furthermore, the complex nature of business projects requires top management to be supportive in allocating adequate resources and also taking necessary actions where required (Al-Mudimigh, 2007; Nah, Lau, & Kuang, 2001).

The success factors of business systems depend on technical and organisational success factors, since business implementation projects are different from conventional IT projects. One example to illustrate such differences is that business is off-the-shelf software that requires organisations to reform their business processes and overcome technical difficulties during and after implementation. Therefore, organisations need time to reap the rewards of business implementation; as a result, success factors ensure the effectiveness and efficiency of the delivered system and thus the success of business implementation projects (Rasmy, Tharwat, & Ashraf, 2005). When success factors are critically addressed, they will have a direct impact on business system implementation projects via the cost reduction associated with money, time and maintenance efforts (Hong & Kim, 2002; Trimmer, Pumphrey, & Wiggins, 2002).

The success of business system has also meant that organisations have to deal with a number of organisational issues. One of the key issues which has been identified in the literature in relation to business systems is knowledge, which means the impact of the knowledge-sharing required for the business systems success (Rosemann and Chan 2000; Sedera et al. 2003). Boehm (2012) states that knowledge-sharing is an important factor that affects the overall performance of an organisation. In essence, the practice of

sharing information, experiences and resources is key to future development, and business systems have been shown to play a vital role in enhancing the level of knowledge-sharing (Alston & Tippet 2009; Baird 2012; Boehm 2012). Knowledge is the foundation of a firm's competitive advantage, and, ultimately, the primary driver of a firm's value (Kraaijenbrink, 2010). Knowledge-sharing within an organisation is crucial, as it enable staff to increase their working skills (Bock et al. 2005). Sedera et al. (2003) find a strong positive relationship between knowledge and business system success.

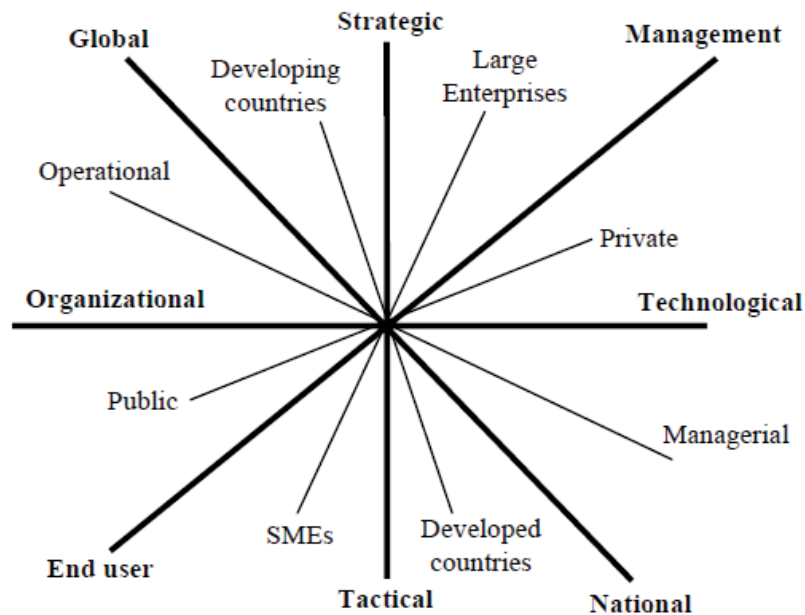
In addition to knowledge-sharing, organisational culture is the encouraging factor that makes a business profitable by encouraging employees to acquire knowledge and develop innovative ideas (Hahn et al., 2013). According to Shao et al. (2012), in order to improve and achieve business systems success, "the top executive needs to facilitate a development culture that focuses on innovativeness, creativity, and adaptation to the external environment, thus to offer the users a vision of organisational strategic directions and inspire the users to think innovatively about how the system might enable the business to accomplish its goals and achieve business performance". Markus and Tanis (1999) state that business systems have been widely accepted within organisations and have significant influence on both the individual organisational and the inter-organisational level.

**Table 2.4: Reasons for adopting business systems (Rajapakse et al., 2005)**

|                          | <b>Small companies/simple structures</b>                                            | <b>Large companies/complex structures</b>                                               |
|--------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| <b>Technical Reasons</b> | Solve Y2K and similar problems                                                      | Most small/simple company reasons plus                                                  |
|                          | Integrate applications across functionality                                         | Consolidate multiple different systems of the same type (e.g., general ledger packages) |
|                          | Replace software maintenance burden through outsourcing                             |                                                                                         |
|                          | Eliminate redundant data entry and concomitant errors and difficulty analysing data |                                                                                         |
|                          | Improve IT architecture                                                             |                                                                                         |
|                          | Ease technology capacity constraints                                                |                                                                                         |
|                          | Decrease computer operating costs                                                   |                                                                                         |
| <b>Business Reasons</b>  | Accommodate business growth                                                         | Most small/simple company reasons plus                                                  |
|                          | Acquire multilanguage and multicurrency IT support                                  | Provide integrated IT support                                                           |
|                          | Improve informal and/or inefficient business processes                              | Standardise different numbering, naming, and coding schemes                             |
|                          | Clean up data and records through standardisation                                   | Standardise procedures across different locations                                       |
|                          | Reduce business operating and administrative expenses                               | Present a single face to the customer                                                   |
|                          | Reduce inventory carrying costs and stockouts                                       | Acquire worldwide "available to promise" capability                                     |
|                          | Eliminate delays and errors in filling customers' orders for merged businesses      | Streamline financial consolidations<br>Improve companywide                              |
|                          |                                                                                     | Improve company-wide decision support                                                   |

There is a wide range of factors that contribute to business success, but the question remains about the reasons for this diversity (Zhang, Lee, Zhang, & Banerjee, 2003). As Shaul and Tauber (2011) explain, success factors are employed in a wide range of studies from different perspectives (such as sociological and technical dimensions,

tactical and strategic dimensions, stakeholders' perspectives and the country development level) (Figure 2.3). Such employment, then, is more likely to result in the variations of success factors importance across these studies.



**Figure 2.2: Critical success factors (Shaul & Tauber, 2011, p. 362)**

Many organisations have adopted business systems in recent years in order to integrate information and information-based processes within and across functional areas (Chou et al. 2014). A study by Ifinedo et al. (2010) of business post-implementation success factors in organisations investigated the relationships among six key constructs in a re-specified business systems success model. The six constructs in the model were system quality, service quality, individual impact, workgroup impact, organisational impact and information quality. Data was collected via survey of 109 organisations in two European countries. The primary focus of the survey was the relationship of the six identified constructs to enterprise system success.

Notably, Ifinedo et al. (2010) considered business success at the post-implementation phase to be measured in terms of the way the package enhances potential benefits to the

organisation such as cost reductions, increased operational productivity, and higher customer satisfaction levels.

Ifinedo et al. (2010) found all measured constructs other than information quality (i.e., five out of the six constructs) demonstrated a significant positive association with businesses' post-implementation success factors. Specifically, significant positive relationships were found between both system quality and individual impact, and service quality (provided by enterprise system vendors and consultants) and individual impact. Additionally, individual impact was found to be significantly positively associated with both workgroup impact and organisational impact.

This finding suggests that when business systems assist individual employees in the organisation improve their "productivity, decision-making processes, and overall performance" (p. 1144), the employee's work-unit and other work-units throughout the organisation will similarly benefit. As such, Ifinedo et al. (2010) also reported a significant positive association between the existence of a strong positive relationship between workgroup impact and organisational impact.

However, the authors found no positive relationship between information quality and individual impact in the context of business applications. This finding has interesting implications for knowledge-sharing. As discussed by Ifinedo et al. (2010), business systems are mostly identified with their capacity to store, access and execute the data used in daily transactions rather than provide information. As such, organisations do not generally use their business as a platform to access information and knowledge. The findings delivered by Ifinedo et al. (2010) thus have clear implications for our understanding of how knowledge management practices can be incorporated into evaluations of business systems success.

Sedera and Gable (2010) further investigate the relationship between knowledge management competence and business systems success. In their study, knowledge management competence was conceptualised across four dimensions: knowledge creation, knowledge retention, knowledge transfer and knowledge application. Survey data was collected from 310 employees working in 27 organisations in Queensland, Australia that use the SAP Enterprise System Financial package. Sedera and Gable found a significant positive relationship exists between knowledge management competence and business system success. Indeed, the authors found knowledge management competence could explain up to half of the variance in business system success.

The main conclusion drawn by the authors is that greater emphasis in organisations on business system-related knowledge management competencies (i.e. knowledge creation, knowledge retention, knowledge transfer and knowledge application) would help to mitigate potential dissatisfaction with business systems investments. On the basis of their findings, Sedera and Gable (2010) argue that to achieve better business system outcomes, it is becoming increasingly important to leverage business implementation knowledge. Moreover, the knowledge must be made available to all stakeholders involved in the ongoing development of the enterprise system.

A review of the literature reveals there is a paucity of recent studies or evaluations of post-implementation business systems success in Saudi organisations. Most studies choose instead to focus on the information system implementation phase. Nonetheless, some insights into post-implementation business system success can be gleaned from the findings and discussion presented in these studies. For instance, a review of studies conducted on the role played by business systems in the management of business processes by ALdayel et al. (2011) revealed a number of critical success factors (CSF)

related to enterprise system implementation. Focusing on business processes in 12 higher education institutions in Saudi Arabia, ALdayel et al. (2011) identified 15 critical success factors during program implementation, including top management commitment, project management, training and consultant participation. The critical success factors identified related to both technical aspects, such as system usefulness and training, and the organisational aspect of user participation. ALdayel et al. (2011) find that effective project management during the implementation phase is the most important critical factor for success in the implementation phase.

Business system selection and stakeholder participation were the next most important critical success factors in that order. The results of the ALdayel et al. (2011) study offer some insights into the relationship between knowledge-sharing and business systems success. For example, it may be argued that an integral component of effective project management is the coordinated use of stakeholders' skills and knowledge. Moreover, effective stakeholder participation to support business systems success, even in the post-implementation phase, is reliant on communication and information-sharing between "different stakeholders in different departments and business systems team" (ALdayel et al. 2011, p. 8).

Similarly, a study by Al-Turki (2011) investigated the current trends in and success factors for the implementation of business systems in Saudi organisations. Specifically, the author sought to shed light on the relationship between four elements: implementation practices, difficulties encountered, success factors and benefits realised. To do that, he surveyed employees from 93 organisations across different industries in Saudi Arabia, including manufacturing oil, gas and petrochemicals, and Saudi basic Industries. Al-Turki (2011) found management commitment and the existence of clear strategic objectives to be the most critical factors for success during business

implementation. Alluding to the post-implementation phase, business systems success in the Al-Turki (2011) study is equated to business outcomes that enhance the organisation's capacity to run more effectively and efficiently. In turn, the study identified management practices and implementation strategies as crucial elements to the attainment of these success outcomes. As such, knowledge management practices are indirectly connected to the success factors of post-implementation success through the conclusion drawn by Al-Turki (2011) that the human-related factors of success such as leadership, change management, and training play a fundamental role in successful outcomes.

Zhu et al. (2010) studied post-implementation success factors by conducting a field study survey of 65 organisations from the Chinese retail industry. Post-implementation enterprise system success was measured by the benefits derived from the system to both managerial practices and organisational operations. The variables of success considered by Zhu et al. were organisational readiness, including leadership involvement and top management commitment; organisational fit; enterprise system implementation quality; effective project management; system configuration; and external support. The main finding from the study is that the success factors implementation quality and organisational readiness are the two elements that significantly affect post-implementation success. External support was not identified as a critical success factor. The main implication for knowledge-sharing to emerge from the findings is that organisational leaders must actively engage in the post-implementation phase of the business systems. Specifically, they must participate to increase their knowledge about what aspects of the business systems facilitates their most efficient use, and then embed this knowledge in decisions about required knowledge-sharing practices in the organisation.

Business systems provide organisations with a wide range of advantages, particularly technical and strategic ones. These advantages vary across the nature and size of organisations (Markus & Tanis, 2000; O'Leary, 2004). The literature suggests that a number of the factors that influence the adoption of business systems in developed countries are not similar to those in developing countries. The issues faced by organisations in developing countries in many cases are unique (Rajapakse et al., 2005, Alvarez Gil et al., 2009), and therefore there is a need to address these issues, such as in the context of Saudi Arabia.

## **2.6 Chapter Summary**

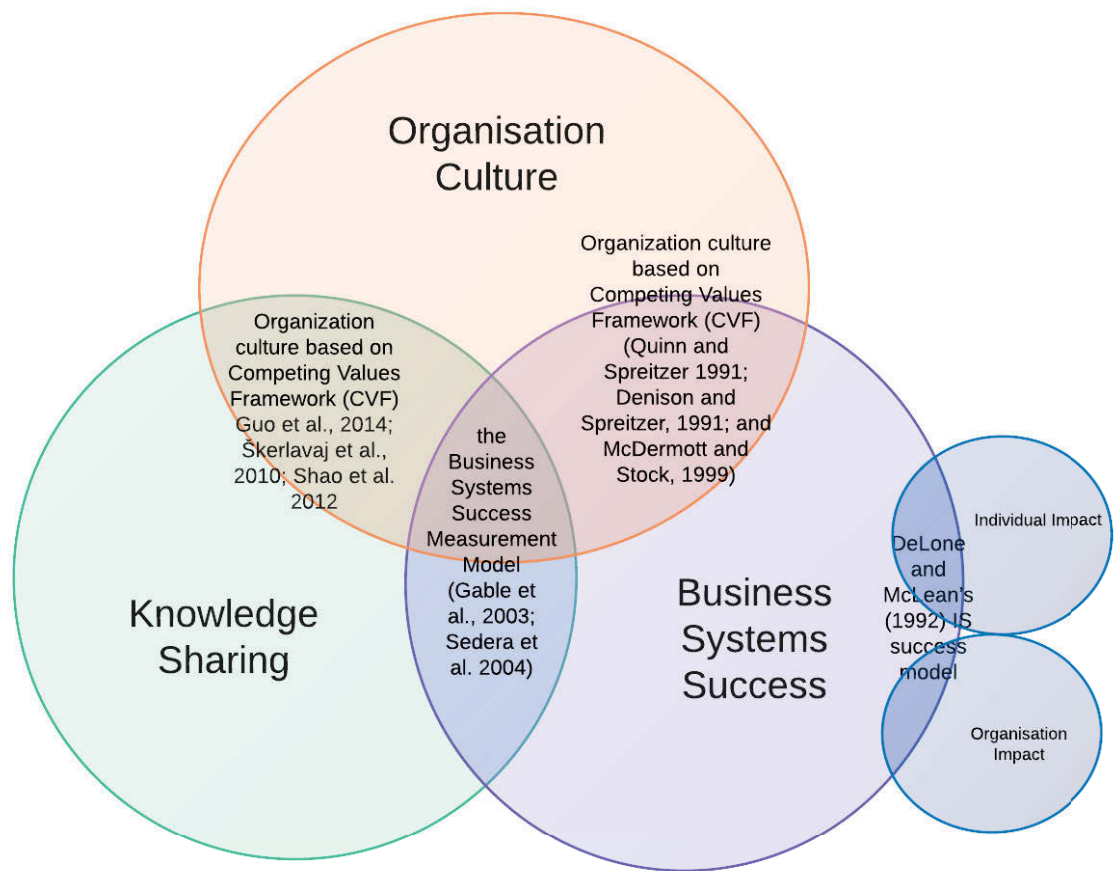
This review revealed a gap in the research literature related to two focus areas: the impact of organisational culture, particularly the four types based on the CVF, on knowledge-sharing among employees in Saudi organisations; and the factors most influencing business systems success in Saudi organisations. To address these gaps further research is required on the relationship between organisational culture and knowledge-sharing and how they influence business systems success in Saudi organisations.

## **CHAPTER 3: THEORETICAL BACKGROUND AND CONCEPTUAL MODEL**

Based upon the critical review of the literature in Chapter 2, this chapter further explains the theoretical development that forms the foundation of the conceptual model built to address the identified knowledge gap. Firstly, the chapter describes the major theories from the literature related to this research. The research model is then proposed, followed by the development of the hypotheses. Finally, the chapter concludes.

### **3.1 Overview**

This section reviews the findings in the literature in order to identify key theories to create a conceptual model upon which to position this study. Business systems are considered information system (IS). Therefore, prior research on user acceptance models for information systems is useful to recognise the contributors to the success of business systems. This study deals with widespread models related to information system (IS) acceptance, which are the DeLone & McLean (D&M) IS success model and the business systems success measurement model (Gable et al., 2003; Sedera et al. 2004). Additionally, organisational culture based on the competing values framework (CVF) (Quinn and Spreitzer 1991; Denison and Spreitzer, 1991; and McDermott and Stock, 1999) is studied to identify the relationships affecting business systems success. The major informing theories from the literature are explained below. Figure 3.1 shows an overview of the existing theories.



**Figure 3.1: Overview of existing studies**

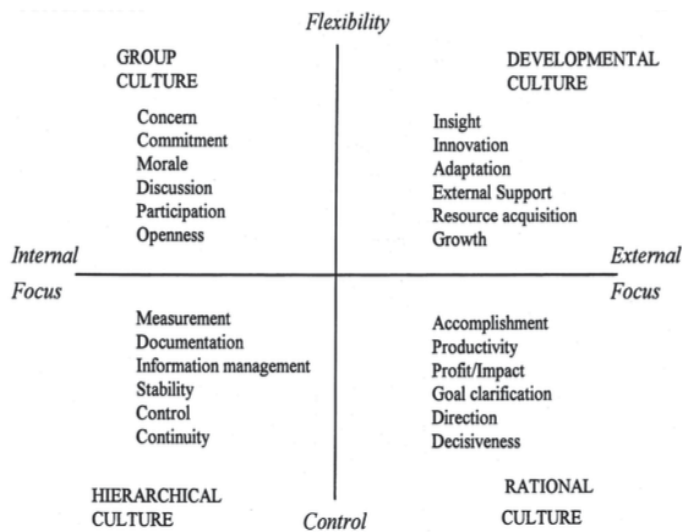
## 3.2 Organisational Culture

Prior research has found that organisational culture is important in business processes (Guo et al. (2014). As presented in Chapter 2, the most significant organisational culture model is based on the competing values framework (CVF) developed by Quinn and Rohrbaugh (1981). The four organisational types have come to be named by Quinn and his colleagues (Quinn & McGrath, 1985; Quinn & Rohrbaugh, 1981, 1983; Quinn & Spreitzer, 1991; Cameron & Quinn, 1999) are the human relations model, the open systems model (OSM), the internal process model (IPM) and the rational goal model (RGM) (Zammuto et al, 2000) and that these organisational types sit on vertical axes of internal/external focus, and horizontally as control/flexibility focus.

Howard (1998) argues that the CVF is an acceptable framework for assessing organisational culture for the following reasons:

- It specifies a descriptive content of organisational culture;
- It identifies dimensions whereby similarities and differences across cultures might be evaluated; and
- It suggests tools and techniques for organisational analysis that enable the measurement and representation of culture.

Drawing on the CVF, Quinn and Spreitzer (1991), Denison and Spreitzer (1991) and McDermott and Stock (1999) suggest that an organisation consists of a number of competing values, in which these values are the organisational culture of the organisation (Figure 3.2).



**Figure 3.2: Organisational culture (Denison and Spreitzer, 1991)**

As shown in Figure 3.2, this framework includes two dimensions: internal emphasis and external focus, and control and flexibility. This framework characterises organisational cultures as group, developmental, rational or hierarchical. The group culture highlights flexibility and emphasises the internal organisation. The developmental culture also is related to flexibility but has a focus on the external environment. The rational culture is control oriented but focuses on the external environment, while the hierarchical culture is related to internal efficiency, coordination and evaluation. The focus is on the logic of the internal organisation and its control (Cameron and Quinn, 1999; Naor et al., 2008).

The relationship between information systems and organisational culture based on the CVF has been explored by Guo et al. (2014). The authors findings showed organisational culture in terms of CVF is of great important significance in obtaining higher level of business systems adaptation.

Therefore, organisational culture centered on the CVF is adopted in this study, which is consistent with prior research (Zammuto and O'Connor, 1992; Schein 2004; McDermott & Stock, 1999; Guo et al., 2014; Škerlavaj et al., 2010; Shao et al. 2012).

### **3.3 Knowledge-sharing**

As discussed in the literature review in Chapter 2, collaborative business systems can be categorised into two broad categories. The first category is business systems for knowledge management, which are implemented business systems (such as enterprise system) serving as knowledge management tools. The second category is knowledge for business systems, which means the impact of knowledge-sharing required for the business systems success (Rosemann and Chan, 2000; Sedera et al., 2003).

Knowledge is the foundation of a firm's competitive advantage and, ultimately, the primary driver of a firm's value (Kraaijenbrink, 2010). Knowledge-sharing can be further divided into explicit knowledge-sharing and tacit knowledge-sharing. According to Shao et al. (2012), "explicit knowledge is formal and systematic, and can be achieved through readings of project manuals and team discussions, while tacit knowledge is highly personal, context-specific, subjective, and can be represented in the form of metaphors, drawings, non-verbal communications and practical expertise". In another study, Shoa et al. (2015) found that hierarchical culture is positively related to staff's explicit knowledge-sharing while a group culture that focuses on trust and belonging is positively related with staff's tacit knowledge-sharing. The influence of knowledge is considered as a significant antecedent to business system success. This is explained by Sedera et al. (2003), who assessed the impact of knowledge-sharing on the success of an enterprise system. Their analysis indicated there is a strong positive relationship between knowledge and the business system success.

This study focuses on the knowledge-sharing required for business systems success in the Saudi context. It is evident that knowledge-sharing has a significant relationship with business system success in terms of the organisational and individual impact.

Therefore, based on the above model, the concept of knowledge-sharing adopted in this study is consistent with Sedera et al. (2003).

### **3.4 Business Systems Success**

Business systems are examples of large complex information systems (IS) that are integrated throughout cross-functional departmental boundaries within organisations (Brady et al., 2001; Umble et al., 2003). Business systems are defined as business software systems that let an organisation:

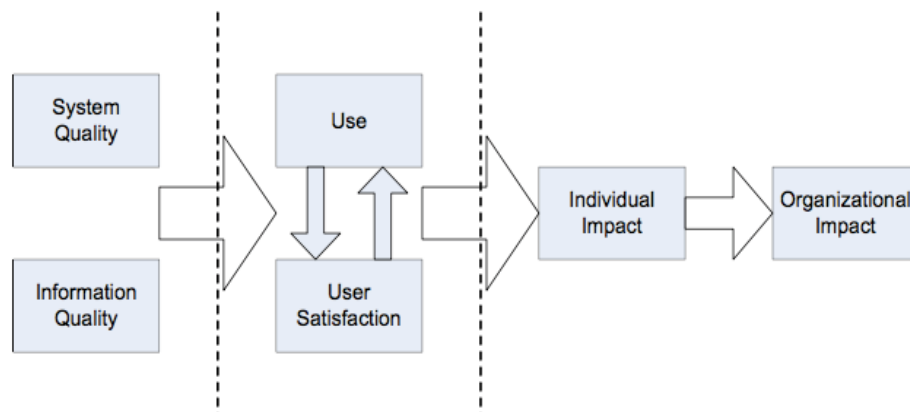
- Assimilate and automate the organisation's business processes;
- Share everyday data and information throughout the organisation; and
- Access and generate information in a real-time situation.

It is important to have a clearly defined understanding of how business systems' success (or failure) could be measured. Prior studies investigated how to evaluate an IS (such as a business system) from a business perspective. For example, Shang and Seddon (2002) highlight that various stakeholders and end-users have diverse system perceptions and needs. Success is referenced against various criteria, such as an organisation's goals, financial performance and on-time delivery (Markus and Tanis, 2000).

Numerous models have suggested how to explain the dimensions of business system success. The most commonly cited model is the IS success model by DeLone and McLean (1992). Business system success is similar to IS success (Chiu et al., 2007; Hsu et al., 2008). However, it is different from IS implementation success (Gable et al., 2008). Essentially, business system success refers to the use of such systems to enhance organisational goals achievement (Ifinedo 2006; Ifinedo et al. 2010).

DeLone and McLean's (1992) IS success model is widely cited and has made a valuable contribution to the literature on IS success measurement. DeLone and McLean's model organises the concept of IS success. As shown in Figure 3.3, the authors identified six key dimensions of IS success, which are as follows.

- System quality: the measure of the information processing system
- Information quality: the measure of information system output
- Use: the users' usage of an information system
- User satisfaction: deals with the use of the output of an information system
- Individual impact: the measure of the outcome of information system on an individual's behaviour
- Organisational impact: the measure of the outcome of information systems on organisational performance



**Figure 3.3: D&M IS Success Model (DeLone and McLean 1992)**

With regards to business systems, Sedera et al. (2004) highlighted that the 'use' factor was not a suitable measurement of success as the operation of business systems is often required in adopting organisations (Hsieh & Wang, 2007).

Organisations expect business systems to influence positive significant changes to organisational processes. Staffs using business systems are more productive, particularly where the use of such systems is compulsory (Holsapple et al. 2005). Likewise, user satisfaction can be considered as an outcome of information systems for the adopting organisations instead of a success factor (Gable et al., 2008). Gable et al. (2003, 2008) propose an enterprise system success measurement that redefined the dimensions of the D&M's IS success model. The dimensions that are retained in are system quality, information quality, individual impact and organisational impact.

The thorough analyses performed by Sedera et al. (2004) did not support the inclusion of user satisfaction as a separate factor of success for business systems. As a result, the business systems success factors used in Sedera et al.'s (2004) model are system quality, information quality, individual impact and organisational impact.

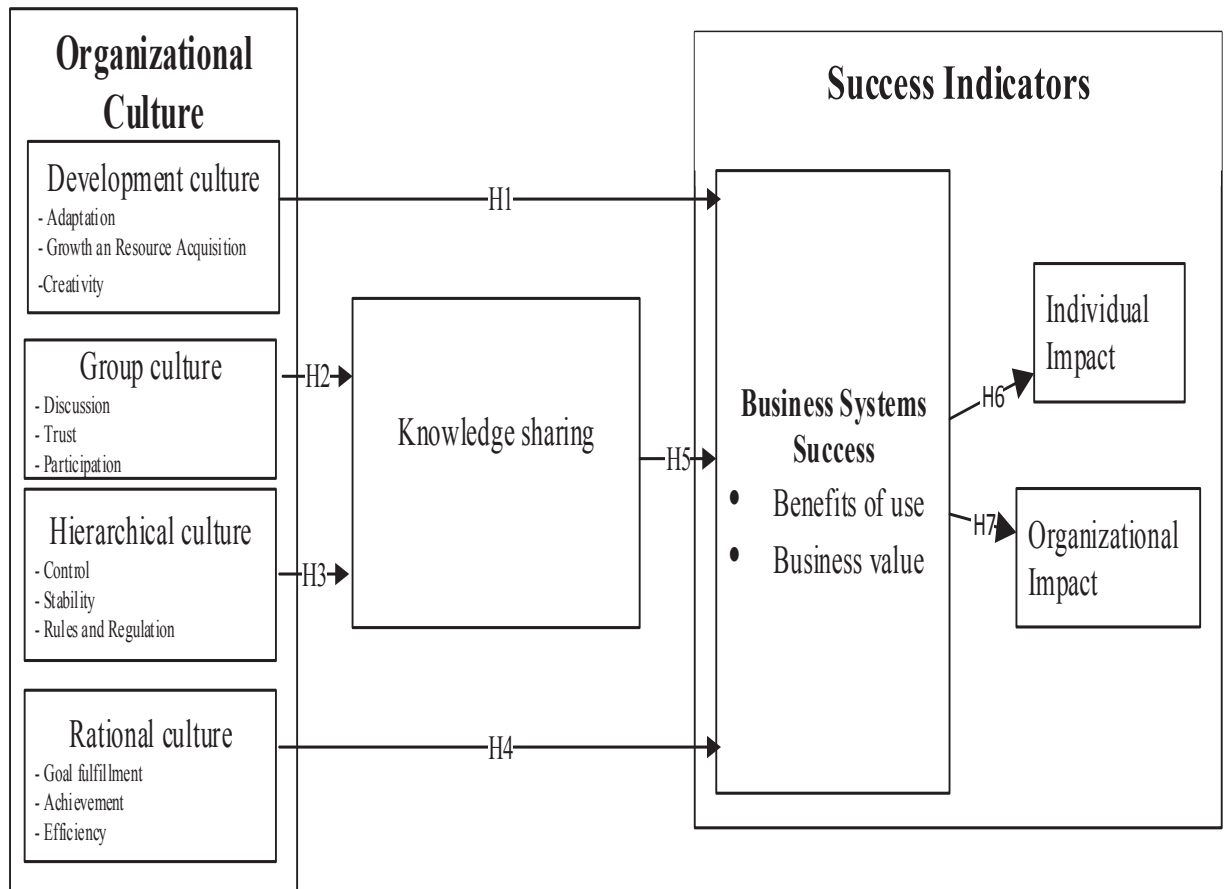
Sedera et al. (2004) find that the most significant ERP success dimensions are organisational and individual impact. Business systems are measured successful at the post-implementation phase, if it improves potential benefits through firm cost reductions, increased customer satisfaction levels and higher operational productivity (Sedera et al., 2004). It is worth mentioning that other investigators have used the Sedera et al. (2004) model of enterprise system success in their studies (such as Ifinedo, 2007; Sehgal & Stewart, 2004; Wang et al., 2008; Yoon, 2009).

Similarly, Ifinedo et al. (2010) showed in their research framework enterprise system success is a dependent construct that measures the benefits of the business package to the organisation, while the impact of organisational culture and IT resources are contingency factors. Their results highlighted that organisational culture promotes greater benefits of business systems.

Also, system success is higher in terms of individual and organisation impact than the other factors. Therefore, the concept of organisational and individual impact adopted in the current study is aligned with the models developed by DeLone and McLean (1992), Sedera et al. (2004) and Ifinedo et al. (2010). Thus, it is suggested that the organisational and individual impact contribute to the ongoing success of business system.

### **3.5 Conceptual Model**

As outlined in Sections 3.1 to 3.4, this study draws from various theories. From this literature review, a model is proposed to describe how organisational culture and knowledge-sharing contribute to business system success at both the organisational and individual levels. Figure 3.4 shows the proposed model. The goal is not to provide a complete view of all aspects influencing the success of business systems. Rather, the general rule of choosing factors for the proposed model is to build on the literature and to use well-studied concepts.



**Figure 3.4: Conceptual model**

The definitions of the key concepts used in the conceptual model are presented in Table 3.1.

**Table 3.1: Description of key factors**

| Factors                 | Sub dimensions                                                                                                                                                                                                                                                                   | Description                                                                                                                                                                                                                                   | Sources                                                                 |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Development culture     | Innovation                                                                                                                                                                                                                                                                       | The flexibility of an organisation towards change and encouragement of innovation.                                                                                                                                                            | (Guo 2014; Shao 2012; McDermott and Stock 1999; Škerlavaj et al., 2010) |
|                         | Adaptation                                                                                                                                                                                                                                                                       | Such as the organisation “would tend to scan the competitive environment to assess their relative competitive strengths and weaknesses in relation to their competition and customers, and strive to make changes to their firm accordingly”. |                                                                         |
|                         | Growth and resource acquisition                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                               |                                                                         |
|                         | Creativity                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                               |                                                                         |
| Group culture           | Discussion                                                                                                                                                                                                                                                                       | “Employees share information and insights throughout the organisation and have considerable influence over decision-making”.                                                                                                                  |                                                                         |
|                         | Trust                                                                                                                                                                                                                                                                            | “The top executive needs to promote a trust-oriented group culture that focuses on belonging and participation”.                                                                                                                              |                                                                         |
|                         | Participation                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                               |                                                                         |
| Hierarchical culture    | Control                                                                                                                                                                                                                                                                          | “Firm standardization to achieve control”.                                                                                                                                                                                                    |                                                                         |
|                         | Stability                                                                                                                                                                                                                                                                        | “Internal firm desire for a focus on change or stability; firm emphasizes on stability”.                                                                                                                                                      |                                                                         |
|                         | Rules and Regulation                                                                                                                                                                                                                                                             | “A concern with formal rules and procedures”.                                                                                                                                                                                                 |                                                                         |
| Rational culture        | Efficiency                                                                                                                                                                                                                                                                       | “The degree of importance placed on employee efficiency and productivity at work”.                                                                                                                                                            |                                                                         |
|                         | Goal fulfilment                                                                                                                                                                                                                                                                  | “A concern with clearly defining the goals of the organisation”.                                                                                                                                                                              |                                                                         |
|                         | Achievement                                                                                                                                                                                                                                                                      | “Firms emphasize on productivity and achievement, with objectives typically well-defined and external competition a primary motivating factor”.                                                                                               |                                                                         |
| Knowledge-sharing       | Knowledge-sharing refers to the extent to which a firm shares a variety of relevant, accurate, complete and confidential information in a timely manner.<br><br>“Sharing of knowledge about business processes and the related knowledge required to make these processes work”. |                                                                                                                                                                                                                                               | (Jones et al. 2006)                                                     |
| Business system success | “A package software system, with a robust system quality and information quality that meets the overall requirements of a client organisation, which leads to an increase in information system usage, subsequent user satisfaction, and                                         |                                                                                                                                                                                                                                               | (Chien and Tsaur, 2007; See-Pui Ng,                                     |

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                        |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
|                              | net benefits (i.e., improvements in individual, business unit and/or organisation performance) to an organisation.”<br><br><b>Benefits of use and business value:</b> establishes the extent to which business systems are contributing to the success of the different stakeholders.<br><br><b>Net benefits:</b> they capture the balance of positive and negative impacts of the business system on organisations. | 2013)                                  |
| <b>Individual impact</b>     | The measure of the effect of information on the behaviour of the recipient.                                                                                                                                                                                                                                                                                                                                          | (DeLone and McLean 1992; Ifinedo 2010) |
| <b>Organisational impact</b> | The measure of the effect of information on organisational performance.                                                                                                                                                                                                                                                                                                                                              |                                        |

### 3.6 Revisiting the Research Questions

The following research questions are addressed in the study.

1. How does organisational culture (group culture, hierarchical culture, development culture and rational culture) impact knowledge-sharing and business system success in Saudi Arabian enterprises?
2. How does knowledge-sharing impact business system success in Saudi Arabian enterprises?
3. How does business system success influence organisational and individual impacts in Saudi Arabian enterprises?

### 3.7 Hypothesis Development

In order to answer the research questions, the following hypotheses are developed.

#### 3.7.1 Organisational Culture

##### Development Culture

The role of development culture within the business environment highlights the crucial role of culture as a way to business system success. Employees' innovativeness has an effect on the success of business systems, as culture is one of the defining

characteristics for any organisation (Rashid et al., 2003).

Organisational culture has been found to affect technology change within organisations (Hannan and Carroll, 2003). In order to improve and achieve business system success, “the top executive needs to facilitate a development culture that focuses on innovativeness, creativity, and adaptation to the external environment, thus to offer the users a vision of organisational strategic directions and inspire the users to think innovatively about how the system might enable the business to accomplish its goals and achieve business performance” (Shao et al. 2012). This leads to the following hypothesis.

**Hypothesis 1 (H1): Development culture has a significant positive impact on business systems success in Saudi Arabian enterprises.**

#### **Group culture**

Liu et al., (2010a) report that continuous learning by staff is one of the important activities in enterprise system adaptation. Since business systems assimilate several business functions, employees must not only be aware of their own job and responsibilities but must also collaborate thoroughly with other employees in the organisation’s primary business processes (Liu et al., 2010b). Ke and Wei (2008) report that the employees’ interaction with organisational members supports knowledge-gathering and thus a culture of knowledge-sharing helps to increase employees’ confidence and reduce their fear of sharing their knowledge.

In order to motivate employees to learn the business systems’ functionalities and facilitate the organisational sharing of business system knowledge, the top executives need to promote a group culture that focuses on participation by taking into account the employees’ individual needs (Shao et al. 2012). Jones et al. (2006) finds that

organisational culture that emphasises teamwork and collaboration can facilitate knowledge-sharing in enterprise systems. In particular, group culture enables tacit knowledge-sharing within the organisation (Jones, 2005). This leads to the following hypothesis.

**Hypothesis 2 (H2): Group culture has a significant positive impact on knowledge-sharing in Saudi Arabian enterprises.**

### **Hierarchy culture**

Lin (2007) suggests that certain forms of extrinsic motivation, such as incentives or praise and public recognition, might stimulate staff's individual motivation and foster their knowledge-sharing intention. In order to promote individuals' active participation in business systems training, top executives need to set up suitable evaluation mechanisms and organise a system of reward mechanisms to raise a hierarchical culture that emphasises efficiency and coordination (Podsakoff, et al., 2006; Sharma and Yetton, 2003; Umble et al., 2003). This leads to the following hypothesis.

**Hypothesis 3 (H3): Hierarchy culture has a significant positive impact on knowledge-sharing in Saudi Arabian enterprises.**

### **Rational culture**

Jones et al. (2006) finds that organisational rational culture is positively related with business systems success within the organisation. An organisation with a high degree of external orientation is more likely to achieve business success (McDermott and Stock 1999). For example, organisations that emphasise an external orientation (rational culture) are more likely to experience positive competitive outcomes. Organisations need to ensure they have the best cultural support available for the success of the business systems (Kaptein 2011; Zhang 2010); hence, organisations needs to promote a

rational culture (Shao et al. 2012). This leads to the following hypothesis.

**Hypothesis 4 (H4): Rational culture has a significant positive impact on business systems success in Saudi Arabian enterprises.**

### **Knowledge-sharing**

Knowledge-sharing within an organisation is considered a vital factor that impacts the overall performance of an organisation (Boehm 2012). In essence, information systems have been shown to play a vital role in enhancing the level of knowledge-sharing (Alston and Tippet 2009; Baird 2012; Boehm 2012). Gable, Scott and Davenport (1998) suggest effective knowledge-sharing offers significant commercial and practical benefits to a business system's success. Knowledge transfer helps an organisation maintain and evolve its business system to generate returns (Davenport 2000).

Bock et al. (2005) suggests that employees are more likely to share knowledge with their coworkers in a trust-oriented culture and to form a mutual belief that focuses knowledge attainment inside the organisation, which are significant factors of business system success (Vandaie, 2008). Employees need to experience a continuous learning process to build a strong relationship between what employees have known and what the business systems wants them to know (Ravichandran, 2005; Ke and Wei, 2008).

Knowledge-sharing is considerably important for organisations to ensure they have the best possible system available in order to deliver long-term success (Kratzer et al. 2011; Roggeveen et al. 2012). Wang et al. (2007) show that active knowledge-sharing can produce a better relationship between business systems and organisational processes and improve business performance for achieving competitive success. This leads to the following hypothesis.

**Hypothesis (H5): Knowledge-sharing has a significant positive impact on business**

**systems success in Saudi Arabian enterprises.**

### **Businesses system success**

Business systems provide the backbone of information, interaction and control for an organisation (Shehab et al., 2004). Zhu et al. (2010) highlight that the business systems directly impact the managerial and operational processes. Therefore, benefits resulting from improvement in those managerial and operational processes can improve the direct benefits to the organisation (Shao et al. 2012). Liu et al. (2011) discuss individuals, nothing that their ability to use enterprise systems and their understanding is critical for organisational level enterprise system adaptation.

From an organisational perspective, a successful business system reduces uncertainty of results and thus lowers risks and controls inadequate resources (Chien and Tsaur 2007). From the end user's perspective, a successful business system improves the user's job performance without frustration. Individual impact refers to measuring the influence of the business system on individual users, such as changes in productivity and decision-making. Kositanurit et al. (2006) also find a significant positive relationship between ERP systems and individuals' performance when using such systems.

Organisational impact requires the evaluation of the changes caused by the business system to the organisation, such as an increase or decrease in operating costs and growth in profits (Chien and Tsaur 2007). This leads to the following hypotheses.

**Hypothesis 6 (H6): Business systems success increases organisational impact in Saudi Arabian enterprises.**

**Hypothesis (H7): Business systems success increases individual impact in Saudi Arabian enterprises.**

### **3.8 Chapter Summary**

In this chapter, key concepts and supporting theories are presented and used to build a conceptual model. The proposed conceptual model (Figure 3.4) integrates the organisational culture (group culture, hierarchical culture, development culture and rational culture), knowledge-sharing and business system success in Saudi enterprises. To investigate the research questions, hypotheses were developed that guide this study.

## **CHAPTER 4 : METHODOLOGY**

This chapter focuses on the research methodology of this study. First, the research design and justification of the design adopted for the current study is explained. Then the quantitative approach (Phase 1 of this study), including the instruments used for this study, are then presented with evidence, after which the population and sample are described. Following this, the data collection procedure is highlighted. Finally, the data analysis procedure is discussed in detail. The qualitative approach (Phase 2) of this study, including data collection, case study design and data analysis, is then presented. The final section concludes the chapter.

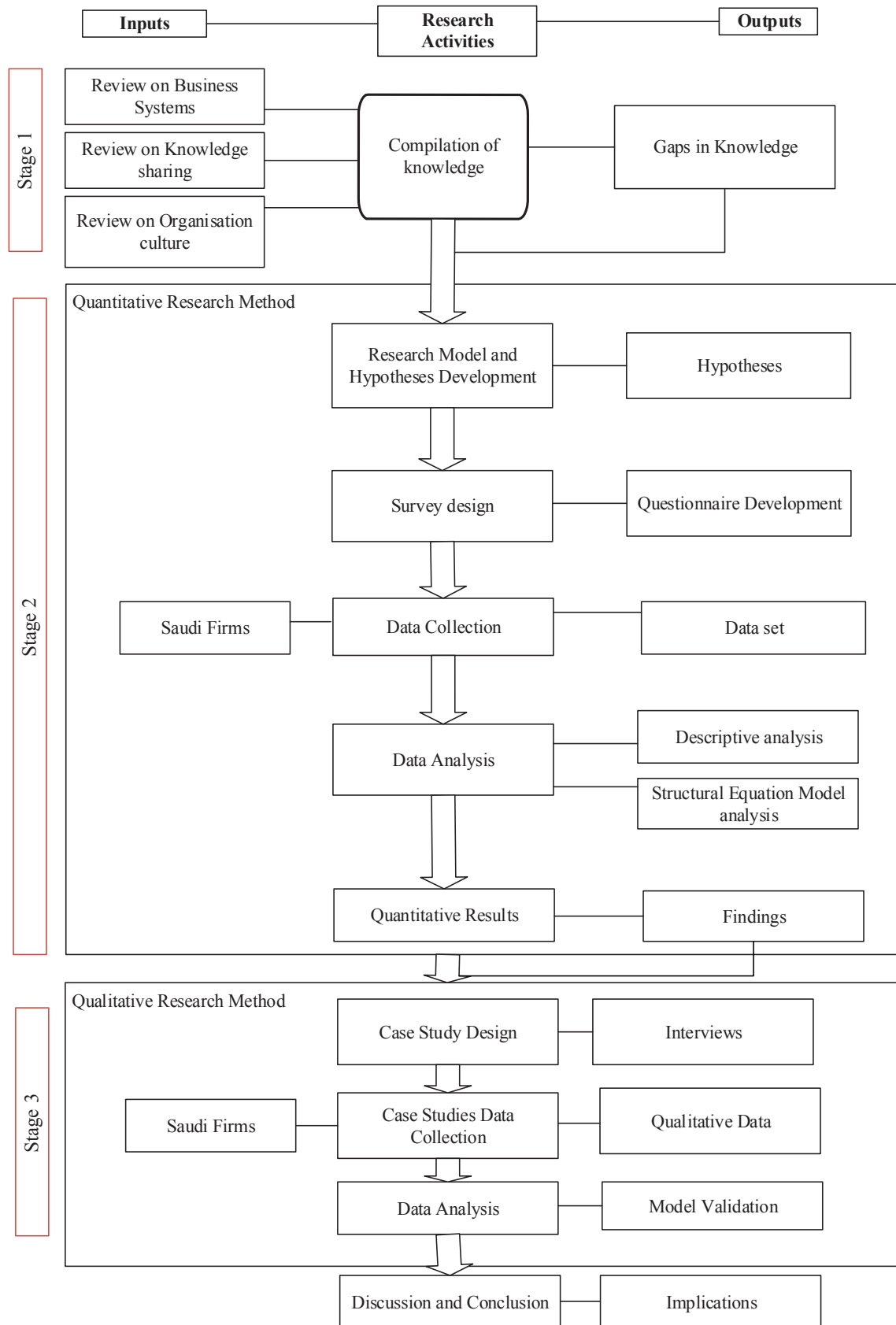
### **4.1 Research Design**

The research design is the framework that steers the conduct of the study through the search for answers to the research questions (Cooper and Schindler, 2011). The research design also ensures that the data collected from the research is adequate to provide answers to the research questions in an unambiguous and credible manner (Vogt 2010). The design of any research is very important, as it is the map that guides the research towards meeting the study's aims. It also directs the research on how to address the study's hypotheses and the research questions by providing a logical flow chart of the study from its early stages through to finalisation.

This research study applied a mixed-method research methodology that incorporated both quantitative and qualitative approaches to answer the research questions and test the hypotheses. Phase 1 of the research study employed a quantitative method, based on data collected using a survey. A qualitative research method (case study) is then carried

out as the second phase of the analysis, which is used to support the validity of the quantitative results.

In this research study, the researcher used an interpretivist approach for the case study. Interpretive research studies are used to know research concepts by meanings which are provided by others (Yanow and Schwartz-Shea, 2011; Yin, 2009). In the case of information systems, interpretive research methods aim to find out about information systems and the factors that are influencing them (Mills et.al, 2009).



**Figure 4.1: Research activities**

A literature review is an ongoing process that continues throughout the research life cycle. The first stage of knowledge compilation in this study involved doing a broad literature review on the fields of organisation culture, knowledge-sharing and business system success. As the research project progressed, the literature review became more focused. This stage required defining the research borders clearly in order to investigate the influence of organisational culture based on the competing values framework (CVF), which categorises organisational culture into development, group, hierarchal and rational types, and knowledge-sharing on business system success (individual and organisation impact).

Once a gap has been identified in the literature and the research borders established, the research questions and hypotheses are developed. In order to answer these questions, a conceptual model was proposed (discussed in Chapter 3). Factors were defined and the interrelationship among the factors identified in the literature review was the basis of developing the hypotheses.

A questionnaire instrument was then developed which involves a quantitative empirical investigation, where an evaluation for each item on the survey questions is conducted based on its relevancy and consistency with each definition in the model. After designing the survey, data were collected in two Saudi firms. Then the quantitative data were analysed followed by the qualitative analysis to validate the model. Finally, the results were interpreted accordingly to match the hypothesis and the results and implications are provided.

## **4.2 Phase 1: Quantitative Data Analysis**

### **4.2.1 Research Instrumentation/Measures**

Several researchers have recommended that whenever possible, researchers should use previously validated survey instruments rather than developing new ones in order to facilitate the confirmation of reliability and validity (Bélanger and Crossler, 2011). Therefore, in this study previously validated survey instruments were revised and used in order to ensure the measures are adequate and representative, thereby adding to content validity. Furthermore, two experts from the Faculty of Engineering and Information Technology at the University of Technology Sydney were consulted to examine whether the complete survey instrument adequately measures each construct. The feedback from the experts recommended minor amendments of the wording and eliminating a few redundant questions.

All constructs were measured using a set of items and then measured by using five-point Likert-scale statistical measures (ranging from 1 = strongly disagree to 5 = strongly agree).

Multi-scale items using at least three observable indicators measured all constructs. All items used in the study are listed in Appendix A. Table 4.1 shows the instrumentation adopted is as follows.

**Table 4.1: Adopted factors**

| <b>Factors</b>          | <b>Sources</b>                                                                    |
|-------------------------|-----------------------------------------------------------------------------------|
| Development culture     | (Guo 2014;<br>Shao et al. 2012; McDermott and Stock 1999; Škerlavaj et al., 2010) |
| Group culture           |                                                                                   |
| Hierarchical culture    |                                                                                   |
| Rational culture        |                                                                                   |
| Knowledge-sharing       | (Shao et al. 2012, 2015; Jones et al. 2006)                                       |
| Business system success | (Chien and Tsaur, 2007; See-Pui Ng, 2013)                                         |
| Individual impact       | (Sedera et al., 2004; Gable et al. (2003, 2008) Ifinedo 2010)                     |
| Organisational impact   |                                                                                   |

#### **4.2.2 Instrument Translation**

The scales implemented in this survey were originally developed in English. However, it was necessary to translate them into Arabic to be used in Saudi Arabian organisations. Based on the cross-cultural development work of Sperber et al. (1994) and the organisational learning culture and climate study in Jordan of Bates and Khasawneh (2005), to maintain a high quality of translation in order to ensure the functional equivalence between the English and Arabic items, a forward translation procedure with subjective evaluation was used. After this, the final English/Arabic version that was used in the pilot test was sent to a group of 10 experts whose first language is Arabic but who use English as the language of communication in their organisations. The objective of producing Arabic items was the meaning or the functional equivalence be used rather than providing an identical word-by-word translation for the English items.

The functional equivalence helps to ensure that the translated measures can deliver the same core meaning as the English statements and have the appropriate form of readability. The translation stages are described in the following sections.

### **Forward Translation**

Two English-Arabic certified translators translated the English version to Arabic. Both translators were instructed to maintain the meaning of the statements as close as possible to the English items. The two Arabic translated versions were compared item by item to assess the accuracy of the translation and the most accurate translation was placed in the final version of the questionnaire.

### **Subjective Evaluation**

The researcher then evaluated the final translated version after the first translation stage to ensure there was equivalence of meaning with the English version. If any meaning differences were found between items, these items were sent back to both translators so they could look at it and refine it to the best translated meaning until the researcher was satisfied.

#### **4.2.3 Sample and Sample Size**

The sample of this study includes employees who use business systems in their selected organisations from the selected industries in Jeddah, Saudi Arabia. Determining the proper sample size for a study is also important to ensure its reliability and validity (Wolverton, 2009). Several structural equation modelling (SEM) researchers have suggested rules of thumb for estimating approximate sample sizes for SEM studies. For example, Hair et al. (2006) suggest five points may affect the required sample size for structure equation modelling (SEM) statistical analysis: multivariate distribution of the data; estimation technique; model complexity; amount of missing data; and amount of average error variance among reflective indicators. They observed that in the vast SEM literature, SEM studies generally use a sample size of between 200 and 400 for 10 to 15

indicators. This study uses a sample of 330 participants for survey.

#### **4.2.4 Data Collection**

In this study the survey instrument is used as the method of data collection. According to Creswell (2003), “A survey design provides a quantitative or a numeric description of trends, attitudes, or opinions of a population by studying a sample of the population”. Babbie (2012) states “surveys are particularly useful in describing the characteristics of a large population because they make large samples feasible”. An English/Arabic questionnaire was used in this research. This study used closed-ended questions when conducting the survey. In closed-ended questions, a small set of responses generates precise answers. The respondents were asked to select or rank answers rather than to express their opinions. To increase the response rate, the questionnaire was designed to take no more than 15 minutes to complete.

Initially, an online survey was used to collect responses from the participants. The web-based survey was administered using the online survey software Qualtrics. However, due to a poor response rate, a paper-based survey was distributed to employees who work in selected organisations. Participants who had not submitted an online response were recruited from selected organisations with the help of managers from each department. The respondents were asked to return the completed questionnaire by dropping it their manager. Follow-up calls to the selected organisations were placed about two weeks after the initial contact.

Data collection lasted from November 2014 to March 2015. 500 questionnaires were distributed, with 350 completed and returned including the online surveys. This represents a response rate of 70%. After removing the incomplete responses, 330 surveys were used for data analysis.

#### **4.2.5 Quantitative Data Analysis Approach**

After receiving the surveys from the participants, specific statistical techniques were used to analyse the data gathered. The data analysis serves to address three main aims: having a feel for the data by checking the central tendency and the dispersion; testing the sufficiency of the data by measuring reliability and validity; and testing the hypotheses which were developed for the research (Sekaran 2003).

The data was analysed using a variance-based structural equation modeling (SEM) statistical technique, partial least squares (PLS) path modelling using SmartPLS version 3 (Ringle et al., 2014), to estimate the relationships between the different parameters of the research model. SEM tests theoretical models using hypothesis testing to understand the simultaneous modelling of relationships among various independent and dependent variables. The partial least squares (PLS-SEM) approach is a preferred analysis technique in information systems and business research because it offers several flexibilities. For example, this approach is well suited for prediction-oriented research, does not require a large sample size, does not require normality and subsequently works without distributional assumptions and with nominal, ordinal and interval-scaled variables (Haenlein and Kaplan, 2004, Hair et al., 2014). The quantitative analysis (phase 1 of the study) went through three stages as follows.

##### **4.2.5.1 Descriptive Data Analysis**

The descriptive data analysis was conducted using the SPSS (Version 22.00) software to find out if the data was ready to continue to the multivariate data analysis step. This analysis contained an examination of the participants' profiles and data screening by studying normality, means, standard deviations and standard error of the mean were implemented to examine the central tendency and the dispersion of the data. The results

of this stage are presented in Chapter 5.

#### **4.2.5.2 Measurement Scale Analysis**

The measurement scale analysis was used in the questionnaire to capture the meaning of each model construct through an assessment of reliability and validity. To measure reliability, a Cronbach's alpha assessment was worked out, which helped to show the consistency of the responses across the items within the Likert scale. To measure reliability and validity, factor analysis and Cronbach's alpha were used. At the end of this stage, the developed hypotheses were tested using several statistical analysis methods, such as correlation analysis, which was used to assess the degree to which particular items/variables/constructs belonged to its scale to find the influence of different factors in each. In addition to this, item-total correlations were used to assess the degree to which a particular item belonged to its scale.

The validity of the measurement scale was also assessed by using factor analysis, which was carried out using two sequential techniques: exploratory factor analysis (EFA) to identify the appropriate set of variables and to explain the variables in terms of a common objective; and confirmatory factor analysis (CFA) to confirm the results in order to provide the grounds for further model assessment and refinement. The CFA is the best-known technique for testing how well a predetermined (hypothesised) factor structure matches the actual data (Hair et al., 2006). More details and results of the measurement scale analysis are presented in Chapter 6.

#### **4.2.5.3 Structural Equation Modelling (SEM)**

Following the confirmation of the measurement model, the latent variables were linked up to represent the relationships in the various hypotheses in a structural model. The partial least squares structural equation modelling (PLS-SEM) technique was used to

investigate the causal relationships of the model (Hair et al., 2006). Unlike first-generation statistical techniques such as regression analysis and analysis of variance, SEM is a second-generation multivariate analysis technique that overcomes the limitations of first-generation techniques (Haenlein and Kaplan, 2004). SEM was used as an extension of the previous technique factor analysis because SEM helps to integrate path analysis and factor analysis by involving two steps in this process: validating the measurement model and fitting the structural model after the CFA and through path analysis (Garson, 2006).

The significance of the path coefficients was examined to assess the hypotheses. The significance of the paths was determined using the t-statistical calculated with the bootstrapping technique (with 5000 subsamples). SmartPLS 3 can perform bootstrapping, a nonparametric procedure that can be applied to test whether coefficients such as outer weights, outer loadings and path coefficients are significant by estimating standard errors for the estimates (Ringle et al., 2014), for both the inner and outer model to specify the t-value for significance. In order to get approximate t-values for the significance test, researchers should use a large subsample (for example, 5000) from the original sample to draw a standard error, and the number of cases should be equal to the number of observations in the original sample (Hair et al., 2014). The critical t-values for a two-tailed test are 1.65 (significance level = 10%), 1.96 (significance level = 5%) and 2.58 (significance level = 1%) (Hair et al., 2011).

A 5% significance level was employed for the two-tailed test in this study. To measure the predictive power of the research model (Chin, 1998), the  $R^2$  value was used to measure the percentage of the variance explained by the independent constructs in the structural model.  $R^2$  values of 0.75, 0.50, or 0.25 for endogenous latent variables in the

structural model can be described as substantial, moderate or weak, respectively (Hair et al., 2011). Details of the SEM analysis and results are presented in Chapter 6.

### **4.3 Phase 2: Qualitative Data Analysis**

The main purpose of this analysis was to qualitatively validate the research model. The analysis guaranteed that the model adequately represented the actual phenomenon within the Saudi Arabian organisational context. In this study, a case study research approach was employed based on qualitative analysis commonly used in social science research (Yin, 2011). It is the preferred strategy in this situation as it is suitable for the nature of this research. Moreover, the explanatory type of the case study helped to revalidate the research model for generalisation purposes (Sekaran, 2003).

To achieve this, the generalisation of the research model could not be fully covered by the statistics phase because the objective of this study is purposive rather than statistical. In order to support the generalisation, multiple case studies were implemented using the developed model template, the outcomes of which were compared to find whether the same findings and results were reliable (Yin, 2011). The results from this stage also strengthened the understanding of how well the model presented Saudi Arabia's current status towards business system success.

#### **4.3.1 Case Study Design**

According to Yin (2013), the case study method can be used for a single case study or multiple cases. The single case study design uses insights study and extensive descriptions of a single phenomenon and is suitable for studying critical cases or unique conditions. Multiple case studies have more than one case, which can be more expensive and time consuming. The multiple cases follow replication logic, where the

result of the studies either predicts similar results or contrasting results. This study adopted a multiple cases approach since replication logic was used in order to achieve analytical generalisation. The selection of organisations that were included in the study was based on similar criteria used in the statistics stage. Case studies can be classified as explanatory, descriptive or exploratory. Exploratory case studies focus on theory and/or hypothesis development; descriptive case studies focus on finding what needs to be described or any information gathered about a situation; and explanatory case studies focus on concepts and hypothesis testing. In this study, an explanatory approach was used to satisfy the purpose of validating the research model that derived from the assessment stage. The proper selection of qualitative methods like case studies is not based on assumptions (Creswell and Clark, 2010). The case study method helps in investigating facts in terms of real life and when the context and boundaries are not clear (Yin, 2011).

#### **4.3.2 Data Collection**

The data collection method in the case studies was conducted using interviews from employees in two selected organisations in Saudi Arabia. According to Yin (2013), interviews can be one of the main sources of information in the case studies approach.

Semi-structured interviews were adopted in this study to maintain flexibility, with an interview guide developed to direct the interviews and relevant lines of enquiry. The interview questions are presented in Appendix. All the interviews were held face to face and were digitally recorded to resolve any ambiguity issues and obtain complete and accurate descriptions of the interviewee's response and comments. A documentation method was adopted that focused on relative organisational and demographic background information to support the relative details of the organisations.

When conducting interviews in research, informed consent is essential. In each firm, the researcher provided the HR manager with information on the research problem statement, the research method, research significance and the nil/negligible risks associated while conducting interviews (see Appendix B).

#### **4.3.3 Qualitative Data Analysis Approach**

Data analysis consists of examination, categorisation and tabulating, and testing or gathering the evidence that satisfies the objectives of the study. After transcribing the semi-structured interviews, the data was analysed using the coding procedure suggested by Strauss and Corbin (1998). The procedure follows a systematic format including open coding, axial coding and selective coding (Strauss and Corbin 1990, p. 58). In the first step, open coding, coherencies are identified within the raw interview data by searching for patterns through the process of constant sentence-by-sentence comparison in order to build initial categories (Strauss and Corbin 1998, p. 101). In the next step, axial coding, related categories are subcategorised and linked to categories with same dimension (Strauss and Corbin 1998). The core category, which is the category with the most coherencies to all other categories, is then introduced (Strauss and Corbin 1990, p. 116).

In this study, the core category is business system success. In the last step, selective coding, all concepts are eliminated that are weakly related to the core category. This analysis type helps to provide a better basis for the data as the data could be linked to in the model (Mitchell and Bernauer, 1998). A cross-case analysis can validate the results from the multiple case studies by using a pattern-matching technique which links the collected data to the theoretical propositions by comparing patterns of the actual values of variables to those predicted in the propositions (Yin, 2011). For the purposes of this

study, pattern-matching compared the patterns of the actual constructs to those predicted by the model in the quantitative phase. The patterns can be judged based on the statistical criteria. The results of this stage are presented in Chapter 7.

#### **4.4 Ethics Consideration**

This research involves human participants for the purpose of data collection. In order to ensure the anonymity and ethical protection of the participants, the Human Research Ethics Committee (HREC) – University of Technology Sydney guidelines were compiled, thus ensuring the integrity of the research methodology. Ethical approval from HREC [Ethics approval: UTS HREC...] was obtained for both the quantitative and qualitative methods of this research.

#### **4.5 Chapter Summary**

This chapter provided a justification of the research design, which was a quantitative and qualitative case study design. The survey instrument used for this study was described then the data collection procedure was explained. A description of adopted measures and the data analysis used in the study was also presented. The statistical analysis using structural equation modelling (SEM) to test the hypotheses was presented. Finally, the case study design was explained.

## **CHAPTER 5 : DESCRIPTIVE QUANTITATIVE DATA ANALYSIS**

This chapter presents the descriptive data analysis. First, the detail about the survey is presented followed by respondents' profile. This is followed by an analysis of the characteristics of the data set. Then, the reliability assessment of each factor used in the current study is described. The final section concludes the chapter.

### **5.1 Questionnaire Survey**

A quantitative research approach is applied to collect numerical data from participants in Saudi firms that use business systems such as ERP, SAP and Oracle. As discussed in Chapter 3, it was determined that a questionnaire was the most appropriate way to collect the data for this study because it is the quickest and most reliable method for data collection. A hard-copy questionnaire survey was given to the department manager to distribute it to employees who worked in the selected Saudi Arabian organisations. The survey was also posted online to participants through the Qualtrics website, whose URL was embedded in email for participants, calling for their survey participation.

Data collection lasted from November 2014 to March 2014. This study adopts previously validated instruments in order to ensure the measures are adequate and representative. The scales implemented in this survey were developed originally in English. A certified translator translated the English version to Arabic. A five-point Likert scale (1 = strongly disagree to 5 = strongly agree) is used because it is considered one of the most commonly used techniques of scaling responses in a survey design. The

Saudi Binladin Group, one of the Saudi biggest enterprises, was used as a case study for data collection. The organisation has 8000 employees. A total of 500 participants were contacted, 350 of whom participated in the survey. After removing incomplete responses, in total 330 responses were collected. Professionals in the Saudi Arabian firm Saudi Binladin Group were asked to participate in the survey which asked their opinions on different measures such as organisational culture, knowledge-sharing and business systems success, including the impact of individuals and organisations. Staff who used business systems in the selected organisation were the target population for this research study. This means that the target sample needs to have some level of experience using business systems in the selected organisation to be able to answer the survey questions.

## 5.2 Participants' Profiles

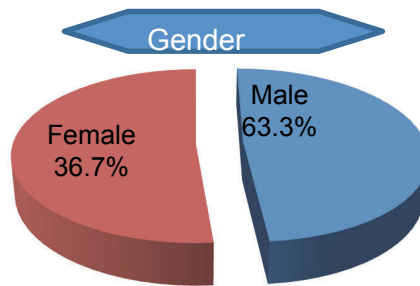
An evaluation of the participants' profiles was done to reveal the ability of the sample to sufficiently exhibit the survey population. The details of each category are follows.

### Gender

As shown in Table 5.1 and Figure 5.1, that majority of the participants are male (209, 63.3%). 121 (37.7%) are female. This distribution of male and female is fairly representative of the population of staff in the selected company.

**Table 5.1: Gender**

| <b>Gender</b> | <b>Frequency</b> | <b>Percentage (%)</b> |
|---------------|------------------|-----------------------|
| Male          | 209              | 63.3                  |
| Female        | 121              | 36.7                  |
| <b>Total</b>  | <b>330</b>       | <b>100</b>            |



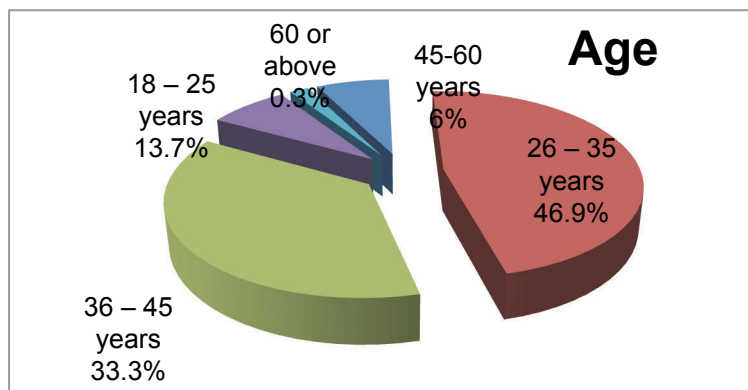
**Figure 5.1: Participants' gender**

## Age

Figure 5.2 and Table 5.2 show the age of the participants. 155 (46.9%) are 26–35 years old, followed by 110 (33.3%) participants who are 36–45 years old. Then 45 (13.7%) of the participant are 18-25 years old, followed by 6.1% who are older than 45 years.

**Table 5.2: Participants' age**

| Age in years | Frequency  | Percentage (%) |
|--------------|------------|----------------|
| 18-25        | 45         | 13.7           |
| 26-35        | 155        | 46.9           |
| 36-45        | 110        | 33.3           |
| 45 -60       | 20         | 6              |
| 60 or above  | 1          | 0.1            |
| <b>Total</b> | <b>330</b> | <b>100</b>     |



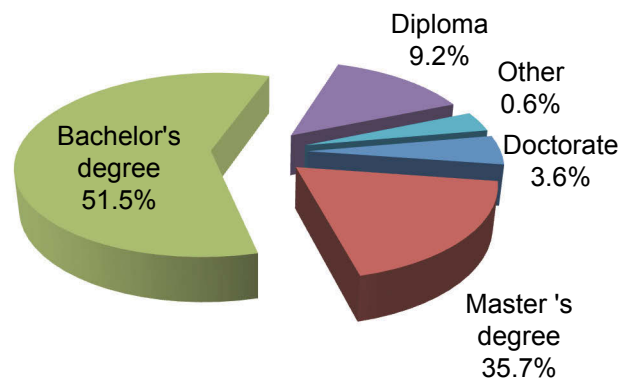
**Figure 5.2: Age**

## Education

As shown in Table 5.3 and Figure 5.3, the majority of participants (51.5%) hold a bachelor's degree with 51.5%, followed by 35.7% with a master's degree. 9.2% of the participants had diploma and 3% a doctorate. This demonstrates all the respondents are literate enough to answer the survey questions.

**Table 5.3: Participants' education**

| Education         | Frequency  | Percentage (%) |
|-------------------|------------|----------------|
| Diploma           | 30         | 9.2            |
| Bachelor's degree | 170        | 51.5           |
| Master's degree   | 118        | 35.7           |
| Doctorate degree  | 12         | 3.6            |
| Other             | 2          | 0.6            |
| <b>Total</b>      | <b>330</b> | <b>100</b>     |



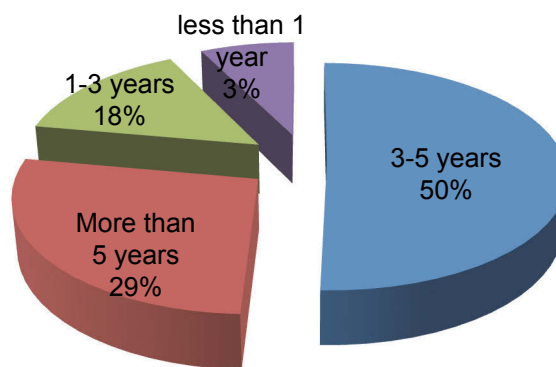
**Figure 5.3: Education**

## Work Experience

As Figure 5.4 and Table 5.4 shows, 50% of participants had 3–5 years of work experience, followed by more than 3–5 years (29%). 18% of participants had work experience of 1–3 years, followed by 3% with less than one year. These figures demonstrate that those participants are experienced in the company.

**Table 5.4: Participants' work experience**

| <b>Work Experience</b> | <b>Frequency</b> | <b>Percentage (%)</b> |
|------------------------|------------------|-----------------------|
| Less than one year     | 10               | 3.0                   |
| 1–3 years              | 60               | 18                    |
| 3–5 years              | 165              | 50                    |
| More than 5 years      | 95               | 29                    |
| <b>Total</b>           | <b>330</b>       | <b>100</b>            |



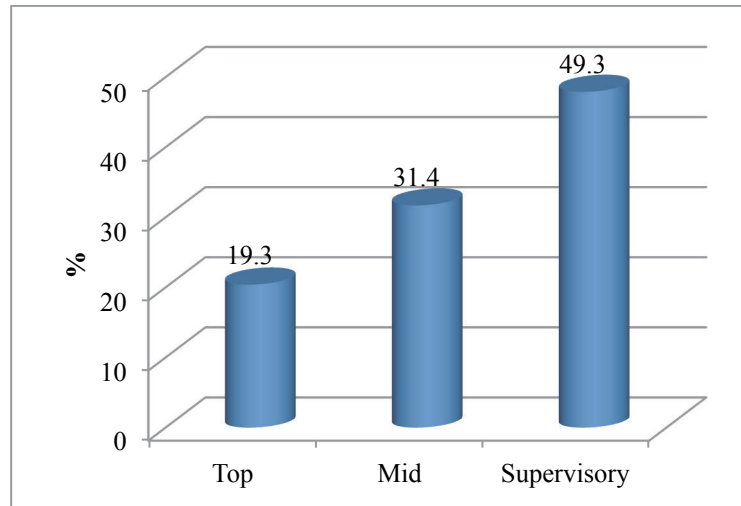
**Figure 5.4: Work experience**

### **Job Level**

Concerning the job level of participants, as presented in Table 5.5 and Figure 5.5, 49% are in a mid-level of management, followed by 31.4% in the supervisory level of management and 19.3% in the top level of management.

**Table 5.5: Participants' job level**

| <b>Management level</b> | <b>Frequency</b> | <b>Percentage (%)</b> |
|-------------------------|------------------|-----------------------|
| Top                     | 64               | 19.3                  |
| Mid                     | 163              | 49.3                  |
| Supervisory             | 103              | 31.4                  |
| <b>Total</b>            | <b>330</b>       | <b>100</b>            |



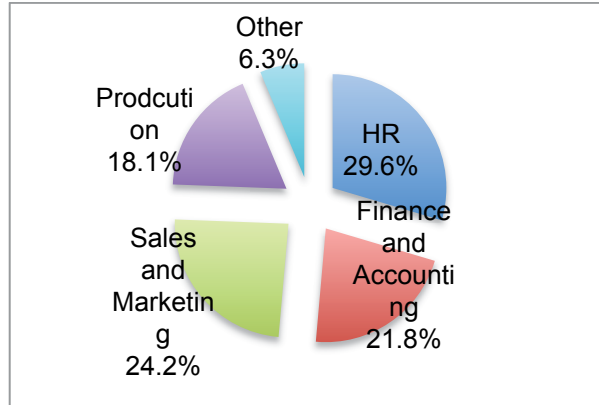
**Figure 5.5: Participants' job level**

### **Department**

As shown in Figure 5.6 and Table 5.6, 98 (29.6%) of participants were from the human resources (HR) department, 72 (21.8%) participants were from finance and accounting, followed by 80 (24.2%) from sales and marketing. 60 (18.1%) were from the production and procurement department, while 20 (6.3%) belong to other departments. This shows reasonable number of participants respondent from each of the departments of the company.

**Table 5.6: Participants' department**

| Department             | Frequency  | Percentage (%) |
|------------------------|------------|----------------|
| Human resources        | 98         | 29.6           |
| Finance and accounting | 72         | 21.8           |
| Sales/marketing        | 80         | 24.2           |
| Production/procurement | 60         | 18.1           |
| Other                  | 20         | 6.3            |
| <b>Total</b>           | <b>330</b> | <b>100</b>     |



**Figure 5.6: Participants Department**

Table 5.7 and Figure 5.7, shows how frequently the business systems are used by participants. In the HR department, the highest percentage (61.2%) used Oracle Human Resources (PER). In the finance and accounting department, 62.5% used Oracle Payroll (PAY) or Account Payables. In the sales and marketing department, 28.7% used Oracle Sales, while in production/procurement department 41% used Oracle Order Management.

**Table 5.7: Business systems and use frequency in each department**

|                                                                                    | Frequency | Percentage |
|------------------------------------------------------------------------------------|-----------|------------|
| <b>Business systems used in the HR department (n = 98)</b>                         |           |            |
| Oracle Human Resources (PER)                                                       | 60        | 61.2       |
| iRecruitment                                                                       | 25        | 25.5       |
| Other                                                                              | 13        | 13.3       |
| <b>Business systems used in the finance and accounting department (n = 72)</b>     |           |            |
| Oracle Payroll (PAY) or Account Payables                                           | 45        | 62.5       |
| Oracle Asset and General Ledger                                                    | 23        | 31.9       |
| Other                                                                              | 5         | 5.6        |
| <b>Business systems used in the sales and marketing department (n = 80)</b>        |           |            |
| Oracle Sales                                                                       | 23        | 28.7       |
| CRM                                                                                | 31        | 38.7       |
| Oracle Marketing                                                                   | 20        | 26.2       |
| Others                                                                             | 6         | 6.4        |
| <b>Business systems used in the production and procurement department (n = 60)</b> |           |            |
| Oracle Advanced Procurement                                                        | 15        | 25         |
| Oracle Order Management                                                            | 25        | 41         |
| Oracle Advanced Supply Planning                                                    | 11        | 18         |
| Manufacturing Scheduling                                                           | 7         | 11         |

|                                                                                    | Frequency | Percentage |
|------------------------------------------------------------------------------------|-----------|------------|
| <b>Business systems used in the HR department (n = 98)</b>                         |           |            |
| Oracle Human Resources (PER)                                                       | 60        | 61.2       |
| iRecruitment                                                                       | 25        | 25.5       |
| Other                                                                              | 13        | 13.3       |
| <b>Business systems used in the finance and accounting department (n = 72)</b>     |           |            |
| Oracle Payroll (PAY) or Account Payables                                           | 45        | 62.5       |
| Oracle Asset and General Ledger                                                    | 23        | 31.9       |
| Other                                                                              | 5         | 5.6        |
| <b>Business systems used in the sales and marketing department (n = 80)</b>        |           |            |
| Oracle Sales                                                                       | 23        | 28.7       |
| CRM                                                                                | 31        | 38.7       |
| Oracle Marketing                                                                   | 20        | 26.2       |
| Others                                                                             | 6         | 6.4        |
| <b>Business systems used in the production and procurement department (n = 60)</b> |           |            |
| Oracle Advanced Procurement                                                        | 15        | 25         |
| Oracle Order Management                                                            | 25        | 41         |
| Oracle Advanced Supply Planning                                                    | 11        | 18         |
| Other                                                                              | 3         | 5          |

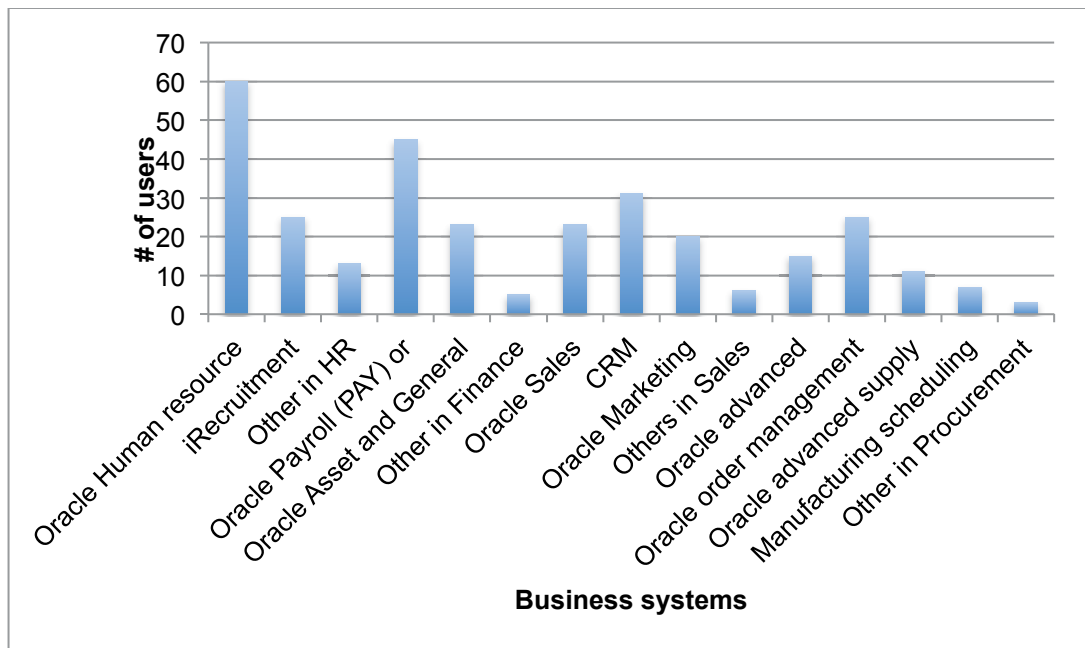


Figure 5.7: Business systems

## **5.1 Verifying Data Characteristics**

The preliminary statistics includes missing data analysis, assessment of normality, standard deviations and standard errors of the mean, which are discussed below. The descriptive statistics for the variables of all the constructs are illustrated in following sections.

### **5.1.1 Missing Data Analysis and Assessment of Normality**

It is quite common that data sets have missing cases (Kline, 2005). However, in the current study, after removing the incomplete responses, there were no missing observations used in the analysis.

An assessment of normality is also required in data analysis (Hair et al., 2006), which is often measured by skewness and kurtosis (Tabachnick and Fidell, 2007). Kurtosis is a measure of the peakedness, while skewness is a measure of symmetry of the distribution (Hair et al., 2006). Both the kurtosis and skewness range between +2.00 and -2.00 values for a normal distribution. In the current study, these values fell within the recommended value range for the entire items (see Tables 5.8 to 5.11).

### **5.1.2 Standard Deviations and the Mean**

A standard deviation (SD) is as a measure of how well the mean represents the observed data (Field, 2009). A large SD indicates that mean is not a good representation of the data, while a small SD indicates less dispersed data and thus it effectively represents the data. The values of SD for all variables in this study were not large (see Tables 5.8 to 5.11). Therefore, it can be reasonably concluded that the mean value can be used as a representative score for each variable in the data set.

## 5.2 Preliminary Data Analysis

Tables 5.8 to 5.11 show the above descriptive analysis of items of all the factors in the current study (organisational culture, knowledge-sharing, business system success, individual and organisational impact).

### 5.2.1 Organisational Culture

This measure of organisational culture, which includes development culture, group culture, hierarchal culture and rational culture, is formed of 12 different items (Table 5.8). Overall, 43.7% of the respondents agreed and 29% of the sample strongly agreed that organisational culture is important for influencing knowledge-sharing and the acceptance of business systems use. Only 2.4% strongly disagreed.

**Table 5.8: Organisational culture descriptive statistics**

| Organisational culture                                                                                        | Skewness | Kurtosis | M        | StD<br>ev | SD<br>%         | D<br>%         | N<br>%         | A<br>%         | SA<br>%         |
|---------------------------------------------------------------------------------------------------------------|----------|----------|----------|-----------|-----------------|----------------|----------------|----------------|-----------------|
|                                                                                                               |          |          |          |           | 1               | 2              | 3              | 4              | 5               |
| <b>Development culture</b>                                                                                    |          |          |          |           |                 |                |                |                |                 |
| <b>DC1:</b> Our firm emphasises collaboration for business success.                                           | 0.42     | -0.09    | 4.20     | 0.84      | 1.0             | 3.5            | 10.5           | 42.0           | 43.0            |
| <b>DC2:</b> Our firm emphasises growth and acquiring new resources for business systems.                      | 0.43     | 0.08     | 4.06     | 0.81      | 1.5             | 2.5            | 15.0           | 45.5           | 35.5            |
| <b>DC3:</b> Our firm encourages creativity and/or the development of new ideas.                               | 0.42     | -0.61    | 4.12     | 0.80      | 2.0             | 3.3            | 10.0           | 40.5           | 45.2            |
| <b>Group culture</b>                                                                                          |          |          |          |           |                 |                |                |                |                 |
| <b>GC1:</b> Our firm emphasises group work.                                                                   | 0.52     | 0.11     | 4.50     | 0.94      | 1.1             | 5.5            | 21.6           | 33.5           | 40.3            |
| <b>GC2:</b> In my firm, people spend time building trust in each other.                                       | 0.47     | -1.48    | 3.89     | 0.81      | 1.5             | 4.9            | 18.3           | 39.9           | 35.4            |
| <b>GC3:</b> In my firm, teams revise their thinking as a result of group discussion or information collected. | 0.43     | -0.68    | 3.95     | 1.21      | 5.9             | 6.6            | 26.5           | 38.3           | 22.7            |
| <b>Hierarchal culture</b>                                                                                     |          |          |          |           |                 |                |                |                |                 |
| <b>HC1:</b> Our firm is a very organised place.                                                               | -0.19    | -0.07    | 3.93     | 1.19      | 3.9             | 6.6            | 19.7           | 40.8           | 29.1            |
| <b>HC2:</b> Our firm emphasises stability.                                                                    | 0.23     | -0.52    | 3.79     | 0.90      | 2.0             | 1.2            | 13.3           | 39.3           | 44.4            |
| <b>HC3:</b> Our firm emphasises rules and regulations.                                                        | 0.34     | -0.18    | 4.12     | 0.85      | 1.7             | 2.7            | 15.6           | 42.2           | 37.8            |
| <b>Rational culture</b>                                                                                       |          |          | <b>M</b> | <b>SD</b> | <b>SD<br/>%</b> | <b>D<br/>%</b> | <b>N<br/>%</b> | <b>A<br/>%</b> | <b>SA<br/>%</b> |

|                                                                       |      |       |             |             |            |            |             |             |           |
|-----------------------------------------------------------------------|------|-------|-------------|-------------|------------|------------|-------------|-------------|-----------|
| <b>RC1:</b> Our firm emphasises tasks and goal accomplishment.        | 0.53 | -1.29 | 3.58        | 0.71        | 1.0        | 7.4        | 27.2        | 61.8        | 2.7       |
| <b>RC2:</b> Our firm emphasises competitive actions and achievements. | 0.43 | -1.87 | 3.55        | 0.70        | 1.0        | 6.3        | 33.1        | 50.5        | 9.2       |
| <b>RC3:</b> Our firm is a very efficacy-oriented place.               | 0.29 | 0.92  | 3.74        | 0.80        | 1.3        | 4.0        | 28.3        | 50.3        | 16.1      |
| <b>Total</b>                                                          |      |       | <b>3.89</b> | <b>0.59</b> | <b>2.4</b> | <b>5.0</b> | <b>19.9</b> | <b>43.7</b> | <b>29</b> |

### 5.2.2 Knowledge-sharing

This variable consisted of five items related to various central aspects of influencing business system success in an organisation, as presented in Table 5.9. This is the reason 42.8% of the respondents stated that they agree with the concept, while 35.4% strongly agree. Overall, it seems worthwhile to consider the importance attached to the practice of knowledge-sharing.

**Table 5.9: Knowledge-sharing descriptive statistics**

| Factor (knowledge-sharing)                                                                            | Skewness | Kurtosis | M           | SDev        | SD %       | D %        | N %         | A %         | SA %        |
|-------------------------------------------------------------------------------------------------------|----------|----------|-------------|-------------|------------|------------|-------------|-------------|-------------|
|                                                                                                       |          |          |             |             | 1          | 2          | 3           | 4           | 5           |
| <b>KS1:</b> I am pleased to share (communicate) my work reports on business systems' use.             | 1.09     | 0.18     | 4.15        | 0.93        | 1.7        | 3          | 17.9        | 33.7        | 43.7        |
| <b>KS2:</b> I would be pleased to communicate business-related official documents with other members. | 0.77     | 0.25     | 4.07        | 0.95        | 1.1        | 6.8        | 12.7        | 39.4        | 39.9        |
| <b>KS3:</b> I would like to provide my expertise on business system use.                              | 0.87     | 0.30     | 4.01        | 0.86        | 1.8        | 4.4        | 12.8        | 52.2        | 28.8        |
| <b>KS4:</b> Collaboration is a key to knowledge-sharing on business system use.                       | 0.60     | -0.69    | 3.90        | 0.81        | 3.7        | 6.7        | 16.5        | 46.6        | 25.5        |
| <b>KS5:</b> Teams must share knowledge in order to make decisions for business system use.            | 0.68     | -0.25    | 4.12        | 0.85        | 2.7        | 1.7        | 15.6        | 42.2        | 37.8        |
| <b>Total</b>                                                                                          |          |          | <b>4.05</b> | <b>0.72</b> | <b>2.2</b> | <b>4.5</b> | <b>15.1</b> | <b>42.8</b> | <b>35.4</b> |

### 5.2.3 Business System Success

This factor was tested through six different items (Table 5.10). 49% of the respondents agreed with the perceived benefits of use and the business value of business system success, while 2.3% strongly disagreed with the concept of business system success.

**Table 5.10: Business system success descriptive statistics**

| Factor (business system success)                                                                                                       | Skewness | Kurtosis | M           | SDev        | SD %       | D %        | N %         | A %       | SA %        |
|----------------------------------------------------------------------------------------------------------------------------------------|----------|----------|-------------|-------------|------------|------------|-------------|-----------|-------------|
|                                                                                                                                        |          |          |             |             | 1          | 2          | 3           | 4         | 5           |
| <b>BSS1:</b> Our firm establishes good relationships with the user community for business systems success.                             | 0.58     | 0.41     | 3.42        | 0.80        | 1.0        | 6.5        | 45.2        | 40.1      | 7.2         |
| <b>BSS2:</b> Our business system satisfies end-user requirements.                                                                      | 0.75     | -0.53    | 3.58        | 0.91        | 2.0        | 7.4        | 25.2        | 60.8      | 4.7         |
| <b>BSS3:</b> Our firm establishes and maintains a good image and reputation with end-users.                                            | 0.56     | 0.23     | 3.55        | 0.70        | 3.0        | 6.3        | 31.1        | 50.5      | 9.2         |
| <b>BSS4:</b> Our business system enables the organisation to respond more quickly to change.                                           | 1.43     | 0.78     | 3.64        | 0.67        | 1.0        | 3.6        | 30.4        | 57.8      | 7.2         |
| <b>BSS5:</b> Our firm ensures that business system projects provide business.                                                          | 0.96     | -0.18    | 3.43        | 0.70        | 3.0        | 5.5        | 44.1        | 42.6      | 3.8         |
| <b>BSS6:</b> The results of business system are achieved through focus on the process of gathering knowledge from business system use. | 0.82     | 1.25     | 3.93        | 1.19        | 3.9        | 6.6        | 19.7        | 40.8      | 29.1        |
| <b>Total</b>                                                                                                                           |          |          | <b>3.52</b> | <b>0.62</b> | <b>2.3</b> | <b>5.9</b> | <b>32.6</b> | <b>49</b> | <b>10.2</b> |

### 5.2.4 Individual and Organisational Impact

The individual and organisational impact of business system success consisted of three items each, shown in Table 5.11. The responses suggest that 44.5% respondents agreed with the individual impact, while 36.8% agreed with the organisational impact.

**Table 5.11: Individual and organisational impact descriptive statistics**

| Factor (individual impact)                                                             | Skewness | Kurtosis | M           | SDev        | SD %       | D %        | N %         | A %         | SA %        |
|----------------------------------------------------------------------------------------|----------|----------|-------------|-------------|------------|------------|-------------|-------------|-------------|
|                                                                                        |          |          |             |             | 1          | 2          | 3           | 4           | 5           |
| <b>IM1:</b> Our business system use enhances individual creativity.                    | 0.93     | 0.59     | 3.51        | 0.91        | 1.3        | 7.2        | 48.3        | 25.7        | 17.5        |
| <b>IM2:</b> Our business system use enhances higher quality decision-making.           | 0.75     | -0.42    | 3.76        | 0.90        | 1.9        | 9.9        | 14.8        | 57.0        | 16.3        |
| <b>IM3:</b> Our business system use saves time for individual tasks/duties.            | 0.66     | -0.33    | 4.04        | 0.93        | 2.3        | 6.1        | 9.1         | 50.8        | 31.7        |
| <b>Total</b>                                                                           |          |          | <b>3.7</b>  | <b>0.91</b> | <b>3.9</b> | <b>7.7</b> | <b>24.0</b> | <b>44.5</b> | <b>21.8</b> |
| <b>Factor (organisational impact)</b>                                                  |          |          |             |             |            |            |             |             |             |
| <b>OI1:</b> Our business system reduces organisational costs.                          | 0.87     | -0.76    | 3.72        | 1.04        | 2.1        | 7.6        | 36.9        | 23.0        | 30.4        |
| <b>OI2:</b> Our business system improves overall productivity.                         | 0.76     | -0.62    | 3.57        | 0.92        | 2.1        | 7.2        | 38.8        | 35.2        | 16.7        |
| <b>OI3:</b> Our business system allows for better use of organisational data resource. | 1.1      | 1.27     | 3.74        | 0.80        | 1.3        | 4.0        | 28.3        | 52.3        | 14.1        |
| <b>Total</b>                                                                           |          |          | <b>3.67</b> | <b>0.92</b> | <b>1.8</b> | <b>6.2</b> | <b>34.6</b> | <b>36.8</b> | <b>20.5</b> |

### 5.3 Reliability Assessment

Reliability measures the degree of correlation between items within an individual construct (Straub et al. 2004). While reliability is calculated in a number of ways, the most commonly accepted measure in field studies is internal consistency reliability using Cronbach's alpha (Cronbach 1971; Hinkin 1998). Internal consistency refers to the degree to which responses are consistent across the items (variables) within a single measurement scale (Kline, 2005). The generally agreed upon lower limit for Cronbach's alpha is 0.7 but it may be lowered to 0.6 in exploratory research (Straub 1989; Hair, Anderson et al. 1995; Carver 2005). While a Cronbach's  $\alpha$  of lower than 0.60 may indicate poor construct definition or a multidimensional construct, a very high Cronbach's  $\alpha$  of above 0.95 may suggest the presence of common methods bias (Straub, Boudreau et al. 2004). Cronbach's  $\alpha$  was calculated using SPSS 20 and a  $0.7 < \alpha < 0.95$

threshold was adopted.

The results show that all Cronbach's alpha scores were above the acceptable level. According to Pallant (2007), a value of the corrected item-total correlation of less than 0.30 indicates that the variable is measuring something different from the construct as a whole. Resulted correlation scores were above the 0.40 thresholds. This indicates that the questionnaire used in this research is reliable and valid.

Tables 5.12 to 5.15 presents the summaries of the initial reliability test.

**Table 5.12: Organisational culture reliability assessment**

| <b>Organisational culture</b>                                                                                 | <b>Cronbach's alpha (<math>\alpha</math>)</b> | <b>Item total correlation</b> | <b>Cronbach's alpha if item deleted</b> |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------|-----------------------------------------|
| <b>Development Culture</b>                                                                                    |                                               |                               |                                         |
| <b>DC1:</b> Our firm emphasises collaboration for business success.                                           | 0.814                                         | 0.612**                       | 0.816                                   |
| <b>DC2:</b> Our firm emphasises growth and acquiring new resources for business systems.                      | 0.804                                         | 0.501**                       | 0.824                                   |
| <b>DC3:</b> Our firm encourages creativity and/or the development of new ideas.                               | 0.812                                         | 0.553**                       | 0.820                                   |
| <b>Group culture</b>                                                                                          |                                               |                               |                                         |
| <b>GC1:</b> Our firm emphasises group work.                                                                   | 0.847                                         | 0.552**                       | 0.816                                   |
| <b>GC2:</b> In my firm, people spend time building trust in each other.                                       | 0.810                                         | 0.605**                       | 0.817                                   |
| <b>GC3:</b> In my firm, teams revise their thinking as a result of group discussion or information collected. | 0.830                                         | 0.602**                       | 0.820                                   |
| <b>Hierarchal culture</b>                                                                                     |                                               |                               |                                         |
| <b>HC1:</b> Our firm is a very organised place.                                                               | 0.817                                         | 0.567**                       | 0.822                                   |
| <b>HC2:</b> Our firm emphasises stability.                                                                    | 0.810                                         | 0.550**                       | 0.820                                   |
| <b>HC3:</b> Our firm emphasises rules and regulations.                                                        | 0.870                                         | 0.565**                       | 0.819                                   |
| <b>Rational culture</b>                                                                                       |                                               |                               |                                         |
| <b>RC1:</b> Our firm emphasises tasks and goal accomplishment.                                                | 0.817                                         | 0.598**                       | 0.817                                   |
| <b>RC2:</b> Our firm emphasises competitive actions and achievement.                                          | 0.810                                         | 0.615**                       | 0.819                                   |
| <b>RC3:</b> Our firm is a very efficacy-oriented place.                                                       | 0.822                                         | 0.581**                       | 0.817                                   |
| <b>Total</b>                                                                                                  | <b>0.821</b>                                  |                               |                                         |

**Table 5.13: Knowledge-sharing reliability assessment**

| <b>Factor (knowledge-sharing)</b>                                                                     | <b>Cronbach's alpha (<math>\alpha</math>)</b> | <b>Item total correlation</b> | <b>Cronbach's alpha if item deleted</b> |
|-------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------|-----------------------------------------|
| <b>KS1:</b> I am pleased to share (communicate) my work reports on business systems use.              | 0.82                                          | 0.710**                       | 0.803                                   |
| <b>KS2:</b> I would be pleased to communicate business-related official documents with other members. | 0.85                                          | 0.679**                       | 0.806                                   |
| <b>KS3:</b> I would like to provide my expertise on business system use.                              | 0.87                                          | 0.665**                       | 0.807                                   |
| <b>KS4:</b> Collaboration is a key to knowledge-sharing on business system use.                       | 0.89                                          | 0.592**                       | 0.813                                   |
| <b>KS5:</b> Teams must share knowledge in order to make decisions for business system use.            | 0.88                                          | 0.646**                       | 0.812                                   |
| <b>Total</b>                                                                                          | <b>0.86</b>                                   |                               |                                         |

**Table 5.14: Business system success reliability assessment**

| <b>Factor (business system success)</b>                                                                                                 | <b>Cronbach's alpha (<math>\alpha</math>)</b> | <b>Item total correlation</b> | <b>Cronbach's alpha if item deleted</b> |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------|-----------------------------------------|
| <b>BSS1:</b> Our firm establishes good relationships with the user community for business systems success.                              | 0.82                                          | 0.779**                       | 0.836                                   |
| <b>BSS2:</b> Our business system satisfies end-user requirements.                                                                       | 0.85                                          | 0.711**                       | 0.843                                   |
| <b>BSS3:</b> Our firm establishes and maintains a good image and reputation with end-users.                                             | 0.86                                          | 0.699**                       | 0.847                                   |
| <b>BSS4:</b> Our business system enables the organisation to respond more quickly to change.                                            | 0.83                                          | 0.730**                       | 0.835                                   |
| <b>BSS5:</b> Our firm ensures that business system projects provide business.                                                           | 0.81                                          | 0.793**                       | 0.833                                   |
| <b>BSS6:</b> The results of business systems are achieved through focus on the process of gathering knowledge from business system use. | 0.82                                          | 0.779**                       | 0.813                                   |
| <b>Total</b>                                                                                                                            | <b>0.86</b>                                   |                               |                                         |

**Table 5.15: Individual and organisational impact reliability assessment**

| <b>Factor (individual impact)</b>                                                       | <b>Cronbach's alpha (<math>\alpha</math>)</b> | <b>Item total correlation</b> | <b>Cronbach's alpha if item deleted</b> |
|-----------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------|-----------------------------------------|
| <b>IM1:</b> Our business system use enhances individual creativity.                     | 0.82                                          | 0.775**                       | 0.714                                   |
| <b>IM2:</b> Our business system use enhances higher quality decision-making.            | 0.85                                          | 0.653**                       | 0.765                                   |
| <b>IM3:</b> Our business system use saves time for individual tasks/duties.             | 0.86                                          | 0.672**                       | 0.745                                   |
| <b>Total</b>                                                                            | <b>0.84</b>                                   |                               |                                         |
| <b>Factor (organisational impact)</b>                                                   |                                               |                               |                                         |
| <b>OI1:</b> Our business system reduces organisational costs.                           | 0.83                                          | 0.674**                       | 0.805                                   |
| <b>OI2:</b> Our business system improves overall productivity.                          | 0.81                                          | 0.622**                       | 0.813                                   |
| <b>OI3:</b> Our business system allows for better use of organisational data resources. | 0.82                                          | 0.635**                       | 0.811                                   |
| <b>Total</b>                                                                            | <b>0.82</b>                                   |                               |                                         |

## 5.4 Chapter Summary

This chapter presented a descriptive data analysis of survey respondents. Descriptive data analysis was carried out to offer a comprehensive insight into the characteristics of the data collected through the questionnaire survey. Firstly, examining the profiles of the 330 respondents revealed that the opinions given by these respondents provided reliable and unbiased information according to their personal qualifications, the characteristics of the organisation by which they were employed and the types of business systems in which they were involved. The data set was screened and found to have an acceptable normal distribution. A further assessment for the standard deviation and the mean indicated that a mean value could be used as a representative score for each variable and that the sample used in the study sufficiently represented the population. Interpretations of the factors values provided preliminary findings, thus considered suitable as an input for the subsequent measurement scale analysis, which is presented in the following chapter.

## **CHAPTER 6: MEASUREMENT SCALE ANALYSIS**

As discussed in Chapter 4, this study used a two-step estimation approach for the data analysis. In the first step, the measurement model is analysed through an exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). As suggested by Anderson and Gerbing (1988), the two-step SEM approach involves first examining a measurement model in order to ensure that the quality of the research model is established before assessing the structural model. The second step evaluates a structural model (path analysis) relationship using partial least squares (Chin 1998).

### **6.1 Exploratory Factor Analysis**

This step refines the measurement model using exploratory factor analysis (EFA) (Straub 1989). After the scale reliability (Chapter 5), the exploratory factor analysis (EFA) is helpful as a primary analysis of the underlying hypotheses (Gerbing and Anderson, 1988). EFA can be used for data reduction by taking a large set of variables and reducing them to a smaller, more manageable number while retaining as much of the original variance as possible (Conway and Huffcutt, 2003). The EFA procedures described here were computed using SPSS 22. Determining the suitability of the data for factor analysis can be achieved by analysing the sample size in relation to a number of variables, examining the inter-correlations of the entire correlation matrix using Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Field 2009).

The sample size of 330 participants is considered adequate as it falls within recommended guidelines for EFA (Tabachnick and Fidell 2007). The KMO measure of sampling adequacy and Bartlett's test minimum acceptable level is 0.60 (Pallant 2007;

Field 2009) and should be below of 0.05 significance level to indicate sufficient correlations among items. As shown on Table 6.1, the KMO measure for this sample is acceptable and the significance level of the Bartlett's test (0.00) indicates that the overall inter-correlations assumptions are met.

**Table 6.1: Kaiser-Meyer-Olkin and Bartlett's test of sphericity**

| Construct                             | KMO*  | Bartlett's test of sphericity |     |      |
|---------------------------------------|-------|-------------------------------|-----|------|
|                                       |       | Approx chi-square             | df  | Sig  |
| All scale                             | 0.725 | 1947.082                      | 435 | .000 |
| HC +GC+ KS                            | 0.695 | 579.596                       | 66  | .000 |
| DC + RC + KSS                         | 0.673 | 720.849                       | 66  | .000 |
| Org_impact +<br>)Ind_impact<br>KS+BSS | 0.652 | 164.122                       | 15  | .000 |

\*Kaiser-Meyer-Olkin measure of sampling adequacy

In addition, the method of rotation needs to be selected. The goal of rotation is to simplify and clarify the data structure (Carver, 2005). There are two categories of rotation: oblique methods and orthogonal rotations. Oblique methods allow the factors to correlate while orthogonal rotations (also called Varimax rotation) produce factors that are uncorrelated (Field, 2009).

Orthogonal rotation is by far the most common method of rotation described in the literature, since it produces a clear and simple structure in a single matrix, which is easy to interpret (Costello and Osborne 2005). However, using orthogonal rotation may result in a loss of valuable information if the factors are correlated. In that case, oblique rotations such as direct oblimin, quartimin, and promax should theoretically render a more accurate solution (Conway and Huffcutt, 2003). However, oblique rotation output is more complex than orthogonal rotation output (Field, 2009). Direct oblimin is the most popular oblique rotation and the results are displayed in two matrices (pattern and structure).

Field (2009) suggests that orthogonal and oblique rotations should be conducted jointly in order to evaluate which produces the clearer and simpler factor structure. In the current study, Field's (2009) suggestion to carry out both orthogonal varimax rotation and oblique direct oblimin rotation is adopted.

| <b>Table 6.2: Summary of parameters used during EFA</b> |                        |                         |                                |
|---------------------------------------------------------|------------------------|-------------------------|--------------------------------|
|                                                         | <b>Number of items</b> | <b>Factors retained</b> | <b>Output</b>                  |
| Orthogonal                                              | 50 items               | Eigenvalue > 1          | Rotated component matrix       |
| Oblimin direct                                          | 50 items               | Eigenvalue > 1          | Pattern and structure matrices |

Finally, factor extraction is conducted using principal component analysis (PCA). As suggested by Hair et al. (2006), PCA is achieved by latent root (eigenvalue) criterion, which implies that variables with an eigenvalue of greater than 1 are significant and that those with an eigenvalue of less than 1 should be omitted. The percentage of variance criterion also ensures that the specific amount of variance is explained. 60% or less of the total variance in information systems research is suitable for further analysis.

As shown in Table 6.3, the total variance cumulative percentage of all the factors ranged from 67% to 75%. The results are consistent with the research in information systems (Hair et al., 2006).

**Table 6.3:** Total variance explained and reliability of the factors

| <b>Factors</b>                               | <b>Total variance explained (%)</b> | <b>Cronbach's alpha</b> |
|----------------------------------------------|-------------------------------------|-------------------------|
| <b>Organisational culture (four factors)</b> | 64.29                               | <b>0.821</b>            |
| <b>Knowledge-sharing</b>                     | 75.64                               | <b>0.867</b>            |
| <b>Business system success</b>               | 71.70                               | <b>0.864</b>            |
| <b>Organisational impact</b>                 | 67.72                               | <b>0.823</b>            |
| <b>Individual impact</b>                     | 69.43                               | <b>0.841</b>            |

Table 6.4 shows the cross loadings in a matrix of items of all the factors in the current study (organisational culture, knowledge-sharing, business system success, individual and organisational impact).

| <b>Table 6.4: Cross loadings</b> |              |              |              |              |              |              |              |              |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                                  | <b>DC</b>    | <b>GC</b>    | <b>HC</b>    | <b>RC</b>    | <b>KS</b>    | <b>KS</b>    | <b>IM</b>    | <b>OI</b>    |
| <b>DC1</b>                       | <b>0.919</b> | 0.048        |              | 0.016        | 0.061        | 0.110        | 0.004        | 0.040        |
| <b>DC 2</b>                      | <b>0.940</b> | 0.065        | 0.228        | 0.038        | 0.091        | 0.115        | 0.000        | 0.104        |
| <b>DC 3</b>                      | <b>0.873</b> | 0.058        | 0.238        | 0.072        | 0.102        | 0.105        | -0.030       | 0.055        |
| <b>GC 1</b>                      | 0.877        | <b>0.732</b> | 0.216        | 0.129        | 0.177        | 0.108        | 0.059        | 0.113        |
| <b>GC 2</b>                      | 0.839        | <b>0.780</b> | 0.264        | 0.096        | 0.132        | 0.083        | 0.052        | 0.078        |
| <b>GC 3</b>                      | 0.771        | <b>0.959</b> | 0.374        | 0.825        | 0.723        | 0.091        | 0.514        | 0.316        |
| <b>HC1</b>                       | 0.794        | 0.884        | <b>0.845</b> | 0.762        | 0.712        | 0.115        | 0.537        | 0.349        |
| <b>HC2</b>                       | 0.882        | 0.904        | <b>0.880</b> | 0.701        | 0.712        | 0.133        | 0.551        | 0.315        |
| <b>HC3</b>                       | 0.824        | 0.906        | <b>0.873</b> | 0.629        | 0.712        | 0.133        | 0.538        | 0.329        |
| <b>RC1</b>                       | 0.770        | 0.873        | 0.040        | <b>0.977</b> | 0.768        | 0.169        | 0.535        | 0.301        |
| <b>RC2</b>                       | 0.785        | 0.843        | 0.104        | <b>0.869</b> | 0.675        | 0.109        | 0.476        | 0.285        |
| <b>RC3</b>                       | 0.785        | 0.756        | 0.055        | <b>0.843</b> | 0.697        | 0.097        | 0.529        | 0.305        |
| <b>KS1</b>                       | 0.108        | 0.758        | 0.113        | 0.970        | <b>0.872</b> | 0.136        | 0.545        | 0.316        |
| <b>KS2</b>                       | 0.083        | 0.779        | 0.078        | 0.960        | <b>0.867</b> | 0.154        | 0.543        | 0.297        |
| <b>KS3</b>                       | 0.091        | 0.777        | 0.316        | 0.948        | <b>0.874</b> | 0.621        | 0.532        | 0.288        |
| <b>KS4</b>                       | 0.115        | 0.751        | 0.349        | 0.957        | <b>0.910</b> | 0.392        | 0.497        | 0.298        |
| <b>KS5</b>                       | 0.133        | 0.703        | 0.315        | 0.670        | <b>0.773</b> | 0.370        | 0.393        | 0.316        |
| <b>BSS1</b>                      | 0.133        | 0.739        | 0.329        | 0.628        | 0.887        | <b>0.739</b> | 0.419        | 0.274        |
| <b>BSS2</b>                      | 0.169        | 0.694        | 0.301        | 0.637        | 0.883        | <b>0.717</b> | 0.332        | 0.270        |
| <b>BSS3</b>                      | 0.109        | 0.656        | 0.285        | 0.511        | 0.755        | <b>0.722</b> | 0.345        | 0.229        |
| <b>BSS4</b>                      | 0.097        | 0.653        | 0.305        | 0.633        | 0.816        | <b>0.544</b> | 0.385        | 0.290        |
| <b>BSS5</b>                      | 0.136        | 0.728        | 0.316        | 0.628        | 0.841        | <b>0.707</b> | 0.380        | 0.280        |
| <b>BSS6</b>                      | 0.154        | 0.696        | 0.052        | 0.553        | 0.845        | <b>0.711</b> | 0.341        | 0.227        |
| <b>IM1</b>                       | 0.134        | 0.738        | 0.514        | 0.699        | 0.921        | 0.471        | <b>0.727</b> | 0.271        |
| <b>IM2</b>                       | 0.007        | 0.540        | 0.537        | 0.517        | 0.392        | 0.378        | <b>0.725</b> | 0.398        |
| <b>IM3</b>                       | 0.054        | 0.504        | 0.551        | 0.469        | 0.370        | 0.370        | <b>0.826</b> | 0.380        |
| <b>OI1</b>                       | 0.033        | 0.559        | 0.538        | 0.530        | 0.405        | 0.282        | 0.909        | <b>0.720</b> |
| <b>OI2</b>                       | 0.013        | 0.518        | 0.535        | 0.453        | 0.373        | 0.358        | 0.885        | <b>0.810</b> |
| <b>OI3</b>                       | 0.044        | 0.556        | 0.052        | 0.486        | 0.403        | 0.404        | 0.914        | <b>0.711</b> |

## **6.2 Measurement Model**

The measurement model includes conducting confirmatory factor analysis and model fit to confirm that the indicator variables load onto their corresponding latent variables using the collected data (Kline, 2011).

### **6.2.1 Confirmatory Factor Analysis**

As discussed in the methodology chapter (Chapter 4), convergent and discriminant validity along with the reliability coefficients are important parts of the confirmatory factor analysis (CFA). To demonstrate the reliability of the latent variables, the loadings of individual measures for each variable exceeded 0.7 values and were significant at  $p$  value  $< 0.05$ . Cronbach's alpha (CA) and the composite reliability (CR) coefficients exceeded an acceptable measure of 0.7. Although the instrument used in this research was validated in a prior study (Zhou, 2012), it was expedient to conduct a CFA to establish its reliability and validity in the context of this study. To demonstrate the reliability of the instrument, CA as well as CR coefficients were accessed. The CA coefficients for individual subscales are addressed in Chapter 6 from Table 6.12 to 6.13. The loadings of all latent constructs are well above the acceptable level of 0.7.

The CR coefficient, which is similar to the CA coefficient, is also used for assessing the internal consistency of a measure. In order to demonstrate internal consistency, the CR should be 0.7 or greater (Gefen et al., 2000). The aim of discriminant validity examines whether a variable is different from all other variables considering the convergent and discriminant validity assessed validity. Convergent and discriminant validity along with the reliability coefficients are important parts of the CFA. Convergent validity is assessed using average variance extracted (AVE) and the CR. Convergent validity is established if the CR value is more than the AVE and all the AVE are greater than 0.50

(Hair et al., 2006). The following sections show all the CR are greater than their corresponding AVE and all the AVE meet the required minimum of 0.50, thereby establishing convergent validity.

Discriminant validity assesses whether a construct is different from all other constructs by establishing that the square root of individual AVE is more than any correlation between the latent variables (Zait & Berteau, 2011). In this research, the square root of the AVE for each individual constructs is greater than the correlations with all other constructs. This demonstrates the discriminant validity of all of the constructs in the study.

The following section shows that the reliability and validity assessment of all constructs are above the threshold values.

### **Organisational Culture**

As discussed in the above section, Tables 6.5 and 6.6 presented the reliability and validity of all four factors of organisation culture (development, group, hierarchy and rational culture), all items loadings and average variance extracted (AVE), composite reliability (CR) and correlation among factors. The number of items for all four latent variables is three. The results show that all latent variable items are above the suggested threshold of 0.70 and significant at  $p < 0.001$  for the sample.

**Table 6.5: Factor loading of organisational culture**

| Item <- Factor             | Original sample (O) | Standard error (STERR) | T-statistics ( O/STERR ) | P values |
|----------------------------|---------------------|------------------------|--------------------------|----------|
| DC1 <- Development Culture | 0.919               | 0.015                  | 59.671                   | 0.000    |
| DC2 <- Development Culture | 0.940               | 0.011                  | 86.519                   | 0.000    |
| DC3 <- Development Culture | 0.873               | 0.023                  | 38.760                   | 0.000    |
| GC1 <- Group Culture       | 0.732               | 0.190                  | 3.853                    | 0.000    |
| GC2 <- Group Culture       | 0.780               | 0.271                  | 2.884                    | 0.004    |
| GC3 <- Group Culture       | 0.959               | 0.191                  | 5.016                    | 0.000    |
| HC1 <- Hierarchy Culture   | 0.845               | 0.044                  | 19.243                   | 0.000    |
| HC2 <- Hierarchy Culture   | 0.880               | 0.074                  | 11.900                   | 0.000    |
| HC3 <- Hierarchy Culture   | 0.873               | 0.071                  | 12.220                   | 0.000    |
| RC1 <- Rational Culture    | 0.977               | 0.006                  | 158.649                  | 0.000    |
| RC2 <- Rational Culture    | 0.869               | 0.191                  | 5.016                    | 0.000    |
| RC3 <- Rational Culture    | 0.843               | 0.044                  | 19.243                   | 0.000    |

**Table 6.6: Reliability and discriminant validity of organisational culture**

| Factors                         | AVE   | CR    | DC           | GC           | HC           | RC           |
|---------------------------------|-------|-------|--------------|--------------|--------------|--------------|
| <b>Development culture (DC)</b> | 0.814 | 0.716 | <b>0.902</b> |              |              |              |
| <b>Group culture (GC)</b>       | 0.793 | 0.851 | 0.839        | <b>0.890</b> |              |              |
| <b>Hierarchy culture (HC)</b>   | 0.802 | 0.810 | 0.771        | 0.650        | <b>0.895</b> |              |
| <b>Rational culture (RC)</b>    | 0.816 | 0.866 | 0.763        | 0.580        | 0.630        | <b>0.903</b> |
|                                 |       |       |              |              |              |              |

### Knowledge-sharing

Table 6.7 and Table 6.9 show the reliability and validity of the knowledge-sharing construct, all items loadings and average variance extracted (AVE), composite reliability (CR) and correlation among factors are well the above threshold value. The number of items for the knowledge-sharing latent variables is five. The results show that all latent variable items are above the suggested threshold of 0.70 and significant at  $p < 0.001$ .

**Table 6.7: Factor loading of knowledge-sharing**

| Item <- Factor           | Original sample (O) | Standard error (STERR) | T-statistics ( O/STERR ) | P values |
|--------------------------|---------------------|------------------------|--------------------------|----------|
| KS1 <- Knowledge Sharing | 0.872               | 0.074                  | 11.900                   | 0.000    |
| KS2 <- Knowledge Sharing | 0.867               | 0.071                  | 12.220                   | 0.000    |
| KS3 <- Knowledge Sharing | 0.874               | 0.183                  | 4.960                    | 0.000    |
| KS4 <- Knowledge Sharing | 0.910               | 0.171                  | 5.530                    | 0.000    |
| KS5 <- Knowledge Sharing | 0.773               | 0.121                  | 5.570                    | 0.000    |

### Businesses System Success

Tables 6.8 and Table 6.9 show the reliability and validity of the business system success factor, including the individual and organisation impact constructs. The number of items for the business system success latent factor is six, with three for the individual and organisational impact factors. The results show that all latent factors items' loadings, AVE, and CR are above the suggested threshold of 0.70 and significant at  $p < 0.001$ .

**Table 6.8: Factor loading of business system success and individual and organisation Impact**

| Item <- Factor                  | Original sample (O) | Standard error (STERR) | T-statistics | P values |
|---------------------------------|---------------------|------------------------|--------------|----------|
| BBS1 <- Business System Success | 0.739               | 0.118                  | 6.074        | 0.000    |
| BBS2 <- Business System Success | 0.717               | 0.176                  | 3.920        | 0.000    |
| BBS3 <- Business System Success | 0.722               | 0.118                  | 6.130        | 0.000    |
| BBS4 <- Business System Success | 0.544               | 0.133                  | 4.098        | 0.000    |
| BBS5 <- Business System Success | 0.707               | 0.122                  | 5.809        | 0.000    |
| BBS6 <- Business System Success | 0.711               | 0.122                  | 5.826        | 0.000    |
| IM1 <- Individual Impact        | 0.727               | 0.179                  | 5.739        | 0.000    |
| IM2 <- Individual Impact        | 0.725               | 0.120                  | 6.069        | 0.000    |
| IM3 <- Individual Impact        | 0.826               | 0.191                  | 5.382        | 0.000    |
| OM1 <- Organisation Impact      | 0.720               | 0.117                  | 6.191        | 0.000    |
| OM2 <- Organisation Impact      | 0.810               | 0.165                  | 6.172        | 0.000    |
| OM3 <- Organisation Impact      | 0.711               | 0.122                  | 5.826        | 0.000    |

**Table 6.9: Reliability and discriminant validity of KS, BSS, IM and OM**

| Factors                                | AVE   | CR    | KS           | BSS          | IM           | OM           |
|----------------------------------------|-------|-------|--------------|--------------|--------------|--------------|
| Knowledge-sharing ( <b>KS</b> )        | 0.803 | 0.703 | <b>0.896</b> |              |              |              |
| Business system success ( <b>BSS</b> ) | 0.773 | 0.761 | 0.957        | <b>0.879</b> |              |              |
| Individual impact ( <b>IM</b> )        | 0.812 | 0.790 | 0.670        | 0.551        | <b>0.901</b> |              |
| Organisation impact ( <b>OM</b> )      | 0.796 | 0.776 | 0.628        | 0.583        | 0.660        | <b>0.892</b> |

### 6.2.2 Model Fit

The model fit should be established before investigating the structural model (Parent et al. 2005). The model fit indices report how well a factor represents the data, such as the goodness of fit index (GFI), adjusted for degrees of freedom (AGFI), comparative fit index (CFI), normed fit index (NFI) and the root mean square error of approximation (RMSEA) (Hair et al. 2006; Kline, 2011).

An acceptable value for GFI is over 0.90 and the GFI adjusted for AGFI value should be over 0.90 (Hair et al. 1995; Chin 1998). The recommended value for the CFI is above 0.80 (Byrne 1994; Hair et al. 1995). The NFI provides an acceptable fit with a value of 0.90 (Hooper et al. 2008). The RMSEA's suggested value range is from 0.08 to 0.10, which indicates a good fit (Hooper et al. 2008). A summary is provided in Table 6.10.

**Table 6.10: Model fit**

| Measure                                 | Value | Supported? |
|-----------------------------------------|-------|------------|
| Goodness of fit index                   | 0.910 | Acceptable |
| Adjusted goodness of fit                | 0.936 | Acceptable |
| Comparative fit index                   | 0.897 | Acceptable |
| Normed fit index                        | 0.920 | Acceptable |
| Root mean square error of approximation | 0.127 | Acceptable |

### **6.3 Structural Model Testing**

Following the acceptable measurement model testing discussed in the above sections, structural model testing was done to test the hypotheses proposed in the current study. The following sections explain the structural model for latent constructs to answer the research questions and address the hypotheses. Tables 6.11 and 6.12 show the path coefficient mean, standard deviation, t-statistics and p-value for each of the proposed hypotheses. The recommended values are  $t > 1.96$  at  $p < 0.05$ ,  $t > 2.576$  at  $p < 0.01$ ,  $t > 3.29$  at  $p < 0.001$  for two-tailed tests.

#### **6.3.1 Organisational Culture**

The first research question was “How does organisational cultural (group culture, hierarchical culture, development culture and rational culture) impact knowledge-sharing and business system success in Saudi Arabian enterprises?” This question is answered by the following hypotheses.

Hypothesis 1 (H1) proposes that the development culture has a significant positive impact on business systems success in Saudi Arabian enterprises. Figure 6.1 shows the assessment of path coefficients. The path testing results show that the relationship between development culture and business systems success is significant ( $t$  value 1.98,  $p < 0.05$  and path coefficient of 0.24). Therefore, hypothesis H1 is supported.

Hypothesis 2 (H2) proposes that the group culture has a significant positive impact on knowledge-sharing in Saudi Arabian enterprises. Figure 6.1 shows the effect of group culture on knowledge-sharing is stronger with path coefficients of 0.43. Table 6.11 shows the relationship between group culture and knowledge-sharing is significant ( $t$  value 4.79,  $p < 0.001$ ). Therefore, hypothesis H2 is supported.

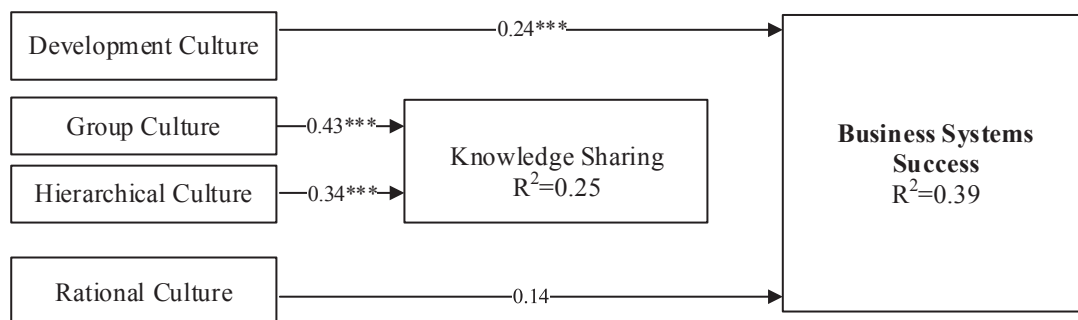
Hypothesis 3 (H3) proposes that the hierarchy culture has a significant positive impact

on knowledge-sharing in Saudi Arabian enterprises. Figure 6.1 shows the effect of hierarchy culture on knowledge-sharing is strong, with path coefficients of 0.36. Table 6.11 shows the relationship between hierarchy culture and knowledge-sharing is significant (t value 3.61,  $p < 0.001$ ). Therefore, hypothesis H3 is supported.

Hypothesis 4 (H4) proposes that the rational culture has a significant positive impact on business systems success in Saudi enterprises. Figure 6.1 shows the effect of rational culture on business systems success is not strong, with path coefficients of 0.14. Table 6.11 shows the relationship between rational culture and business systems success is insignificant (t value 1.20,  $p > 0.05$ ). Therefore, hypothesis H4 is not supported.

**Table 6.11:** Organisational culture hypothesis testing

|                                                                                                                                                                                                                                                           | Path      | Path mean | StDev | T-statistics | P values  | Supported? |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-------|--------------|-----------|------------|
| <b>H1</b>                                                                                                                                                                                                                                                 | DC -> BSS | 0.25      | 0.03  | 1.98         | 0.003*    | Yes        |
| <b>H2</b>                                                                                                                                                                                                                                                 | GC -> KS  | 0.43      | 0.05  | 4.79         | 0.000**** | Yes        |
| <b>H3</b>                                                                                                                                                                                                                                                 | HC -> KS  | 0.34      | 0.03  | 3.61         | 0.000***  | Yes        |
| <b>H4</b>                                                                                                                                                                                                                                                 | RC -> BSS | 0.145     | 0.03  | 1.20         | 0.336     | No         |
| Notes:<br>• StDev: Standard deviation; DC: Development culture; GC: Group culture; HC: Hierarchy culture; KS: Knowledge-sharing; BSS: Business system success<br>• *Significant at 0.05 level ** Significant at 0.01 level *** Significant at 0.001 level |           |           |       |              |           |            |



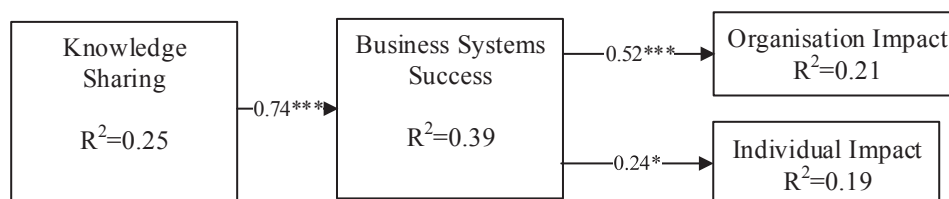
**Figure 6.1:** Organisational culture path testing

### 6.3.2 Knowledge-sharing

Research question two asked “How does knowledge-sharing impact the business system success in Saudi Arabian enterprises?” This question is answered in the following hypothesis, Hypothesis 5 (H5), which proposes that knowledge-sharing has a significant positive impact on business systems success in Saudi Arabian enterprises. Figure 6.2 shows the effect of knowledge-sharing on business system success is strong, with path coefficients of 0.75. Table 6.12 shows the relationship between knowledge-sharing and business system success is significant (t value 5.90,  $p < 0.05$ ). Therefore, hypothesis H5 is supported. The variance in knowledge-sharing is 25%.

**Table 6.12: Knowledge-sharing and business system success hypothesis testing**

|                                                                                                                                                                                                                                          | Path      | Path mean | StDev | T statistics | P values | Supported? |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-------|--------------|----------|------------|
| <b>H5</b>                                                                                                                                                                                                                                | KS-> BSS  | 0.75      | 0.04  | 5.90         | 0.000*** | Yes        |
| <b>H6</b>                                                                                                                                                                                                                                | BSS -> OM | 0.52      | 0.07  | 2.50         | 0.000*** | Yes        |
| <b>H7</b>                                                                                                                                                                                                                                | BSS -> IM | 0.24      | 0.03  | 1.99         | 0.002*   | Yes        |
| Notes:<br>• StDev: Standard deviation; KS: Knowledge-sharing; BSS: Business system success; OM: Organisation impact, IM: Individual impact<br>• *Significant at 0.05 level **, Significant at 0.01 level, *** Significant at 0.001 level |           |           |       |              |          |            |



**Figure 6.2: Knowledge-sharing path testing**

### 6.3.3 Businesses System Success

Research question three asked “How does business system success influence organisation and individual impact in Saudi Arabian enterprises?” This question is answered in the following hypotheses.

Hypothesis 6 (H6) proposes that business systems success increases organisational impact in Saudi enterprises. Figure 6.2 show the effect of business system success on organisational impact in Saudi context is strong, with path coefficients of 0.52. Table 6.12 shows the relationship between business system success and organisational impact is significant (t value 2.50,  $p < 0.001$ ). Therefore, hypothesis H6 is supported.

Hypothesis 7 (H7) proposes that business systems success increases individual impact in Saudi enterprises. Figure 6.2 show the effect of business system success on individual impact in the Saudi context is strong, with path coefficients of 0.24. Table 6.12 shows the relationship between business system success and individual impact is significant (t value 1.99,  $p < 0.05$ ). Therefore, hypothesis H6 is supported. In addition, variance in business system success is  $R^2 = 0.39$ , organisational impact ( $R^2 = 0.21$ ) is and individual impact ( $R^2 = 0.19$ ).

#### **6.3.4 Model Summary**

According to the path testing as shown in Figure 6.3, the order of significance among the organisational culture factors that have a significant effect on business system success is group culture, followed by hierarchy culture, development culture and rational culture. This means group culture is the most important factor associated with knowledge-sharing in business system success in the Saudi context. It can be interpreted to mean that staff share information and insights throughout the organisation and have considerable influence over decision-making. The organisation promotes a trust-oriented group culture that focuses on belonging and participation. The reason behind the significance of group culture is that sharing more accurate data and timely information with others is one of the biggest advantages of business systems success, so users may think that they should use business systems because of their work group. Bock et al. (2005) suggests that when they are in a trust-oriented culture, staff are more willing to share knowledge with their co-workers, therefore to form a shared belief that places emphasis on knowledge attainment and application within the organisation.

Another noteworthy finding is that hierarchy culture has a significant impact on knowledge-sharing. This indicates that the hierarchical culture focuses on internal organisation and stability to emphasise efficiency and coordination. The reason hierarchy culture is significant is that sharing knowledge with others is one of the biggest advantages of business systems success, so when in an organisation with a strong hierarchy culture, users may think that internal efficiency, coordination, rules, control and regulations are core organisation values (McDermott & Stock, 1999).

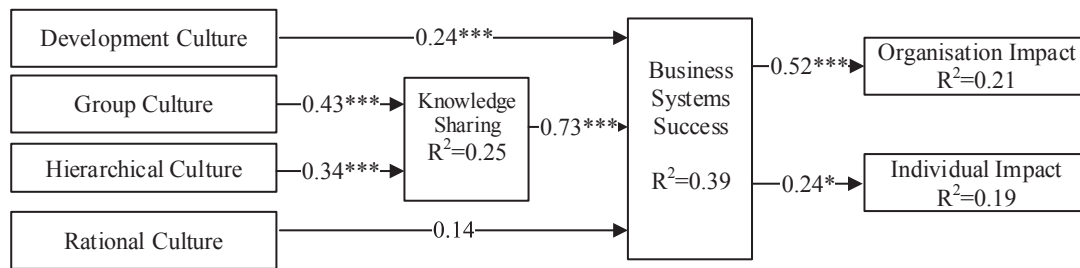
The results show that development culture has a marginal impact on business system success. This indicates that in order to enable a development culture, which emphasises creativity, adaptation and innovativeness to the external environment, the employees

should think innovatively about how the business systems accomplish their business performance (Shao et al., 2012).

It was hypothesised that rational culture has a significant positive impact on business system success in Saudi Arabian enterprises. However, its impact is not significant, even though it has a strong correlation with other factors. Rational culture is the development of new knowledge and has the potential to change individual and organisational behavior (Škerlavaj et al., 2010). Hence, this finding indicates that if the objectives and productivity of the firm are not achieved through business systems, then the users should use the system to increase the productivity.

Another interesting finding is that knowledge-sharing has a positive influence on business system success. This indicates that active knowledge-sharing can enhance a business system success in order to improve business performance and achieving organisational competitive success. Knowledge-sharing is vital for employees to integrate knowledge and to develop a deeper understanding of business system functionalities and capabilities (Wang et al., 2007). The whole empirical model predicted 25% of the variance in knowledge-sharing, 39% in business system success, 19% s individual impact and 21% is organisational impact.

Finally, it was anticipated that the success indicators of business system would have a positive impact on the final dependent variables organisational impact and individual impact. The results indicate that the use of business systems can increase the benefits of organisational and individual impact. With these results, it can be concluded that organisational culture is more likely to facilitate knowledge-sharing towards the success of business system within the organisation (Jones, 2005).



**Figure 6.3: Conceptual model path testing**

**Table 6.13:** Summary of hypotheses results.

| No. | Hypotheses                                                                                                    | Outcome       |
|-----|---------------------------------------------------------------------------------------------------------------|---------------|
| H1  | Development culture has a significant positive impact on business system success in Saudi Arabian enterprises | Supported     |
| H2  | Group culture has a significant positive impact on knowledge-sharing in Saudi Arabian enterprises             | Supported     |
| H3  | Hierarchy culture has a significant positive impact on knowledge-sharing in Saudi Arabian enterprises         | Supported     |
| H4  | Rational culture has a significant positive impact on business system success in Saudi Arabian enterprises    | Not Supported |
| H5  | Knowledge sharing has a significant positive impact on business system success in Saudi Arabian enterprises   | Supported     |
| H6  | Business system success increases organisation impact of Saudi Arabian enterprises                            | Supported     |
| H7  | Business system success increases individual impact in Saudi Arabian enterprises                              | Supported     |

## 6.4 Chapter Summary

This chapter presented the quantitative results of this study. PLS-SEM was conducted using SmartPLS 3.0 and all of the assumptions for SEM were met. The data analysis generated mixed results for the hypotheses. In particular, H4 was not supported, while the all other hypotheses were supported. In the following Chapter 7, results are validated through multi-case study.

## **CHAPTER 7: MULTI-CASE STUDY**

The purpose of this chapter is to validate the model and confirm the findings. This case study is based on two companies, Company A and Company B, which have business systems in place such as Oracle Business Systems and SAP R/3. This chapter provides an insight into senior management perceptions about their experiences of business system success. This chapter begins with a discussion of the background of the case study to provide a general overview of the companies and their businesses. Then, organisational culture and knowledge-sharing are discussed in relation to business system success at the individual and organisation level.

### **7.1 Qualitative Validation of Research Model**

The model validation phase was used to decide whether the outcomes resulting from the quantitative assessment process illustrated in the chapter 6 can be reconfirmed and to help generalise the findings to the actual phenomena. Model validation was achieved through an analytical generalisation that utilised an explanatory case study research approach. As stated in Chapter 3, semi-structured interviews were used to probe certain variables denoting each of the model factors. The case studies are employed to validate the model, with all measures stemmed based on the results found in Chapter 6. This process was undertaken to confirm that the data gathered from the case studies are compatible with those collected from the quantitative survey, resulting in a more accurate validation of the model.

## 7.2 Company A Background

Company A is a multinational construction company and is headquartered in Jeddah, Saudi Arabia. The history of Company A begins in 1931. During the early years under the reign of King Abdul Aziz Al Saud, Mohammed Binladin Organisation was formed as a general contracting company. The company's construction activities expanded under number of autonomous operating divisions in the Kingdom of Saudi Arabia and as well as internationally. The Public Buildings and Airports Division (PBAD) is one of the most active divisions of Company A incorporated in 1967 and diversified into construction activities in the United Arab Emirates (UAE) in 1971 and in the Kingdom of Saudi Arabia in 1981.

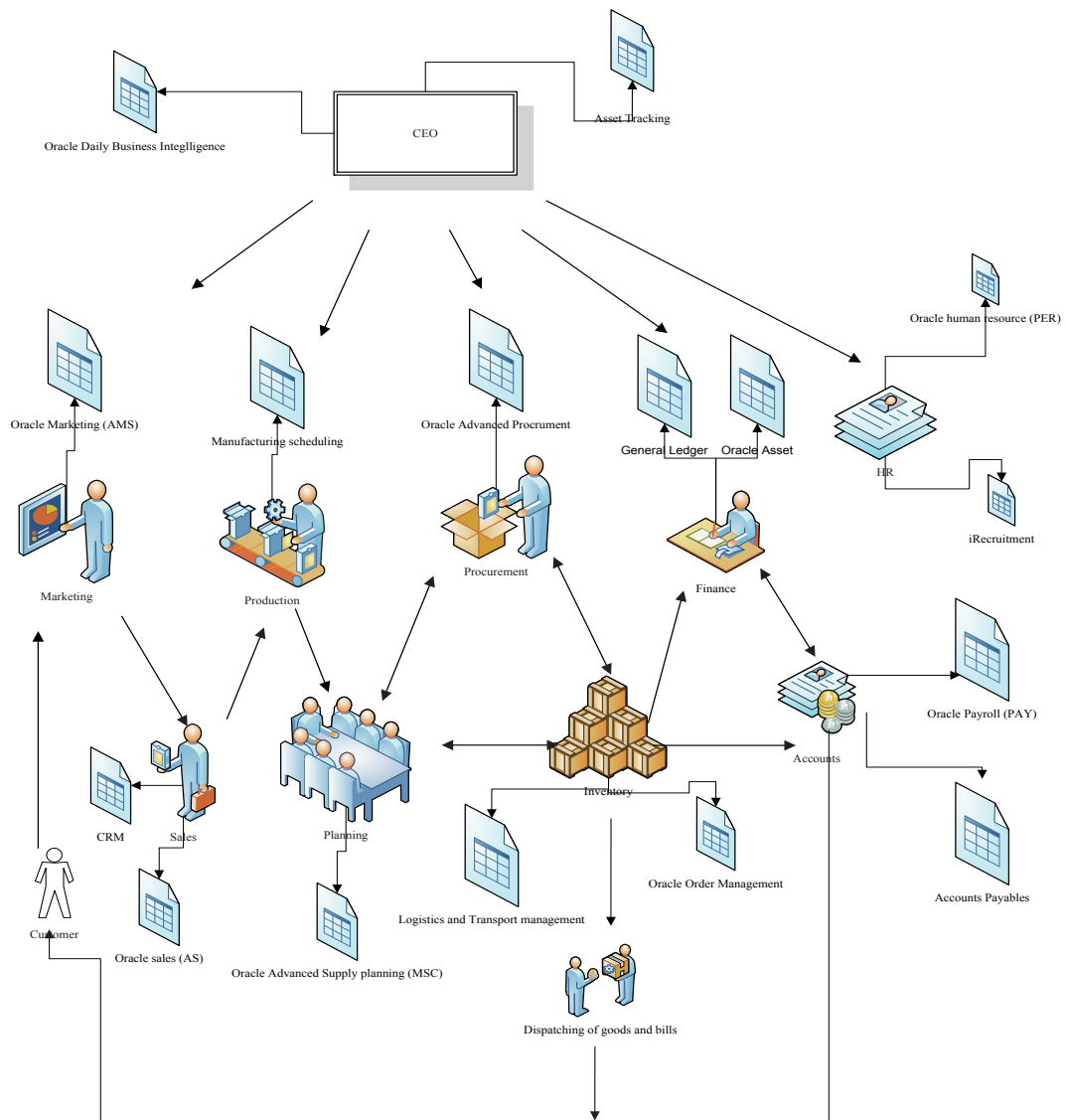
As well as working in construction, the company also has invested in industrial and power generation projects. The continuous development and expansion of the company in such services contributed heavily to the national economy of Saudi Arabia and has achieved its prime objectives of the organisation by creating value for the investing shareholders. Table 7.1 shows the interview information at the Company A.

**Table 7.1:** Information about interviewees at Company A

|   | <b>Code</b>   | <b>Positions</b>                       | <b>Years of experience</b> | <b>Educational level</b> | <b>Functional background</b> |
|---|---------------|----------------------------------------|----------------------------|--------------------------|------------------------------|
| 1 | CEO           | Chief executive officer of the company | 25                         | Master's degree          | Engineering                  |
| 2 | Manager (A-1) | Chief information officer              | 20                         | Bachelor's degree        | Management                   |
| 3 | Manager (A-2) | Human resources manger                 | 15                         | Master's degree          | Human Resources (HR)         |
| 4 | Manager (A-3) | Senior accountant                      | 18                         | Master's degree          | Accounting and Finance       |
| 5 | Manager (A-4) | IT manager                             | 22                         | Master's degree          | IT                           |

### 7.2.1 Business Systems in Company A

The company has a strategic plan to promote its competitive capabilities by running an enterprise system that synchronises with the international standards and laws that regulate its financial, administrative and operational activities. The company adopted the latest Oracle business systems. Such systems and applications are aimed at supporting the company's units in keeping up with growth while simultaneously improving the level of corporate services. Figure 7.1 shows the various Oracle applications running in Company A.



**Figure 7.1: Business systems at Company A**

The CEO of the company stated:

The various new business systems resulted from the real need of the company to cope with the national and international developments in the construction field and to apply the new technology to be consistent with the nature of the company requirements and activities. The purpose is also to fill the gap between the previously implemented system and the new one, to ensure optimum use of this newly applied technology.

The CEO reported that the company is very confident that the current and future business requirements of the company would be met by the professional information systems.

### 7.3 Company B Background

Company B was established in Saudi Arabia in 1990 and now is a leading toy distribution company that has been operating successfully for over 20 years. The company's core business relies on business-to-business (B2B) business operations, with dedicated sales, marketing and merchandising teams throughout the region distributing toys for infants, toddlers, preschoolers, kids and teenagers up to 15 years of age. Table 7.2 shows the interviews information at Company B.

**Table 7.2: Information about interviewees at Company B**

|   | <b>Code</b>   | <b>Positions</b>                       | <b>Years of experience</b> | <b>Educational level</b> | <b>Functional background</b> |
|---|---------------|----------------------------------------|----------------------------|--------------------------|------------------------------|
| 1 | CEO-B         | Chief executive officer of the company | 35                         | Master's degree          | Management                   |
| 2 | Manager (B-1) | Sales                                  | 10                         | Bachelor's degree        | Management                   |
| 3 | Manager (B-2) | IT manager                             | 12                         | Master's degree          | IT                           |
| 4 | Manager (B-3) | Finance officer                        | 15                         | Master's degree          | Accounting and finance       |
| 5 | Manager (B-4) | Human resources manager                | 22                         | Master's degree          | Human resources              |

### 7.3.1 Business Systems in Company B

Company B uses SAP R/3, an enterprise-wide information system, to coordinate all the resources, information, and activities needed to complete business processes such as order fulfilment, sales and distribution, billing, human resource management, accounting and finance. Figure 7.2 shows the SAP applications in Company B.

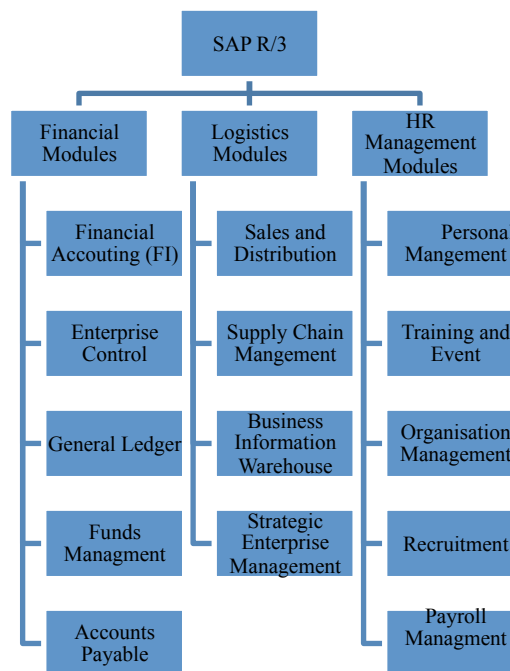


Figure 7.2: Business systems in Company B

## 7.4 Staff Perspectives on Business System Success

### 7.4.1 Organisational Culture Dimensions

As discussed in Chapter 2, previous research has shown that organisational culture is one of the most important factors required for the successful use of a business system, which enables the end user to be able to adapt and to the system in their work environment (Guo et al. 2014; Shao et al. 2012). Stakeholders need to ensure that the culture of the organisation is well understood, especially in the Saudi context, which is

often problematic (Adlan and ten Have, 2012). An important challenge that arises for organisations is to clearly understand the needs of their organisation and change their norms according to their needs in order to succeed (Henk, 2007). Looking at Saudi Arabian organisations, managers need to ensure that employees follow the set of beliefs that are followed all around the world, so that Saudi Arabian companies can be on the learning curve. The set of beliefs that employees follow are set by the leaders of organisation (Ifinedo, 2007). Getting high-quality products at a minimum cost is all due to the following cultural beliefs (Passos et al., 2012). It has been discussed that quality, culture, productivity and good management are all linked (Shao et al., 2012). The importance of business systems is significant, as the stakeholders and business managers need to ensure that the effect of culture on employees can be established (Juntiwasarakij, 2008). Since most of the employees are aware of how the business systems works and how it linked to various departments, functionally it is very important for employees to understand that organisational culture and knowledge-sharing are the main factors of organisational success in terms of business systems.

The case study shows that group culture can promote business systems success at the individual and organisational level across functions. This was described by Manager (A-1) from Company A:

“Everybody in our organisation has a very good understanding and enjoys working together. The staff know, encourage and help each other, and finally do the work well”.

The group culture of Company B effectively enables the learning and understanding of business systems knowledge through coordination and knowledge-sharing among the staff. IT Manager (B-2) from Company B also expresses this sentiment:

“We have a team cultural environment and thus we ask for help from each other. Such culture also leads to more knowledge-sharing and understanding about the business systems issues”.

Group culture requires effective leadership and the willingness and the support to direct the staff attitudes towards the system use. This was recognised by Manager (A-3):

“Culture in Saudi organisations need to be more vigilant and responsive towards changes in demand, so that usefulness can be benefit with the use of business systems”.

The analysis of the case study revealed that group culture could enable knowledge-sharing, thus helping in the success of business systems among staff and across departments. Additionally, a hierarchical culture can affect business system success through coordination between employees within the organisation. Hierarchical culture is described as regard for authority, rationality for rules and regulation and a hierarchical structure (Hu et al., 2012). The IT Manager (A-4) of Company A explicitly mentioned the importance of hierarchical culture in affecting coordination among employees.

“We have a support team available for any issues related to business systems. There are manuals and rules for the system use and any issues encountered, but the level of support makes it easier to coordinate the system activities”.

Moreover, CEO -B of Company B also emphasised that:

We have strict valuation criteria to ensure the systems quality. The procedure is that the IT manager assesses the system accuracy and the IT team conducts random inspections on the actual business systems.

In addition, the development and rational culture highlights the organisation’s ability to function well in its environment (Denison and Spreitzer, 1991).

Manager (A-3) from Company A stated:

“The culture of creativity and adaptation to the external environment is considered as the most important part of our organisational culture. We continually scan the competitive environment to assess their relative competitive strengths and weaknesses in relation to make changes to the firm

accordingly”.

Manager (B-2) in Company B expressed similar views.

“We continuously improved the business systems’ functions in order to satisfy the needs of the external market, because our focus is not only on internal information but also on the external growth resources acquisition”.

Similarly, Manager (A-1) stated:

“We always emphasise the significance of enhancing innovation and goal achievement. So, we continuously improve the business systems functions to meet our local business market and also overseas business”.

Additionally, the CEO of the Company B stated:

“In order to raise the organisation’s efficiency everyone has to work hard and perform his or her duties to their best ability. But unfortunately, this doesn’t happen every time”.

Manager (B-1) from Company B said that:

“I encourage all staff to write a work plan for every single day, but not all the staff follows me”.

This case study shows that the development and rational cultures encourage organisations to deepen the existing business systems’ functions through resource growth, innovation and creativity and explore new areas of business through employee efficiency and productivity at work. The most important element is the way that the organisations have a system that can improve their organisational effectiveness (Zhao 2004). Managers need to understand that companies that create efficient systems enjoy success in their organisations (Kleine 2008). Table 7.3 shows a summary of the two case study companies in relation to hypotheses.

**Table 7.3: Summaries of case companies in relation to organisational culture**

| <b>Factors</b>              | <b>Hypothesis</b>                                                                                                                           | <b>Typical sentences</b>                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Development culture</b>  | <b>Hypothesis 1 (H1):</b><br>Development culture has a significant positive impact on business system success in Saudi Arabian enterprises. | A-3: The culture of creativity and innovation is considered as the most important part of our organisation's culture.<br><br>B-2: We continuously improved our business systems' functions in order to satisfy the needs of the market.<br><br>A-1: We focus on the significance of enhancing innovation and goal achievement to improve the business systems' functions. |
| <b>Group culture</b>        | <b>Hypothesis 2 (H2):</b> Group culture has a significant positive impact on knowledge-sharing in Saudi Arabian enterprises.                | B-4: Group culture also leads to more knowledge-sharing and understanding about the business systems' issues.<br><br>A-3: Our firms promote a trust-oriented culture that focuses on teamwork.                                                                                                                                                                            |
| <b>Hierarchical culture</b> | <b>Hypothesis 3 (H3):</b><br>Hierarchy culture has a significant positive impact on knowledge-sharing in Saudi Arabian enterprises.         | A-4: We have support team that makes sure the rules and regulation for the business systems [are followed].<br><br>B-3: Our boss focuses on team meetings for any issues that arises.                                                                                                                                                                                     |
| <b>Rational culture</b>     | <b>Hypothesis 4 (H4):</b> Rational culture has a significant positive impact on business systems success in Saudi Arabian enterprises.      | CEO- B: Everyone has to work hard in order to raise organisational efficiency.<br><br>B-1: I encourage all staff to write a work plan for every single day, but not all the staff follow me.                                                                                                                                                                              |

The two case analyses showed that the responses from both Companies A and B are consistent with quantitative results. From the survey results, statistically significant support was not found regarding rational culture, which suggested that rational culture has a significant positive impact on business systems success in Saudi Arabian enterprises. However, the case analyses support the hypothesis. The academic debate on the role of culture within the business environment highlights the crucial role of culture as a way of improving the business systems (Jalal et al., 2011, Kabasakal et al., 2006). As noted by Buenger et al. (1996), organisational culture has an important role in the knowledge-sharing adopted by organisations.

In evaluating the relationship between the group and hierarchy culture and knowledge-

sharing constructs, a similarity is viewed in the cases of Companies A and B, where both organisations showed a strong connection in that sharing knowledge among employees strongly affected the company's business system's success. Moreover, the development culture shows a strong focus on business system success at the individual and organisational levels. Both firms have a high level of innovation and goal achievement to improve the business systems' functions in order to meet the demands of the local and overseas business markets. However, no emphases on rational culture can have a negative impact on business system. This is also consistent with survey results, where H4 was not supported.

#### **7.4.2 Knowledge-sharing**

Many studies find that a variety of social factors are more important than technical support in facilitating knowledge-sharing (Choi et al., 2008; Lin et al., 2006). In particular, organisational culture is reflected as a key factor supporting knowledge-sharing among staff within an organisation (Shao et al. 2012). This view was expressed by CEO-B of Company B.

*"The manager plays an essential role in sharing knowledge through both technology and cultural change, making the managers understand the human factors necessary for business systems success".*

In addition, CEO-A of Company A stated:

*"Economies are increasingly based on knowledge, which is now recognised in our organisation, which provides a focus on the role of information, technology and learning in economic performance, which ultimately rising into a knowledge-based economy for Saudi Arabia".*

Knowledge-sharing within an organisation is also considered a main factor influencing the overall performance of any organisation (Boehm 2012). According to Manager (B-4) of the Company B:

“Teamwork is important for knowledge-sharing. The nature of problem-solving in our firm is structured in a way where teamwork will enable the organisation to gain the level of support and help as part of the organisational culture, therefore delivering the best possible services through the use of technology”.

Moreover, IT Manager (A-4) said:

“Employees would not acknowledge the technology unless they understood its associated benefits. Collaboration enhances the process of decision-making through information systems that result in the improved productivity of the firm”.

Sedera et al. (2003) highlight the strong positive relationship between knowledge-sharing and business system success. This is supported by Manager (A-2):

The impact of knowledge-sharing on the business systems can also mean that the staff not only use the systems, but also collaborate to improve their efficiency and effectiveness.

In addition, Manager (B-2) expressed his sentiment as:

“We use the knowledge management techniques over the course of business system use to facilitate knowledge-sharing among employees”.

The case analysis showed that the responses from both Companies A and B are consistent with quantitative results, which supports that argument that knowledge-sharing has a significant positive impact on business systems success in Saudi Arabian enterprises. Table 7.4 summarises the analysis.

**Table 7.4: Summaries of case companies in relation to knowledge-sharing**

| Factor            | Hypothesis                                                                                                                               | Typical Sentences                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Knowledge-sharing | <b>Hypothesis 5 (H5):</b><br>Knowledge-sharing has a significant positive impact on business system success in Saudi Arabian enterprises | CEO-B: The manager plays an essential role in sharing knowledge through both technology and cultural change.<br><br>A-4: Knowledge-sharing enhances the process of decision-making through information systems that result in the improved productivity of the firm.<br><br>B-3: Teamwork is important for knowledge-sharing that delivers the best possible services through the use of technology |

### 7.4.3 Business System Success

The success of business systems is measured at the post-implementation phase. A business system is seen to be successful if it improves potential benefits through organisational cost reductions, increased customer satisfaction levels and higher operational productivity (Sedera et al., 2004). According to CEO-A of Company A:

“The success or failure of our firm can be easily foreseen by reviewing its financial performance. Therefore, our financial modules evaluate key benefits involved with the use of these business systems”.

In addition, Manager (B-3) said:

“The finance module is the backbone of our business system; we analyse and understand financial trends that ultimately support business decisions”.

However, some researchers suggest that the successful adoption of business systems is not only measured through cost. Other factors, such as user satisfaction, are also critical to the success of business systems (Gable et al., 2008). This is also explained by Manager (B-1):

“We expect our IT team to support us in the necessary services provided by the business systems to keep facilitating our work and solve our problems to avoiding any delay of the employees’

daily work tasks”.

In addition, Manager (A-3) stated that:

“At first the system was not easy to use, for new staff especially. Then through proper training and support from the IT department, I found that the system tended to enhance our performance and provide us with strong motivation with the latest technology which is related to our work”.

Moreover, Manager (B-1) mentioned:

“The online communications process provided by the enterprise systems enables us to communicate with our customers efficiently, and hence results in good net profit from achieving an accelerated sales target for the fiscal year”.

Sedera et al. (2004) finds that the most significant business systems success dimensions are individual and organisational impact. This is expressed by Manager (B-1):

“Business systems have been accepted in our organisation and have significant influence on the individual and inter-organisational level, such as individual work performance is improved and organisation achieving their annual targets”.

Business systems facilitate data transfer across functional departments, enhance staff productivity and maximise customer satisfaction. Additionally, quick access to information can enhance workflow. This was clearly mentioned by Manager (A-2) of Company A, who elaborated as follows:

“We believe that the human resource system enabled the enterprise to reduce its volume of paperwork, maximise productivity, and improve customer satisfaction. The use of these systems enables improved management of services related to personnel and reduces costs to the organisation activity”.

In addition, CEO-B of the Company B stated:

“Organisational culture and knowledge-sharing are important to business system success, and that employees who interact with more colleagues are more willing to share knowledge with them, which enable higher individual and organisation performance”.

Looking at business systems success, the case study analysis showed that the responses

from both Companies A and B are consistent with the quantitative results, which is that business systems success increases individual and organisation impact in a Saudi Arabian context. Table 7.5 summarises the analysis.

**Table 7.5: Summaries of case companies in relation to business systems.**

| Factor                         | Hypotheses                                                                                                                                                                                                                                         | Typical Sentences                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Business system success</b> | <p><b>Hypothesis 6 (H6):</b><br/>Business systems success increases organisational impact in Saudi Arabian enterprises.</p> <p><b>Hypothesis 7 (H7):</b><br/>Business systems success increases individual impact in Saudi Arabian enterprise.</p> | <p>CEO-A: Our financial modules evaluate key benefits involved with the use of these business systems.</p> <p>A-3: I found that the business system tended to enhance our performance and provide us with strong motivation which is related to our work.</p> <p>B-1: Business systems have been accepted in our organisation and have significant influence on the individual and inter-organisational level.</p> <p>CEO-B: Organisational culture and knowledge-sharing are important to business system success.</p> |

## 7.5 Chapter Summary

This chapter presented qualitative (case study) analysis of two Saudi Arabian firms. Five participants from each firm were interviewed. The results supported all hypotheses and the findings were consistent with quantitative results. The following Chapter 8, describes the key findings of this research. It also outlines the limitations of this study, areas for future research and concludes the thesis.

## **CHAPTER 8: DISCUSSION AND CONCLUSION**

This chapter presents the findings and discussion of the survey and case study research. The research aim and objectives, research questions and hypotheses of the study are revisited then an analysis of study findings is discussed. This is followed by a presentation of the theoretical and practical implications of the study. Finally, this chapter concludes by identifying the limitation of the study and providing recommendations for future research.

### **8.1 Revisiting the Research's Aim and Objectives, Research Questions and Hypotheses**

Revisiting the research aims, objectives and the link between research questions and hypotheses is a very important step to complete in order answer the questions prior to evaluating the study's major findings. Chapter 3, the theoretical background and model, highlighted the findings and recommendations of the relevant research studies.

Table 8.1 presents a review of research aim and objectives, research questions and the hypotheses addressed in this thesis.

**Table 8.1: Revisiting the research aim and objectives, research questions and hypotheses**

| <b>Research Aim and Objectives</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The main aim of this study is to enhance insight concerning the impact of organisational culture and knowledge-sharing on business system success in Saudi Arabian firms. Following on from this aim, the research objectives are</p> <ul style="list-style-type: none"> <li>• To investigate the impact of organisational culture on knowledge-sharing and business systems success in Saudi Arabian firms.</li> <li>• To investigate the impact of knowledge-sharing on business systems success in Arabian Saudi firms.</li> <li>• Propose a business systems success model for Saudi Arabian firms.</li> <li>• To empirically validate the proposed model using survey and case studies.</li> </ul> |                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Factors</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Research questions</b>                                                                                                                                                                              | <b>Hypotheses</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Organisational culture</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1. How does organisational cultural (group culture, hierarchical culture, development culture and rational culture) impact knowledge-sharing and business system success in Saudi Arabian enterprises? | <p>Hypothesis 1 (H1): Development culture has a significant positive impact on business systems success in Saudi Arabian enterprises.</p> <p>Hypothesis 2 (H2): Group culture has a significant positive impact on knowledge-sharing in Saudi Arabian enterprises.</p> <p>Hypothesis 3 (H3): Hierarchy culture has a significant positive impact on knowledge-sharing in Saudi Arabian enterprises.</p> <p>Hypothesis 4 (H4): Rational culture has a significant positive impact on business system success in Saudi Arabian enterprises.</p> |
| <b>Knowledge-sharing</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2. How does knowledge-sharing impact business system success in Saudi Arabian enterprises?                                                                                                             | Hypothesis 5 (H5): Knowledge-sharing has a significant positive impact on business systems success in Saudi Arabian enterprises.                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Business system success</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3. How does business system success influence organisational and individual impact in Saudi Arabian enterprises?                                                                                       | <p>Hypothesis 6 (H6): Business systems success increases organisational impact in Saudi Arabian enterprises.</p> <p>Hypothesis 7 (H7): Business systems success increases individual impact in Saudi Arabian enterprises.</p>                                                                                                                                                                                                                                                                                                                 |

## **8.2 Discussion of the Research Findings**

The results of the data analysis generated mixed findings for the research hypotheses. The results of the quantitative analysis are consistent with case study results. The findings of this study are discussed below.

### **8.2.1 Findings on Organisational Culture**

The order of significance among the organisational culture factors that have a significant effect on business system success is group culture, followed by hierarchy culture, development culture and rational culture. This means group culture is the most important factor associated with knowledge-sharing in business system success in the Saudi context while rational culture is the least most.

Hypothesis 1 argues that development culture has a significant positive impact on business systems success in Saudi Arabian enterprises. The results discussed in Chapter 6 show a strong statistical support for the direct effect on the relationship between development culture and on business systems success in Saudi enterprises. This means that the development culture highlights the crucial role of culture as a way to achieve business system success in Saudi firms. The findings from the case studies also confirmed the survey results. The participants revealed that development culture encourages organisations to deepen the existing business systems' functions through resource growth, innovation and creativity at work.

Hypothesis 2 posited that group culture has a significant positive impact on knowledge-sharing in Saudi enterprises. The results in Chapter 6 showed strong statistical support for the effect on the relationship between group culture and knowledge-sharing on business systems success in Saudi enterprises. This shows that an organisational culture

that emphasises groups and teamwork can facilitate knowledge-sharing in Saudi firms. The analysis of the case studies also revealed that group culture enables knowledge-sharing to contribute to the success of business systems among the staff and across departments.

Statistically significant support was also found for Hypothesis 3, which argued that hierarchy culture has a significant positive impact on knowledge-sharing in Saudi Arabian enterprises. This means the Saudi organisations should organise a system of reward mechanisms to create a hierarchical culture that focuses on coordination among employees. The analysis of the case studies also showed that authority, rationality for rules and regulation and hierarchical structure affect business system success through knowledge-sharing between employees within the organisation.

Furthermore, contrary to expectation, statistically significant support was not found for Hypothesis 4, which posited that rational culture has a significant positive impact on business systems success in Saudi enterprises. This means that a rational culture did not highlight the organisation's ability to function well in its environment. However, the analysis of case studies shows that rational culture encourages organisations to deepen the existing business systems' functions to improve employees' efficiency and productivity at work.

The findings related to organisational culture are consistent with previous studies (Škerlavaj et al., 2010; Jones et al. 2006; Shao et al., 2012; Ifinedo 2007; Shao et al., 2015). According to the statistical results (discussed in Section 6.2.4), the order of importance among the organisation culture factors that have a significant influence is group culture, followed by hierarchy culture, development culture and then rational culture. This means group culture is the most significant factor to be associated with

knowledge-sharing's influence on business systems success in Saudi firms.

From these findings, it can be interpreted that the existence of a strong cooperative and collaborative culture is an important prerequisite for knowledge transfer between individuals and groups. The organisation promotes a trust-oriented group culture that focuses on belonging and participation.

A strong culture of experimentation together with high levels of trust and a collaborative and cooperative climate will have a positive influence on knowledge transfer. The reason behind the significance of group culture is that sharing more accurate data and timely information with others is one of the biggest advantages of business systems success, in that users think that they should use business systems because of their work group. In a strong group-oriented culture, staff are expected to share knowledge more with their co-workers, consequently producing a shared belief that highlights knowledge attainment within the organisation.

Another noteworthy finding is that hierarchy culture also has a significant effect on knowledge-sharing. This specifies that the hierarchical culture's focus on internal organisation and stability emphasises employee efficiency and coordination. The existence of hierarchy culture leads employees to think that internal efficiency, coordination, rules, control and regulations are core organisational values in sharing knowledge with others, thus contributing to business systems success in Saudi organisations. In order to promote employees' active participation at work, top management needs to set up suitable incentive mechanisms to create a hierarchical culture that put emphasis on efficiency and coordination.

Organisational culture not only determines the norms regarding the distribution of knowledge between an organisation and its employees but also the business system success. The findings of this research demonstrate that development culture positively influences business system success. This indicates that employees who focus on innovativeness and creativity enhance business system success and that rational culture has a significant positive impact on business systems success in Saudi enterprises.

The findings from the case studies showed that a rational culture can promote business system success. However, from the survey results, its influence is not significant. This indicates that employees are not concerned with the goals of the organisation, which suggests that not all employees are working hard to improve productivity. One reason for this would be that Arab people are high uncertainty avoidance culture, and thus people are prone to avoid tasks that involve some degree of risk unless strong assurances and confidence measures for success are provided.

### **8.2.2 Findings on Knowledge-sharing**

Hypothesis H5 postulates that knowledge-sharing has a significant positive impact on business systems success in Saudi enterprises. The survey results show knowledge-sharing is positively linked to business system success. This means staff are more willing to share knowledge with their coworkers in a group-oriented culture, which is an important factor of business system success. The case study analyses also show that knowledge-sharing has a positive role in business systems success in Saudi organisations. Knowledge is the foundation of an organisation's economic advantage and ultimately the primary driver of an individual performance. The findings related to knowledge-sharing are aligned with previous studies (Sedera et al. 2003; Bock et al. 2005; Jones, 2005; Wang et al., 2007; Shao et al. 2012).

This research shows that knowledge is an important antecedent to business system success.

The findings also illustrate that Saudi organisations are mainly built on a foundation of knowledge in terms of information exchange and knowledge creation and sharing. This indicates that business system success is built upon the concept of knowledge-sharing and usage.

In order to motivate staff to learn the functionalities of their business systems and enable knowledge-sharing within organisation, the top management needs to encourage an organisational culture that emphasises active participation by considering their employees' needs, such as a group and hierarchy culture. Knowledge-sharing is vital for employees to integrate knowledge and hence to have a complete understanding of the business systems' capabilities. Knowledge-sharing among employees in organisations ensures that they are able to use the business systems effectively and efficiently, thus contributing to their satisfaction, which subsequently influences the system's success. For example, certain forms of incentives might stimulate staff motivation and raise their knowledge-sharing intention. Thus effective knowledge-sharing could lead to a better fit between business systems and organisational processes to improve an organisation's business performance to achieve competitive success.

The results of the study identify the way in which employees' confidence in their ability to successfully use business systems is inextricably linked to their intrinsic level of motivation to engage in knowledge-sharing. This highlights the importance of managers increasing the usage of business systems to increase user confidence levels and thus improve organisational performance.

### **8.2.3 Findings on Business System Success**

Hypothesis H6 postulates that business systems success increases the organisational impact of Saudi enterprises. Strong statistical support was found for the success of business systems in term of organisational impact. This means that business system success positively affects the operational processes of Saudi organisations. The analysis of the two case studies also shows the effective use of business system results in good net profit from achieving an annual target.

Hypothesis H7 posited that business system success increases individual impact in Saudi enterprises. The findings from the survey results denote a positive effect on the relationship between business system success and individual impact in Saudi enterprises. This means that the effective use of business systems enhances individual work productivity. The analysis of case studies also shows higher user satisfaction through business systems.

The findings suggest that business systems create business value and enhance business performance and the success indicators of business systems have a positive impact on the final dependent variables organisational and individual impact. The results indicate that the increased use of business systems increases the benefits of organisational and individual impact in Saudi enterprises. These results are consistent with Sedera et al. (2004) and Gable et al. (2008), who found that business systems facilitate data transfer across functional departments, enhance staff productivity and maximise customer satisfaction.

It is evident from the survey and the case study analyses that business systems success reduce organisational costs, improve overall productivity and allow for the better use of

organisational data resources. Regarding the individual impact of business systems, their use enhances a higher quality of decision-making and individual creativity and saves time for individual tasks/duties.

### **8.3 Contribution and Implications of the Study**

This research provided both theoretical and practical implications of business system success for Saudi firms. The implications are presented as follows.

#### **8.3.1 Theoretical Implications**

There are several theoretical implications resulting from this study. Firstly, this study has made a noteworthy contribution to the body of knowledge in that it is the first to investigate the relationship between organisational culture, knowledge-sharing and business system success in a Saudi Arabian context. This research has confirmed that such a relationship exists and has identified key factors of that relationship.

Secondly, the main theoretical contribution of the study is the development of a business system success model that can be used in further studies. Therefore, this research contributes to the existing knowledge by proposing a business system success model that includes the role of organisational culture based on the competing values framework (CVF). Previous studies have highlighted the role of organisational culture in influencing IS/ERP assimilation.

Thirdly, this study extended prior research on the effects of knowledge-sharing on business system success at the individual and organisational level. Additionally, this research addresses the shortcomings in the existing literature by examining the effect of knowledge-sharing in Saudi enterprises on business system success.

Fourth, this study confirmed that organisational culture and knowledge-sharing are positively related to business system success. It also shows the positive relationship between organisation culture and knowledge-sharing in the Saudi Arabian context.

Finally, the various hypotheses supported in this study all add to the literature for developing hypotheses for future studies. Additionally, this study contributes to validating the survey instrument of the various factors used in a proposed model.

### **8.3.2 Practical Implications**

This study has several practical implications. Firstly, from a managerial perspective, this study provides insights that Saudi organisations can utilise in order to understand the influence of organisational culture on business system use. Secondly, managers should not pay attention on only one cultural type, but should focus on all four cultural types (development, group, hierarchy and rational) to form a well-balanced culture to achieve the success of business systems in terms of organisation and individual impact.

Thirdly, the top management should recognise that knowledge-sharing is key for business system success. Therefore, top executives should set up definite rules and regulations, a hierarchical structure and formal communication channels so as to promote the success indicators of business systems. Fourth, the top management who control resources and decision-making must play a significant role in building organisation-wide awareness of knowledge-sharing practices and how they can contribute to systems improvements. This emphasises the importance of managers increasing the usage of business systems to increase employee confidence levels and consequently improve organisational performance.

Fifth, the top management support and internal incentives should promote effective knowledge transfer within organisations. The interconnection between knowledge management and organisational culture will improve their competitive advantage and increase their business systems' performance, which in turn improves the organisation's operations and financial performance. Sixth, organisations are not using their business systems as a platform to access information and knowledge. Therefore, knowledge management practices should be incorporated into evaluations of business systems success to help mitigate potential dissatisfaction with business systems investments.

Seventh, both small and large organisations that are planning to apply new business systems will be better able to identify those factors (organisational culture and knowledge-sharing) that will enhance the possibility of success. The findings of this study will help them to establish those factors to which they should pay specific attention to ensure that they receive continuous management scrutiny.

Finally, the top executives should set up clear goals and inspire staff to achieve goals by using rational effectiveness criteria so as to increase employees' perception that organisational practices are equitable and to foster the effective sharing of knowledge for long-term business system success.

#### **8.4 Conclusion**

The purpose of this study was to investigate the impacts of organisational culture and knowledge-sharing on business system success in Saudi Arabian firms. Three research questions were raised: (1) How does organisational cultural impact knowledge-sharing and business system success in Saudi Arabian enterprises? (2) How does knowledge-sharing impact business system success in Saudi Arabian enterprises?

And (3) how does business system success influence organisational and individual impact in Saudi Arabian enterprises? To answer these research questions, prior research on organisational culture and user acceptance models for information systems were examined in relation to business systems success. Research on organisational culture based on the competing values framework (CVF) (Quinn and Spreitzer 1991; Denison and Spreitzer, 1991; and McDermott and Stock, 1999), the DeLone & McLean (D&M) IS success model, and the business systems success measurement model (Gable et al., 2003; Sedera et al. 2004) was reviewed in order to identify the factors (such as organization culture and knowledge sharing) affecting business system success. Based on above theories, a model is proposed to describe how organisational culture and knowledge-sharing contribute to business system success in Saudi enterprises, as well as the organisational and individual impact.

To empirically test the model, answer the research questions and test the hypotheses, this study applied a mixed-method research approach that incorporated both quantitative and qualitative approaches. Phase 1 of the research study employed a quantitative method based on the collected data using a survey. The second phase of the analysis involved a qualitative research method that was carried to support the validity of the quantitative results.

Previous validated instruments were used and established qualitative methods undertaken to ensure that the study was strong in design and approach. 330 responses were used for quantitative data analysis and 10 interviews were conducted with employees from two firms in Saudi Arabia. The results show a positive relationship between organisational culture (such as development, group, hierarchy and rational

culture), knowledge-sharing and business system success in Saudi Arabian firms. Finally, the theoretical and practical implications of this research were provided.

In conclusion, the impact of organisational cultural on business system success through knowledge-sharing should not be ignored. In Saudi Arabia, the organizations do not focus on the way in which the culture of the employees and the organizations are influenced by the different factors. The importance of the culture cannot be overlooked due to its impact on success of any organization. Culture has an important influence on the business systems in Saudi organizations. Taking the example of Saudi Arabian organizations, managers need to ensure that employees follow the set of beliefs that are followed all around the world, so that Saudi Arabian companies can be on the learning curve.

It is evident from these findings that the most important contributions of the business systems are that they considerably reduce the time required to complete business processes and help organisations' performance. However, even though business systems might be successfully implemented from a technical perspective, the success also depends on the systems' actual usage.

On the basis of this study's findings, it is argued that to achieve better business system outcomes (such as improve the impact of the systems on the organisation and individuals) it is important to influence organisational culture and knowledge-sharing. Moreover, the knowledge must be made available to all stakeholders involved in the ongoing use of business systems.

## **8.5 Limitations and Recommendations for Future Research**

Like most research, this study has some limitations. First, this study focuses on a limited number of factors for business systems success. Other relevant factors such as system quality, service and information quality could be added to improve the understanding of business systems success in Saudi context. The second limitation of this study is the sampling process. The data were collected from two organisations in one city in Jeddah, Saudi Arabia, which may affect the generalisability of the findings of this study. In addition, having a larger base of survey respondents and interviewees would provide better insight on the issues on a larger scale.

The third limitation is the determinants of organisational culture have not been taken into consideration. This might weaken the conclusive strength of the findings. Future studies could include other factors that influence organisational culture that were not considered in this research. Additionally, future studies could be conducted in Saudi Arabia that incorporate measurements of national culture into the research model.

As knowledge-sharing was found to be strongly related to business system success in Saudi organisations, future studies could explore what specific types of knowledge-sharing is more effective: tacit, implicit or explicit. Additional research could attempt to document the knowledge-sharing tools through which employees can share knowledge in an organisation.

## **8.6 Chapter Summary**

In this chapter, a discussion of the thesis and the findings of the study were presented. This chapter also addressed the implications of the study by outlining the theoretical implications as well as the practical implications. Furthermore, the limitations of the study and the recommendations for future research were also described.

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## **APPENDIX A: SURVEY QUESTIONNAIRE**

### **INFORMATION SHEET AND CONSENT FORM FOR SURVEYS**

My name is Mohammed. I. Alattas and I am a student at UTS. My supervisor is Dr. Kyeong Kang.

The purpose of this research /online survey is to find how organization culture and collaboration mechanism for the success of business system for Saudi enterprise. I will ask you to about experiences of with business systems in Saudi firm. The questionnaire should take no more than 10 -15 minutes.

The researcher believes that there is little or no risk associated with your participation. Your responses will be kept completely confidential and will only be used for academic purpose. Participation in this research study is completely voluntary. You have the right to withdraw at any time or refuse to participate entirely. If you agree to be part of the research and to research data gathered from this survey to be published in a form that does not identify you, please continue with answering the survey questions.

If you have concerns about the research that you think I or my supervisor can help you with, please feel free to contact me (us) on +61 2 9514 1912. Or via email

[REDACTED]

If you would like to talk to someone who is not connected with the research, you may contact the Research Ethics Officer on 02 9514 9772 or [Research.ethics@uts.edu.au](mailto:Research.ethics@uts.edu.au) and quote this number (UTS HREC 2014000391).

1- Gender

☐ Male (1)

☐ Female (2)

2- What is your age group?

☐ 18-25 (1)

☐ 26-35 (2)

☐ 36-45 (3)

☐ 45 and above (4)

3- Current level of education.

☐ Diploma (1)

☐ Bachelor's Degree (2)

☐ Master's Degree (3)

☐ Doctoral Degree (4)

☐ Other ..... (5)

4- Citizen

☐ Non- Saudi (1)

☐ Saudi (2)

5- Work Experience in this company

☐ Less than one Year (1)

☐ One year (2)

☐ 2-3 Years (3)

☐ 4-5 Years (4)

☐ More than 5 Year (5)

6- Your role in the company (Job)?

☐ Director (1)

☐ Executive Director (2)

☐ Manager department (3)

☐ data entry (4)

☐ Other (5)

7- Department name

☐ HR (1)

☐ Finance and Accounting (2)

☐ Sales / Marketing (3)

☐ Production / Procrument (4)

1 جنس

☐ ذكر

☐ أنثى

2 ما هي فئتك العمرية؟

☐ 18 25

☐ 26 35

☐ 36 45

☐ 45 فما فوق

3 المستوى الحالي للتعليم.

☐ دبلوم

☐ درجة البكالوريوس

☐ درجة الماجستير

☐ درجة الدكتوراه

☐ أخرى.....

4 الجنسية

☐ السعودية

☐ غير السعودية

5 الخبرة في العمل في هذه الشركة

☐ أقل من سنة

☐ سنة

☐ 2 3 سنوات

☐ 4 5 سنوات

☐ أكثر من 5 سنوات

6 دورك في الشركة ( مسمى الوظيفة )

☐ مدير عام

☐ مدير تنفيذي

☐ مدير قسم

☐ مدخل بيانات

☐ أخرى

7 اسم القسم

☐ إدارة الموارد البشرية

☐ المالية والمحاسبة

☐ المبيعات / التسويق

☐ الإنتاج / Procrument

☐ أخرى \_\_\_\_\_

**Answer If Department name HR Is Selected**

8- Business Systems at HR department you involved in?

- ☐ Oracle Human resource (PER) (1)  
☐ iRecruitment (2)  
☐ Other \_\_\_\_\_ (3)

**Answer If Department name Finance and Accounting Is Selected**

9- Business Systems at Finance and Accounting department you involved in?

- ☐ Oracle Payroll (PAY) (1)  
☐ Account Payables (2)  
☐ Oracle Asset (3)  
☐ General Ledger (4)  
☐ Other \_\_\_\_\_ (5)

**Answer If Department name Marketing Is Selected**

10- Business Systems at Sales and Marketing department you involved in?

- ☐ Oracle Sales (1)  
☐ CRM (2)  
☐ Oracle Marketing (3)  
☐ Others \_\_\_\_\_ (4)

**Answer If Department name Production / Procrument Is Selected**

11- Business Systems at Production / Procrument department you involved in?

- ☐ Oracle Advanced procrument (1)  
☐ Oracle order management (2)  
☐ Oracle advanced supply planning (3)  
☐ Inventory (4)  
☐ Other \_\_\_\_\_ (5)

**الإجابة إذا كان اسم قسم الموارد البشرية يتم تحديد**

8 نظم الأعمال في إدارة الموارد البشرية تقوم بالمشاركة فيها؟

- ☐ أوراكل الموارد البشرية (PER)  
☐ iRecruitment  
☐ أخرى \_\_\_\_\_

**الإجابة إذا كان قسم المالية والمحاسبة يتم تحديد**

9 نظم الأعمال في المالية والمحاسبة القسم الذي تشارك فيه؟

- ☐ أوراكل الرواتب (PAY)  
☐ حساب دانتون  
☐ أوراكل الأصول  
☐ دفتر الأستاذ العام  
☐ أخرى \_\_\_\_\_

**الإجابة إذا كان في قسم التسويق يتم تحديد**

10 نظم الأعمال في المبيعات والتسويق القسم الذي تشارك فيه؟

- ☐ مبيعات أوراكل  
☐ CRM  
☐ التسويق أوراكل  
☐ أخرى \_\_\_\_\_

**الإجابة إذا كان في قسم الإنتاج / Procrument يتم تحديد**

11 أنظمة العمل في الإنتاج / قسم Procrument لك بالمشاركة فيها؟

- ☐ أوراكل المتقدم procrument  
☐ أوراكل إدارة النظام  
☐ الموارد  
☐ أوراكل المتقدمة تخطيط العرض  
☐ نظم المخازن  
☐ أخرى \_\_\_\_\_

The following questions related to the Organization culture (Development culture (DC))

DC1: Our firm emphasize on collaboration for business success.

(1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

DC2: Our firm emphasizes on growth and acquiring new resources for business systems.

(1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

DC3: Our firm encourages creativity and/or the development of new ideas, as cultural values.

(1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

The following questions related to the Organisation culture (group culture (GC))

GC1: Our firm emphasize on group work.

(1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

GC2: Our firm emphasizes on human resources.

(1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

GC3: In my firm, people spend time building trust with each other.

(1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

GC4: In my firm, team/groups revise their thinking as a result of group discussion or information collected.

(1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

الأسئلة التالية المتعلقة بثقافة منظمة (التطوير الثقافي)

12 لدينا شركة وتؤكد على التعاون لنجاح الأعمال.

○ لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

13 تؤكد شركتنا على النمو والحصول على موارد جديدة لأنظمة العمل.

○ لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

14 لدينا شركة وتشجع الإبداع و / أو تطوير أفكار جديدة، والقيم الثقافية.

○ لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

1 لدينا شركة وتشجع الإبداع و / أو تطوير أفكار جديدة، والقيم الثقافية.

○ لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

الأسئلة التالية المتعلقة بثقافة منظمة (الثقافة الجماعية)

2 لدينا شركة التأكيد على العمل الجماعي.

○ لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

3 وتؤكد شركتنا في مجال الموارد البشرية.

○ لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

4 في شركة بلدي، الناس يقضون بناء الثقة الوقت مع بعضهم البعض.

○ لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

5 في شركتي، وجماعات فريق / تنقيح تفكيرهم نتيجة المناقشة الجماعية أو المعلومات التي تم جمعها.

○ لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

The following questions related to the Organisation culture (Hierarchical (HC) and Rational Culture (RC))

HC1: Our firm is a very organized place.

- (1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

HC1: Our firm emphasizes on stability.

- (1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

HC1: Our firm emphasizes on rules and regulations.

- (1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

RC1: Our firm emphasizes on tasks and goal accomplishment.

- (1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

RC2: Our firm emphasizes on competitive actions and achievement.

- (1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

RC3: Our firm is a very efficacy oriented place.

- Strongly Disagree  
(1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

The following questions related to the Knowledge sharing (KS)

K51: I am pleased to share (communicate) my work reports on business systems use.

- (1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

K52: I would be pleased to communicate business related official documents with other members.

- (1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

K53: I would like to provide my expertise on business system use.

- (1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

K54: Collaboration is a key to knowledge sharing on business system use.

- (1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

K55: Teams must share knowledge in order to take decisions for business system use.

- (1) Strongly Disagree  
(2) Disagree  
(3) Neither Agree nor Disagree  
(4) Agree  
(5) Strongly Agree

الأسئلة التالية المتعلقة بثقافة منظمة (الثقافة الهرمية والرشيدي)

6 شركتنا هي مكان منظم جدا.

- لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

7 وتؤكد شركتنا على الاستقرار.

- لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

8 تؤكد شركتنا على القواعد واللوائح.

- لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

9 تؤكد شركتنا على إنجاز المهام والأهداف.

- لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

10 تؤكد شركتنا على الأعمال التنافسية والإنجاز.

- لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

الأسئلة التالية المتعلقة بتقاسم المعرفة

1 ويسرني أن مشاركة (التواصل) استخدام التقارير عملي على أنظمة العمل.

- لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

2 سيكون من دواعي سروري للاتصال وثائق رسمية الأعمال ذات الصلة مع الأعضاء الآخرين.

- لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

3 أود أن تقديم خبرتي في استخدام نظام عمل.

- لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

4 التعاون هو مفتاح لتبادل المعرفة في استخدام نظام عمل.

- لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

5 يجب أن فريق تتقاسم المعرفة من أجل اتخاذ قرارات لاستخدام نظام عمل.

- لا أوافق بشدة  
○ لا أوافق  
○ لا أوافق ولا أعارض  
○ أوافق  
○ أوافق بشدة

Business systems success (BSS)

BSS1: Our firm establishes good relationships with the user community for business systems success.

- (1) Strongly Disagree
- (2) Disagree
- (3) Neither Agree nor Disagree
- (4) Agree
- (5) Strongly Agree

BSS2: Our business system satisfies end-user requirements.

- (1) Strongly Disagree
- (2) Disagree
- (3) Neither Agree nor Disagree
- (4) Agree
- (5) Strongly Agree

BSS3: Our firm establishes and maintains a good image and reputation with end-users.

- (1) Strongly Disagree
- (2) Disagree
- (3) Neither Agree nor Disagree
- (4) Agree
- (5) Strongly Agree

BSS4: Our business system enables the organization to respond more quickly to change.

- (1) Strongly Disagree
- (2) Disagree
- (3) Neither Agree nor Disagree
- (4) Agree
- (5) Strongly Agree

BSS5: Our firm ensures that business system projects provide business.

- (1) Strongly Disagree
- (2) Disagree
- (3) Neither Agree nor Disagree
- (4) Agree
- (5) Strongly Agree

BSS6: The results of business system are achieved through focus on the process of gathering knowledge from business system use.

- (1) Strongly Disagree
- (2) Disagree
- (3) Neither Agree nor Disagree
- (4) Agree
- (5) Strongly Agree

نجاح نظم الأعمال (فوائد)

6 شركتنا يؤسس علاقات جيدة مع المجتمع المستخدم لنجاح أنظمة العمل.

- لا أوافق بشدة
- لا أوافق
- لا أوافق ولا أعارض
- أوافق
- أوافق بشدة

7 لدينا نظام عمل يلبي احتياجات المستخدمين النهائيين.

- لا أوافق بشدة
- لا أوافق
- لا أوافق ولا أعارض
- أوافق
- أوافق بشدة

8 شركتنا يؤسس ويحافظ على صورة وسمعة جيدة مع المستخدمين النهائيين.

- لا أوافق بشدة
- لا أوافق
- لا أوافق ولا أعارض
- أوافق
- أوافق بشدة

9 نظام أعمالنا تمكن المنظمة من الاستجابة بسرعة أكبر للتغيير.

- لا أوافق بشدة
- لا أوافق
- لا أوافق ولا أعارض
- أوافق
- أوافق بشدة

10 شركتنا تضمن مشاريع نظام عمل توفر الأعمال.

- لا أوافق بشدة
- لا أوافق
- لا أوافق ولا أعارض
- أوافق
- أوافق بشدة

11 يتم تحقيق نتائج نظام العمل من خلال التركيز على عملية جمع المعرفة من استخدام نظام عمل.

- لا أوافق بشدة
- لا أوافق
- لا أوافق ولا أعارض
- أوافق
- أوافق بشدة

| Individual Impact (Ind_Impact)                                                                                                                                                                                                                                                                                                         | التأثير الفردي                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Ind_Impact1: Our business system use enhances individual creativity.</p> <p>(1) Strongly Disagree<br/>(2) Disagree<br/>(3) Neither Agree nor Disagree<br/>(4) Agree<br/>(5) Strongly Agree</p>                                                                                                                                      | <p><b>12</b> لدينا استخدام نظام عمل يعزز الإبداع الفردي.</p> <p><input type="radio"/> لا أوافق بشدة<br/><input type="radio"/> لا أوافق<br/><input type="radio"/> لا أوافق ولا أعارض<br/><input type="radio"/> أوافق<br/><input type="radio"/> أوافق بشدة</p>                  |
| <p>Ind_Impact1: Our business system use enhances higher quality of decision-making.</p> <p>(1) Strongly Disagree<br/>(2) Disagree<br/>(3) Neither Agree nor Disagree<br/>(4) Agree<br/>(5) Strongly Agree</p>                                                                                                                          | <p><b>13</b> لدينا استخدام نظام عمل يعزز جودة عالية من صنع القرار.</p> <p><input type="radio"/> لا أوافق بشدة<br/><input type="radio"/> لا أوافق<br/><input type="radio"/> لا أوافق ولا أعارض<br/><input type="radio"/> أوافق<br/><input type="radio"/> أوافق بشدة</p>        |
| <p>Ind_Impact1: Our business system use saves time for individual tasks/duties.</p> <p>(1) Strongly Disagree<br/>(2) Disagree<br/>(3) Neither Agree nor Disagree<br/>(4) Agree<br/>(5) Strongly Agree</p>                                                                                                                              | <p><b>14</b> لدينا استخدام نظام عمل يوفر الوقت للمهام الفردية / الواجبات.</p> <p><input type="radio"/> لا أوافق بشدة<br/><input type="radio"/> لا أوافق<br/><input type="radio"/> لا أوافق ولا أعارض<br/><input type="radio"/> أوافق<br/><input type="radio"/> أوافق بشدة</p> |
| <p>Organizational Impact (Org_Impact)</p>                                                                                                                                                                                                                                                                                              | <p><b>الأثر التنظيمي</b></p>                                                                                                                                                                                                                                                  |
| <p>Org_Impact1: Our business system reduces organizational costs.</p> <p>(1) Strongly Disagree<br/>(2) Disagree<br/>(3) Neither Agree nor Disagree<br/>(4) Agree<br/>(5) Strongly Agree</p>                                                                                                                                            | <p>نظام أعمالنا يقلل التكاليف التنظيمية.</p> <p>m <input type="radio"/> لا أوافق بشدة<br/>m <input type="radio"/> لا أوافق<br/>m <input type="radio"/> لا أوافق ولا أعارض<br/>m <input type="radio"/> أوافق<br/>m <input type="radio"/> أوافق بشدة</p>                        |
| <p>Org_Impact1: Our business system improves overall productivity.</p> <p>(1) Strongly Disagree<br/>(2) Disagree<br/>(3) Neither Agree nor Disagree<br/>(4) Agree<br/>(5) Strongly Agree</p>                                                                                                                                           | <p>نظام عملنا على تحسين الإنتاجية العامة.</p> <p>m <input type="radio"/> لا أوافق بشدة<br/>m <input type="radio"/> لا أوافق<br/>m <input type="radio"/> لا أوافق ولا أعارض<br/>m <input type="radio"/> أوافق<br/>m <input type="radio"/> أوافق بشدة</p>                       |
| <p>Org_Impact1: Our business system allows for better use of organizational data resource.</p> <p>(1) Strongly Disagree<br/>(2) Disagree<br/>(3) Neither Agree nor Disagree<br/>(4) Agree<br/>(5) Strongly Agree</p>                                                                                                                   | <p>يسمح نظام أعمالنا لاستخدام أفضل للموارد البيانات التنظيمية.</p> <p>m <input type="radio"/> لا أوافق بشدة<br/>m <input type="radio"/> لا أوافق<br/>m <input type="radio"/> لا أوافق ولا أعارض<br/>m <input type="radio"/> أوافق<br/>m <input type="radio"/> أوافق بشدة</p>  |
| <p>Any suggestions about business systems success in your organisation? For-example. What are the other factors you think is important for business system use such as leadership?</p> <p>أي اقتراحات حول أنظمة العمل النجاح مؤسستك؟ من وجه أخرى . ما هي العوامل الأخرى التي تعتقد أنها مهمة في نجاح نظام العمل على النحو القيادة؟</p> |                                                                                                                                                                                                                                                                               |

## APPENDIX B: INTERVIEW QUESTIONS

### INFORMATION SHEET

Dear Participant,

This study is being conducted as a part for my research degree. **The purpose of the study is to learn the impact of culture on collaboration and business system success in Saudi Enterprise.** The results from this project will help us understand organisation culture and collaboration mechanism for the success of business systems for Saudi enterprise. **The interview should take no more than 30 minutes.**

The researcher believes that there is little or no risk associated with your participation. Your responses will be kept completely confidential and will only be used for academic purpose. Participation in this research study is completely voluntary. You have the right to withdraw at any time or refuse to participate entirely.

If you have concerns about the research that you think I or my supervisor can help you with, please feel free to contact me (us) on [REDACTED] (Saudi) +61 2 9514 1912 (Sydney). Or via email [REDACTED]

## **Interview Questions**

How would you describe the culture of your organization?

### **Development Culture**

Do your team members build on everyone's ideas when working on a business system?

Do you feel that your team tries to achieve the best possible outcomes from the business system?

### **Group culture**

Do you feel a sense of togetherness in the team?

Do they always talk about new ideas/technologies/techniques with team members?

Does your team try to spend time exploring different approaches in solving problems?

### **Hierarchical Culture**

When your team achieves something good, does he give credits to the team members?

Does your team have any special activity that use to develop new ideas?

How did your team seek to keep others informed about company goals and progress on business systems?

### **Rational Culture**

Does the firm prefer you to stick with your existing business systems?

Do you think your firm provides enough funding, for-example, investing in new business systems?

### **Knowledge sharing**

What about the communication? Do you feel an open collaboration atmosphere?

Is it easy to communicate with people in different department, do you have to go through some sort of channels?

How important is project teamwork to your company?

Do you encourage team members to share information?

Do you usually work on a project team or do you primarily work alone on projects?

### **Business systems success (Benefits)**

What are the primary benefits your organization wants from business systems?

Do you think your firm has a good reputation with clients?

What are the primary benefits your organization wants from business systems?

### **Individual Impact**

Do you think you are more rewarded for individual activities or for work on teams?

Are you confident in your ideas/knowledge?

Do you think the use of business systems improves your individual productivity?

### **Organizational Impact**

Comparing with your competitor, do you think your firm is ahead in adopting new technologies?

Do you think your firm has a growth in terms of increased profits, more contracts over the last years?

Does the firm have enough people to support such new technologies?

**Other**

Based on all your experience, what do you think are the most important success factors for use of business system?