Managing CoDesign in Dynamic Alliance Networks

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Declaration

I, Abdussalam Ali, declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references given.

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Abstract

The research described in this thesis develops ways to support creativity in dynamic business networks. Businesses in a business network are organized to bring their knowledge and assets together to develop new services and products. Traditionally business networks were stable. However, the changing nature of the business environment calls for new knowledge, which is increasingly met by bringing in new businesses with the new knowledge into the network and often changing the network structure. At the same time greater creativity and innovation are needed to address the emerging problems. Consequently, networks must create the environment that supports members from businesses working together to combine their knowledge to create innovative solutions. The design process is thus becoming increasingly collaborative as product design emerges as new ideas emerge. There is more emphasis on supporting collaborative design (CoDesign) where individuals and teams from different disciplines, including customers, consumers and users work together in the design process.

Although CoDesign itself is now well-understood, how to manage it within a dynamic networking environment given greater emphasis on privacy and knowledge is still not well understood. The research described in this thesis will contribute to knowledge of how to integrate business networking arrangements with CoDesign while maintaining knowledge sharing and privacy. To do this we have developed a model that will contribute to knowledge of how to integrate business networking arrangements with CoDesign and enable knowledge sharing and privacy.

To develop the model we have analysed existing business network structures, classified them by a set of concepts and developed a model that covers existing practices, integrates structure with CoDesign and supports dynamic change to networking arrangements. The model is made up of two levels – the business networking level and the design level. The business networking level defines the responsibilities of businesses and the privacy
constraints. In the model, teams are created across the businesses and organisations. The design level is where these teams carry out CoDesign. The model describes ways for such networks to change as people in businesses join and resign over the time and the governance structures to preserve privacy.

The design level is facilitated by providing people in businesses with an environment to create and share knowledge for CoDesign. Knowledge management related research has been investigated as the CoDesign process is considered knowledge management intensive. In the networking level the model defines spaces where people in businesses join and agree on collaborative activities. In the creativity level those people are provided with tools where they can create and share knowledge. In the thesis we show how Design Thinking tools are introduced to support creativity in the CoDesign process. However, the model can support any tools needed for some special problem. Maintaining privacy is considered where rules and policies are defined to control accessing the knowledge and other components.

The model has been defined and a prototype has been implemented to evaluate the model by following the qualitative method. The model has been evaluated by conducting semi-structured interviews with experts. The experts agree that the model supports creativity in the dynamic business networks. However, their advice for future work and development should be considered.
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List of Abbreviations

SECI: Socialisation, Externalisation, Combination and Internalisation. The model of knowledge transfer mechanisms developed by Nonaka.

KM: Knowledge Management

DAN: Dynamic Alliance Network

CoDAN: The acronym of our research model

CoDesign: Collaborative Design

WWW: World Wide Web

CAD: Computer Aided Design

DT: Design Thinking
Glossary

Alliance Network
In business context alliance network is where businesses of common interests build relationships to collaborate. Participants in alliance networks create and share knowledge for innovative outcomes and competitive advantages (Chen and Chen, 2002).

Brainstorming
Brainstorming is where teams collect as many ideas as possible in a short time. The main purpose is to get ideas rather than discussing them (Tschimmel, 2012).

Business
In this thesis we refer to an organisation, a company and firm as a business. According to the business dictionary (2018a) business provides goods or services, either privately owned or not-for-profit.

CoDAN
CoDAN is the acronym for our research model, the model for supporting CoDesign in Dynamic Alliance Networks (DANs).

CoDesign
CoDesign is the process where two or more businesses in a business network collaborate to create a product or service. People from different disciplines, including users and customers, participate in the CoDesign process ((Du et al., 2012) and (Kankainen, 2012)).
CoDesign Outcomes
CoDesign outcomes are goals and business objectives to be achieved through the CoDesign process such as developing new products and services.

CoDesign Process
CoDesign process is a number of activities, which are carried out to achieve the CoDesign outcomes and are performed collaboratively.

CoDesign Space (CoDesign-Space)
CoDesign space in CoDAN is where business members in the network create the outcome of CoDesign Activities. CoDesign-Space is created in the DAN-Space. The person who creates CoDesign-Space becomes CoDesign-Space-Owner.

CoDesign Activity
CoDesign Activity in CoDAN is what a group of people do and perform to achieve one or more of CoDesign outcomes in DAN. CoDesign Activities are the breakdowns of CoDesign process.

CoDesign Activity to CoDesign Activity knowledge transfer mode
In this mode the knowledge is transferred from one CoDesign Activity to another within the same CoDesign-Space.

CoDesign-Space to CoDesign-Space knowledge transfer mode
In this mode the knowledge is transferred from one CoDesign-Space to another within the same DAN-Space.

CoDesign-Space-Owner
A role defined by CoDAN assigned to a person who creates CoDesign-Space to manage it. In Governed DAN-Space this role is assigned to DAN-Space-Coordinator. In Not-Governed DAN-Space it is assigned to DAN-Space-Contributor.
**CoDesign-Space-Participant**

A role defined by CoDAN assigned to a person who is assigned to CoDesign-Space to participate in CoDesign. This role is assigned to the person from a business in DAN or from outside of DAN.

**Collaboration**

Collaboration is a process of joint decision making for a defined problem key issue. This process is a joint activity performed by people and teams across the business units or between businesses themselves (Qureshi, 2006), (Scariot et al., 2012) and (Elliott, 2011).

**Complexity (in business context)**

Complex systems are those systems with large numbers of elements. These elements are interrelated and connected. The change of one element may cause big changes to all of the system. Usually complex systems are adaptive to these changes. In business context complexity results from relationships between businesses which share the same environment of operation. As a result, these businesses should respond to emergence and changes to adapt to this complex environment (Bar-Yam, 2004).

**Components Privacy**

Maintaining privacy in the research model is to control accessing the components defined in CoDAN. These components are; DAN spaces, CoDesign spaces, CoDesign Activities and Creativity Tools. People access these components based on their roles’ policies.

**Conceptual Framework**

Conceptual framework in this research represents a number of concepts which are used to categorise DAN types. These concepts are domination, governance, collaboration modes, knowledge management domination and privacy concern levels.
**Contributed DAN**

Based on the conceptual framework, the DAN is considered contributed when a number of businesses participate in the DAN. One of the reasons which motivates businesses to participate is to benefit from the opportunities provided by the network.

**DAN Space (DAN-Space)**

DAN Space in CoDAN is a virtual space where businesses in DAN can join to network for CoDesign. In the model, DAN Space represents the level of supporting networking between businesses in Dynamic Alliance Network (DAN).

**DAN-Space-Contributor**

A role defined by CoDAN assigned to a person from the contributing business in DAN. In Governed DAN-Space, the person with this role can only be assigned to CoDesign-Space to participate in CoDesign. In Not-Governed DAN-Space, in addition, DAN-Space-Contributor can create CoDesign-Spaces and manage them.

**DAN-Space-Coordinator**

A role defined by CoDAN assigned to a person from the governing business in DAN to govern the Governed DAN-Space.

**DAN-Space-Dominant**

A role defined by CoDAN assigned to a person from the dominant business in DAN to have full access to the Governed DAN-Space.

**DAN-Space-Participant**

A role defined by CoDAN assigned to a person from outside of DAN in DAN-Space. The person with this role can be assigned to CoDesign-Space(s) to participate in CoDesign.

**Design Process**

Design in the business context often means the development of processes that lead to the creation of products or services.
Design Thinking

Design Thinking (DT) is a human-centred approach of solving problems through a set of creativity tools that support CoDesign to achieve innovative outcomes. In our research DANs utilise Design Thinking tools for CoDesign ((Tschimmel, 2012) and (Du et al., 2012)).

Dominant Business

Dominant business is the business that dominates DAN when it, for example, owns all or most of the assets and/or shareholdings in the network. Also, the domination is gained when the dominant business has an experience and expertise over the other member businesses in the network.

Dominated DAN

Based on our conceptual framework, the DAN is considered dominated if it is dominated by at least one business. The DAN can be dominated by more than one business. A business which dominates the DAN is called the dominant business.

Dominated Knowledge Management (KM)

Based on our conceptual framework, KM is considered dominated in DAN when at least one business controls the KM processes in the DAN.

Dynamic Alliance Network (DAN)

In our research, Dynamic Alliance Network (DAN) is a business networking environment created by businesses for collaboration in CoDesign. Businesses in DAN join and leave at any time. Business networks are known as business alliance networks, and because of their dynamic feature we call such networks in this thesis Dynamic Alliance Networks (DANs).
**Flat Governance**

Flat governance, based on our conceptual framework, is when the members of the network share the responsibility of governing and coordinating the network. The flat governance usually encourages sharing the costs, risks and challenges between the members in the DAN (Pisano and Verganti, 2008).

**Governed DAN-Space**

Governed DAN-Space is a type of DAN-Space that is governed at least by one business from DAN. The person who governs the Governed DAN-Space is assigned DAN-Space-Coordinator role.

**Governing Business**

Governing business is the business that governs DAN in terms of coordination and management. Governing business governs the DAN-Space created for DAN. Also, the governing business can be assigned for a single project in DAN.

**Hierarchical Governance**

In our model, the hierarchical governance is when a specific business has the authority to coordinate and manage the process in the DAN or in the DAN-Space.

**High Level of Privacy Concern**

Based on our conceptual framework, DAN is considered with a high level of privacy concern when there is a design and production processes performed among the members of the DAN.

**Human-Centered Design**

Human-Centered design is when users and consumers are involved in the design process for developing a product or service ((Tschimmel, 2012), and (Mootee, 2011)).
Knowledge Management Processes

Knowledge management processes are those processes involved in managing the knowledge. These processes include knowledge discovery, capturing, filtering and sharing ((Awad and Ghaziri, 2004) and (Becerra-Fernandez and Sabherwal, 2010) and (Dakilir, 2011b)).

Knowledge Ownership

Knowledge ownership defines who owns the knowledge. Knowledge owners can be individuals and/or businesses. When maintaining privacy in CoDesign, knowledge ownership should be considered. The owned knowledge is only accessed by those who are authorised.

Knowledge Sharing

It is the process when tacit and explicit knowledge is exchanged between individuals and groups ((Awad and Ghaziri, 2004) and (Becerra-Fernandez and Sabherwal, 2010)).

Knowledge Transfer

In our model knowledge transfer is moving a specific knowledge from one CoDesign-Activity to another or from one CoDesign-Space to another. Knowledge transfer is a KM process which supports knowledge sharing.

Low Level of Privacy Concern

Based on our conceptual framework, the DAN is considered with a low level of privacy concern when there are no design and development processes performed among the members of DAN.

Maintaining Privacy

Maintaining privacy is the implementation of the procedures and methods to be applied to protect the private assets. These procedures include the ways of how to authorise people to access these assets when needed.
Not-Governed DAN-Space

The Not-Governed DAN-Space is the DAN-Space type that is not governed by a governing business in DAN. The person who creates this DAN-Space is assigned DAN-Space-Contributor role.

Open Mode Collaboration

Based on our conceptual framework, the network is in open mode collaboration if the problem and knowledge domain are not defined (Pisano and Verganti, 2008).

Persona-map

Persona-map is a Design Thinking tool used to record the knowledge in relation to people’s needs ((Tschimmel, 2012) and Crandall (Crandall, 2010)).

Privacy

Privacy is keeping something protected and secured unless authorised. That includes the knowledge and personal information and actions (Muniraman et al., 2007).

Research Framework

Research framework in this thesis shows the guidelines towards designing and implementing a model to manage CoDesign in DANs. In this framework CoDesign management is based on five themes; knowledge sharing, self-organising, business networking, maintaining privacy and enabling creativity. A number of enablers are defined in this research for each theme which are supported by the research model, CoDAN.

Role

Role as defined in the model, CoDAN, is a number of responsibilities assigned to the person when joining DAN-Space and CoDesign-Space.
Shared Knowledge Management (KM)

Based on our conceptual framework, KM is considered shared, not dominated, when there is no a specific business dominates the KM processes. The sharing of the knowledge management does not involve a specific business as a central point of management.

Stakeholders

Stakeholders are the individuals, groups and businesses who benefit from the developed product or service.

Storyboarding

Storyboarding is a Design Thinking tool used to create stories. Stories in the storyboard form the focus for new ideas (Tschimmel, 2012).

System as such strategy

It is a strategy when the users are not involved in the system evaluation process. In this case only the evaluator refers to the system and the documentation provided for evaluation ((Cronholm and Goldkuhl, 2003) and (Chen et al., 2011)).

System in use strategy

It is a strategy when the users are involved in the system evaluation process. ((Cronholm and Goldkuhl, 2003) and (Chen et al., 2011)).

Wicked Problem

Wicked problem is a kind of problem that has no specific definition or formulation. Every wicked problem can be described in more than one way. This kind of problems has no specific solution. Solutions for wicked problems cannot be described as right or wrong, instead, they are either better or worse. The way to reach this solution is iterative ((Rylander, 2009) and (Buchanan, 1992)).