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SYSTEMIC PROBLEMS RELATED TO MULTIPLE STAKEHOLDERS IN TECHNOLOGY ADOPTION AND USE IN ORGANIZATIONS: A SYSTEMS THINKING PERSPECTIVE

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A thesis submitted in partial fulfilment of the requirements for the degree of

Doctor of Philosophy

School of Management
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Western Australia

August 2011

SYSTEMIC PROBLEMS RELATED TO MULTIPLE STAKEHOLDERS IN TECHNOLOGY ADOPTION AND USE IN ORGANIZATIONS: A SYSTEMS THINKING PERSPECTIVE

School of Management
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Edith Cowan University
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August 2011

USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

ABSTRACT

Understanding and creating the conditions under which information systems will be embraced by human organizations (thinking systems) remain high-priority research issues. Despite numerous benefits associated with information technology (IT), implementing an information system (IS) in organizational environment is challenging. The literature reports numerous IS project failures. During IS implementation, several factors impede technology's widespread adoption and use in organizations. These organizational problems often result from such barriers or 'systemic problems'.

The proposed work is based on the argument that addressing 'systemic problems' can reduce barriers to organizational progress. Most of the IS/IT adoption theories (e.g. TAM, UTAUT, TAM2 and TAM3) highlight factors related to system users, completely ignoring the other stakeholders who are affected by the adoption process. The purpose of this study is to apply an holistic or systems thinking approach to identify systemic problems in information technology adoption and use within an organizational context by considering the complete stakeholder set as a 'system of stakeholders'. It involves the study of a web portal implementation project in an Australian university referred to as Aus-Uni. Data was collected through face-to-face interviews of different stakeholders across Aus-Uni and were fundamentally classified into the two categories of 'involved' and 'affected'. Their relevant comments and experiences have been analysed using the lens of a systems thinking-based framework of Critical Systems Heuristics (CSH). The interpretive approach, based on structured-case study method, and the technique of practising CSH have been used as a data gathering framework for this case study.

The study's findings contribute towards identifying information needs and systemic problem scenarios, related to multiple stakeholders in the context of the web portal project. However, its insights may allow broader applications. The roles which these stakeholders play have been classified under the categories prescribed by the CSH methodology of boundary critique. This generated 'system of stakeholders' was further analysed to explore problem scenarios as subsystems to this 'system of stakeholders'. Each problem scenario

identifies who was *involved* and *affected* by it. It is believed that identifying problems holistically will lead to smoother IS adoption, and reduce IS project failures.

This research also proposes two theoretical models based on Critical Systems Heuristics (CSH); one for IS adoption, which demonstrates how CSH can be coupled with the existing IS implementation methodologies to create a holistic perspective of IS implementation issues. This model uses Systems Development Life Cycle (SDLC) as an example, and proposes that the stakeholder roles need to be identified using boundary critique throughout the project life cycle. The second model is for managing conflicts in the context of organizational change, and is applicable for implementing innovative practices inside organizations, and identifying conflicting scenarios which surface during that process.

Some sections of this thesis have already been published in refereed journals and refereed conference proceedings:

Refereed Journal Publications:

1. Syed Arshad Raza and Craig Standing (2011), A systemic model for managing and evaluating conflicts in organizational change, Systemic Practice and Action Research, Volume 24, DOI: 10.1007/s11213-010-9186-0.

2. Syed Arshad Raza and Craig Standing (2010), Towards a systemic model on information systems' adoption using critical systems thinking, Journal of Systems and Information Technology, Vol. 12 Issue 3, 196–209, ISSN: 1328-7265, DOI: 10.1108/13287261011070821.

Refereed conference papers and proceedings:

1. Syed Arshad Raza and Craig Standing (2011), Critical Systems Heuristics: A Tool for the Identification of Information Needs of Multiple Stakeholders in a Web Portal Project, Proceedings of the AIM 2011 Information Systems Conference, 25 – 27 May, 2011, Reunion Island.

2. Syed Arshad Raza and Craig Standing (2010), A Critical Systems Thinking Perspective for IS Adoption, Proceedings of the 5th Biennial ANU Workshop on Information Systems Foundations: Theory Building in Information Systems, September 29 – October 2010, The Australian National University, Canberra, Australia.

3. Syed Arshad Raza and Craig Standing (2008), Systemic Problems in Information Technology Adoption and Use: A Systems Thinking Perspective, Proceedings of the 14th ANZSYS Conference, 1 – 2 December 2008, Edith Cowan University, Perth, Australia.

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CHAPTER ONE
INTRODUCTION

1.1 Introduction

This thesis examines barriers to information technology (IT) adoption and use, considered as *systemic problems*, in an organizational context using an interpretive case study of a university portal. The research study adopts a perspective of Critical Systems Heuristics. The first chapter provides an overview of the thesis and its structural organization. Initially, it provides the research background on IT-based innovations, followed by the research need, purpose and questions. Then the significance of the study is provided. The chapter then concludes with explaining the organization of the thesis.

1.2 Background to the Study

Adoption and use of Information Technology (IT) innovations in organizations have been extensively researched within the information systems (IS) field. Embracing and using IT to improve efficiency and to create competitive advantage has been a major focus for organizations in the past few decades. IT comprises of a growing range of hardware, applications and services to process of information, which are specifically related to computers, telecommunications, and multimedia data (Keen, 1995). These three building blocks can be put together in various ways to produce a complete IT resource across an organization (Harper & Utley, 2001). Previous studies (Mata, Fuerst, & Barney, 1995; Santhanam & Hartono, 2003) showed that IT is deployed to develop organizational IS to mainly manipulate organizational information and facilitate operational effectiveness. The investment in IS/IT projects continues to grow until today as IT becomes less expensive, more portable, and systems become more mutually integrated (Quinn & Martin, 1994).

Adoption is about using an innovation in full, as it is seen by the user as the best option available for the completion of a task (Rogers, 2003). As much of diffusion research considers innovations in terms of technology, Rogers (2003) has referred to "technology" and "innovation" interchangeably. The last two and a half decades have marked an eminent progress in elaborating and predicting the adoption of IT-based innovations through a rich and diverse body of theoretical and empirical work. (Jeyaraj & Sabherwal, 2008), as shown in Figure 1.1.

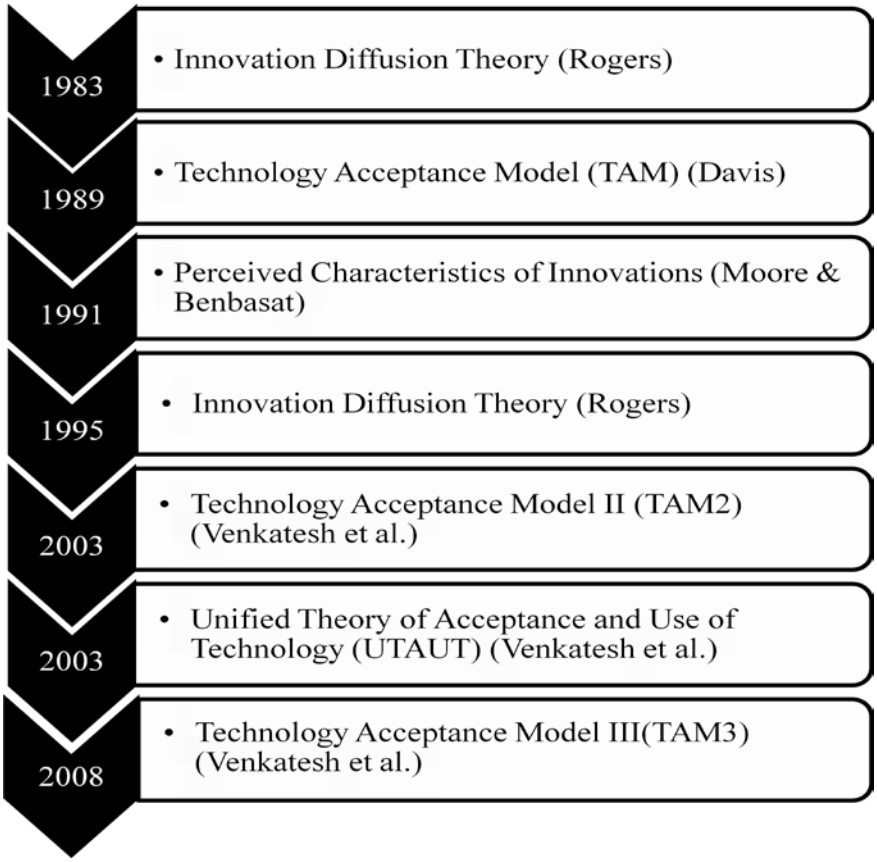


Figure 1.1: Development of IS/IT research in the last 25 years

User acceptance models such as the Technology Acceptance Model (TAM) (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989), Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980), Theory of Planned Behaviour (TPB) (Ajzen, 1991), and Innovation Diffusion Theory (IDT) (Rogers, 1983) have played a vital part in contributing to the organizational understanding related to user acceptance of technology. TRA is about the intention of an individual about adoption, while IDT explains an individual's adoption

behaviour. Various studies such as Szajna (1996), Karahanna, Straub, & Chervany (1999), refer to behavioural intention and adoption behaviour interchangeably.

Theories proposed earlier contributed to the ones developed later. For example, TPB which incorporated the additional notion of perceived behavioural control, actually originated from TRA (Ajzen, 1991; Fishbein & Ajzen, 1975). Similarly, IDT by Rogers (1983) was elaborated further as the Perceived Characteristics of Innovations (PCI) by Moore and Benbasat (1991).

TAM comprises of *Perceived Usefulness* and *Perceived Ease of Use* as primary elements for predicting technology adoption (Venkatesh & Bala, 2008). According to TAM, the user's beliefs about an innovation and the resultant attitude guide a user's decision about using or not using a technology. TAM was later extended to TAM2 (Venkatesh & Davis, 2000), and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003).

TAM2 proposed the additional variables of *Subjective Norm, Output Quality, Result Demonstrability, Image*, with two moderating variables of *Experience* and *Job Relevance*. It explained how perceived usefulness and behavioural intention are influenced by different factors through *Social Influence* and *Cognitive Instrumental* processes (Venkatesh & Bala, 2008). It theorized that people utilize mental assessment (*Cognitive Instrumental* processes) to work out how vocational objectives are related to the outcome of system usage (Venkatesh & Davis, 2000). The constructs of *Subjective Norm* and *Image* in TAM2, represent the *Social Influence* processes.

UTAUT was formulated with the additional constructs of *Social Influence, Effort Expectancy, Performance Expectancy,* and *Facilitating Conditions*, impacting directly on the acceptance and usage behaviour, while the constructs of *Age, Experience, Gender,* and *Voluntariness of Use* were the moderators (Venkatesh, et al., 2003). Further refinement in TAM2 was brought about by TAM3 (Venkatesh & Bala, 2008), which enhanced our understanding of a system's usage experience by supplementing TAM's *Perceived Ease of Use* with constructs such as *Computer Anxiety,, Computer Self-efficacy, Computer Playfulness,* and *Perceived Enjoyment*.

The theory building contribution of Rogers (1983, 1995) mainly dealt with the study of individualistic behaviour on the innovation diffusion process. However, he also addressed innovation diffusion within organizations. His theory defines an innovation as "an idea, practice, or project that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12). He identified *innovation*, *communication*, *time*, and *social system* as the four ingredients to his Innovation Diffusion Theory (IDF). The rate at which an innovation is adopted by individuals is related to the characteristics of that innovation, while the communication process contributes to creating and sharing of perceptions about it. The infrastructure for innovation diffusion is provided by our social setup, which comprises of individuals, groups, and organizations, sharing a common binding objective.

The theories mentioned above proposed various types of individual variables in the form of individual attributes, innovation characteristics and organizational characteristics (Jeyaraj, Rottman, & Lacity, 2006). Individual attributes include *Gender* and *Age* (e.g. Venkatesh, et al., 2003), *Motivation* (e.g. Davis, et al., 1989), *Education* (e.g. Igbaria, 1993), *Experience*, *Personal Innovativeness* (Agarwal & Prasad, 1997), *Anxiety* (e.g. Compeau & Higgins, 1995), and *Attitudes* (e.g. Taylor & Todd, 1995). Innovation characteristics differ among theories. For example, while TAM proposed *Perceived Ease of Use* and *Perceived Usefulness* (Davis, et al., 1989), Innovation Diffusion Theory (IDT) (Rogers, 1995) considered *Compatibility*, *Observability*, *Complexity*, *Trialability* and *Relative Advantage* as being influential. Organizational characteristics comprise of *Voluntariness* (e.g. Agarwal & Prasad, 1997), *Subjective Norms* (e.g. Fishbein & Ajzen, 1975), and *Facilitating Conditions* (e.g. Thompson, Higgins, & Howell, 1994). Table 1.1 presents a summary of the inter-related core constructs among these seminal works.

Table 1.1: Technology adoption theories and their inter-connections

Theory	***Core Constructs***
Theory of Reasoned Action (TRA)	Attitude Toward Behaviour, Subjective Norm
Technology Acceptance Model (TAM)	Perceived Usefulness, Perceived Ease of Use
Theory of Planned Behaviour (TPB)	Attitude Toward Behaviour, Subjective Norm (both adapted from TRA), Perceived Behavioural Control
Technology Acceptance Model-2 (TAM2)	Perceived Usefulness, Perceived Ease of Use (both adapted from TAM), Subjective Norm (adapted from TRA/TPB)

Although these theories are underpinned by different concepts pertaining to "decision to adopt, intention to adopt, intention to use, adoption and diffusion, there is a consensus in the literature that beliefs affect attitudes, which in turn, affect intentions, which in turn, affect adoption and use" (Jeyaraj & Sabherwal, 2008, p. 207), as shown in Figure 1.2.

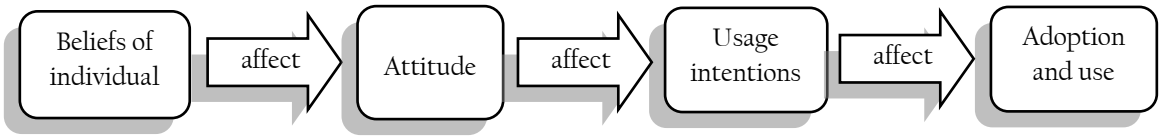


Figure 1.2: Focus of IS/IT literature

1.3 Need and Purpose of the Study

Successful information technology adoption has not been without its challenges. Although earlier work has usefully contributed to the understanding of IS/IT adoption, as per Jeyaraj and Sabherwal (2008), it has mainly been with:

- Exploring constructs that influence users or adopters of IS/IT innovations

- Focusing on IS/IT adopters' perceptions about system usage rather than actual behaviours

- Adoption behaviour of "individuals" as a unit of analysis

Among all theories mentioned above, Innovation Diffusion Theory (Rogers, 1983, 1995) is the only one applied in both individual and organizational adoption studies, as shown in Table 1.2.

Technology adoption is not a single event (Attewell, 1992). The trend dictating the change or transformation of several stand-alone applications into information systems which are mutually connected and distributed across organizations, have a major influence on the structure, norms, and working habits of an organization (Doherty & King, 1998). According to Eveland and Tornatzky (1990), the advanced technologies are too large and complex for an individual's grasp of cognitive power, the decisions regarding their adoption are also tedious. They, instead recommend a perspective that views diffusion and adoption of technologies within contexts which comprises of five elements.

Table 1.2: Theories used in individual and organizational IT adoption research (Jeyaraj, et al., 2006)

Theory	***Main author(s)***	***Used in individual adoption studies***	***Used in organizational adoption studies***
Innovation Diffusion Theory	Rogers (1983, 1995)	X	X
Perceived Characteristics of Innovations	Moore and Benbasat (1991)	X	
Social Cognitive Theory	Bandura (1986)	X	
Technology Acceptance Model	Davis (1989)	X	
Technology Acceptance Model II	Venkatesh et al. (2003)	X	
Theory of Planned Behaviour	Ajzen (1991)	X	
Theory of Reasoned Action	Fishbein and Ajzen (1975)	X	
Unified Theory of Acceptance and Use of Technology	Venkatesh et al. (2003)	X	
Diffusion/Implementation Model	Kwon and Zmud (1987)		X
Tri-Core Model	Swanson (1994)		X

These five elements of the context, as suggested by Eveland and Tornatzky (1990) include:

1. Nature of technology to be adopted
2. User characteristics
3. Characteristics of those deploying the technology
4. Boundary considerations between those deploying the technology and those using it (or supposed to use it)
5. Characteristics of communication and transaction mechanisms

Due to IS becoming more complex and inter-connected, for example with the advent of e-commerce that connects firms and customers, a broader view for IS adoption has become even more important (Stockdale & Standing, 2005). IS/IT research should, therefore, go beyond individualistic perspective. As mentioned above, Eveland and Tornatzky (1990) recommend that in addition to the user, those who are deploying the technology (technology deployer) should also be included.

In reality, the individual users are embedded in a system of stakeholders in which other stakeholders, who are not the end users of the IT based system, also have an influence or role in the overall IS/IT adoption process. Most of the above mentioned IS/IT adoption theories (e.g. TAM, UTAUT, TAM2 and TAM3) highlight factors related to system users, completely ignoring the other stakeholders and the roles they play in the adoption process. Software Engineering stresses an information system to address the needs of end users and other stakeholders (Ågerfalk & Eriksson, 2006). This clearly points out the significance of the other stakeholders which may not be directly involved in the system usage but still render vital contribution over time in the adoption and use of IT innovation across the organization. For example, in a e-healthcare system, the administration may opt for an information processing technology based on the usage factors or constructs pertaining to doctors, nurses and administration staff, who are directly related to the system usage, ignoring entirely or paying minimum attention to

the data handling issues related to a major category of stakeholders which are affected by such an implementation and practice, i.e. the patients.

Thus, the poverty of the individual adoption models lies in the fact that they attempt to address technology adoption and usage factors without any guidelines sought from the 'affected' category of people. Putting these 'victims' beyond the boundary of the model may result in serving the interests of those who are dominant and influential, without having any ethical considerations for those affected while making boundary judgements. This requires more inclusive and ethical methods in IS research (J. Mingers & Walsham, 2010). This study addresses this research gap and contributes to the knowledge base of IS/IT adoption within organizations.

It is widely accepted that the processes of designing, developing and implementing an information system are cumbersome and not straightforward due to frequent failures of IS projects (Devos, Van Landegham, & Deschoolmeester, 2008). The exploration of how IS/IT might be successfully applied to enhance performance and productivity reveals numerous relevant aspects of that organization. These aspects comprise issues such as an organization's human relationships or interactions, policies and procedures, strategies and controls (Harper & Utley, 2001). These factors create a complex amalgam that is hard to identify and analyse. The number of these factors and their cause and effect over time make situational studies even more complicated (Waldman, 2007). If a malfunction occurs and its root causes are not effectively addressed, the problems are exacerbated (Devos, et al., 2008), leading to unintended consequences (Waldman, 2007).

Smith and Keil (2003) noted the inability of the traditional techniques such as JAD (Joint Application Development) in dealing with social issues in an organization. However, in reality the design practices of information systems have been dominated by the technical issues (Doherty & King, 1998), creating a 'culture gap' between IS professionals and their business counterparts (Taylor-Cummings, 1998). Technology adoption requires not only modification and mastery of the technology, but often also modifications in organizational practices and procedures which remain frequently unanticipated (Attewell, 1992).

These critiques imply that a different lens or perspective is needed which is capable of undertaking or encompassing:

1. A more comprehensive boundary consideration, which is capable of portraying a holistic picture of the complete stakeholder set and their roles in relation to IT/IS adoption and use.

2. A study focusing on what potential barriers organizations face in IS/IT adoption and use from a multiple stakeholder perspective. The study refers to such problems as "systemic problems". The introduction to "systemic problems" in the context of the study is presented later in this section.

Generally speaking, despite all scientific and technological advancements, our society is confronted with some serious social and resource problems and issues. For instance:

- Wastage of food despite poor basic infrastructure in many countries around the globe as thousands of tons of food is dumped into the sea each year

- Unsustainable exploitation of forests

- Absence of electric supply service to one-third of the world's population

- Inability to avoid wars, openly committed war crimes, racial violence and abuses of individual rights without any significant progress towards the establishment of justice

The above listed examples are just a glimpse of some of the worst scenarios prevailing in various societal systems around the globe. The issues or problems do not generate in isolation but *emerge* as a consequence of the factors such as selfishness, corruption, greed for wealth and political dominance, incompetent leadership or the lack of vision of those in power. *Emergent* means that these problems are generated by the interaction or, in some cases, the lack of interaction among various parts. Such problems are termed as 'messes', which in fact, are systems of problems (Ackoff, 1999).

Understanding the mechanism behind such problems is a major challenge. Due to their inter-connectedness, even mere identification of these problems cannot be properly achieved unless a holistic study is undertaken, let alone seeking solutions to them. Such a research demands extending the boundary of analysis for the system we all are connected with. It necessitates *Systems Thinking* and, as Herrscher (2006) urges, *passion, rigour* in scientific inquiry and *dialogue* for the exchange of ideas.

This study undertakes the identification of such problems in the context of IS/IT adoption in organizations. It was motivated by the study conducted by (S. Standing & Standing, 2007) on a Mobile Technology Adoption Project in the healthcare sector. The project was carried out by a major healthcare provider to improve the level of service, provide productivity gains, and reduce costs in that sector. In addition to indicating the benefits, their findings also shed light on the barriers to mobile technology adoption and use, as experienced by its stakeholders. They pointed out that the long lasting organizational problems are often a result of such barriers or *systemic problems*. This study as of Gharajedaghi (2006), considers them as a system of issues or factors which contribute to a problem scenario. However, underpinned by the systemic methodology of Critical Systems Heuristics (CSH), this research also investigates these problem scenarios in terms of stakeholders who are involved in their formulation, and those affected by them. In the context of IS/IT adoption CSH, with its underpinnings of systems thinking based theoretical and methodological guidelines, provides a forum for gathering stakeholder viewpoints about the technology being adopted. The details of CSH and the anatomy of *systemic problems* are discussed in the coming chapters.

Thus, *systemic problems* cause an IS to deviate from its purpose and the analysis of these issues requires:

- Seeking perspectives governing the context of a problem situation

- Developing a shared understanding of why the system behaves the way it does

Along with *passion*, the study uses Critical Systems Heuristics (CSH) as a method for providing *rigour* in scientific inquiry, and an alternative focus for identifying *systemic*

problems in IS/IT adoption in an organizational context. The methodology of Critical Systems Heuristics, proposed by Ulrich (1983) is a systems thinking-based framework for a reflective practice which uses *boundary critique* for the boundary definition of the social system design that includes those *involved* in and *affected* by it. Since the choices of boundary consideration are affected by the biases and interests over what should be included or excluded i.e. what is in the system as opposed to what is considered as the system's environment, CSH defines a boundary by including the maximum amount of information into the defined system boundary on one hand, and posing the question for their rational justification through a debate between stakeholders on the other. This makes it an ethical process involving multiple viewpoints (Achterkamp & Vos, 2007). The *dialogue* component is thus covered by the consideration of multiple stakeholder viewpoints. Moreover, the study considers organizations as thinking and learning systems in which issues emerge due to human interaction who continuously learn from their previous experiences. The details underlying the philosophy of CSH are presented in the next chapter.

The study is based on the following assumptions:

Assumptions:

1. An organization is a complex thinking system.

2. An effective organization is a dynamic learning system.

3. It is essential to define the scale or boundary of the system (organization) from a certain perspective.

Organizations as thinking systems require thinking humans for decisions in situations for which there are no established right answers (*assumption#1*). Since, a thinking system always learns, it can envisage preferred outcomes into the distant future (Waldman, 2007) (*assumption#2*). A learning organization possesses a capability to bear on decisions through the collaboration of an organization cum a machine network

(Levine & Monarch, 1998). The consideration of a perspective (*assumption#3*) is essential as a system in one perspective is a subsystem in another (Lazlo, 1972).

Moreover, this research considers IS/IT adoption as a change-based innovation project, taking an organizational IS as the "first successful system using a new information processing technology" (Agarwal, Tanniru, & Wilemon, 1997, p. 347). The study embraces Zaltman's (1979) definition of innovation as "an idea, practice, or a material artifact, perceived as new by a potential user or adopter" (p. 82), while IS/IT adoption is considered as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1995).

1.4 Research Questions

This section points out the specific goals of the study and the major research questions. The research aims to:

1. Apply the principles of Critical Systems Heuristics (CSH) for the establishment of a multiple stakeholder perspective to analyse IS/IT adoption and use as experienced by a Western Australian University in implementing its web portal.

2. Suggest some recommendations for organizations to facilitate IT adoption and use.

Based on the above objectives, the following research questions were formulated:

Research Question 1:

- What systemic problems or issues related to multiple stakeholders affect IT adoption, its use and success inside the organizations?

Research Question 2:

- What recommendations can be made to address these *systemic problems* for a smoother technology adoption and use for organizational success?

1.5 Significance of the Study

This research study is based on the argument that *systemic problems* are fundamental barriers to IS/IT adoption and use. They include motivation of staff, organizational practices and procedures, and multiple world views that exist within an organization. As an alternative focus, the study suggests that addressing *systemic problems* can be a method of reducing fundamental barriers to organizational progress. The study aims to highlight such problems and thus enhance organizational learning. Organizational learning is built out as individual insights and skills which become embedded in organizational routines and practices creating an amalgam rather than any individual's view or understanding (Attewell, 1992). The study of *systemic problems* considers that a multiple stakeholder perspective, underpinned by CSH, can be effective in identifying fundamental barriers to IS/IT adoption and hence in improving organizational capabilities for dealing with such issues.

The research uses a qualitative analysis of an IS/IT project involving the implementation of a web portal inside a Western Australian university. The study analyses and outlines the experiences related to barriers in IS/IT adoption and use (systemic problems) by viewing them through the eyes of multiple stakeholders.

This study marks its difference in various ways from the tradition in which IS/IT adoption has been previously investigated:

1. Determination of stakeholders and their roles in IS/IT adoption and use in an organizational context using boundary drawing guidelines based on *boundary critique*.

2. Recognition of marginalized or affected stakeholder perspectives using a holistic or Systems Thinking framework of Critical Systems Heuristics (CSH).

3. Utilization of CSH as a tool for the identification of information needs of multiple stakeholders in a web portal project.

4. Identification and analysis of *systemic problems* or issues related to them in order to facilitate a smoother IS/IT adoption, organizational learning and change.

5. Development of an IS/IT adoption model based on the existing IS theory to encompass the involvement of multiple stakeholder perspectives.
6. Development of a methodological model for identifying and managing conflicts in the context of an organizational IS/IT adoption project at various complexity levels in an organization involving individuals, face-to-face teams, and inter-departmental groups.

7. Recognition of the applicability of network-based mechanisms and intervention strategies for IS/IT adoption.

The thesis contribution can be portrayed as shown in Figure 1.3.

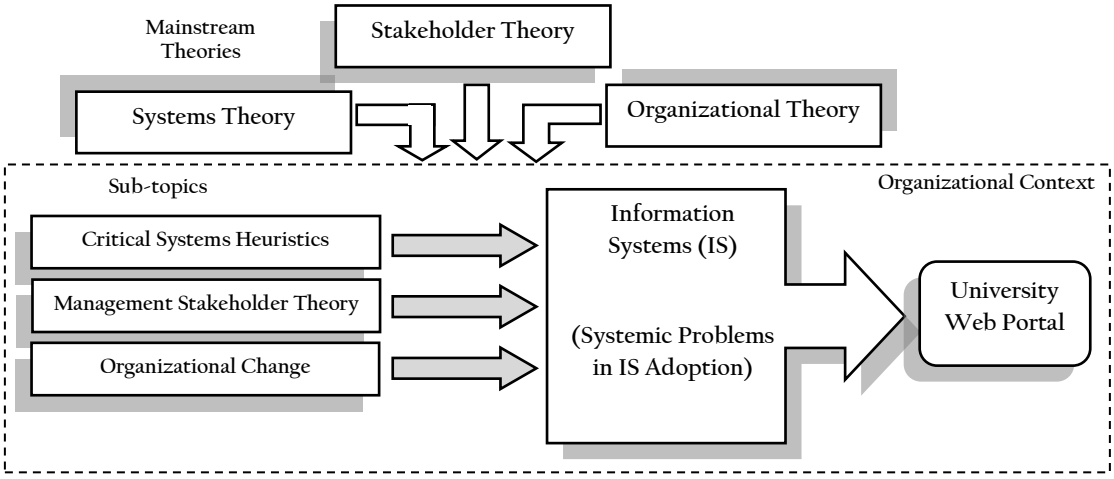


Figure 1.3: Theoretical contribution of thesis

The above figure illustrates the main stream theories underpinning this research and the topics within these theories. Critical Systems Heuristics (a sub-topic of Systems Theory), Management Stakeholder Theory (a sub-topic of Stakeholder Theory) and Organizational Change (a sub-topic of Organizational Theory) have been applied to a web portal project in an organizational context within Information Systems field. A

clear representation as to how these are tied together in form of a research contribution is shown in Figure 2.1.

1.6 Thesis Outline

CHAPTER ONE

Chapter one begins with an introduction to the research background of the study. The reader is then oriented to the need and purpose, underlying assumptions, research questions, and the significance of the study. The chapter mainly discusses the need of a holistic perspective for studying IS/IT adoption in an organizational context. It then highlights the application of *boundary critique* for seeking a multiple stakeholder perspective to identify *systemic problems*, and the development of a Critical Systems Heuristics (CSH) based conflict management and IS/IT adoption models in the context of organizational change.

CHAPTER TWO

Chapter two is a literature review of the core concepts which underpin the study, including systems thinking, Critical Systems Heuristics, stakeholder theory and organizational change. A brief overview of the history of the development or evolution of these underlying theories is also provided.

CHAPTER THREE

Chapter three outlines the research methodology applied to the study. Initially, it briefly discusses the research paradigm chosen for this research, followed by the justification of its choice. It then describes the research design at length. This study uses an interpretive methodology-based qualitative approach with an in-depth case study using interviews. This chapter also includes details about interview questions, data collection method and data analysis.

CHAPTER FOUR

Chapter four examines the case study and presents the data analysis and research findings. The data analysis was conducted in two phases. Phase one carried out boundary judgment, and explored the information needs of from a multiple stakeholder

perspective. Phase two identified systemic problems and the stakeholders involved in and affected by those problem scenarios. It also proposes a classification of these problems scenarios.

CHAPTER FIVE

To deal with systemic problems, chapter five provides recommendations in form of two CSH based theoretical models; a conflict management model to look at conflicts from a holistic perspective, and an IS model to demonstrate the applicability of boundary critique throughout an IS project life cycle. Discussions and limitations for these models are presented in separate sections.

CHAPTER SIX

This chapter provides research evaluation and conclusion. In the beginning, it highlights the requirements of the study which led to choosing CSH as a methodological framework, followed by the research contribution made by the study. It then evaluates the research on the basis of a framework proposed by Weber (2010). Finally, the chapter presents overall limitations of the research and some possible future research directions.

1.7 Summary

Organizations' dependence on IS/IT, for achieving operational and strategic efficiency, is widely acknowledged. The research study began from considering IS/IT as a toolset to manage organizational information. IS/IT is a source of improvement in information flow, decision making, level of service and productivity. However, it can sometimes face a number of potential barriers or *systemic problems* to its widespread adoption and use. The objective of the study was to identify and possibly classify such *systemic problems.*

The study used Critical Systems Heuristics (CSH) to a real life web portal project in a Western Australian university for boundary considerations from a multiple stakeholder perspective. An interpretive qualitative methodology was carried out for data analysis. The study also proposes a systemic conflict management model in an organizational

change scenario, and a systemic model for IS/IT adoption to enhance organizational learning for smoother IS/IT adoption and use. Both of these models are based on the principles of boundary critique, underpinned by the methodology of Critical Systems Heuristics, proposed by Ulrich (1983).

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of the concepts that underpin the study undertaken. Beginning with a brief introduction to reductionism and holism/systems thinking, a summary of the key concepts governing systems thinking is presented. The chapter, then, provides a bird's eye view of developments that took place across disciplinary fields, marking their contribution to the systems theory. This is followed by a brief discussion of the key concepts of the Critical Systems Thinking (CST) and Critical Systems Heuristics (CSH). The discussion then focuses on boundary critique, the core methodology of practising CSH, which in fact is the heart of the study. The chapter also discusses concepts related to stakeholder theory comprising of management stakeholder theory multiple stakeholder perspectives and stakeholder identification. The following sections establish the relationships between systems theory, stakeholder theory and organizational change in the context of organizational information systems (see Figure 2.1).

Due to enormously rich nature of the theories underpinning this study, the set of articles and books referred in this chapter do not offer a complete overview of the concepts these theories are based on. Nevertheless, it is believed that the selection of articles provides an adequate coverage of these concepts and yet capable of stimulating further research.

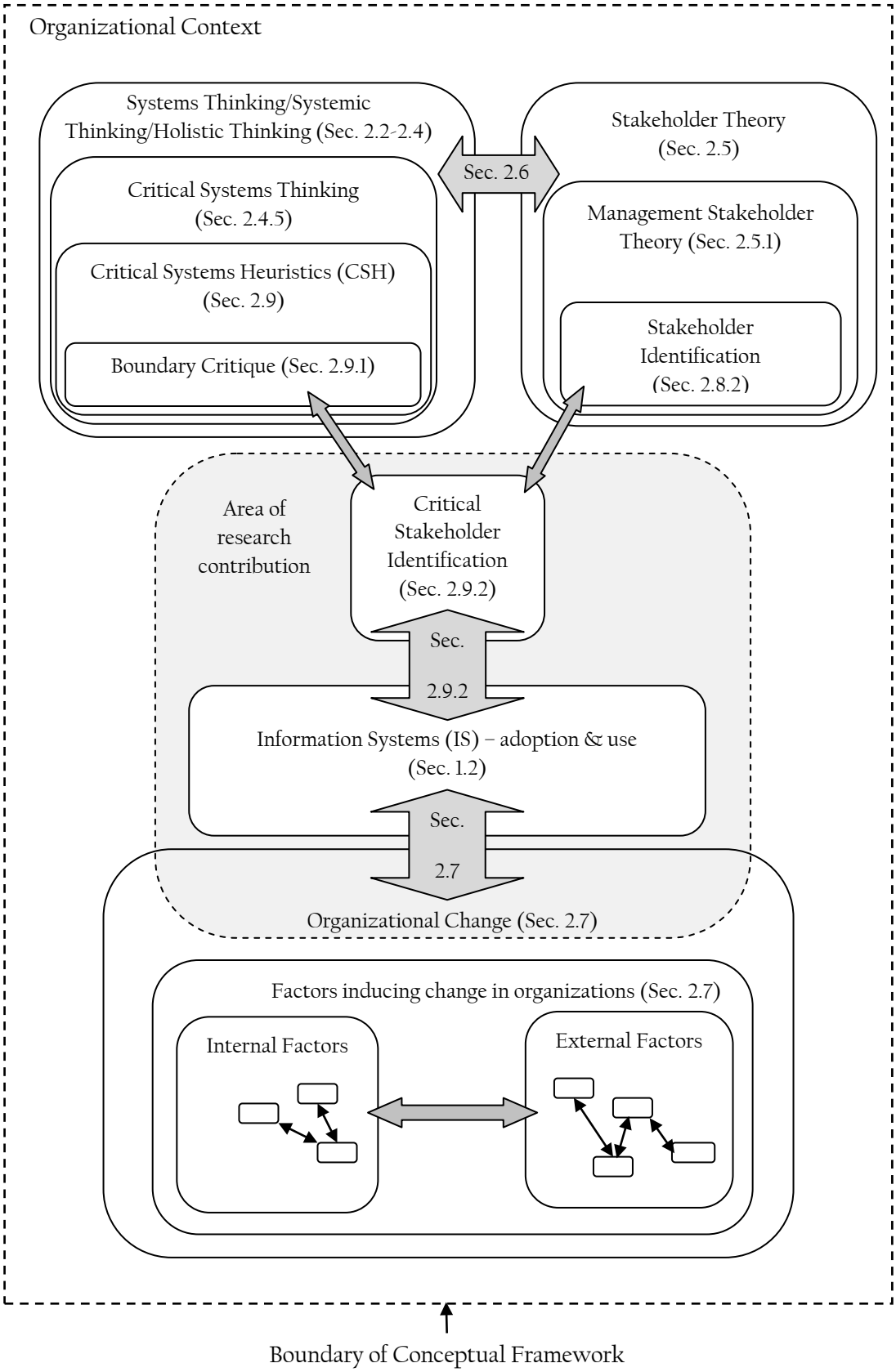


Figure 2.1: Conceptual framework of the research

2.2 From Reductionism to Systems Theory

Reductionism has been a dominant research principle and approach since the advent of modern science (Dongping, 2007). It focuses on the parts of a problem situation rather than the whole i.e. the knowledge and understanding of a phenomenon is generated by analysing cause and effect relationships through the study of its constituent parts in isolation, taking little or even no account of the interactions between them (Flood, 2010; Jackson, 2006). Conversely, systems theory or holism, also termed as systems/systemic or holistic Thinking conceptualizes a phenomenon in its entirety before that of its parts (Ackoff, 1995). It considers that the mechanism of a system can not be correctly portrayed by studying its components in segregation (Bertalanffy, 1975). Aristotle exemplified the functioning of different parts together to keep it alive and resembled it to describe the role of individuals in relation to the State (Jackson, 2006).

Too much reductionism, in the eyes of many observers is the cause of crisis in humankind as fragmented thinking or lack of holism causes limited human insight, decision-making and action (Mulej, 2007). Last fifty years of research have marked their focus on the comparative analysis between reductionism and holism pertaining to their applicability in scientific methodology.

Reductionism has a limited applicability in complexity sciences and the research related to living things (social sciences, for instance), asking for the need of new explanatory models (Dongping, 2007; Flood, 2010). Referring to a lecture by Fritjof Capra, Hammond (2002, p. 430) noted that the understanding or resolution to the problems currently faced by humanity such as poverty, violence, crime, environmental deterioration, nuclear warfare, and terrorism, cannot be attained through fragmented thinking as a more ecological or systemic worldview is required to see how we are mutually inter-connected and to the rest of ecological factors. According to Capra (1982), the current problems resulted from a perception crisis embedded in the worldview based on mechanistic concepts descending from the uprising of the scientific methods in the seventeenth century.

To tackle with world's complex problems, modern scholars and philosophers, therefore, aspire for 'beyond reductionism' by promoting ideas governing holism (for example, see Flood & Carson, 1993; Jackson, 2003). A critical assessment of the philosophical basis of reductionism marked the emergence of systems thinking in the twentieth century (Flood, 2010). A detailed discussion on the emergence of systems theory and its concepts and principles is presented in section 2.5.

A comprehensive comparative analysis between reductionism and holism/systems thinking is not the purpose of this chapter. It rather highlights basic concepts of systems thinking in the coming sections in contrast to reductionism, the evolution of systems concepts in the last hundred years (section 2.4), and a detailed discussion on Critical Systems Heuristics (CSH) (section 2.9), a systems methodology underpinning the study. The subsequent sections and sub-sections have been organized on the basis of Figure 2.1 to help the reader understand how various theories and concepts underpinning this research are linked to one another.

2.3 Systems Thinking in Focus

"A system is an assembly or set of related elements" (van Gigch, 1991, p. 30). A common understanding of a system refers to a complex whole of related parts (Cabrera, Colosi, & Lobdell, 2008; Waldman, 2007), in form of, for instance, a living system (e.g. an organism), structural system (e.g. a transport system) or an ideological system (e.g. religion). Bertalanffy (1979, pp. XXI-XXII) classified systems as *real systems* ranging from galaxies to an atom; and *conceptual systems* such as mathematics, music and science. Systems thinking considers a system in its totality, including all of its multi-level relationships over time (Waldman, 2007), as shown in Figure 2.2.

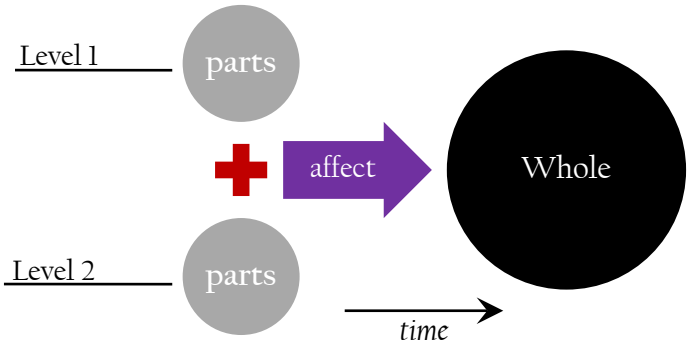


Figure 2.2: Cross-level interaction of parts affecting the whole system over time

According to Jackson (1995), the most interesting and important problems surface when the interactions of individual parts produce emergent properties, which are not directly related to those of the individual parts. Flood (2010) regards emergence and inter-connectedness as the foundation concepts of systems thinking.

According to (Waldman, 2007), to conduct a systemic analysis, consideration of the boundary or scale of analysis is vital. The boundary consideration coherently defines *what* issues are to be included or excluded and *who is to be involved* (e.g. stakeholders or components) with these issues (Midgley, 2003), by taking multiple perspectives into account. Lazlo (1972) points out that what one perspective regards as a system, may be looked at as a subsystem in the eyes of another perspective. Churchman (1970) argues on the importance of pushing out the boundaries of analysis by including or '*sweep*ing-*in*' as much information as possible.

A question that arises here is what should be considered inclusive for the boundary of analysis to make it holistic. Most of the systems thinkers (for example, see Bunge, 1977; Churchman, 1970; Ulrich, 1983) appreciated that it is impossible for human thought to encompass everything within the boundary of analysis, and they also recognised that narrowly focused studies could still usefully perform systemic analyses to answer well-defined questions (for example, see Checkland, 1985).

Mulej (2007) emphasizes that a holistic study is to be a dialectical system of essential viewpoints, as the consideration of each and every viewpoint may not be possible. Dialectic, having a rich history from Greek times (Barton & Haslett, 2007), deals with

the divergence or conflict of views on a subject matter through a debate between two perspectives to reach at a better position than the two opposing ones (Dunning, 1997, p. 11; Mason & Mitroff, 1981, p. 129).

Although everything is inter-connected in the context of a world view pertaining to dialectics, it is not possible to consider all inter-connections, but to take them into pieces that encapsulate relevance and meaning for our activity (Robinson & Wilson, 2003). Wilby (2005) argued that the goal of holistic study is not to *sweep-in* or include everything involved, rather it is about deciding what is relevant to the study and what is not, and understanding the reasons of those choices. The choices are affected by the biases and interests about what is likely to be included or excluded i.e. what is in the system as opposed to what is considered as the system's environment.

What Wilby (2005) called 'holistic', Mulej (2007) called it 'requisitely holistic'. Interdisciplinary co-operation, according to Mulej (2007), is be the best way for an adequate achievement of *requisite holism* as the immense growth in humankind has resulted in knowledge fragmentation causing professions to split into narrow fields of specialization.

A different system boundary, thus, may result in a different problem analysis and, accordingly, in different solutions or changes. For example, if a car, producing the desired level of power output, is causing environmental pollution through unhealthy composition of its emissions, then *sweep*ing-*in* the environmental safety consideration into the boundary of analysis will lead to an entirely opposite system evaluation outcome. However, justifying on *why* a certain scale or boundary of analysis was chosen is important. As per above discussion, Table 2.1 summarizes the differences between systemic/systems/holistic and un-systemic/un-holistic/reductionist thinking.

Table 2.1: Systems thinking vs Reductionism (adapted from Mulej, 2007)

Systems/Systemic/Holistic Thinking	***Un-systemic/Un-holistic/Reductionist Thinking***
Whole, big picture	Parts and partial attributes only
Interdependence(s), Relation(s), Inter-connectedness	Independence, One-way dependence
Networking, interaction, interplay	No mutual influences
Dialectical System (multiple viewpoints)	A single viewpoint
Emergence/Synergy	No attributes emerging from inter-relationship of parts and the relation between parts and environment

2.4 Development of Systems Ideas

Systems thinking history dates back to Ancient Chinese and Greek philosophies of 'yin-yang' and 'dialectics', respectively (Mulej, 2007). As mentioned by Midgley (2007), today's systems thinking concepts may quite possibly be traced back to the ideas presented by ancient Greeks especially Heraclitus and Aristole. From the perspective of its historical development in the last century, systems thinking has evolved to compensate for the incapacity of reductionism in seeking solutions to complex problems.

'Systems movement' which is often referred to as 'systemics' is a broad term which encapsulates a range of systems approaches (Schwaninger, 2006). The development of systems approaches in the last hundred years has been summarized by Midgley (2007) by using a 'wave' metaphor, the idea behind being that "a wave throws useful materials onto the beach, and these are then added to and sometimes rearranged when the next wave hits" (p. 12). He identified three *waves* of systems thinking since 1940s by presenting successive developments of their constituent systems ideas and critiques. Each *wave*, thus, offered a different insight to systems understanding and consequently a different methodological approach. However, Zexian (2007), discusses four *waves* of systems movement. Regardless, Midgley (2007) and Zexian (2007) both recognize that

systems thinking of the present age is the result of the research contribution which was made in the first fifty years of the 20th century.

According to Zexian (2007, p. 409), the foundation concepts of emergence and hierarchy surfaced at the start of the 20th by the work of some scientists and philosophers such as Broad, Morgan, Alexander, and Smuts. However, Midgley (2007, p. 13) attributed Bogdanov in Russia for the development of systems ideas between 1910 and 1913 prior to Bertalanffy's research writings. This review, however, discusses the development of systems ideas from 1940, as its first *wave.* The following sections provide an overview of this development.

2.4.1 First wave of systems thinking (1940s and 1950s)

At the end of second World War, some scientists and scholars including L. von Bertalanffy and N. Wiener realized the limitations of fragmented or reductionist thinking and that the holistic thinking was the solution to human decision-making and action (Mulej, 2007). Debora Hammond, referring to her meeting in the year 1993 with West Churchman, recognized four people including "Bertalanffy, Boulding, Gerard and Rapoport" for the initiation of systems ideas (Hammond, 2002, p. 429).

This *wave* comprised of interdisciplinary research in the form of *General System Theory* (GST), *Cybernetics* and *Complexity Science* as a solution to reductionist science (Midgley, 2007). Ludwig von Bertalanffy proposed the concepts of *open system* and *general system* in 1940 and 1943 respectively. His famous book *General System Theory: Its Basis, Development and Application*, which recognized him as a pioneer in systems research, came up in 1968. Elohim (cited in Mulej, 2007, p. 351) states that Bertalanffy, as a pre-condition for mankind to survive, required people to behave as global citizens by looking at the world in its entirety. The following sections briefly discuss the contribution made by GST, cybernetics and complexity science in the evolution of systems thinking ideas.

a) General Systems Theory (GST)

The key concepts of General Systems Theory (GST) can be summarized as follows (Midgley, 2007):

1. Ideas and concepts can be exchanged among disciplines by treating them as *open systems* in a similar fashion in which an exchange of matter and energy occurs between an *open system* and its environment.

2. Emergent properties are exhibited by a system as an arrangement or organization of elements. This organization is crucial because the emergent properties cannot be realized in a disorganized collection of the same elements.
3. Mathematics or an ordinary language can describe systems from individual cells through to galaxies as they have certain characteristics in common.

Following concepts can also be extracted from GST.

System viability: refers to the capability of an open system seeking to survive in a turbulent environment by exhibiting the necessary characteristics to thrive.

System hierarchy: Systems are embedded as subsystems within larger systems. The whole can enable and/or constrain the parts, and the parts can contribute to and/or challenge the stability of the whole.

b) Cybernetics

The cybernetic theory, proposed by Norbert Wiener, emerged very close to the period of Bertalanffy's mile stone research. The concept of *feedback* in cybernetics proved fundamental to the development of research in systems thinking paradigm (Hammond, 2002). According to Schwaninger (2006), Wiener's work provided the basis for trans-disciplinary science in design, control and communication mechanisms in all kinds of dynamic systems. By the middle of 20th century there had been enormous achievements by cybernetics in terms of trans-disciplinary research (Zexian, 2007).

Weiner, Ashby, and Bateson are the early key writers on cybernetics (Midgley, 2007). As of general system theory by von Bertalanffy, Bateson came up with his general theory of cybernetics. He correlated dynamic models with organic systems as his research widened into the disciplines of psychiatry and evolution (Flood, 2010). Management sciences use cybernetics theory in the fields including systems analysis, system dynamics and systems engineering (Midgley, 2007).

c) Complexity science

The third line of systems research which surfaced in 1940s and 1950s was the complexity science. Complexity, from a commonly understood viewpoint, results when the number of constituent elements and/or their mutual coupling incapacitate an observer about their understanding. However, observing change can become equally complex with a system comprising fewer parts and/or their inter-connections, when studied using a dynamic frame of reference (Midgley, 2007). Such systems exhibit the *emergence* phenomenon i.e. new characteristics emerge over time asking for today's evaluation criteria to be supplemented by others tomorrow (Allen, 1988). Socio-ecological systems, for example, are highly complex and therefore our ability to understand and predict their behaviour is limited (Flood, 2010).

2.4.2 Criticisms posed on the first wave of systems thinking

The first wave of systems thinking, in the eyes of several authors failed to bring in subjective and inter-subjective insights of stakeholders into activities of planning and decision-making with no accommodation for multiple perspectives (Ackoff, 1981; Checkland, 1981; Churchman, 1970; Eden, Jones, & Sims, 1983). These criticisms on the modelling techniques of the first wave have been discussed at length by Midgley (2007), which can be summarized as follows:

1. These techniques served just as depictions of reality, suggesting changes to be made rather than elaborating on how the changes could be made.

2. They failed to properly engage those who were being affected by, or had to be the ones executing the change process.

3. They considered human beings as mechanistic parts of larger systems, without any consideration for them as individuals with their own aims and objectives which may or may not blend with those of the organization.

2.4.3 The second wave of systems thinking (1970s and 1980s)

The second wave stemmed from the criticisms posed on the first wave, which brought a major shift in the theory of systems thinking and its application. Debatably, Churchman, Ackoff, and Checkland were among the pioneers who triggered this shift. This new wave stressed upon the importance of considering multiple viewpoints using dialogue, as 'systems', now were to aid inter-subjective construction of understandings instead of just a representation of world realities (Midgley, 2007). Following is the summary of the major shifts to the second wave of systems thinking.

a) Churchman's boundary judgements and sweep-in

The major contribution made to the second wave of systems thinking can arguably be attributed to Churchman's (1968a, 1970, 1971, 1979) work on boundary judgements. For change to be regarded as improvement, he emphasized on the requirement of boundary analysis, which defines what is to be included in or excluded from it (Midgley, 2007).

Unlike a materialistically realizable object like the skin of a living organism, a system's boundary, as per Churchman (1970), comprises of the knowledge and all the stakeholders pertinent for analysis, as shown in Figure 2.3. He further argued on the importance of pushing out the boundaries of analysis by including or '*sweep*ing-*in*' as much information as possible. A different system boundary may result in a different problem analysis and, accordingly, in different solutions or changes.

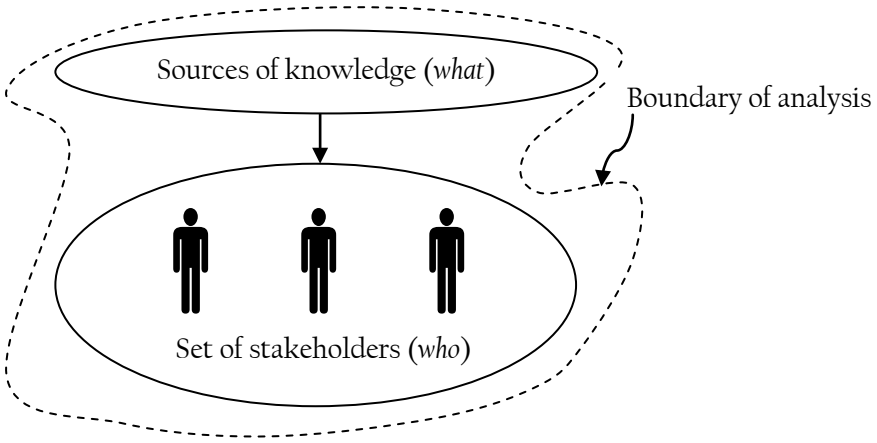


Figure: 2.3: Boundary judgments as viewed by Churchman (1970)

b) Introduction of dialectical process

Churchman (1968b) coined the phrase "systems approach begins when first you see the world through the eyes of another" (p. 231). Unlike the traditional way of just considering the 'experts' as a source of knowledge, this new process of setting system boundaries should be practiced using a "dialectical process" (Churchman, 1979). A dialectical process is exercised by searching for the opponents of our propositions and surviving our justifications for those propositions by using dialogue (Midgley, 2007).

Acknowledging the limitation of an expert's or evaluator's perspective when considered alone, resulted in methodologies based on stakeholder participation, replacing those which were only piloted by experts (Ackoff, 1981; Checkland, 1981; Mason & Mitroff, 1981). Consequently, the consideration of multiple perspectives and the recommendations arising from them asked for qualitative data about those perspectives, rather than just presuming the adequacy of a predetermined set of quantitative factors. Moreover, the emphasis was on the inclusion of pertinent number of perspectives as seeking out for a complete set of perspectives is practically impossible.

2.4.4 Criticisms posed on the second wave of systems thinking

The critical assessment on the second wave of systems thinking surfaced in the late 1970s and early 1980s. The focal point of these criticisms was the "participative methodologies". These criticisms, as per Midgley (2007), can be summarized as follows:

1. In the second wave, widespread stakeholder participation was stressed upon by *sweep*ing-*in* a variety of relevant perspectives for the most ethical position to emerge. However, these methodologies could not provide any guidelines to proceed with the interventions in the presence of power relationships and/or the social conflicts resulting from them. This was based on a key observation that people refrain from speaking frankly when they are afraid of its outcome (Jackson, 1982; J. C. Mingers, 1980, 1984).
2. A rift was perceived in the community of systems thinking as the concepts stemming from the second wave were regarded to be in competition with those of the first wave.

2.4.5 The third wave of systems thinking (1980s to present)

In response to the two above mentioned critiques, there has been a noteworthy emergence of system methodologies, which advocate to inter-linking various systems approaches (Flood & Jackson, 1991; Flood & Romm, 1996; Jackson, 2000, 2003). These methodological approaches mainly include critical systems thinking and multi-methodology (Mobach, 2007). The following section discusses Critical Systems Thinking, which is the core systems concept for this study.

a) Critical systems thinking

According to (Jackson, 1991a), critical systems thinking marked its appearance in 1980s followed by a swift progress in 1990s. The major commitments of critical systems thinking can be summarized as follows (Jackson, 1991a; Mobach, 2007):

1. *Critical awareness* by a close assessment of value assumptions considered for systems design or any proposed design, in light of the available systems methodologies and techniques, provided that we also understand the pros and cons of these available methods.

2. *Social awareness* by identifying the existing pressures pertaining to organizations and society which guide to choosing certain systems methodologies systems, and making users aware of, and reflect on the outcomes of the methodologies being employed.

3. *Human emancipation* by concentrating on broad participation for providing an improved stance in decision-making to those who are weak. It focuses specially on those not involved but rather affected by the targets defined and achieved by those in power i.e. the involved.
4. *Complementary and informed use of multiple systems methodologies* by coupling various systems methodologies at hand.

5. *Complementary and informed development of multiple systems methodologies* by building theories and methodologies unifying diverse range of disciplines with existing systems methodologies to observe human emancipation, and complementary and informed use of multiple systems methodologies.

The two fundamental developments in critical systems thinking were: Ulrich's (1983) methodology of Critical Systems Heuristics; and the concept of *methodological pluralism* in Jackson and Key's (1984) paper. Ulrich considered factors of motivation, control, expertise and legitimacy in the design of a social system by looking at those who are in authority i.e. the involved, and those influenced by it. Jackson and Keys asserted that the first two waves, rather considered as in conflict, should be taken as balancing and complementing each other. Consequently, a third wave of systems thinking was born. The concepts underpinning this wave are discussed as under.

b) Critical Systems Heuristics (CSH)

The methodology of Critical Systems Heuristics, proposed by Ulrich (1983) is a critical systems thinking based framework for a reflective practice, which considers the design of a social system, comprising of those who are *involved* in and *affected* by it. It advanced the notion of *sweep-in* for boundary consideration (Churchman, 1970, 1979) towards 'boundary critique', a methodology for systemic analysis to define and defend a system's boundaries by holding dialogue among stakeholders (Midgley, 2007).

To Ulrich (1983), boundary judgements are closely connected to the value judgements, rendering boundary critique as an ethical process. In seeking to develop a practical strategy to conduct boundary critique, he proposed twelve questions, which could effectively be used both by experts and common people. These questions encompass two main categories of the people, those who are the planners and decision-makers, and those affected by the planning and decision-making. Boundary critique investigates and compares the current state of a system with what it should be. Since critical systems thinking is one of the main stream concepts of the study, a detailed discussion on this methodology and the nature of questions it offers, is provided in section 2.9.

c) Methodological pluralism

Methodological pluralism refers to using a mix of methodologies that suits a particular problem situation. In the study of complex systems such as biological system, environmental system or a human interaction system, there is no single methodology which could serve as an absolute solution to such problem scenarios no matter it descends from the systems practice or somewhere else (Midgley, 2007; Zexian, 2007). The fundamental idea of methodological pluralism, therefore, is to develop a really flexible and responsive evaluation exercise to study the problems of complexity. In such scenarios, methodological pluralism becomes meaningful as it embodies methods and methodologies having diverse theoretical assumptions and underpinnings guiding to select the most appropriate ones among them (Midgley, 2003). According to Jackson (2000), pluralism supports the use of methodologies, methods and tools of various

systems thinking paradigms by critiquing their limitations and harvesting their potentialities.

Sequel to the research of Jackson and Keys (1984), Jackson (1987) aligned systems approaches into a framework to deal with a variety of problem scenarios. He argued about the utility or the application of various forms of systems thinking waves in three different types of problem situations. His argument, in a simplified form, is summarized as Table 2.2.

Flood and Jackson (1991), later embedded this within a new methodological framework for a creative exploration of problem scenarios and implementation of an effective solution by choosing a suitable systems approach. This methodology was further developed by Flood (1995) and Jackson (2003). Midgley (1997) provides with a review of a range of criticisms on it.

Bailey (2001, p. 43), in his attempt to develop a unified terminology noted that pluralism contests against the disintegration of science by providing a way to put together all the pieces various disciplinary specializations, and developing inter-disciplinary co-operation.

Table 2.2: Application of systems thinking waves in various problem scenarios (Jackson, 1987, 1991b)

Systems Thinking wave	***Problem Scenario Systems Thinking wave applicable in***
First wave (GST, Cybernetics, Complexity Science)	Unanimity among stakeholders on the problem context and the goals to be achieved
Second wave (Dialectical Process)	Non-coercive divergence among stakeholders about the problem situation, asking for the need of dialogue for resolution
Third wave (CSH)	Coercion, hurdling the way of holding dialogue among stakeholders, which needs to be improved by considering the concerns of those being influenced or disadvantaged i.e. the affected.

2.5 Stakeholder Theory

Due to being an essential element in any organizational life cycle, the importance of stakeholders cannot be undermined (Rowley, 1997). An increase towards the interest in stakeholder concepts has generated a number of views on the subject (Friedman & Miles, 2002). The research and writings on this subject has accumulated a wealth of literature on *who* the stakeholders are and *what* they mean in practice. By 1995, over 100 articles on the subject had already been published (T. Donaldson & Preston, 1995, p. 65) with the number increasing to date.

Although defining of the term "stake" has been one of the paramount challenges in stakeholder analysis (L. Donaldson, 1995), it encompasses people as individual persons, small groups, or organizations which are deemed considerable by those in authority such as leaders and/or managers (Bryson, 2004). Carrying out a comprehensive stakeholder analysis requires identification of these people and the way they are associated with an organization. As per Brenner and Cochran (1991), in outlining stakeholder perspective, the organizations should address stakeholder expectations by managing the stakeholders' influences on organizations.

Thus, a broad classification of stakeholder theory development is based on *demographic* and *structural* approaches (Frooman & Murrell, 2005). The *demographic* approach deals *who* the stakeholder are along with identifying their attributes (e.g. Mitchell, Agle, & Wood, 1997). As per Mitchell et al. (1997), the stakeholder attributes rest on power, legitimacy and urgency. The *structural* approach deals with the inter-relationship of stakeholders and the firm, focusing as to *how* individual stakeholders influence firms' operations. Some early works on *structural* approach include Rowley (1997) and Frooman (1999).

In the present age of increasingly inter-connected world, stakeholder analyses have their importance beyond doubt. For addressing problems such as illiteracy, poverty, economic crisis, global warming, crimes, terrorism, stakeholder analyses have become the order of the day. In today's shared-power world, our problems are also connected and thus shared within organization or around the globe, indicating that no one in fact is

fully in charge (Kettl, 2002). Seeking for a solution or solutions to a problem requires to understanding *who* actually are the part of the problem, indicating stakeholder analysis as a highly important ingredient for problem solving (Bardach, 1998; Bryson & Crosby, 1992).

Most of the stakeholder analyses use a corporate perspective of the stakeholder theory by taking it as an organizational theory as opposed to a theory which inter-links an organization with the society (Steurer, 2006). However, if a normative view is taken into account, it asserts firms to respond to the issues and concerns of various stakeholders of the society (de Bakker & den Hond, 2008). So consequently, the definition of a stakeholder has been presented in various forms ranging from the narrowest to the broadest scopes possible. Mitchell et al. (1997) presented, though not complete, but a comprehensive chronological development of the definition of a stakeholder in an organizational context.

Stakeholder theory has been applied to a diverse range of disciplines such as education (e.g. McDaniel & Miskel, 2002), health (e.g. Lim, Ahn, & Lee, 2005), corporate social responsibility and ethics (e.g. Agle, Mitchell, & Sonnenfeld, 1999; Hillman & Keim, 2001), management (e.g. T. Donaldson & Preston, 1995; Greenwood, 2001), marketing (e.g. de Bussy, Ewing, & Pitt, 2003), information technology (e.g. de Bussy, Watson, Pitt, & Ewing, 2000; Pouloudi, 1999), water utilities (e.g. Ogden & Watson, 1999), construction project management (e.g. Bourne & Walker, 2005; Newcombe, 2003). The next section covers stakeholder theory from a management perspective.

2.5.1 Management stakeholder theory

According to de Bakker and den Hond (2008, p. 9), stakeholder theory in management marks its gravity by giving assistance to management in responding to the stakeholder demands, using it for their own advantage, and keeping a sense of responsibility for the actions they take. Managerial decision-making is one of the essential operational grounds of stakeholder theory (Jones & Wicks, 1999), which demands consideration for all necessary stakeholders (T. Donaldson & Preston, 1995).

It was Freeman (1984) who brought stakeholder theory into the mainstream of management literature (Frooman, 1999). In his classic text *Strategic Management: A Stakeholder Approach*, Freeman defined a stakeholder as, "any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman, 1984, p. 46). He conceptualized the firm or the focal organization (F.O.) as the hub of a wheel and stakeholders as the ends of spokes around it (Frooman, 1999), as shown in Figure 2.4.

Since Freeman's definition, there has been an issue about the consistent application of this term (Starik, 1994), as it has been looked at from different angles. Some typical definitions of stakeholders include:

- "All parties who will be affected by or will affect [the organization's] strategy" (Nutt & Backoff, 1992, p. 439).

- Stakeholders are the "constituents who have a legitimate claim on the firm" (Hill & Jones, 1992, p. 133).

- "Any person group or organization that can place a claim on the organization's attention, resources, or output, or is affected by that output" (Bryson, 1995, p. 27).

- "People or small groups with the power to respond to, negotiate with, and change the strategic future of the organization" (Eden & Ackermann, 1998, p. 117).

- "Those individuals or groups who depend on the organization to fulfil their own goals and on whom, in turn, the organization depends" (G. Johnson & Scholes, 2002, p. 206).

As mentioned by Rowley (1997), Freeman's (1984) hub-and-spoke model, which portrayed stakeholders' connections only with central firm or focal organization at the centre, did not portray a realistic picture as:

1. In reality, stakeholders do also have connections among themselves, which give birth to a network of influences.

2. Organizations do not simply respond to each stakeholder individually; they respond, rather, to the interaction of multiple influences from the entire stakeholder set.

3. An organization does not necessarily exist at the centre of the network, but rather as a stakeholder in its relevant social system.

Freeman and Evan (1990, p. 354), later viewed stakeholder relations as "a series of multilateral contracts", leading to a shift in realizing these 'multilateral contracts' as a network of influences, as shown in Figure 2.5.

The current era is advancing towards stakeholder networks (Powell, 1990), which often operate in the disguise of an organizational hierarchy (Hanf & Scharpf, 1978). Hill and Jones (1992), in their 'agency-stakeholder model', also viewed a firm as a nexus of contracts among stakeholders. De Bakker and den Hond (2008) also consider stakeholders in competition of gaining salience, which collaborate and operate in a stakeholder network asking firms to decide which of them to prioritize over others in managing stakeholder issues.

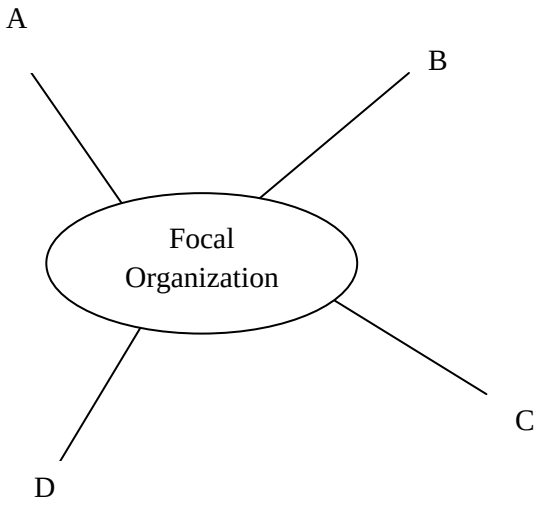


Figure 2.4: Freeman's hub-and-spoke model

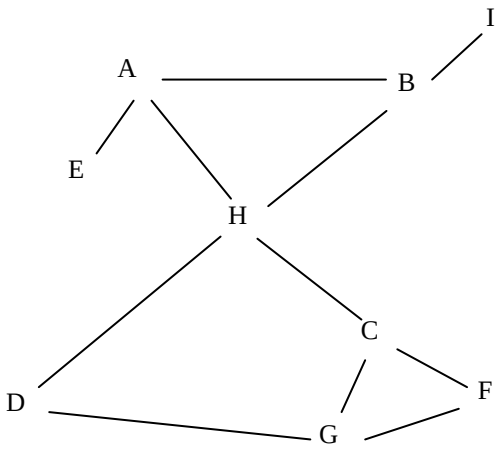


Figure 2.5: Network of stakeholders

Freeman's work has been advanced and enhanced by a number of scholars in the fields of business and society. Caroll (cited in Rowley, 1997, p. 888) was among the first to develop a framework to encompass issues related to business and society by using a stakeholder approach. My study, however, takes the Freeman and Evans's (1990) view of stakeholders' "multilateral contracts" with the two major stakeholder categories of 'involved' and the 'affected', as mentioned in Freeman's (1984) definition of stakeholders. Moreover, from a managerial perspective, this study also considers the systemic attributes and roles pertaining to these stakeholders categories (Achterkamp & Vos, 2007; Vos, 2003), as shown in Table 2.5. These stakeholder categories, along with their roles give birth to a "system of stakeholders". The details of these roles with regard to boundary critique are discussed in the coming sections.

2.6 Systems Thinking and Stakeholder Participation in Organizational Context

According to (Hammond, 2002, p. 429), systems thinking was looked at by the people from various professional and disciplinary backgrounds, establishing different viewpoints about it. This section seeks to answer as to what extent systems thinking has enlightened us about the study of stakeholder participation, and their social behaviour in an organizational context.

From systems viewpoint, an organization is a social subsystem of the society which provides it a lawful market environment to conduct business (Clarkson, 1994, p. 21). The participation of people in organizations is a complex phenomenon (Rashford & Coghlan, 1994), with increasing levels of complexity from the relationship of an individual with the organization to the whole organization and its environment taken as a whole (McIlduff & Coghlan, 2000), as shown in Figure 2.6. The stakeholders of an organization have different versions of their understanding of the overall system (Vos, 2003). The individuals of an organization learn how to optimize on their personal utility while the organization faces a bigger challenge of aligning their goals with the organizational objectives.

In relation to the complex nature of relationships among people such as in organizations, Jackson (1995) defined unitary, pluralist and conflictual relationships as possible 'ideal-type' problem contexts. He positioned these concepts in two dimensions, based on the divergence of values and interests of those involved in or affected by a problem as a horizontal axis and complexity as a vertical axis. Relationships are: unitary when people share values and interests; pluralist if their values and interests diverge but still share enough in common to form a worthwhile coalition; and conflictual or coercive if their interests diverge irreconcilably (Jackson & Keys, 1984). The combination of axes depicts an ideal-type grid in which problem contexts become more cumbersome to manage with the increasing divergence of values and interests with an increase in complexity, as shown in Figure 2.7.

The study of complexity has produced a set of laws (Warfield, 1995), the number of which has been steadily growing. The following laws serve as a basis for this research:

The law of diverse beliefs – states that at the outset of investigating a complex issue, the group members will have quite diverse beliefs about it.

The law of inherent conflict – asserts that there will always be significant conflict in interpreting what is important in resolving a complex issue regardless of what that complex issue is and what is the group involved.

Mechanistic thinking considers humans a as complex machines which could be fully understood by theories of mechanics and other natural sciences without any consideration for them as individuals having their own goals which may or may not harmonize with wider organizational priorities and objectives.

Situations and issues emerging from human actions and interactions do not have well-established solutions, as unlike *machine-type systems*, in which various parts interact to achieve zero variability in outputs, organizations operate with *thinking and learning humans*. For example, hospitals deal with uncertain scenarios with patients, a reporter reaches to a viewpoint based on his/her judgement. Organizations, therefore, are *thinking systems* with multiple objectives and with the capability to envisage their future targets (Waldman, 2007, p. 273). Mechanistic thinking, therefore, is handicapped to circumscribe social/human issues within its boundary of judgement.

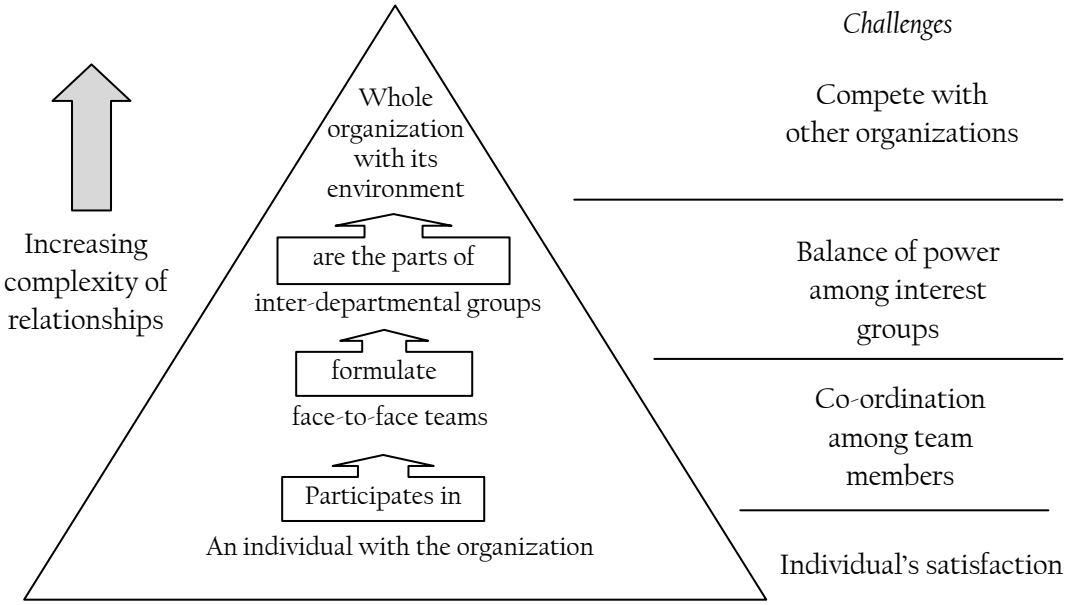


Figure 2.6: Levels of complexity of relationships and challenges

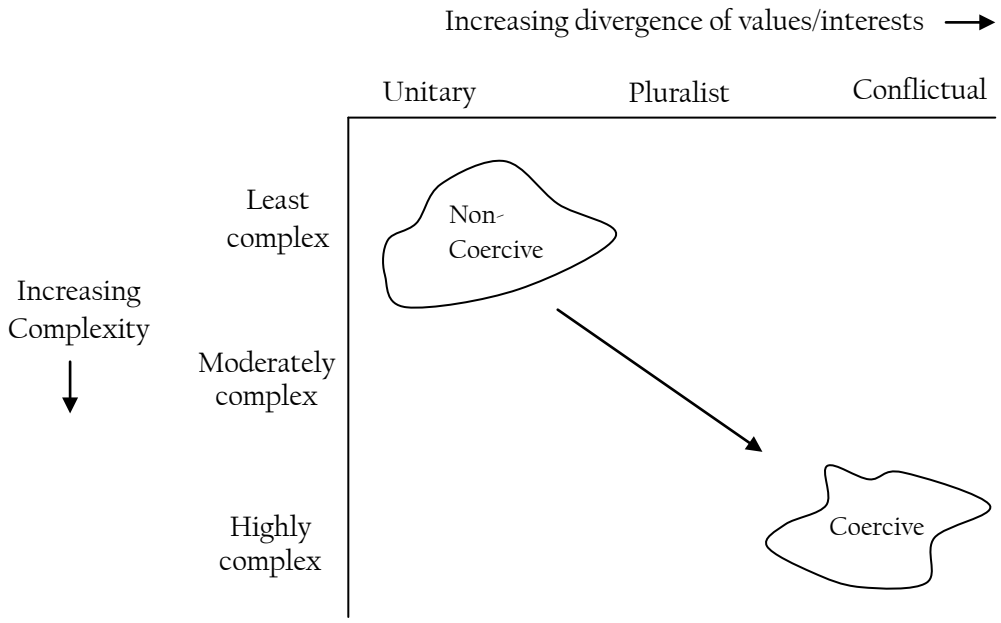


Figure 2.7: Complexity of problem scenarios versus divergence of values/interests

On the contrary, systems theory, particularly with its second and the third waves (see sections 2.4.3 & 2.4.5), brought human perceptions, values and interests to the limelight. The second wave, in form of Churchman's (1970, 1979) "dialectical process", stressed upon the widespread stakeholder participation by considering multiple perspectives, suitable to study a problem scenario, for the most ethical position to emerge. The participative methodologies of the third wave, through the Ulrich's (1983) recognition of the voice of "affected" by linking boundary definition with the value judgements using "boundary critique", accounted for power relationships within interventions and/or the resulting social/organizational conflicts. Pinzón and Midgley (2000), presented a systemic model for evaluating conflicts in social context which was later used by Raza and Standing (2011) to propose a systemic conflict management and evaluation model in an organizational change scenario (for details see section 5.2.2).

Hence, systems theory has the potential to provide methodologies and guidelines for studying complex organizational issues and conflicts (see Figure 2.7) in the complex organizational setup (see Figure 2.6) and in implementing policies pertaining to social behaviour. The difference between systems theory and mechanistic thinking in terms of social implications is summarized in Table 2.3.

Table 2.3: Social implications of systems theory and mechanistic thinking: contrasting views (Hammond, 2002; Waldman, 2007)

Systems theory	***Mechanistic thinking***
Free will, creativity	Determinism
Diverse intentions/interests	Fixed tasks/assignments with no consideration for interests
Emergence	No attributes emerging from inter-relationship of parts and the relation between parts and environment
Self-organization	Externally imposed order and control
Democracy/ Participatory decision-making processes	Technocracy
Conflicts/Variable outputs in different situations	Repeated output (seeking for zero output variance)

2.7 Organizational Change and Information Systems

Change is the product of the age we live in, as the current world is dynamic in nature (Redmill, 1997). Organizational change is one of the major and extensively discussed topics in organizational literature (Oden, 1999; Robey, 1986). According to Tushman and Nadler (cited in Maon, Lindgreen, & Swaen, 2008, p. 415), organizations as social systems must be capable of responding to environmental and organizational uncertainties and threats, and should use opportunities to survive.

Through a detailed literature analysis, Malmsjö and Övelius (2003) identified change factors that influence information systems (IS) in organizations. Based on observation and argumentation, they identified these factors ranging from an organizational to an individual level i.e. the user. They classified them into *internal* and *external* factors. According to them, these factors contain uncertainty. These change factors mentioned at the organizational level included:

External factors:

1. Competition
2. Technology
3. Laws and regulations
4. Economy
5. Society

Internal factors:

1. Growth
2. Politics and struggles
3. Resources
4. Economics
5. Culture

Environmental volatility, which includes changes occurring in technology and business environment, results in unpredictable needs of IS users (S. Lee, Koh, Yen, & Tang, 2002; Seilheimer, 2000). As the external factors cause changes in an organizational IS, internal changes happening to an organization also affect IS success (Winklhofer, 2001).

Hall and Hord (2006) indicated that the success of a change process depends less on whether the source of change is internal or external. It, however, significantly depends more on the degree of openness and readiness of an organization in considering the actions being undertaken and continually examining ways to improve. The pace of improvement is dictated by the ability of an organization to learn (Harkness, Kettinger, & Segars, 1996)(see assumption 2, section 1.3). A learning environment (Paper, Rodger, & Pendharkar, 2000), and the organization's vision (Teng, Jeong, & Grover, 1998), enable top management to disseminate its change philosophy to the people at work. A change vision based on systems or holistic thinking has an underlying objective of aligning employee goals with those of the organization and vice versa (Paper, et al., 2000; Teng, et al., 1998), which reduces the possibility of sub-optimization. The next

section discusses the application and linkage of organizational change, systems thinking and stakeholder theory with organizational information systems.

2.8 Organizational change, Information Systems, Systems Thinking, and Stakeholder Participation

Research shows that the implementation of information systems in an organizational setting (see Figure 2.6) more likely brings changes to the distribution of tasks and the patterns of inter-departmental interaction inside organization (R. A. Hirschheim, 1985; B. M. Johnson & Rice, 1987; Markus, 1984). These patterns of interaction are composed of issues such as relationships among organization's stakeholders, policies and procedures, strategies and controls (Harper & Utley, 2001).

Hall and Hord (2006) view change as an innovation diffusion process (not an event). The dynamic nature of IS field necessitates organizations and researchers to understand and manage diffusion of innovations (Nilakanta & Scamell, 1990). Innovation is defined as an idea; practice such constructivist teaching technique; or a material artefact (product) such as a computer, perceived to be new by the relevant unit of adoption (Hall & Hord, 2006; Zaltman, Duncan, & Holbek, 1973). Innovation diffusion, according to Rogers (1995), is the process by which an innovation is communicated among the members of a social system through certain channels over time. Information system, in form of innovation, emerges as a more complex setup as it inter-links all organizational processes, and reaches out for more users or stakeholders at numerous locations around the globe. As per Ryan (1999, p. 89), today's complex nature of technology is the consequence of making it simpler.

Resistance can be anticipated if proposed changes or innovations alter values and visions, as stakeholders often perceive that these actions cause disenfranchisement and redistribute benefits (Trader-Leigh, 2001). Psychological and management literature describe it as a natural and almost inevitable response that applies to changes ranging from modest (first order) to the far-reaching (second order) (for example, see Conner, 1998; Kotter, Schlesinger, & Sathe, 1979; Mullins, 1999). Cooper and Markus (1995) indicated that organizations often fail to realize that the resistance offered by people is

not to the change per se, but the way they are treated and the roles they play in the change process. Organizational participants who are vaguely aware of the change process can cause rumours and anxiety resulting in attitudes different from those intended by management, which ultimately lead to resistance (Jick, 1993).

It is argued that it is critical to identify stakeholders and to know how they are affected and understand the dynamics and cost of change. This helps in identifying the factors underlying resistance and consequently in managing conflictual situations (see Figure 2.7) inside organizations, providing a smoother pace for organizational learning and change (Raza & Standing, 2011).

Despite numerous success stories related to IS projects, failures still quite frequently occur (Azzara & Garone, 2003). A wealth of published literature provides an understanding of the phenomenon of IS failure (for example, see Barker & Frolick, 2003; Beresford, Hansen, & Willis, 1976 ; Heeks, 2002; Kay, Boyle, Regier, & George, 1999; Kaye, 1990; Keil & Robey, 2001; Mitev, 1994). Many researchers have attempted to analyse it through the lens of success and failure factors (for example, see Birks, Nasirim, & Zailani, 2003; Ginzberg, 1981 ; Lorenzi & Riley, 2003; Lyytinen & Robey, 1999; Peterson, Kim, Kim, & Tamura, 2002; Poon & Wagner, 2001; Schmitt & Kozar, 1978; Senn, 1978; C. Standing, Guilfoyle, Lin, & Love, 2006).

Lyytinen and Robey (1999) pointed out that one of the common reasons, which prevents our understanding of IS failure, is the misconception that acquiring of new technical knowledge is the only biggest challenge for IS success. On the contrary, it is a concern, which is not only related to technology, but has underpinnings from social and organizational issues as well. Lorenzi and Riley (2003) have classified IS failure factors into categories of technology's underperformance, overwhelming growth of information and organizational issues. An organizational IS, therefore, is composite in terms of knowledge, spanning across disciplinary boundaries (Gorgone, Davis, Vlacich, & Topi, 2002), with social issues as one of its aspects (Land & Hirschheim, 1983; Walsham, Symons, & Waema, 1988). In the context of an IS, problem solving therefore requires technical as well as social issues to be taken into account. Seilheimer (2000) has mentioned about the limitations in the applicability of the strategies used in IS

development in a change scenario, such as evolutionary and waterfall models, which demands consideration of emerging needs from the environment.

Churchman (1971, p. 198) noted that knowledge is not to be acquired in fragmented parts, but it should rather be seen from all different angles. Hirschheim and Klein (2003) regarded technical knowledge as one of pieces of knowledge in the complete picture of IS field. Thus, IS professionals are required to be equipped with the understanding and skills pertaining to IT applications, function and administration of business processes, and interpersonal skills (Gupta & Wachter, 1998; D. M. Lee, Trauth, & Farewell, 1995). This asks for methodological pluralism and the consideration of multiple perspectives, as a single perspective emphasises on specialization which is hard to achieve. Moreover, in a complex environment, single perspective, most likely, does not lead to any solution (Vo, Chae, & Olson, 2006).

Systems thinking would, therefore, be helpful to guide our understanding of IS issues in organizations. On one hand, the second wave will be beneficial in form of Churchman's (1970, 1979) "dialectical process", by the inclusion or *sweep-in* of pertinent multiple perspectives, while on the other hand, the participative methodologies of the third wave for a socio-technical analysis of an organizational IS, through Ulrich's (1983) recognition of boundary judgements, with the use of 'boundary critique'. The next section discusses the existence of multiple perspectives in relation to an IS project.

2.8.1 Multiple stakeholder perspectives in an IS project

In a societal system, people interact with one another on a continuous basis and develop their perceptions and interpretations of the world. An organization sits inside the larger domain of the host society providing legal and a market setup to operate within (Clarkson, 1994). The stakeholder that put across their expectations and perspectives to an organization may comprise owners, employees, customers, suppliers, competitors, community and government (Maon, et al., 2008), which an organization is supposed to respond to. Figure 2.8 depicts multiple stakeholder perspectives for an organization. The arrow heads pointing towards the organization represent stakeholder expectations

while the arrowheads pointing away from the organization represent the organization's response to various stakeholder groups.

Similarly, in an IS project, each stakeholder sees the project outcome from its own position and arrives at different conclusions (Elpez & Fink, 2006). Although different viewpoints complicate IS/IT evaluation by resulting in a broad array of evaluation criteria (Agourram, 2009; Chou, Chou, & Tzeng, 2006; Klecun & Cornford, 2005), Stockdale and Standing (2005) argue that, in addition to considering technical and financial issues, IS evaluation should also consider social aspect. Thus, essential to consider multiple stakeholder perspectives such as technical staff, users, management and external stakeholders, in the assessment of IS effectiveness to portray a comprehensive picture of the variations arising from them. Bernrioder (2008) added about the significance of multiple stakeholder perspectives in the evaluation of enterprise resource planning (ERP).

The consideration of multiple stakeholder perspectives needs stakeholder identification, which in turn, requires some formal methodology to guide this process. The next section sheds light on the importance of stakeholder identification in an IS project.

Figure 2.8: Portrayal of multiple stakeholder expectations/perspectives with an organization

2.8.2 Stakeholder identification in IS projects

Identifying stakeholders, in view of Vos (2003), is to draw a line between the parties to be involved and the parties not to be involved. Paying attention to all 'appropriate' stakeholders (T. Donaldson & Preston, 1995) has led stakeholder theorists to address the issue of stakeholder identification (Frooman, 1999). The stakeholder literature presents a diverse range of views about this issue (for details see section 2.5), as stakeholder analysis has been carried out in various situations. For example, Mitchell et al. (1997), in a political context, described about how African National Congress (ANC) claimed its definitive status as a stakeholder in South Africa. Savage et al. (1992), discussed a number of stakeholders in a rural hospital in US. Mitchell et al. (1997) generated various theoretical classifications of stakeholders from a management perspective, based on stakeholder attributes pertaining to power, legitimacy and urgency. Various other stakeholder classifications include generic vs specific (Carroll, 1989); primary vs secondary (Clarkson, 1995). Wood (1994) has suggested categories such as concrete vs symbolic, economic vs social. Freeman (1984), in the context of assisting managers in strategic decision-making has proposed categories of 'involved' and 'affected'.

Involving people having a stake in the successful development of information systems is a well-established fact in the information systems literature. Pouloudi and Whitley (1997) indicate about the necessity of the involvement of "interested parties" in IS development (p. 1), as the extent and effectiveness of this participation possibly affects the outcome of the system (e.g. Cavaye & Cragg, 1995; Checkland & Scholes, 1990; C. Standing, et al., 2006). The importance of this becomes even more evident when information systems are targeted to become an integrated part of the organizational setting (Whitley, 1991), as shown in Figure 2.6.

A broad categorization or identification of stakeholders in an IS project leads to those using or supposed to ultimately use the system (end users or simply users) and those responsible for the design and development (IS professionals/Project Management Team). As per Fisher (2001, p. 25), IS cannot be regarded as successful if it cannot be used "effectively and efficiently". User expectations substantially contribute to defining

IS success (Elpez & Fink, 2006). In order to get the users' perspective on IS success, it is therefore crucial to gain an understanding of user expectations about the system being developed or improved. CIO (2003) (cited in Elpez & Fink, 2006) ranked user satisfaction as one of the top three measures of IS success as mentioned by 78% of the study participants. As per C. Standing et al. (2006), whether it is about designing a new information systems, or modifying the existing ones, the user involvement is among those prime factors which influence its success or failure.

Project managers or IS professionals are those concerned with the development or improvement of IS. They are supposed to resolve the requirements of the end-users and the management (Elpez & Fink, 2006), as managing user expectations has become a critical factor for the delivery of successful IS (Staples, Wong, & Seddon, 2002). However, due to a defined time and budget the project management perspective, instead of considering user requirements, has mainly focused on business performance, cost, time and quality measures (Wateridge, 1998; D. White & Fortune, 2002).

Although a typical classification of participants in IS projects comprises IS users and developers, a wider range of people exists, who are influenced by the system usage or influence its development. In the context of IS development, Pouloudi and Whitley (1997) marked a difference between 'participants' and 'stakeholders' by defining participants as the people (individuals, groups or organizations) involved in IS development, while 'stakeholders' being such 'participants', who can directly or indirectly influence or can be influenced by IS development and use. Pouloudi and Whitley have demonstrated this difference from an inter-organizational IS perspective.

Hence, identifying stakeholders and having insights to their viewpoints is a complex and challenging task. This study takes the 'landmark' definition of Freeman (1984), as acknowledged by Wood (1991) and Clarkson (1995), for classifying the stakeholders into two basic categories of 'involved' and 'affected' in the context of a web portal implementation project in a West Australian University (Aus-Uni). Furthermore, the roles stakeholders play under these categories (see Table 2.5), have been considered under the circumference of Critical Systems Heuristics' methodology of boundary critique. A comprehensive view of Critical System Heuristics (CSH) and boundary

critique is given in section 2.9. Before providing a discussion about how boundary critique could be exercised to critically identify stakeholders in IS projects, it is essential to provide a brief introduction about web portals and the existence of multiple perspectives about them in an organizational context.

2.8.3 Web portals as organizational IS

Although Enterprise Information Portals (EIPs) or simply web portals are normally considered as gateways to enterprise content (Shilakes & Tylman, 1998), the matter of finding commonly accepted definition in the academic and industry literature is still fuzzy (Scheepers, 2006). This study, however, embraces a definition recently coined by M. A. Smith (2004) as "an infrastructure providing secure, customizable, personalizable, integrated access to dynamic content from a variety of sources, in a variety of source formats, wherever it is needed" (p. 94), which encompasses both public and enterprise portals. Content are the information in form of digital files, codes or databases, which are valuable for an organization and its users, (Weiss & Datta, 2002, p. 40).

Like organizational intranets, EIPs are also the applications of Web-based technology; they, however differ from each other in a sense that intranets contain information while EIPs serve as *points of access* to it (Chan & Chung, 2002; Daniel & Ward, 2005; Scheepers & Rose, 2001). Mostly from intranets, information is to be '*pull*ed' by the users (Zmud, 1984), while portals mostly allow information to be '*push*ed' to targeted users or communities (Scheepers, 2006). Portals also provide *customization* and *personalization* experience (van Brakel, 2003). EIP literature often refers to these terms interchangeably (Coner, 2003). This study, however, considers customization and personalization as supply-side and demand-side functions respectively. Customization moulds an EIP content to meet specific needs of the portal users, while personalization, facilitates them to define their preferences such as layout, and personal links (Scheepers, 2006).

2.8.4 Web portals and multiple stakeholder perspectives

Enterprise Information Portals (EIPs) serve as gateways to the tailored organizational information (Shilakes & Tylman, 1998). Implementing an EIP in large organizations is a complex issue as it typically aims to address quite diverse information needs of the user communities or groups with thousands of individual users (Scheepers, 2006).

Despite the wealth of literature available on potential advantages of EIPs for organizations, the question as to how these information needs of the EIP users could be addressed remains unanswered (M. White, 2000). In reality, these individual users are embedded in a system of stakeholders in which the needs of one stakeholder group may differ significantly from the others, which is a strong indicator of the fact that EIPs cannot be implemented with 'one size fits all' approach due to the existence of multiple stakeholder perspectives.

In a university environment, prominent stakeholder groups include students, working staff, lecturers, tutors, senior executives, portal management and possibly the local community. Figure 2.9 depicts multiple stakeholder perspectives for a university web portal. The arrow heads pointing towards the portal represent stakeholder interacting with the portal while the arrowheads pointing away from the organization represent portal 'pushing' information towards various stakeholder groups.

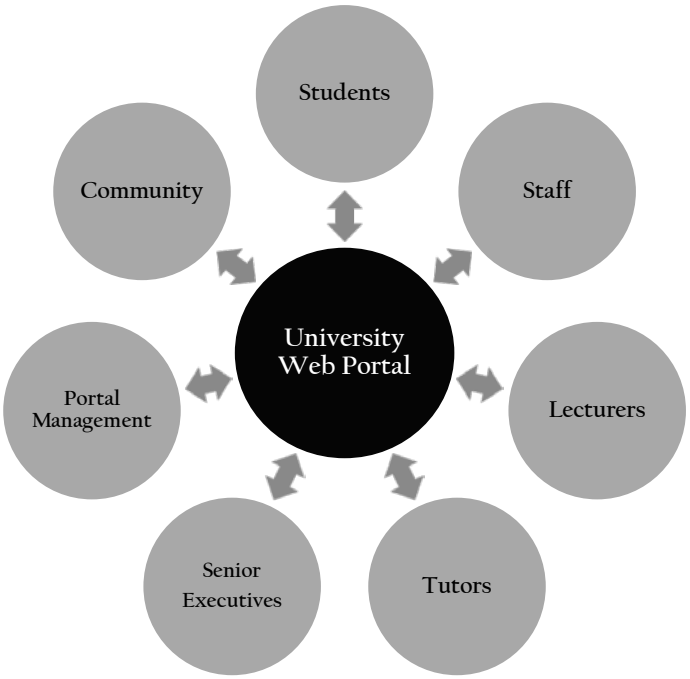


Figure 2.9: Portrayal of multiple stakeholder expectations/perspectives with a university portal

As delivering a company's content on-line renders technological and organizational changes in an enterprise (Weiss & Datta, 2002). They also identify that in addition to the technological changes, moving an enterprise's content online also brings about changes in customs, work practices and skills. Hence, in the context of this study, the problem scenarios, such as identifying information needs related to various members inside and outside of an organization, become more cumbersome to manage with the increasing divergence of customs, values and interests with an increase in complexity, as identified by Jackson and Keys (1984) (see Figure 2.7).

This study regards EIP as an innovation and its implementation as a change project aiming for an improvement. It also emphasizes the identification of stakeholders, and their roles as an integral component of the EIP implementation strategy, to precisely determine their information needs, and to optimize user satisfaction (Benbya, Passiante, & Belbaly, 2004; Detlor, 2000; McCubbrey, Bloom, & Younge, 2005) and the utilization of portal's functionalities (Kakumanu & Mezzacca, 2005; Rose, 2003).

This study examines how critical systems heuristics methodology of boundary critique, which focuses on multiple stakeholder views, can be used to inform EIP implementers of a university web portal from an enterprise content planning and management perspective. The coming sections put light on critical systems heuristics, boundary critique and the identification of stakeholders using boundary critique.

2.9 Critical Systems Heuristics (CSH)

In logically and mathematically well-defined situations in which solutions to problems are sought through the application of algorithmic procedures, applied disciplines related to social issues like management science, however, cannot be professionally practiced as the problem situations are ill-defined or qualitative in nature (Ulrich, 1996, 2000). Attempts to seek out for solutions in such cases cannot be replicated like the individual steps in a laboratory experiment, because no single right answer exists for such issues. This distinguishes 'action research' from 'scientific research', as action research attempts to validate hypotheses in a social context, while the latter establishes "universal truths" based on laws (Barton & Haslett, 2007, p. 147). The unavailability of a definite answer points out to the need of a critical approach capable of taking personal views, interests and value assumptions into account. Such an approach will not possibly lead to definite solutions either, but it must comprise of a practice which supports viewpoints to be considered through dialogue about the problem scenario under consideration.

The methodology of Critical Systems Heuristics rooted in Critical Systems Thinking was proposed by Werner Ulrich to scientifically inform the domains of planning and design with an intention to bring improvement in human condition (Schwaninger, 2006). It was the first systematic systemic attempt to prepare methodological grounds for a reflective and emancipatory practice (Ulrich, 2000). Complying with the Greek verb 'heurisk-ein' meaning to find or to discover, CSH (Ulrich, 1983), was presented as an art of discovering the philosophical foundations for the professional critical practice (Ulrich cited in Daellenbach & Flood, 2002, p. 72f), not only for professionals and decision makers, but also for the ordinary people (Ulrich, 1987).

The relevance of systems thinking stands in this arena because CSH is based on the idea of bringing improvement to the whole system (Ulrich, 1983). It challenged earlier systems thinking philosophy with the introduction of a more socially aware and critical form of systems practice, and introducing the notion of system boundaries or boundary judgement in proposing a conceptual framework for analysing facts and values, underlying a decision-making process (Carr & Oreszczyn, 2003).

Reynolds (2007) identifies the following three main principles underlying the practice of CSH:

1. Cultivate holistic awareness:

For practising CSH, all processes of problem definitions, opinion formation, solution proposals, decision-making and action are based on prior judgements, also called boundary judgements, so that avoid sub-optimization could be avoided (Ulrich, 1987). The issues related to "measures of success", "power" and "knowledge", and "externalities" in terms of the those affected (see Table 2.4) are woven together for generating a holistic inquiry (Reynolds, 2007, p. 109).

2. Appreciate and develop perspectives

Providing a critique on systems thinking paradigm, Zhichang (2007, p. 450) added that Critical Systems Thinking considers multiple perspectives about cultural and political issues in system design. Multiple viewpoints of stakeholders are used to justify system boundaries, which makes it an ethical process (Midgley, 2007).

Boundary judgements, therefore, play a key role in practising CSH, while improvement refers to the relevant system, defined under these boundary judgements, termed as a 'reference system' (Ulrich, 1987, 1996). Boundaries define what is considered inside i.e. included in, and what is considered outside i.e. excluded from the reference system, known as the system's environment. Environment, as per (Checkland, 1981, p. 174), is something which cannot be engineered, but likely be affected.

The selection of a boundary causes a change in the nature of analysis (Yolles, 2001), and hence may alter the final outcome. The guidelines for practising boundary judgements are provided by 'boundary critique' which is the methodological core principle of Critical Systems Heuristics (Ulrich, 1983). Following section provides a discussion on 'boundary critique'.

3. Nuture responsibility

CSH raises questions not only as to whether the objectives of the matter under study were reached, but at the same time seeks for a critical and reflective justification whether the objectives were the right ones. As beauty lies in the eyes of the beholder, the improvement being sought may not at all be looked at as an "improvement" by others. This is achieved by the second principle, as bringing in multiple viewpoints enriches the study and burdens the experts to give a rational justification of the set objectives.

2.9.1 Boundary critique

Boundary critique refers to a systematic effort targeting for boundary judgements critically (Ulrich, 1996). It has roots in Churchman's (1970, 1979) quest for finding ways of seeking 'improvement' in problem situations (Yolles, 2001), which led him to envision of his "dialectical processes" to continuously *sweep-in* maximum amount of information for including new aspects of religious, moral, political or aesthetic perspectives into the boundary of analysis (Ulrich, 2001).

Given that the human knowledge is limited, everything that should be taken into account within the boundaries of analysis cannot be considered (Ulrich, 1991). Hence, humans draw boundaries delimiting which elements they intend to focus on by including them inside the defined boundaries and excluding the rest by leaving them outside.

Churchman's work acknowledged the need as to how people could rationally justify the boundaries they use (Midgley, 2007). Boundary critique (Ulrich, 1983) is the answer to this need as it aims to *sweep-in* the maximum amount of information into the defined system boundary on one hand and poses the question for a rational justification of the

boundaries through a debate between stakeholders on the other, thus making it an ethical process involving multiple viewpoints (Achterkamp & Vos, 2007).

As per Ulrich (1987), boundary drawing has either been entirely ignored by systems science or not practiced (Robinson & Wilson, 2003). Ulrich (1983) proposed how inquirers could rationally define a reference system's boundaries. Based under the categories of "Motivation", in terms of purpose to be achieved; "Control", in terms of decision-making process; "Expertise", in terms of those who claim to have the knowledge; and the "Legitimation", in terms of challenging the claim of expertise, he devised twelve questions as guidelines to support and practice the systematic processes of boundary critique. These questions have been summarized in Table 2.4.

Table 2.4: Checklist of boundary questions (Ulrich, 1991)

Questions
Sources of motivation
Q1. Who ought to be the client/beneficiary?
Q2. What ought to be the purpose?
Q3. What ought to be the measure of success/performance?
Sources of control
Q4. Who ought to be the decision maker?
Q5. What resources or components of the system should be control led by the decision maker?
Q6. What resources or components of the system should not be controlled by the decision maker?
Sources of expertise
Q7. Who ought to be involved in the design of the system or who should be the designer?
Q8. What sort of expertise ought to be considered for design/ who should be the expert and what role he should play?
Q9. Who should be guarantor (held responsible) for the system's performance?
Sources of legitimacy
Q10. Who should represent or witness the affected?
Q11. Who among the affected ought to be involved? To what extent the 'affected' be given chance to challenge the premises and promises of those involved?
Q12. What worldview should underlie the design of the system?

Ulrich classified his twelve questions around four social roles, under two basic categories of *involved* and *affected*. Each role bears a question about who plays or occupies that role and a question about what is/are the key concern/s related to that role (Carr & Oreszczyn, 2003). The roles and their definitions are summarized in Table 2.5.

Table 2.5: Social roles for practising boundary critique

Role	***Definition***
Involved	People involved in the decision-making process in terms of authority, setting purpose or objectives (see Q2) and performance measures (see Q3) for the problem at hand etc. It includes three sub-roles of client(s), decision maker(s) and expert(s). A guarantor should be among them held responsible for actions taken in the achievement of the objectives set (see Q9).
Client (Q1)	Beneficiary of the improvement or a party whose objectives are being served
Decision maker (Q4)	Those having a say or input into the decision-making process. They control over the resources (see Q5 & 6)
Expert/Designer	Those having expertise/relevant know-how/experience about the problem undertaken. They serve as sources of knowledge (see Q7 & Q8)
Affected	People who take the effects/side effects or bear the costs through the achievement or pursuit of the objectives by those involved. These are the ones not having any say or authority in the decision-making process unless involved (see Q11).
Witness	Those chosen on behalf of the affected or to represent the affected (Q10)

The above mentioned questions can be used to (Achterkamp & Vos, 2007; Midgley, 2007; Raza & Standing, 2011; Ulrich, 1987, 1996, 2000):

- Identify boundary judgements systematically of a 'reference system' by identifying roles of involvement i.e. involved and affected as the two basic categories and the sources of knowledge or expertise.

- Examine boundary judgements on their practical and ethical implications by linking boundary judgements with value judgements (the *ought to* scenario) as different values may lead to different factors that are considered relevant by different people, which may ultimately lead to a different system boundary. Hence the system is constructed in view of multiple perceptions rather than as an objective entity.

- Offer the "involved" and the "affected" the opportunity to show their competence, irrespective of the magnitude of their theoretical understanding or expertise about the problem scenario.

- Identify stakeholders playing the roles of client, designer, expert, guarantor and witness within the two basic categories of involved and affected (a discussion on the stakeholder identification using boundary critique is provided in the next section).

- Secure an advantage of argumentation for the affected citizens by imposing the burden of proof upon the clients/experts/designers/guarantors involved.

- Mediate between the conflicting demands or perspectives of those involved and affected.

- Define or reflect on system's 'improvement' in light of multiple stakeholder viewpoints and judgements because different stakeholders may bring different insights to bear on the decision.

Boundary critique demands from the person or group of persons practising it to be able to independently identify elements of concerns to be considered for boundary judgements, since boundary critique, by itself, is not capable to inform them about the coordinates of such elements (Mejía, 2002). Hence, boundary critique does not oblige practitioners to possess any particular knowledge on their own, but and requires them to be critical of any forms or aspects of knowledge under consideration. The question, here arises whether one is being critical or imposing a particular ideology, although the philosophy underlying boundary critique stresses personal views need not to be brought about in the nature of inquiry.

Mejía (2002, p. 1316) discussed this issue in the context of a community's health system proposal. Although, we are not guided by boundary to any specific view of a health system, but if the people in charge of defining system's boundary hijack it to be used for the imposition or appraisal of their personal views then resulting health system will be contaminated with their personal ideology. Consequently, the acceptance of such views shall promote someone's own set of beliefs. Ulrich (1996), therefore, proposes to educate the citizens to enable them to be critical and participative in the concerns of public issues.

In practice, the capacity to resolve and prioritize upon a diverse range of interests for socially responsible actions has been challenging. Boundary critique provides an ethical process (Midgley, 2007) for attaining an ethically-defendable 'improvement', as CSH framework encourages people to critically reflect on *who should* be the beneficiary, and *what should* be considered as pertinent sources of knowledge and expertise as compared to who *is* currently benefiting and *what* currently the sources of knowledge and expertise *are* (Carr & Oreszczyn, 2003).

Thus, CSH is a methodology which employs critical reflections, underpinned by the principle of boundary critique for systematically identifying system's boundary for sound professional practice. The next section discusses the identification of stakeholders using boundary critique, which is also termed as critical stakeholder identification.

2.9.2 Critical stakeholder identification

This section seeks to address the question as to how stakeholder identification can be handled using the lens of Critical Systems Heuristics (CSH) from a management perspective. Reed (1999) has earlier proposed stakeholder theory to be anchored on critical theory by arguing that normatively all citizens of the society have a general stake that their political equality be assured. This study, however, takes a managerial stance of the stakeholder theory in relation to its applicability with critical systems heuristics in an organizational context.

Stakeholder definition by Freeman (1984), as mentioned previously, is broadly considered as a milestone in stakeholder classification pertaining to managerial practice. This definition has been numerously cited and has drawn considerable attention since its inception. This study uses this definition as a launching pad to aim for broad view on stakeholder classification pertaining to 'involved' and 'affected' categories. Being "inherently managerial" (Freeman, 1984, p. 43), it can capacitate managers with a knack of developing more balanced and more robust strategy to handle unfolding changes involving various stakeholders, such as in an IS project, within the organization and also in the environment of the corporate landscape. Moreover, boundary critique's categories of 'involved' and 'affected' being in line with Freeman's classification, provides guidelines for critical stakeholder identification in form of twelve question (see Table 2.4) and insight to the roles stakeholders may play in these two stakeholder classes (see Table 2.5). Boundaries, in this case shall confine the two basic stakeholder categories of 'involved' and 'affected' along with the knowledge and expertise pertaining to the development and use of information system in an organization context.

This study regards web portal implementation as a change-based innovation project, aiming for an improvement. For the success of such a project, Baccarini (1999) assert that the enterprise-wide change initiatives must seek for the preferences and satisfaction of various internal and external stakeholders. Achterkamp and Vos (2007) have proposed a four-step method for project-based stakeholder identification using boundary critique that focuses on two key points: *roles of involvement* and *phasing this involvement*. They have defined a project broadly as an innovation project especially set

up for pursuing the development of new products, services or processes, or a project concerning a (temporary) task inside or outside an organization. The *roles of involvement* are underpinned by Ulrich's notion of boundary critique (Ulrich, 1983) while *phasing of involvement* relates these roles to the dynamic processes of a project encompassing four phases of *initiation, development, implementation,* and *maintenance*. Regarding IS adoption as an innovation project, Raza and Standing (2010) have used these *roles of involvement*, proposing a systemic model for IS adoption in an organizational context. Unlike four project phases, identified by Achterkamp and Vos (2007), Raza and Standing (2010), considered *phasing of involvement* as defined under Systems Development Life Cycle's (SDLC) phases of: investigation, analysis, design, development and maintenance. Moreover, based on the four-step stakeholder identification method suggested by Achterkamp and Vos, Raza and Standing have emphasized on the ongoing requirement of the identification of stakeholders and its repetition as required with the progression of the IS adoption project (for details see section 5.2.2). Raza and Standing have named this as *'phase-stakeholder-identification'*, or shortly speaking *'pha-stak-ification'*. This identification is capable of generating a *network of stakeholders* (see Figure 2.5), while its repetition generates the capacity of *sweep*ing-*in* more information based on the effectiveness of the strategies applied in the previous cycle(s) through the SDLC phases.

Due to time constraint, the study outlined in this thesis does not apply repeated stakeholder identification. The stakeholder roles (see Table 2.5) have been identified under the two basic categories of 'involved' and 'affected' by using Ulrich's (1983) twelve questions for boundary judgements. Chapter four presents stakeholder perspectives for the project and provides findings of data analysis.

2.10 Summary

This chapter analyses systems theory, stakeholder theory, information systems, change management and the other related topics in the way these concepts underpin this research. It provides a diagram to show how various concepts underpin this study in an organizational context. This diagram is the evidence of a strategic and a systematic

approach adopted for making a valuable contribution. It also identifies the sections in which various topics have been overviewed.

The chapter commences with the genealogy of systems theory, followed by the stakeholder theory, the two mainstream theories of this research. The linkages between the concepts provide the overall picture of the thesis contribution made by the study. By realizing the complex nature of an organizational setup, this chapter highlights the pioneering contribution made by Churchman (1970), establishes the importance of considering multiple perspectives in terms of the sources of knowledge (*what*), and the concerned people (*who*), to make boundary judgments. This chapter also provides various criticisms posed on the ideas of systems theory as the time progressed. Ulrich's (1983) proposition for a systematic involvement of stakeholders (involved and the affected) through Critical Systems Heuristics (CSH), has also been discussed at length.

With systems thinking as the major research paradigm, stakeholder theory from a management perspective serves as the second wing for this study to fly. It uses Freeman's (1984) landmark definition of a stakeholder as a launching pad. Stakeholder participation, complexity of relationships in organizations, existence of multiple perspectives, stakeholder identification and its significance in IS projects are the subsequent topics. Finally, as the point of convergence for the entire literature review, the chapter presents discussions on stakeholder participation in a web portal project and boundary critique, which is the core principle of Critical Systems Heuristics (CSH) and the methodological guideline for this study.

CHAPTER THREE
RESEARCH METHODOLOGY & RESEARCH DESIGN

3.1 Introduction

The choice of a research methodology guides the research process and findings. This chapter is basically composed of two streams. The first stream examines the need for a research philosophy. It also describes and justifies the chosen methodology and its philosophical stance.

The second stream presents the research model which is based on hermeneutic inquiry as underpinned by Ulrich's (1983) methodology of Critical Systems Heuristics (CSH). The principles of conducting CSH, proposed by Reynolds (2007), are presented in the context of the study. Ethical considerations, and data collection and analysis procedures are also discussed.

3.2 The Research Paradigm

The data collection, its analysis and interpretation are underpinned by a research methodology that strongly influences the research process and its findings (Llewellyn, 1993; Putnam, 1993). A paradigm is underpinned by a set of philosophical beliefs (Ticehurst & Veal, 1999), which provide guidelines and principles as to what methods and techniques fit the research problem at hand (Dobbert, 1990). For conducting research, different schools of thought or paradigms provide various methodologies. As mentioned by Williamson (2000), the two major paradigms for guiding business research are positivist and interpretivist, while Chua (1986) and other researchers (Cavana, Delahaye, & Sekaran, 2001; Myers, 1997; Orlikowski & Baroudi, 1991) classify them into three categories namely positivist, critical and interpretive.

The choice of research paradigm is dependent upon the advantages and disadvantages of the different alternatives, and their relative suitability for investigating the research problem.

3.3 Towards an Interpretive Paradigm

The research approach for this thesis uses interpretive, qualitative, action research based case study, supported by hermeneutic enquiry. The philosophical basis of interpretivism is the construction of the social realities as perceived by humans (Berger & Luckmann, 1966; Walsham, 1995, 2006; Weick, 1979) through language, beliefs and interpretations (Cavana, et al., 2001; Klein & Myers, 1999; Myers, 1997). Interpretivism takes interpretations to be subjective in nature (Walsham, 2006), while positivism assumes them to be objective (Nwokah, Kiabel, & Briggs, 2009).

Although, positivism has traditionally been the favoured choice in information systems research (Trauth, 2001), interpretive research has become much more important in the last two decades and now plays a well-established role within the IS field (Walsham, 2006). It generates knowledge about situations where information systems affect or are affected by the context in which they are implemented (Walsham, 1993). This research considers IS as having both social and technical entities (Stockdale & Standing, 2005), as looking only at the technical aspect of IS leads to meaningless conclusions that overlook the social aspect playing its part in the organization (R. Hirschheim & Smithson, 1988).

3.4 Justification for opting Interpretive Paradigm

This research adopts an interpretive case study approach, and the following characteristics of the study favour the adoption of an interpretive paradigm.

- The focus of the study was to apply Critical Systems Heuristics (CSH) to highlight systemic problems in information systems adoption and use, which is a reflective practice, employed on social system design using human participants. This considers the socio-political environment of the organization in focus, as emphasized by R. Hirschheim and Smithson (1988).

- The findings of the study are based on the methodological guidelines for people's involvement (roles of stakeholders), as proposed by Ulrich (1983), in

an organizational context. The recognition of the roles of stakeholders demands an interpretive approach (Stockdale & Standing, 2005) to achieve a deeper understanding of the socio-political influences.

- The lens of investigating multiple perspectives, for the study of information system in focus, required a research paradigm which is geared towards the understanding of the shared meanings behind an information system's adoption and use. Interpretive research considers the existence of contrasting interpretations about a subject, which may include a physical entity, an organization, or a human (A. S. Lee, 1991).

3.5 Research Approach

In addition to the philosophy-based research classifications mentioned above, research approaches are also categorized as *quantitative* and *qualitative*. Quantitative research, having its origin in the study of natural science phenomena, has found its way into social sciences in form of surveys and laboratory experiments. The qualitative approach, in contrast, has its origin in social sciences. It facilitates the study of social and cultural phenomena through processes like interviews, and participant observation (Myers, 1997). Its areas of application include action research, ethnography, and case study research.

According to Garcia and Quek (1997, p. 444), the choice of a qualitative or quantitative methodology is based on the "ability to identify the philosophical and theoretical assumptions" of the study undertaken. Qualitative research has proven useful in IS research related to organizational issues (Myers, 1997).

This study adopts a qualitative and interpretive IS case study research strategy based on a single in-depth case. Case studies are:

- advantageous for gaining deep insights from the viewpoints of the participants (Tellis, 1997).

- regarded as being applicable to IS research (Klein & Myers, 1999).

Qualitative research approaches, including case studies, have previously attracted criticism for their lack of rigour, data validation and conclusions (Benbasat & Zmud, 1999; A. S. Lee, 1999; Sarantakos, 1993). However, researchers are now recognizing that no method, whether quantitative or qualitative, is completely flawless or is necessarily better or worse than the other (Balnaves & Caputi, 2001; Dennis & Valacich, 2001). Moreover, it is also well-accepted that positivist research is not always appropriate in achieving social research outcomes (Klein & Myers, 1999; Tesch, 1990).

The question here arises whether accessing and analysing a few or even one organization can produce a generalizable outcome? Lee and Baskerville's (2003) generalizability framework shows that it is possible from a limited number of case studies or even a single one. Walsham (1993) emphasizes that the understanding of human nature in context and the need for studying such issues are only answered by so-called in-depth case studies.

3.6 Choosing a Style of Involvement

Walsham (2006) viewed the style of involvement as a 'spectrum' which often changes over time. A neutral observer and the full action researcher lie at the two extremes of this spectrum, as shown in Figure 3.1. Even with a neutral observer, the possibility of bias cannot be discarded as we all perceive things in different ways based on our environment and knowledge base (Walsham, p. 321).

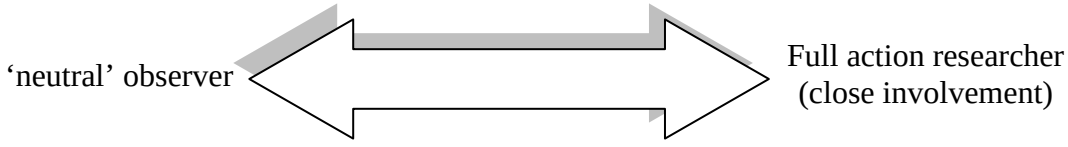


Figure 3.1: Styles of involvement represented as a 'spectrum'

As identified by Walsham (2006), there are advantages and disadvantages on both sides; below the advantages of 'close involvement' are compared to 'neutral' engagement:

Advantages of close involvement:

1. Causes in-depth access to data, people and hence to the issues related to them.

2. Enables observation or participation rather than just a mere access to opinions as happens in the interview-only studies.

3. Facilitates a contribution to the field itself by linking research to practice rather than taking the data away and writing it solely for a theoretical contribution (Baskerville & Myers, 2004).

Disadvantages of close involvement

1. Time-consuming and sometimes not permitted.
2. Field subjects being less open or honest in case researcher is seen to be pursuing personal interest.

3. Possibility of prejudiced research outcome as the researcher's results may reflect the viewpoints of those he/she socializes within the field.

The style chosen for this research study is discussed in the next section.

3.7 Research Design

The study comprised of three major phases viz. development of conceptual framework, data collection and data analysis (using NVivo8 software), as illustrated in Figure 3.2. The design of this study is fundamentally governed by the principles of hermeneutic circle, and is informed by the technique of doing CSH.

Although there is no agreed strategy of practising CSH, an evaluation using this approach relies on adhering to the principles outlined in section 2.9. However, based on personal experience, Reynolds (2007, p. 110), proposes a set of rules for systematically practising CSH. A discussion, on the research phases of this study, guided by these rules and how they specifically underpin the principles of hermeneutic circle, is presented below.

PHASE I: CONCEPTUAL FRAMEWORK

Rule#1: Search for the "system"

This refers to identifying a system of interest (SoI) for evaluation which may comprise of a plan, policy, strategy or a project. Enterprise Information Portals (EIPs) are IS/IT systems that enhance access capability, organizational content, which aim to address the information needs of a variety of user groups (Scheepers, 2006).

My system of interest (SoI) was a web portal implementation project referred to as Aus-Uni throughout this thesis. This organization was selected for the following two major reasons:

1. The implementation of a university-wide web portal covering a diverse range of stakeholders' information needs, making it suitable to be undertaken as a research case study involving multiple stakeholder viewpoints.

2. Easy access and availability of the research participants for data collection.

Rule#2: The researcher's role as evaluator

The researcher as the evaluator has to reflect on his/her role in SoI either as an independent observer, "expert" linked to the project or situation, or an "expert" providing expertise on an independent basis, or a "witness" for the affected or a combination of these roles. As an action researcher, this involves a role in a spectrum with "neutral observer" and "close involvement" as two extremes (see section 3.6).

Since I was not paid by any of the stakeholders of the project, my role with the SoI was completely as an independent or 'neutral' observer, involved in face-to-face interviews. Other reasons for choosing this style of involvement include:

1. A requirement of a fresh outlook on boundary judgements and stakeholder issues (systemic problems) from multiple angles or perspectives

2. Limited time frame

3. Limited access to data and information

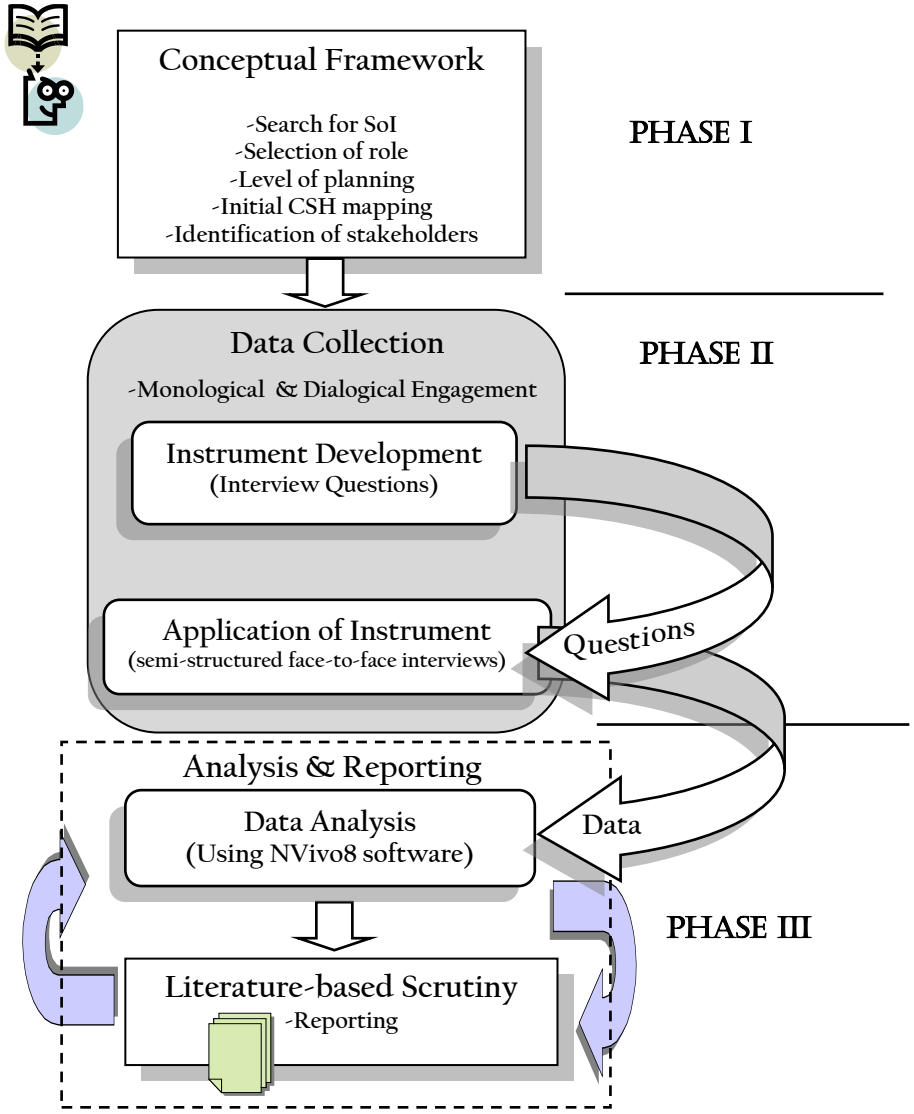


Figure 3.2: Phases of the research study – based on a hermeneutic circle underpinned by the CSH technique

Rule#3: The level of planning

Both Churchman (1979) and Ulrich (1988) emphasize the value of planning, and the level of planning at which a particular study is carried out. Jansch (cited in Reynolds, 2007, p. 108) identified three different levels of planning. These three levels of planning are:

Operational planning: considers the given purpose and endeavours to define means that will bring about "improvement" based on the purpose given.

Objective planning: outlines objectives or the purpose for SoI in order to secure improvement. This may include developing a strategic plan or mission statements.

Goal or ideal planning: relates to outlining vision statements, and goal to challenge the existing purposes of SoI.

The overall purpose of the web portal at Aus-Uni was to provide a forum for easy access to the university's information and resources.

"[The purpose of the project is] to simply provide access to all the different systems at the university and information the people need." (Project Manager – Deputy Vice Chancellor Academic)

Being an independent researcher, I observed operational planning to explore the perception of "improvement" against the above mentioned objective, through multiple viewpoints.

Rule#4: Initial CSH mapping

This deals with a start-up map for the journey of unfolding the SoI by using the CSH questions in the "ought to" mode. It is underpinned by any initial reference material available before the CSH evaluation is initiated.

Prior to seeking a stakeholder perspective for the summative-cum-formative evaluation of SoI (for details, see section 4.2), the normative use of CSH was conceived, which was principally based on an internal document about the review of Aus-Uni website carried out by an external consultant company. Table 3.1 illustrates the initial CSH mapping.

Rule#5: Identification of stakeholders

The key point of this activity is to identify individuals or groups who represent the stakeholders associated with the SoI in the best possible way. The stakeholders are selected to understand the concerns related to the specific roles in the practice of CSH, as shown in Table 2.5. There may be considerable overlap among these roles as one stakeholder may be playing a number of these roles in the context of SoI.

I interviewed people from a broad range of stakeholder groups in accord with Churchman's "sweeping-in" of stakeholder issues, and Ulrich's notion of the "affected" in addition to approaching the "involved". I also used "snowballing technique" by asking interviewees to name or recommend others whom we should further contact for further interviews. This helped me in looking at the system's stakeholders from their eyes and in attracting additional viewpoints which might otherwise have been missed.

The stakeholders for my SoI included people directly responsible for the implementation of the portal such as the Project Manager, Director Information Technology Centre (ITC), and the Technical Coordinator ITC. In contrast, the user group consisted of people from the library, Human Resources Centre (HRC), Office of Research and Innovation, Marketing, Graduate Research School (GRS), academic staff, and the students from undergraduate and postgraduate students, including PhD students.

Table 3.1: Initial mapping of Aus-Uni web portal project to CSH stakeholder roles

Sources	***Stakeholder Role***	***Role-specific concerns***	***Possible problems***
Possible problems/risks	Beneficiary: Various stakeholder groups at Aus-Uni under the principal categories of students and staff	Purpose: To address the information needs of various stakeholders at Aus-Uni through web portal as a single point of access	i. Consideration of incorrect measures/factors for the achievement of the purpose ii. Incorrect measures of improvement
Control	Decision maker: i. Project Management Team ii. IT Centre iii. User groups	Resources: Information repositories of students and staff including: i. Library, ii. Human resources, iii. Student Services etc.	i. Lack of proper representation of the 'affected' in the decision making process (marginalization) ii. No feedback mechanisms on decisions made iii. Personal interests iv. Monopoly v. Friction/conflict with the experts vi. Difference between decision maker(s) and the users in perceiving the project's objectives
Expertise	Expert: i. Project Management Team ii. IT Centre	Expertise: i. Knowledge of IT ii. Experiential know-how about project management iii. Social skills iv. Social and environmental responsibility	i. Incompetence ii. No accountability iii. Lack of consultation with users to incorporate their concerns in the implementation iv. Friction/conflict between experts and decision maker(s) v. Over confident experts
Legitimation	Witness: i. Student representation on the web committee on behalf of: a) students in all current academic degree programs in various schools around Aus-Uni b) and the future students; ii. Staff representation on the web committee on behalf of: a) all current academic and non-academic staff in various schools and service centres around Aus-Uni b) and the future staff	Emancipation: Opportunities to challenge the decisions and expertise of those 'involved'	Conflicts between 'involved' and 'affected' due to: i. Difference of vision ii. Lack of opportunities for 'affected' to raise their concerns

E-mail was used as a source of invitation with the 'information letter to participants' and the 'participants consent form'. The participation of the informants in the data gathering process was based on their consent. The informants reserved the right to refuse to participate at any point of time, as mentioned in the Ethical Guidelines in the section related to Dialogical engagement.

PHASE II: DATA COLLECTION

Rule#6: Monological engagement

This rule is about engaging with the commissioning authority of the SoI to access any documentation available for assessing the progress of the study. In the case of my SoI, there was no access available to any documentation. However, further insights for an appropriate practice of CSH were gained through the literature review and discussions with my supervisor.

Rule#7: Dialogical engagement

A purposeful dialogue between the evaluator and the stakeholders is required for the collection of viewpoints for the unfolding of SoI. The questionnaire underpinning this study was designed around CSH questions (see Table 2.4), which are quite generic in nature as they fit any SoI related to assessment and planning. However, care must be taken with the following aspects of when designing the questionnaire:

a) Jargon use must be relevant to the context of SoI.

b) The questions should address issues related to the purpose of SoI.

Following were observed during dialogical engagement:

i) Briefing the interviewee about the researcher's role and the purpose of the evaluation exercise

ii) Providing information about the level of confidentiality

iii) Indicating about the possibility of the provision of the research outcome in form of journal articles and conference papers

iv) Structuring the engagement into a semi-structured format which does not strictly follow the format of only answering specific questions, but invokes further discussion as issues regarding SoI unfold. This guideline helped in exploring systemic problems as the twelve questions, proposed by Ulrich (1983), do not address it directly.

v) Keeping the conversation relaxed but still challenging for the interviewees

3.7.1 Developing the interview questions

The introductory material and interview questions were designed with the following objectives in mind:

- The introductory information to the participants is shown in the 'information letter to participants' and the 'participants' consent form'. Since these served as the first contact with those who may participate in the study, the letters were designed to enhance the participants' trust in the study. The aim was to increase both the response rate and the reliability of the responses.

- The questions (see Table 4.1) are based on the nature of investigation that is underpinned by the theory in focus. The main theme of the questions revolves around the reflective practice of Critical Systems Heuristics, as proposed by Ulrich (1983), with an additional focus on the systemic problems.

- The questions serve the study objectives (see section 1.5) and provide a basis for data analysis within the planned time frame. The questions were categorized as general and specific questions and were kept to a reasonable number.

3.7.2 Ethical guidelines

Both the researcher and interview participants (informants) had to comply with the ethical practices as prescribed by Australian Code for the Responsible Conduct of Research (2007) and the National Statement on Ethical Conduct in Human Research (2007) (*Ref: http://www.unisa.edu.au/res/nationalstatement.asp*). Since the study involved human participation, ethics clearance was sought from the Aus-Uni Human Ethics Committee. The following precautions were observed to conform with appropriate guidelines:

- The participants were invited through an 'information letter to participants' and provided with a 'participant's consent form'.

- The participants had the right to choose whether or not to participate.

- In order to secure the identity and privacy of the participants, they were assured that in all references to their responses, their identity would be protected. This involved concealing their real names in the research reports and other publishable documents.

- Copies of responses from the participants were secured using locked filing cabinets and password protected devices. The data could only be used for the research purpose specified to the participants at the beginning of the study. Any change in the data usage could only occur with the consent of the participants.

- The questionnaire went through several revisions before the approval was granted by the Aus-Uni Human Ethics Committee.

3.7.3 Conducting interviews

Interviews are regarded as a key way to assess informants' interpretations (Walsham, 2006). As mentioned above, data collection involved 25 individual face-to-face semi-structured interviews between November 2009 and May 2010 across

the Aus-Uni. The interviews lasted between 30 to 45 minutes and were audio-recorded and transcribed. Qualitative analysis software (NVivo8) was used for a detailed analysis of the data.

To conduct the interviews in a mutually conducive environment and to make informants feel at ease during the discussions, the questions and policy information, in form of the 'information letter to participants' and the 'participant's consent form', were provided to them quite in advance. In the beginning of each interview, the informant was given a brief introduction about the nature of study. To help obtain the true opinions of the informants, their privacy and confidentiality were assured. This not only helped in building informants' trust and confidence in the research process but also contributed to the quality of the research. All the interviews were digitally recorded. The following advantages of digital recording (Walsham, 2006) outweighed its disadvantages and limitations.

1. It keeps a truer record, compared to taking notes.

2. It makes it possible for the researcher to engage well with the informant.

3. It makes it possible to make use of transcriptions for various forms of analysis.

4. It facilitates the use of direct quotes when writing up the research.

The questions posed during interviews were based upon the theoretical foundations established during the literature review.

PHASE III: ANALYSIS & REPORTING

Data analysis – Hermeneutic perspective

This thesis used a hermeneutic approach (Packer & Addison, 1989) as an instrument for data analysis, informed by the technique of practising Critical Systems Heuristics (CSH). Hermeneutics is derived from the Greek word *Hermeneuein*, meaning to interpret. Hermeneutics, therefore, is the art of interpretation. It looks at human activity through in-depth inquiry, focusing on participant's viewpoints, emotions and attitudes rather than just observed behaviour (Packer & Addison, 1989). A. S. Lee (1994) and Lacity and Janson (1994) used this approach in information systems research.

For interpretive data evaluation, Klein and Myers (1999, p. 71) proposed seven principles to maintain quality standards for in-depth cases studies and ethnographies. They did not see these principles as bureaucratic rules, but instead envisaged researchers using their judgement about the applicability of each principle in the context of their research. This section describes how these principles were observed for this research, if indeed a specific principle was practised. It also indicates how these principles are informed by the rules of practising Critical Systems Heuristics, outlined in sections related to phase I and II of the research. These rules have been identified as rule#1, rule#2 and so on, where applicable.

i) The fundamental principle of the hermeneutic circle

This fundamental principle provides the basis for the other six principles. Hermeneutics emerged as the study of analysing textual data, and was later extended to include not only the documentary artefacts, but their behaviour was also treated as "text analogues" for interpretation (A. S. Lee, 1994, p. 149).

As opposed to a scientific approach which sees interpretation and analysis as the two ends of a spectrum, the hermeneutic approach visualizes interpretation and analysis as being on the circumference of a circle, where the viewpoints formulate a 'forward arc'

and their interpretations form a ‘reverse arc’ (Packer & Addison, 1989, p. 34), thus establishing a constant learning process for the researchers.

Given that the needs of stakeholders in an organizational context, and the technology that fulfils these needs are ever-changing, hermeneutic enquiry was considered as a suitable interpretive approach for this research. This transitional nature of user needs and technology also requires the ‘forward’ and ‘reverse’ arcs be in continuous motion. This will keep the research cycle going, prompting other researchers to build on this research and theorize further propositions.

ii) The principle of contextualization

This principle of hermeneutic circle was based on rules#1, 2 and 3. The portal project at Aus-Uni was undertaken to address the information needs of its various stakeholder groups through a common forum. The project was preceded by the implementation of the Aus-Uni website which initially allowed access to various systems which were subsequently accessed through the portal. However, some of them could still be accessed without using the portal. The internal document that elaborated on the implementation issues of the Aus-Uni website was consulted to understand the contextual history of the portal project. This document, which was prepared by an IT consulting company, provided a review of the standards followed in the implementation of the Aus-Uni website and the factors considered in addressing the information needs of the stakeholder community of Aus-Uni.

Although the Aus-Uni website implementation and that of the portal were not sequential, as the portal project was initiated while the website implementation was still in progress, the internal document still provided the pros and cons of the website project. It provided insights into the environmental settings in which portal project was initiated. This study refers to the portal project as a ‘moving target’ (Klein & Myers, 1999, p. 73) as it was perceived as a change project, triggered by emerging information needs and technological advancements, for which getting continuous user feedback was deemed essential.

iii) The interaction between the researcher(s) and the subjects

Rules #5 and 7 provided the basis for this principle. The mode of interaction with the subjects or participants, as mentioned earlier, was through semi-structured face-to-face interviews on an individual basis. The research recognized them as 'interpreters' of the context under investigation (Klein & Myers, 1999, p. 74). This aspect was further addressed by posing additional questions, which facilitated open conversations providing richer insights which may not have been gleaned solely through structured questions. Such questions also served as a yardstick for verifying information, gathered from other participants, which assisted with exercising the principle of suspicion (see principle vii).

A few informal conversations also took place with some of the stakeholders who became interested in my research and ultimately became willing participants. These conversations also provided additional insights and in some cases, beneficial advice to progress my research.

iv) The principle of abstraction and generalization

Generalizations from interpretive case studies can be classified into four types; developing concepts, generating theory, extracting inference, and contributing to rich insight (Walsham, 1995). The purpose of this research is the acquisition of a rich insight, into the problems confronted in an IS portal implementation, through logical reasoning and sense making from multiple stakeholder viewpoints. The study also seeks a possible classification of such problems. However, the study does not generate a new theory or a definitive IS adoption model.

Sufficient contextual information has been provided about this research to assist those making judgements about the transferability of these research findings to similar contexts. It is, however, incumbent upon them to check whether there is enough contextual similarity among the problem situations to achieve a valid transfer and generalization.

v) The principle of dialogical reasoning

This research principle is based on rule#7 of observing the methodology of Critical Systems Heuristics (CSH) which provides a set of twelve questions to set up a "dialectical process". These twelve questions have been appended along with additional questions to enhance the depth of insights from the case study. The study is thus based upon some root assumptions, provided in chapter one.

Action research, as opposed to scientific methodologies, cannot be isolated from the phenomenon under study and, therefore cannot be purely objective (Packer & Addison, 1989). Moreover, contextual bias remains a threat (Mason, McKenney, & Copeland, 1997). The researchers do also have some 'preconceptions' (Klein & Myers, 1999, p. 76) which may cause both understand and misunderstand the case under study.

The prior knowledge and prejudices of the researcher have been balanced by the collection of multiple viewpoints (see principle vi) and cross-checking them across the spectrum of views, collected from various stakeholders around Aus-Uni (see principle iii). Moreover, these stakeholders were also divided into categories of IS professionals/Developers (C1) and the end users (C2) to analyse the problem scenario from the perspective of the 'customer-supplier' relationship (for details, see section 4.2.2).

vi) The principle of multiple interpretations

The principle of multiple interpretations is inherently embedded in the practice of 'boundary critique', the core methodological principle of Critical Systems Heuristics (CSH), discussed under rule#7. In that critique, multiple stakeholder viewpoints are sought to establish the boundary of analysis and studying multiple influences on the socially constructed context. The conflicting interpretations of these stakeholders about the problem situation assisted in boundary judgement in this case study.

This was augmented by the insights gained through the inclusion of certain questions pertaining to the 'is' scenario (Summative evaluation – for details, see section 4.2) in

Ulrich's twelve questions. This provided an additional lens for practising the boundary critique by cross-checking the boundary of analysis between the 'is' and 'should' scenarios. The division of stakeholders into C1 and C2 (see principle v) assisted in analysing the conflicts arising among these two categories during the portal implementation at Aus-Uni.

vii) The principle of suspicion

The principle of suspicion is one of the least developed in IS literature (Klein & Myers, 1999, p. 78). Preconceptions could have led to bias, ultimately leading to misinterpretation of viewpoints. This was avoided through the cross-examination of the viewpoints gathered from the stakeholders in the same group such as multiple stakeholders in the library, human resources, marketing, research and innovation centre, academic staff, students and information technology centre. This provided a mechanism to look at the situation through multiple eyes within the same group e.g. library, and detect any bias based merely on personal interests of certain stakeholders which may lead to inappropriate interpretation of the problem scenario.

Since all these principles are interdependent (Myers, 1994), the application of one principle provided assistance in an intentional or unintentional observation of the remaining set of principles. However, it is not possible to be certain that the findings of my research, reported under rule#8, are completely free from errors arising from personal ideologies and perspectives (Kesier, 1994). Figure 3.3 shows how some of the principles of hermeneutic circle are underpinned by the rules of practising CSH.

Rule#8: Reporting

Reporting is about presenting the evaluation in a narrative form, which should provide a distinction between the researchers' personal views by using the terms like "I" or "in my view" from the views of the stakeholders. The report should clearly indicate the "ought" mode of the analysis, which is open to challenge and further deliberation.

The reporting of the current SoI was carried out in line with the above mentioned guidelines. The research outcome presented in journal and conference papers, listed at the beginning of this thesis, used Aus-Uni as the name of the university for confidentiality. No interim reports were submitted to the stakeholder groups interviewed as the study was carried out for academic purposes only. However, the research findings in this thesis and associated publications are available to inform project management and/or the participating user groups, as mentioned in the rule of dialogical engagement.

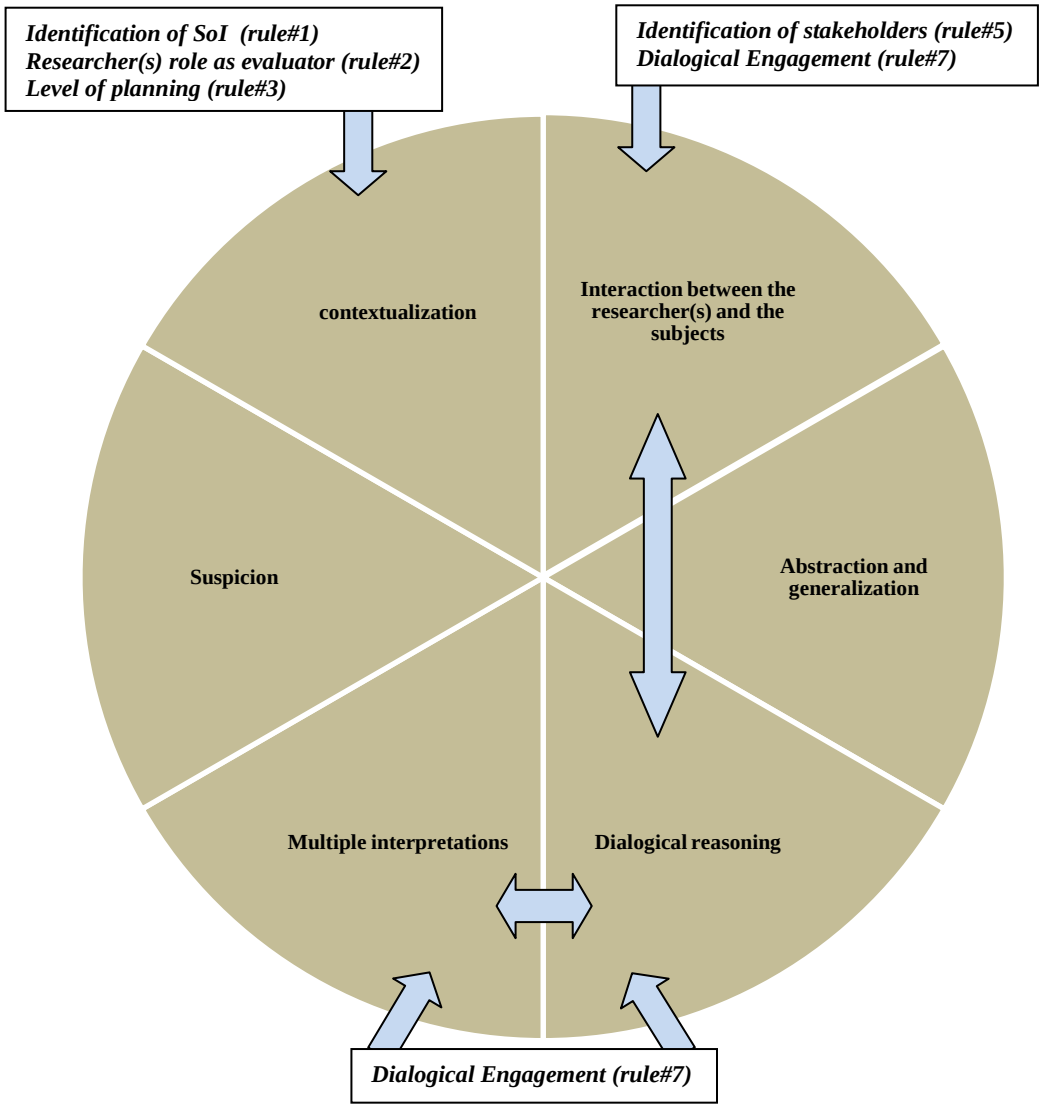


Figure 3.3: Hermeneutic circle as underpinned by the rules of doing CSH – arrows showing how they interlink

3.8 Summary

This chapter highlighted the research paradigm, research approach and the research design. It also provided a comprehensive discussion on the choices made for conducting the study. It began with a justification of my choice of an interpretive qualitative paradigm. It later presented a detailed description of the research design, highlighting the rules of practising CSH, and how they have been followed under the context of this study. The chapter also shed light on how the principles of hermeneutic circle (Klein & Myers, 1999), are underpinned by the technique of CSH, proposed by Reynolds (2007).

CHAPTER FOUR
DATA ANALYSIS

4.1 Introduction

This chapter provides a qualitative analysis of data collected using the methodology of Critical Systems Heuristics (CSH). It also presents a discussion on the inferences made from it. It starts with an introduction to the significance and applicability of CSH in the context of the research study, followed by highlighting the mode of CSH analysis applied. Then it presents data analysis by focusing on four tasks; boundary judgement to establish the system of stakeholders, exploration of the information needs through multiple stakeholder perspectives, and the identification of *systemic problems* arising from conflicting viewpoints of stakeholders.

4.2 Significance and applicability of CSH in the context of the study

Critical Systems Heuristics (CSH), which is profoundly evaluative in nature, is debatably the most powerful assessment framework developed so far (Reynolds, 2007). It is embedded in the area of critical systems thinking which emphasizes broad participation, and the assessment of a diverse range of stakeholder viewpoints. CSH is applicable in social contexts to evaluate the purposiveness of a system under study. Purposiveness refers to the "purposefulness" of the "means" or "tools" through a comparative analysis of the critical reflections provided by those who are "involved" and "affected" by the use of these "tools" (Ulrich, 1983, p. 328). This means that counting the number of computers in a university does not necessarily relate to the quality of IT education, unless justified and critically reflected upon by those in authority and those who supposedly "suffer".

This study questions as to whether the objectives concerning Aus-Uni's web portal are being achieved. The research considers the web portal as a social activity tool and evaluates it against the information needs of the multiple stakeholders and ultimately identifies potential barriers or problems in the achievement of these objectives.

Although CSH can be supported by the use of statistical (quantitative) methods, CSH on the whole is essentially a qualitative inquiry.

(Reynolds, 2007, p. 108) has identified the following four modes of CSH evaluation:

1. Ideal mapping: also called norms evaluation which applies CSH only using the "ought' questions

2. Classic *summative* evaluation: using a comparative analysis or "critique" through "ought" and "is" questions (see Figure 4.1)

3. Reframing or *formative* evaluation: suggesting new practices or norms

4. Challanging or *probing* evaluation: questioning or challenging dominant understandings or judgements by comparing "ought" and "is" questions

The current study is a summative-cum-formative evaluation (a combination of modes two and three) as it identifies information requirements and the systemic problems pertaining to the web portal's adoption and use at Aus-Uni, and finally makes some recommendations, which are discussed at length in chapter five.

4.2.1 An overview of the interview questions

As mentioned in chapter three, the data for this study was collected from November 2009 to May 2010. In total, 25 semi-structured individual interviews across the Aus-Uni were conducted. A small sample size is adequate to reveal a comprehensive insight in most of the case studies (Tan & Hunter, 2002). Since the study used the saturation principle in qualitative research (Yin, 1994), the interviews were halted once new findings were not surfacing. Senior manager directly responsible for the implementation of the portal, staff (academic and non-academic) and students from various degree programs formed the main source of data. The interviews lasted between 30 to 45 minutes and were digitally-recorded and transcribed. To enable more thorough and efficient analysis of the case study data, a qualitative analysis software (NVivo8) was

used. NVivo, developed by QSR International, is a software tool for organizing and analysing qualitative data, which is applied in across various field of study such as management sciences, anthropology, tourism and forensics (visit: http://en.wikipedia.org/wiki/NVivo).

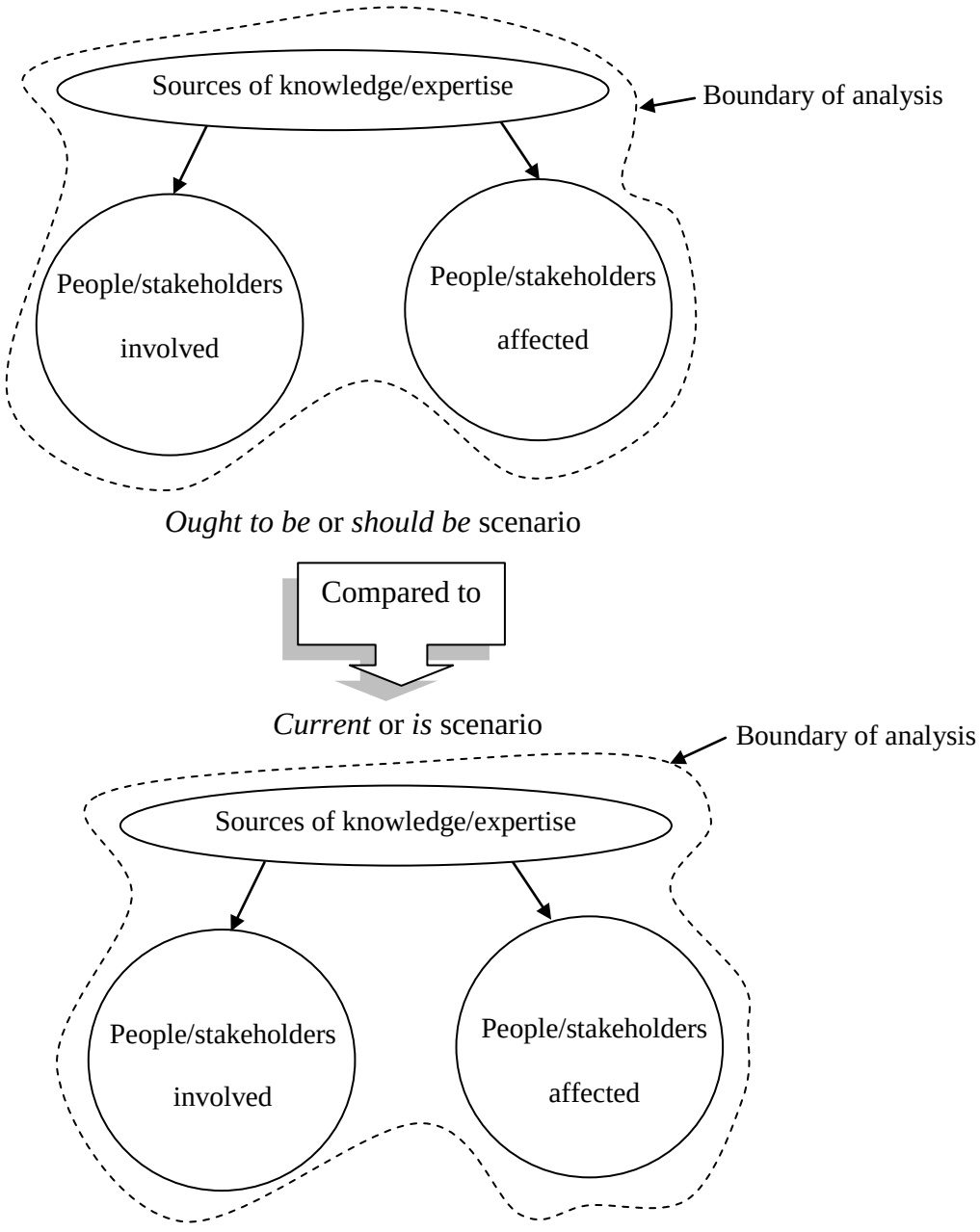


Figure 4.1: Practical implications of boundary critique in view of multiple interests

CSH does not provide a prescriptive methodology, and in some situations, not every question needs to be investigated (Reynolds, 2007). The interviews comprised of some general questions about participant's tenure of study, or the nature of work at Aus-Uni, followed by some questions about participant's experience with the portal. Since participants were expected to have difficulty in understanding the actual language of the questions listed in Table 2.4, the questions were simplified as of Table 4.1.

To comply with the nature of the classic summative evaluation, some issues in Table 4.1 were posed with an 'is' question, followed by the 'ought to be' or 'should be' question. The 'should be' questions prompted for more open responses as they encouraged participants to think and reflect broadly, while the 'is' questions caused restricted responses. Questions 5 and 6 of Table 2.4 were merged to a single question (Question 10 in Table 4.1), as it helped participants to have a focused thinking as 'not' question in real life situations normally results in a more comprehensive response. The response of question 5 (Table 2.4) was then sought within the same reply. Question 15 in Table 4.1, was not posed with 'is' phrase because this seemed to produce similar responses as for an ongoing project, this question refers to someone responsible for the success of a project sometime in the future. The second portion of question 11 (Table 2.4) was posed as a side question to find out the level of involvement of the affected.

Since the questions were rephrased to suit the context of the web portal project at Aus-Uni, on most of the occasions, the interviewees did not face any problems in understanding the questions. A brief introduction about the nature of the research and the clarification about the concepts underlying the 'involved' and 'affected' categories of stakeholders helped them understand the questions correctly. Further clarifications on questions were provided to the interviewees, whenever required.

Table 4.1: Interview questions

Questions
General Questions: 1. How long have you been working/studying in Aus-Uni? 2. How would you define your role in relation of the Aus-Uni portal (end user or administrator or both)? 3. How long have you been using/administering Aus-Uni portal? *Specific Questions:* 1. Who do you think are the stakeholders or people related to Aus-Uni portal? 2. Who should be the beneficiary in the design and improvement of the Aus-Uni portal? 3. Who do you think is the beneficiary of the Aus-Uni portal? 4. What should be the purpose or goals of Aus-Uni portal to serve the beneficiary? 5. What in your opinion is the purpose of Aus-Uni portal? 6. Which factors e.g. social, technological etc. do you think should be considered in measuring Aus-Uni portal's performance? 7. What are the problems related to your experience with Aus-Uni portal? 8. Who in your viewpoint should make major decisions about the content, purpose and resources of the Aus-Uni portal? 9. Who do you think makes these decisions or who is the decision maker? 10. What resources should not be controlled by Aus-Uni portal's decision maker? 11. Who should be involved in defining the requirements of the Aus-Uni portal? 12. Who do you think are actually involved in defining the requirements of the Aus-Uni portal? 13. Who do you think are not involved but influenced or affected by the development or improvement of Aus-Uni portal? 14. Who among the affected should be involved? 15. Who you think should be held responsible if Aus-Uni portal fails to achieve its purpose? 16. How do you think the Aus-Uni portal should evolve in the future?

Some interviewees asked for examples to gather ideas for their response, which was avoided. Prompting interviewees with my viewpoint or guiding them how to respond would have produced a bias in the data gathering exercise, as it leads thinking process of the interviewees into a certain direction. However, some explanations to such questions were provided instead of guiding them how they should respond.

4.2.2 The overall nature of analysis

The days when researchers or experts, engaged in studying social processes and issues, enjoyed ultimate ability and authority of producing pre-planned outcomes are long gone. A more realistic outset in which experts are players just like other stakeholders (Midgley, 2000) is the order of the day. I argue that the EIP (Enterprise Information Portal) implementation does not prove successful until stakeholders and their roles are identified and the voices of the affected heard and considered. Therefore, boundary critique should be applied as a part of EIP implementation strategy. This requires mediation among perspectives and seeks for more user involvement mechanisms into the overall decision making process.

This research considers IS as both social and technical entities (Stockdale & Standing, 2005), as looking only at the technical aspect of IS leads to meaningless conclusions that overlook the social aspect of the organization (R. Hirschheim & Smithson, 1988). As discussed in chapter two, a broad categorization of stakeholders in an IS project leads to those using or supposed to ultimately use the system (end users or simply users) and those responsible for the design and development (IS professionals/Project Management Team). User expectations substantially contribute to the outcome of an IS project (Elpez & Fink, 2006). C. Standing et al. (2006) regard user involvement as one of the most important factors that influence success or failure. As per Elpez and Fink (2006, p. 222), the project managers or IS professionals are supposed to resolve the requirements of management and those of end users.

The project managers serve as ‘suppliers’ of an IS/IT innovation, while the users are on the ‘customers’ side. In this research, the view point analysis of the stakeholders is, therefore, carried out under the categories of project managers/developers and the end

users, represented by C1 and C2 respectively. C1 comprised of Project Manager (DVC Academic), Director Information Technology Centre (ITC), and the Technical Coordinator ITC. While C2 consisted of people from the library, Human Resources Centre (HRC), Office of Research an Innovation, Marketing, Graduate Research School (GRS), academic staff and the students from various degree programs including PhD, masters, and bachelors. Although there were representatives of academic and non-academic staff in the Web Governance Committee (or simply Web Committee), there was no student representation. Moreover, some of the responses from the staff (academic and non-academic) revealed an inappropriate representation of their concerns. The Web Committee was, therefore, categorized as C1 as the Committee decisions were primarily made by the Project Manager.

The notion of boundary considerations was incorporated to reveal concerns of a diverse set of enterprise stakeholders. It considered *which* groups of people and their concerns *should* be considered relevant as compared to *who have been* considered inclusive or relevant to the decision of EIP implementation (see Figure 4.1). Moreover, the study also identified *who have been* considered irrelevant and thus excluded or marginalized. The stakeholder viewpoints were considered as C1 and C2 to further enhance the understanding of these perspectives regarding the stakeholder roles, and managing their mutual disagreements for the purpose of improving the overall EIP implementation process. By simply generating the reflections of the entire range of stakeholders would have generated an amalgam of viewpoints which would have made data analysis quite tedious in extracting meaningful conclusions. By polarizing the perspectives into C1 and C2, considered as ‘suppliers’ and ‘customers’ respectively, generated a ‘tug-of-war’ between vision, interests and objectives of these two major groups, leading to a more comprehensive situation analysis based on ‘should be’ and ‘is’ scenarios.

The primary purpose of this study was to reveal systemic problems, faced by these stakeholders in the adoption and use of the Aus-Uni’s web portal. This analysis was undertaken in two phases. The first phase comprised of the viewpoints analysis from the perspectives of C1 and C2, to define the boundaries for the system of stakeholders. Then a more detailed analysis of this phase identified the information needs of the stakeholders in C1 and C2. In the second phase, systemic problems related to these

information needs were then identified from the responses emerging from question 7 (see Table 4.1). The responses to this question were further elaborated by asking sub-questions for the identification of those involved and affected by the problem scenarios, which is the basic requirement and ingredient of CSH based analyses.

4.2.3 The use of data analysis software

As mentioned earlier, the qualitative analysis of data was conducted using computer-based software called NVivo8. The use of software for data analysis saves researchers' time through effective handling of large amounts of data, and by liberating them from the pain of manual data handling, which ultimately improves the validity of the qualitative research (St. Johnson & Johnson, 2000). Tesch (1990) has highlighted the advantages of using such a tool over manual data processing techniques in terms of rigour, speed and consistency.

St. Johnson and Johnson (2000) recommend that the researchers should investigate the suitability of the software package to their research needs and their own computer literacy. The benefits of using a voice recognition software have been stressed by Anderson (1998). No voice recognition software was used for data transcription as the accuracy of the output in using software is still debatable. Moreover, manual transcription helped me gather ideas about data analysis as I started getting acquainted with data even before the analysis phase. Here I would like to clarify that the analysis carried out for this research is not of a statistical nature.

DATA ANALYSIS: PHASE-I

4.3 Stakeholder Viewpoints Analysis and Boundary Judgment

This section discusses the details of the boundary judgment. The information needs of various stakeholders in C1 and C2, and the scenarios of systemic problems identified by further analysis are given in the subsequent sections.

The boundary of the stakeholder roles, as specified by boundary critique (see Table 2.5), has been looked at through the eyes of the viewpoints that emerged from the categories of C1 and C2, using the 'should be' and 'is' scenarios (see Tables 4.2 and 4.3). Question 1 (see specific questions in Table 4.1), which is not from the set of Ulrich's (1983) twelve questions, was posed to trigger a broader picture of the entire set of possible stakeholders without putting any stakeholder classifications into the interviewee's minds right from the beginning. For instance, some responses to this question, in addition to identifying university staff and students as stakeholders, also mentioned the outside community and/or government and/or business bodies to have a stake into the system. Then the questions related to the stakeholder roles were asked to map the list of stakeholders from question 1 to the roles of beneficiary, decision maker, expert or designer, and the guarantor. An overall summary of the responses for the stakeholder roles, resulting from C1 and C2, have been provided in Tables 4.2 and 4.3 respectively.

Table 4.2: Comparison of the system of stakeholders between 'should be' and 'is' scenarios (C1 perspective)

Role	***Stakeholders (should be)***	***Stakeholders (is/are)***
Beneficiary	Students, Staff (academic, non-academic), Marketing, everybody who uses it	Students, Staff (academic, non-academic), Marketing, IT (e.g. in announcing outages)
Decision maker	Web Advisory Group/Web Governance Committee, web business manager, senior executives (project sponsors), end users (students and staff)	Deputy Vice Chancellor Academic (DVC), Web Business Manager, business owner of the particular area on the portal (e.g. Human Resources Centre)
Expert/Designer	Web Advisory Group (with representation from each faculty and service center), IT	Web advisory group (with representation from each faculty and service centre), IT

Deputy Vice Chancellor (DVC) Academic, Web Business Manager, Senior Management and the IT people were seen as the *guarantors* of the project's success. One of the participants from ITC regarded everyone to be *affected* by the design and development of the portal, which led to a blurred distinction between the involved and affected categories. However in another response, students and staff in support areas such as IT service desk were pointed out as affected. Overall, students and staff were the groups identified by C1 as *affected,* and thus need to be involved.

Table 4.3: Comparison of the system of stakeholders between 'should be' and 'is' scenarios (C2 perspective)

Role	***Stakeholders (should be)***	***Stakeholders (is/are)***
Beneficiary	Students, Staff (academic, non-academic/admin), community, IT, Portal developers, university as an entity	Students, Staff (academic, non-academic), marketing, university as an entity; web portal administrators
Decision maker	Students, Staff (academic, non-academic/admin), Web Governance Committee with representatives of various stakeholders around the university, Senior executive group, user group through representation, joint decision between the IT administrators, CIO and users, copyright officer; Executive Deans, DVC and general staff ; IT and users	IT support group, academic staff, some of the groups in student guild, Web Governance Committee, administrators; Marketing (e.g. for the news) and the IT people; IT department, head of schools, Professional Development people (may be), Student Services, copyright officer, Vice Chancellor (perhaps); DVC in conjunction with the web team; Chancellery and IT; senior university executive
Expert/Designer	Students, Staff (academic, non-academic/admin), community (e.g. for posting career opportunities), Web Governance Committee with representatives of various stakeholders around the university; Cross-functional team; user group through representation, library central staff; users, technical people; IT people, key stakeholders from each school, marketing and management (Chancellor, Vice Chancellor, Executive Deans); *For staff portal*: Representatives from academic and general staff, HR, Finance, *For student portal*: Student groups, library, Student Services Centre, all faculties; Users at different levels	IT support staff, admin staff, Web Governance Committee, CIO, staff; Schools, management (Chancellor, Vice Chancellor, Executive Deans) and the marketing people, copyright officer (for copyright reasons); DVC and Web Committee; Users at higher levels

Deputy Vice Chancellor (DVC) Academic, senior executive team, IT people, Marketing, Management (Chancellor, Vice Chancellor, Executive Deans) were pointed out as the *guarantors* of the project's success. Some responses regarded it to be a shared responsibility i.e. everybody is responsible. The user perspectives regarded students, staff (academic and non-academic), researchers and adjunct staff, Government of Western Australia and outside community were identified as *affected*.

4.4 Comparison between Project Management/IS Developers (C1) & User Perspectives (C2)

This section summarizes the boundary judgment by quoting some actual viewpoints collected from the interviewees in C1 and C2 categories. Although, outlining a few responses does not do due justice to the richness of the viewpoints collected, listing a complete bunch of quotations was also not practically possible. This brief discussion on the boundary judgment, and the information needs in the next section grasps the bigger picture before focusing closely on systemic problems. This is similar to conceptualizing the phenomenon in its entirety before that of its parts (Ackoff, 1995), which is the essence of systems thinking. Raza and Standing (2011), while discussing their systemic model for managing and evaluating conflicts in organizational change, also propose to take a comprehensive snapshot of the full stakeholder set before it is further zoomed-in for the conflicting stakeholders.

Both C1 and C2 regarded students and staff as the 'should be' beneficiaries and decision makers. However, the limitation of their possible involvement in these roles was also realized.

> "...you can't obviously talk to 4000 staff members and 22000 students individually, so there should be a process of dealing with as many people as you can in certain sort of structure...structured format... through workshops or forums or whatever." (Director ITC)

"I am not a democrat that believes that every single person should be involved, otherwise we'll be here in the next fifty years. It has to be done on the representative basis. But they [project management/Developers] have got to do it with the interests of those people very much in mind not just their own interests." (HR Staff)

"...the end users the students and staff, they should be involved. It is very hard, very challenging to involve so many people... how you do that, its very challenging." (IT Coordinator)

Students and staff were the ones found to be *affected* in view of both perspectives. The mechanism for their involvement/representation (*witness*ing) was found challenging and a matter to be pondered about. Based on the experience of the project management, seeking feedback from the portal was found more effective in addressing user needs as compared to workshops or forums.

"We sort of pro-act more in terms of using the feedback system rather than going out formally having workshops with the people, because in reality people don't come. So we have tried to do few workshops with students and staff and ... just don't get enough people turning up to make it worthwhile. So we try and use, you know, web based input through forms and ... everyday there are these five or six issues that people come up with." (Project Manager - DVC Academic)

Users from students, staff and library advocated a close involvement of all system users where as one of the participants from marketing regarded feedback mechanism to be enough for involvement, as following quotes testify:

"...if there is feedback option available that's sufficient involvement for the people. If there is opportunity for the people on the portal to submit information in form of, I guess feedback, complaints, and it is regularly monitored that is involvement for the majority and that what they need." (Marketing Staff)

The response from IT Coordinator advocated the involvement of support staff for the purpose of change management, which further uncovered a systemic problem scenario presented in section 4.7.3 (see problem scenario#3).

> "One of the other areas that should be involved, as I was saying, are the support areas, so we should be involving areas such as service desk, not in the decision making process, but when we change things. We should be making sure that they are aware of what we have changed so those support areas can answer the questions from the end users about the portal. It is not just the IT support, its really all the support areas of the university." (IT Coordinator)

This research, therefore, highlighted the difference in views between C1 and C2, and identified a venue to ponder as to how users, especially the students could have proper representation in the Web Committee.

> "...students should be involved since it's a large group ... what they want it to look like, what they want screens to be like when using it. I think we'll have a very different tool if we did that." (Library Staff)

> "... in terms of staff like I said you know I have seen calls to be involved here and there ...I think students are affected but they are not involved. I don't know whether they have been asked. Students definitely should be involved. I think every school should have a user representative, so from each school you should have student, admin and academic [as a representative]." (Academic Staff)

Project management mentioned about the future involvement of some student groups in the student guild for student representation in the web advisory group.

> "Well, it [web advisory group/web governance committee] doesn't have it [student representation] at the moment but we actually, [in] the last meeting, ... decided that we get some students... probably through the guild we'll work that would be the easiest, because if we don't get them from a sort of a formal student group they don't turn up. ... we might a post grad rep and an under grad rep or something like that." (DVC Academic)

The issues of user representation and involvement unleashed systemic problem scenarios 4 and 5 presented in section 4.7.3.

4.5 Identification of the Information Needs of Stakeholders

This section discusses the information needs explored through various stakeholder viewpoints under the two main categories of C1 and C2 described earlier. The participants in C1 and C2 came up with a number of factors related to their information needs as listed in Table 4.4, but the following ones were found to be the most important.

Table 4.4: Information needs from the viewpoints of C1 and C2

S.No.	***Information Needs/Factors***	***C1***	***C2***
1.	Single sign on	√	√
2.	Usability	√	√
3.	Consistency	√	√
4.	High availability	√	√
5.	Use of current technology	√	√
6.	Customized experience	√	√
7.	Communication of changes	√	√
8.	Accessibility	√	√
9.	Clarity and organization	√	√
10.	Social networking		√
11.	Dynamic integration	√	
12.	Speed		√

Single sign on referred to simply have access to all the different systems at the university and the required information. As per C1, the main priority and the initial scope of the portal were to provide staff and students an easier access to the key web applications through a single point. Both C1 and C2 agreed to have portal as a single

forum of access, which was partially achieved as there were still some applications e.g. the black board which required an extra log in.

According to C1, usability relates to clarity and ease of interaction, such as minimum number of clicks to the required information, special access capabilities for the disabled such as people with partial blindness. While C2 perceived it as the ease of use and the availability of equipment for accessing the system. A conflict was found between the ways usability was perceived by C1 and C2, which is presented in section 4.7.3 as systemic problem scenario#1.

> "We should have the ability for blind people to be able to read with the appropriate technology. That doesn't mean totally blind, blind being with 20 or 30% vision something like that...blind with partial sight." (Director ITC)

The purpose of the portal should include:

> "Usability stuff [refers to the] easiness, how you can access the portal." (Phd Student)

Consistency, as per C1 and C2, is the design issue so that the individual systems look and work the same way. It was about implementing a standardized look and feel across the university portal. This was pointed out as challenging as some systems are not customizable. C1 informed that they were trying to control the design of the individual systems so they look and work the same way.

> "...we have mandated if you are not able to customize the whole thing we can ... provide a header and a footer which is constant and then in the middle they [users] can do what they like." (DVC Academic)

One of the key things in terms of information needs for users was to make sure that it is actually up and running 24/7. It should, therefore, be highly available for the users all the time. The importance of portal's availability was realized both by C1 and C2, as shown in Table 4.4.

There was an agreement between C1 and C2 that the technology underlying portal should be the latest ones. It does not need to be state of the art technology but it should be smart enough to deliver the objectives. C2 realized that the technology being used is slightly old. They envisaged that at some point in the next couple of years, they will have to re-engineer the system. They will probably change technologies, and one of the things they will probably do is to integrate the portal a bit more with the main university web site, and in particular with the staff and student intranet.

One of the responses from C2 regarded enrolment process to be 'clunky', pointing to a huge opportunity where technology needs to be upgraded. C2 related it to keeping customer in mind so that the technology matches with the user requirements.

> "It's about keeping customer in mind but then [at the same time] being mindful of what technology is also available to help drive that. What technologies are mainstream, what technologies are customers using generally, so what technologies are students using generally out there. You know, linking with iphones and that kind of things. So, anything that makes for people easy to interact will have to be way to go." (Academic Staff)

Customization, as seen both by C1 and C2, is one of the important requirements. However, in compliance with the EIP literature, it was seen by C1 as a supply-side function whereas C2 perceived it as a demand-side function which is considered by EIP literature as 'personalization' (for definitions see section 2.8.3).

> "Portal, as a single point of access was not just getting into application systems but bringing information from the different systems into that one place and then almost pushing it out to end users students and staff." (IT Coordinator)

Portal was regarded to be a personalized experience, so it is not to be a website having news and other information posted to the users on a global basis, but information that is personalized.

> "I think we need to have more personas. So when you log into the portal, it needs to be more targeted more precisely at what type of student you are, what type of staff member you are. We need to do is to be able and try to make the portal a little bit more contextual to different types of roles within the university and I think that's what we are looking at the moment." (DVC Academic)

As there have been a frequent number of changes done on the portal, its communication to the users was realized both by C1 and C2 as one of the requirements for the management purpose. The communication of changes also produced a scenario leading to a systemic problem scenario#3, which is presented in section 4.7.3.

> "The portal has been changing quite a lot so unless you are using it daily, [you] sometimes don't notice all the improvements. And some things aren't very obvious...[there should be] some sort of regular communication to be improved to make people aware of changes." (Marketing Staff)

> "...those areas which are in contact with students, if we go and change something [and] we don't communicate that change properly then the students are going to ask those support areas about that change ... So, there are going to be more service requests from end users towards the support areas [like] IT service desk, in particular." (IT Coordinator)

One of the interviewees from HR staff (C2) regarded accessibility as number one user requirement. It was realized by C2 as remote and wireless access, while C1 extended it with the mobile access capability.

> "From technological [viewpoint] ... speed of access to the databases, yeah...wi-fi access, external access through VPN [Virtual Private Network]." (GRS Staff)

"Lot of people work from homes. Students need to work beyond university hours and so on. So, it has to be remotely accessible, with ease and speed..." (Research and Innovation Staff)

A number of participants in C2 pointed out information overload and the lack of clarity and organization in the information presented. C1 also pointed out that the portal should be geared towards the clarity of information. It needs to be something that delivers information in a very clear and concise manner, rather than being confusing or presenting an over whelming amount of information. Some participants in C1 also emphasized information organization in such a way that getting to a piece of information becomes swift.

Most of the information I have to find is by using the search function... I don't have a map in my mind of how the structure is like.... So usually it is guessing because usually you click here and there and the third click is the search." (Academic staff)

One of the staff from GRS (C2) commented:

"... it [portal] should give you a slightly better description [of the options or links]...because there are so many options here [pointed to the screen]... there is a lot of stuff here which may not be clear." (GRS Staff)

"I think that the amount of information on this site as far as the look and feel of the site is [concerned], it is just a lot of information on one area and when you first log in there is just a lot of information just directly on there. It is kind of overwhelming when you are saying okay well, I want to read all of these things but I don't really want to read them I need to go over there, I need to do that so your head becomes overwhelmed, I think." (Master Student)

C2 stressed the inclusion of social networking features pertaining to web 2.0. It was emphasized to be more dynamic in nature, as compared to its current state in terms of having a tool for chatting, setting up a wiki, for instance.

> Its more like trying to make everyone know each other, and connected to each other. .. A chat room or something [like that] on the portal, that would be nice." (Master Student)

> "So it is like if I want to set up a wiki say for my school, I should be able to... there should be an area where I can use these tools, and do those things like I am talking about social networking in organizations to share things." (Academic Staff)

There was a realization by C1 that the portal needs a dynamic integration to the information as:

> "... it is still fairly static. The portlets or different areas of the portal that a student gets are pretty much fixed ... We could probably integrate more information on other systems ... potentially integrating things like calendaring. It would be nice you could go into the portal and see when, in particular, your lecturer is available for meeting with students if you want to do that. You may book a meeting with your lecturer on the portal and that sort of thing." (IT Coordinator)

Speed was considered as one of the major technological factor to be considered in terms of system usage and the number of hits each page of the system gets. The concerns about the portal's speed were raised by the students, especially during the course registration and the time of final exams. According to them, it was a matter of frustration as system during this period just bogs down and sometimes takes a while even to get into the portal.

> "[Speed can be improved by] being able to monitor how much is the usage, how many people are on it at what given time, and being able to delegate, may be, more band width for those times." (Master Student)

> "You can monitor how many hits or many people logon to it each day." (GRS Staff)

4.6 Some General Observations

- Some of the responses given on ‘is’ and ‘ought’ scenarios were found similar, while on occasional basis discrepancies were also noticed as the respondents pointed out the difference between how things currently are and how they ought to be.

- Some of the topics like ease of use, ease of access or accessibility were recurringly mentioned. The issue of marginalization triggered the subject of identifying a mechanism of involving the “affected” or “marginalized” group of stakeholders, making respondents to brain storm and come up with suggestions.

- Explaining the responses in simple language was a difficult task as the responses themselves, in the majority of the cases, were simple to understand. Thus, opening up the narrations of the respondents for further elaboration proved quite challenging for me.

- Participants sometimes responded by referring to the views of other stakeholders rather to their own, which seemed to be making the people go astray from their own critical view related to the subject matter of the question. The people playing multiple roles such as an administrator and an academic staff, were sometimes found to be wondering which ‘shoes’ to put themselves in for a particular response. This issue of being into different ‘shoes’ should not pose any problem for the practice of CSH as it helped in exploring diversity in boundary judgments and thus each of those ‘shoes’ was found to be making a valid contribution to the study.

- Some overlap among questions was commented about by a few of the participants as the responses to the questions pertaining to the ‘ought/should’ and ‘is’ were inter-mixed. A partial reason to this could be that the participants could not compartmentalize their thoughts under these two contexts or probably due to these questions being in a linear sequence. The overlapping responses

made data analysis quite tedious as the purpose behind such questions was to have a comparison between these scenarios. However, at some occasions, the response to one question prompted further clarifications and reflections to the earlier question. This process, in fact, encouraged critical reflections without checking participants' natural flow of thoughts.

- In some of the cases, the users were not able to respond to the 'is' question as they were not aware of the current scenario. In some cases, the users just guessed about the 'is' question by using words like 'may be' or 'perhaps', as mentioned in Table 4.3. Tables 4.2 and 4.3 mention the diverse range of stakeholders indicated by the participants in form of different words. The tables do not repeat same responses as their purpose is to provide comparison between the 'should' and 'is' scenarios, and not to list individual responses.

DATA ANALYSIS: PHASE-II

4.7 Exploration of Systemic Problems

This section addresses the first research question by reporting and analysing systemic problems through the lens of CSH. It presents four scenarios of systemic problems explored through this study with a separate analysis for each one of them. It must be kept in mind that the set of stakeholders related to them, shown as stakeholder mapping are specific to the study of the web portal at Aus-Uni. They, therefore, may or may not exist in other IS projects. However, the issues and their interrelationships which were formulated on the basis of the data can be generalized to other IS contexts. The purpose of discussing and analysing these problems is to pave the way for such investigations in various IS projects in particular, and in other social contexts in general. The analyses provide discussions based on the perspectives of the stakeholders and, therefore, do not provide any personal views of the researcher. Wherever possible, a literature based scrutiny related to the issues constituting a systemic problem has also been conducted. Before various problem scenarios are presented and discussed, I feel necessary to outline the anatomy of systemic problems.

4.7.1 The anatomy of systemic problems

This section discusses the anatomy of systemic problems by using the guidelines of CSH. We know how to solve problems, but do not know how we can define them (Gharajedaghi, 2006). The reason for our failure is not our failure to solve problems but our failure to identify them correctly (Ackoff, 1981). The purpose of this analysis is not to propose solutions but to formulate problems as a system of interrelated factors or issues. It represents this system in terms of the system's current state of affairs which may in turn generate unintended consequences.

This research considers that problems constitute stakeholders and the issues related to them. Systemic problems are not defined in terms of the traditional ways such as communication gap, lack of resources such as time and money, or deviation from the norms or culture. These factors or issues, in fact, act as parts in defining the *system of a problem* in form of causes and/or effects over time. Due to the interconnectedness of these factors, the whole problem cannot be understood by isolating them from the whole, which in fact, is the essence of systems or holistic thinking. Drawing upon the fundamentals of CSH, systemic problems are encapsulated by a boundary comprising of the stakeholders who are 'involved' and 'affected' by the problem scenario. The 'involved' are those stakeholders who can influence the resolution of a problem or who actually are the people causing it, while affected are those who take the influence or effects of the problem without having any authority to influence its resolution. Furthermore, these stakeholders (involved or affected) are also identified as C1 or C2, to comply with the earlier classification of these stakeholders in the context of an IS project (see section 4.2.2),

In the context of IS adoption, for example, lack of user involvement is not a systemic problem in itself, but a factor as a cause or effect in the holistic view of the problem situation. In the context of this research, following traits of systemic problems must be understood before a detailed analysis of the problems is presented.

4.7.2 Traits of a systemic problem

In addition to the characteristics of messes as mentioned by (Gharajedaghi, 2006, p. 137), the systemic problems are proposed to have traits based on the principles of boundary critique (Ulrich, 1983), which are given as follows:

- A systemic problem is dynamic in nature, the analysis of which should also be dynamic.

- The boundary for a systemic problem comprises *what* sources of knowledge i.e. the issues constitute the problem and *who* are those involved and affected by it. These issues are underpinned by the values and interests, as shown in Figure 4.2.

- For each problem scenario, a systemic problem is to be diagrammatically represented with the issues as nodes, and the stakeholders (involved and affected) as the stakeholder mapping.

- It is essential to identify those who are involved and affected by the problem as this will provide ways for corrective actions to be taken.

- The issues are interrelated as causes and effects in time and the context that surrounds a system of a problem.

- In a system of problem, a cause and effect are inter-replaceable except the initial cause and the ultimate effect.

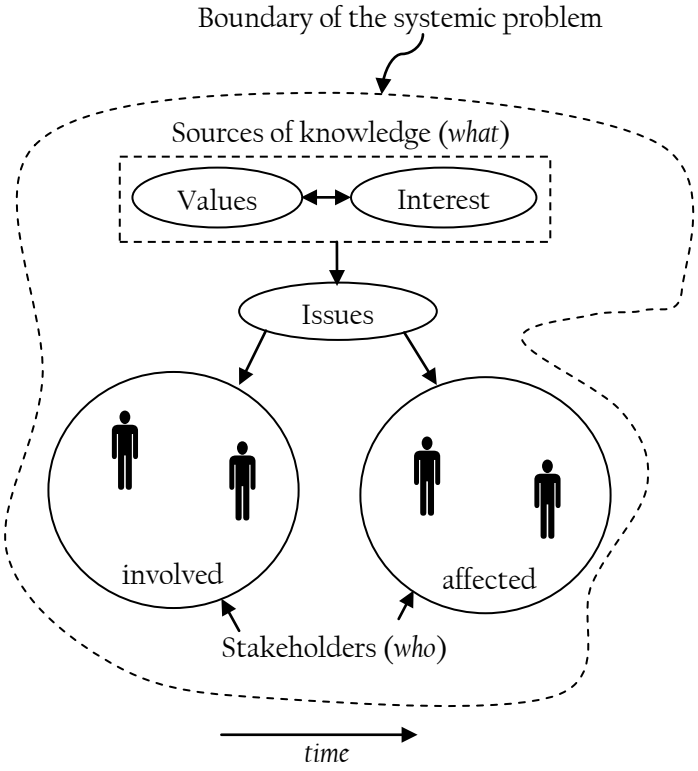
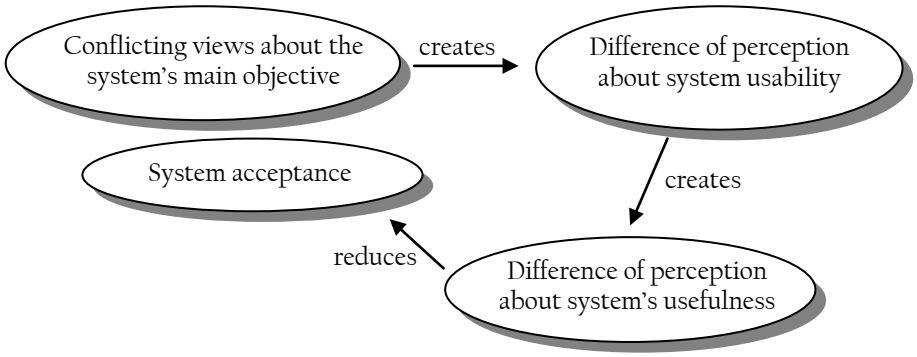


Figure 4.2: System of a problem (systemic problem)

4.7.3 Systemic problem scenarios and their analyses

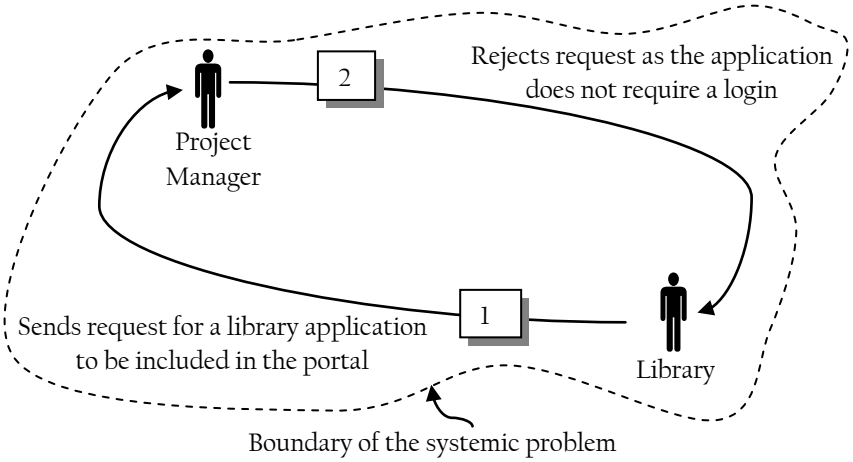
Systemic Problem Scenario#1



Initial cause	***Ultimate effect***
Difference of perception about system's main objective	Reduced system acceptance

Figure 4.3(a): Problem scenario#1

Stakeholder Mapping



Involved	***Affected***
Project Manager (C1)	Library, students (C2)

Figure 4.3(b): Stakeholder mapping for problem scenario#1

Analysis of the problem

The conflicting views about the main objective of the portal created different perceptions about the usability of the system. The perception about the main objective of the Project Manager (Deputy Vice Chancellor Academic) about the portal was found in conflict with the library representative. According to DVC, the purpose of the portal is single sign on, while in view of the library representative, the purpose should be but not be limited to single sign on. It should rather be on based on what is useful and relevant to the end users.

These conflicting views were revealed on the basis of a request sent from the library for the inclusion of Library One as a new search tool on the portal which was declined by the Web Committee as it did not require a login. According to the library representative the absence of the library search tool would create problems for students while DVC had an opinion that they could not provide links to each and every search system of the library, as the presence of multiple links will complicate things and the absence of the login requirement by the search tool would hinder to maintain the logic of single sign on of the web portal and eventually would affect its usability.

Usability is a deeply rooted concept in IS literature. Considering the dichotomy of functional requirements, pertaining to what operations the users and other stakeholders can perform on the system; and the non-functional requirements, related to the system constraints (Sommerville, 1996), a system's usefulness, according to Nielsen (1993) comprises of its utility or functionality and its usability. Grudin (1992) and Bevan (1995), elaborating on a system's utility and usability imply that a system may be usable but may not be useful, which gives an instrumental view of a system's usability in terms of the ease of using a system's user interface.

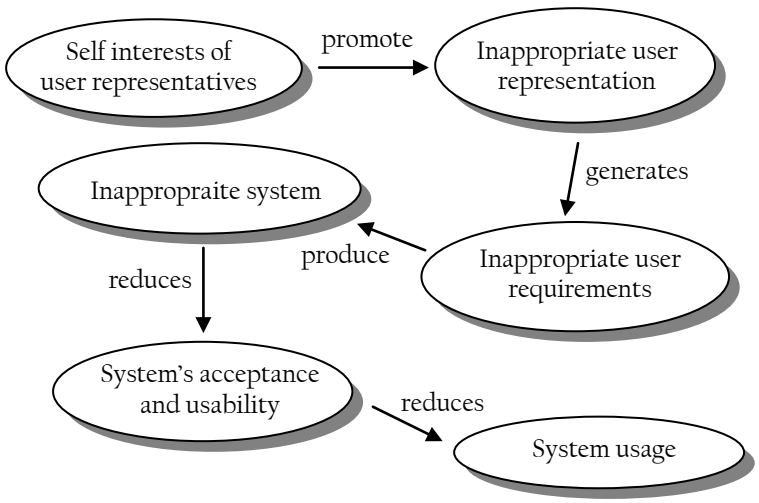
This systemic problem, pertaining to the view of the library representative about the usability of Aus-Uni's web portal falls into the same category of perceiving the system as usable but not useful for the students, as being adamant on achieving single on and sacrificing what students need, according to him would seriously hurt the system's utility.

This problem was further analysed on the basis of a widely accepted definition of usability, which regards it as the achievement of specific objectives with "effectiveness, efficiency and satisfaction in a specified context of use" (ISO 9241-11 cited in Ågerfalk & Eriksson, 2006). Effectiveness refers to the utility of the system (Grudin, 1992) by considering how completely and accurately a system performs its job (Preece, Rogers, & Sharp, 2002). Efficiency is the minimization of the required resources such as mental or physical effort, time and financial cost for achieving the specified goals (Bevan, 1995). Satisfaction is about having positive attitudes about and comfort and ease in using the system (ISO 9241-11 cited in Ågerfalk & Eriksson, 2006; Davis, 1989; Guimaraes & Igbaria, 1997).

The perception of the library representative was found inferring to the partial achievement of these factors as in the absence of an important library resource, the students would not be able to efficiently do the library catalogue search, which would eventually destroy the purpose of the portal as a single platform for all information. This will direct them to go to other university resources such as Aus-Uni web site, requiring extra mental and physical effort in locating the required information, which will create a partial satisfaction about the system usage.

The above mentioned view of IT usage, according to Ågerfalk & Eriksson (2006), is merely focused on the desired outcome or goal seeking actions resting on means/ends rationality rather than considering how this usage could be understood taking a socially constructed view of the IT use situation. An analysis based on Critical Systems Heuristics portrays a larger picture of this systemic problem in which interpersonal relationships focusing on the stakeholder roles of involved and affected are established in the social context of the study. It also provides the reason of the difference in perceptions i.e. the conflicting views about the system's main objective, which is in fact, the actual bone of contention causing contrasting views on the system's usability.

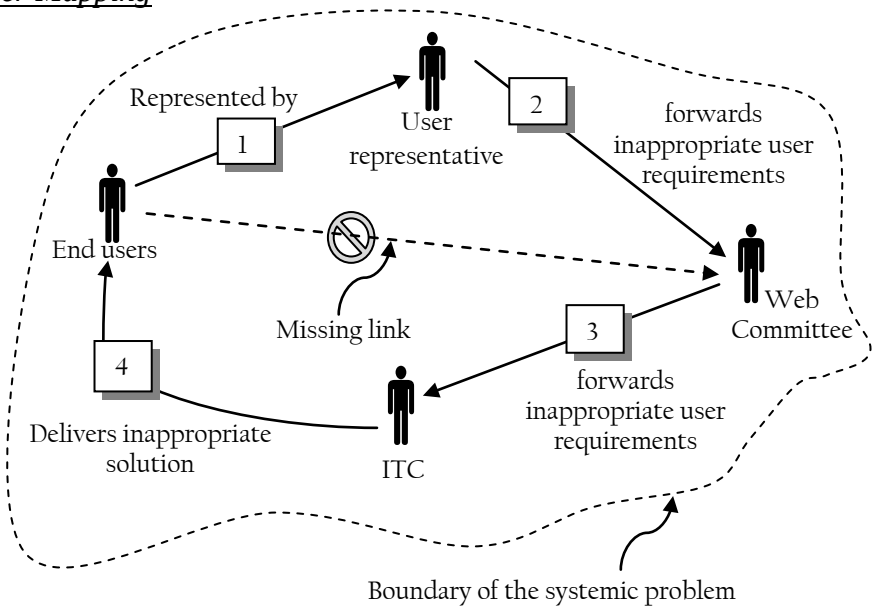
Systemic Problem Scenario#2



Initial cause	***Ultimate effect***
Self interests of user representatives	Reduced system usage

Figure 4.4(a): Problem scenario#2

Stakeholder Mapping



Involved	***Affected***
User representative (C2), Web Committee (C1), ITC (C1)	End users (students &staff – C2)

Figure 4.4(b): Stakeholder mapping for problem scenario#2

Analysis of the problem

By realizing the fact that Aus-Uni cannot have a committee with all students and staff, the Technical Coordinator ITC for the web portal project pointed out the possibility of misrepresentation of the concerns of students and faculty. Theoretically speaking, the Web Committee should represent all the end users by accurately feeding through their requirements.

> "It all comes down to [as to whether] those members accurately representing them [the end users], do the business requirements are actually reflecting what the students and staff really want out of that thing [portal], or are they actually more representing what they want out of the portal... You would hope that they are representing the students and the staff, we [IT] are not the part of that committee so it is hard to judge whether that is actually happening or not." (IT Coordinator)

Ideally speaking, when the Student Services Centre sits on the Web Committee, they should represent student needs for the portal, but when they actually attend the Web Committee meetings, are they more interested in the students point of view or they are more interested in their own point of view. In case the students are misrepresented, they will not be able to get their "voice" heard in the Web Committee regarding what they actually need out of the portal. Such a systemic problem is quite frequent in political negotiations when people's representatives, while sitting in the parliament, may forward their own personal agendas without prioritizing the issues of whom they are representing.

In a wider social context, Pinzón and Midgley (2000) discussed such a scenario in relation to 'Colombian guerrilla conflict', which encompassed the Colombian government, its national army, numerous paramilitary groups, drug traffickers and various individuals and groups in the society. The peace negotiations in 1980s between the leftist guerrilla group, known as M-19, and the Columbian government apparently called upon the concerns of the Columbian masses, but in contrast, only resulted in the gratification of the interests of the Colombian government and the guerrillas. Although the negotiations were regarded as a success by both parties and the media, the larger Columbian population could not observe any improvements with regard to their concerns.

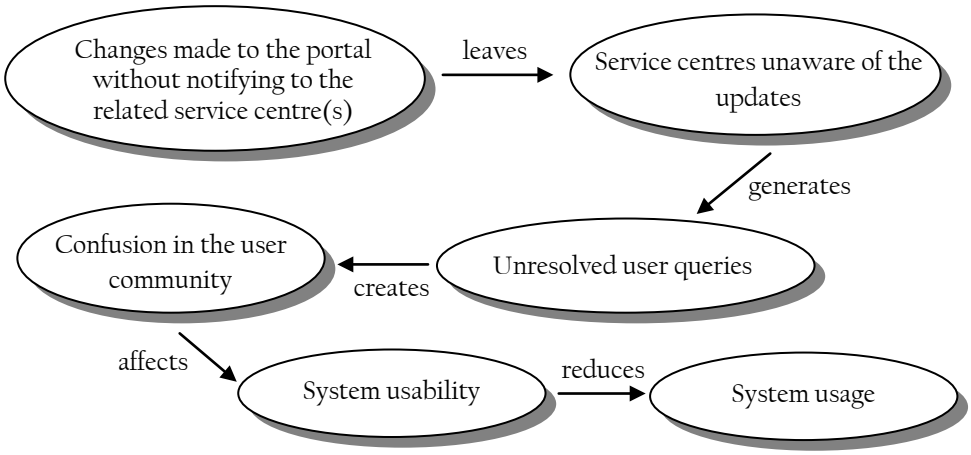
This systemic problem, which is generated by the domination of interest groups, results in the compartmentalization of issues as it ignores the ethical stance of raising the concerns of those being represented. This eventually breaks the back bone of holistic thinking, as it apparently seems to satisfy the concerns of those being represented, but in fact has surprising consequences when the boundary of analysis is pushed out to include the reflections of those affected by it. Considering a wider system boundary by *sweep*ing-*in* maximum information for analysis as per the notion of Churchman (1970), results in an entirely different system outcome. A detailed discussion on the nature of human interest is not the scope of this analysis, Habermas (1972) provides a comprehensive elaboration on the subject.

Critical Systems Heuristics is capable of conveying societal or organizational expectations of multiple stakeholder groups. In the context of the web portal project, a boundary comprising of the Web Committee along with the user representatives and IT, would have resulted in the marginalization of the end user concerns. Since CSH considers to looking at the end user requirements independently of those forwarded by the user representatives sitting inside the Web Committee, it provides a mechanism of cross checking whether the correct measures of success are being implemented for the IS project by including or *sweep*ing-*in* the end user perspectives. This analysis does not mean that this compartmentalization or promotion of personal views was actually occurring in the project but it presents a scenario on *what if* basis.

As identified by the DVC Academic, there was no student representation on the Web Committee. This had already been realized, and the committee was already considering having some student representation from the student guild. This would eventually take care of the missing link, as shown in Figure 4.4(b).

> "... probably through the guild we'll work [as] that would be the easiest, because if we don't get them from a sort of a formal student group they don't turn up. So, we tend to try and work through the guild and we might have a post grad rep[representative] and an under grad rep[representative]." (DVC Academic)

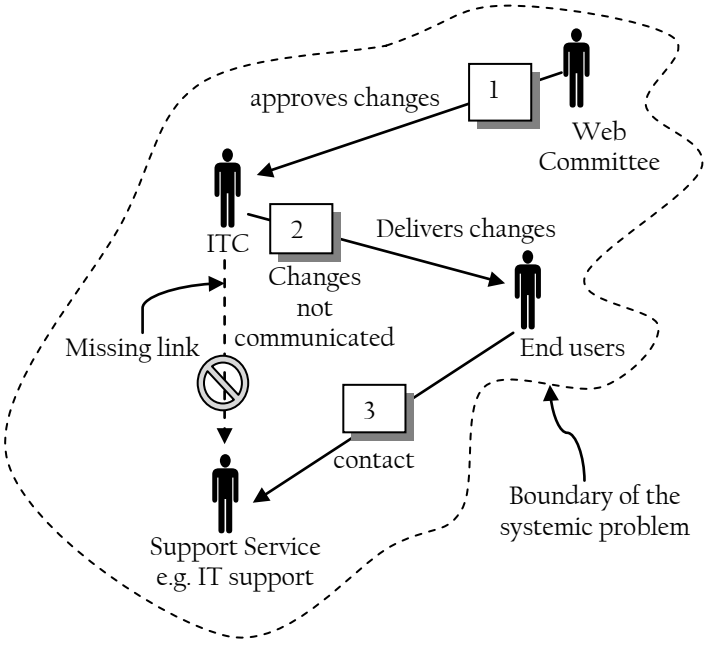
Systemic Problem Scenario#3



Initial cause	***Ultimate effect***
Changes made to the portal without notifying to the related service centre(s)	Reduced system usage

Figure 4.5(a): Problem scenario#3

Stakeholder Mapping



Involved	***Affected***
Web Committee (C1) , ITC (C1)	Support services (e.g. IT service desk, library help desk – C2), End users (students & staff – C2)

Figure 4.5(b): Stakeholder mapping for problem scenario#3

Analysis of the problem

As the web portal at Aus-Uni undergoes improvements or changes, they should be communicated to the service centres which are in direct contact with the end users. Failing to do so would result in end user queries which would eventually go unresolved due to this lack of communication. This problem, as regarded by the IT coordinator, was the cause of trouble for the related service centres including IT service desk, student support staff within student service centre, library support, and faculty support. The communication gap, shown as the missing link in the stakeholder mapping, affects these service centres, as the portal undergoes further development or improvement.

> "[in case change is not communicated to the concerned support area], there is going to be more service requests from end users towards the support areas whenever we do something [on the portal]." (IT Coordinator)

> "... the portal has been changing quite a lot, so unless you are using it daily sometimes you don't notice all the improvements. And some things aren't very obvious...[there should be] some sort of regular communication to be improved to make people aware of changes." (Marketing Staff)

The following example in the stakeholder literature was found similar to the scenario that outlines this systemic problem. Although this was not exemplified as a systemic problem, it clearly illustrates the consequences such a communication gap may invite.

Rowley (1997) provides an example of an airliner crash incident resulting from such a communication gap. In 1968, Convair, on a contract from McDonnell Douglas for making fuselages and cargo doors for DC-10 aircrafts, reported McDonnell Douglas about the unsafety of a new electric locking system. This was ignored by McDonnell Douglas, and was not reported to Federal Aviation Administration (FAA) as there was no direct relationship between Convair and FAA. This resulted in a DC-10 crash incident after a couple of months. Had there been a direct connection between Convair and FAA, the crash could have been avoided as, being aware of the unsafe locking mechanism, FAA would have directed McDonnell Douglas to rectify the safety issue. This problem has been illustrated in Figures 4.6(a) and 4.6(b).

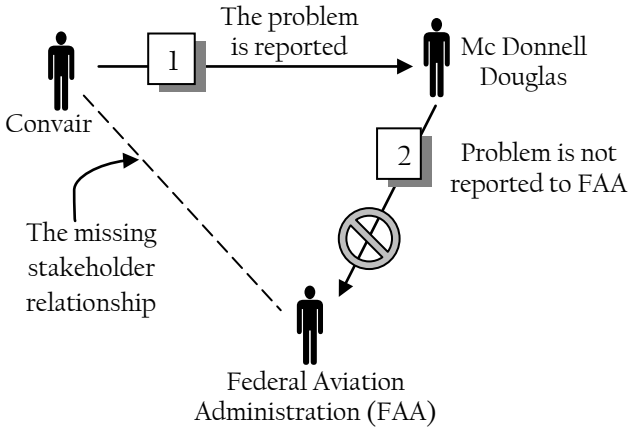


Figure 4.6(a): A missing link in the stakeholder network causing the airline DC-10 crash

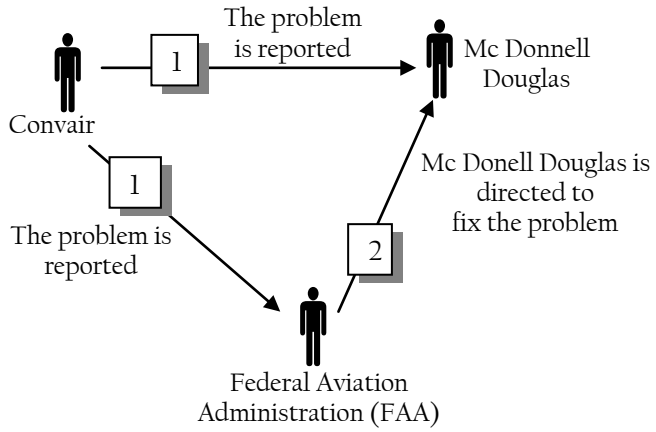
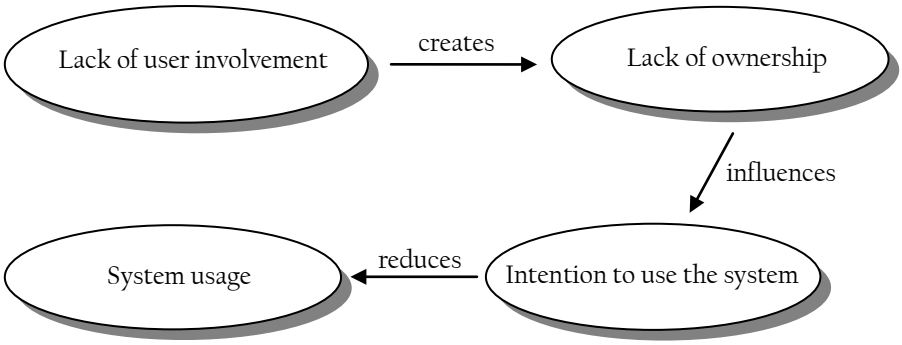


Figure 4.6(b): The scenario in which the DC-10 crash could have been avoided

In the context of a web portal project, it is highly unlikely that this systemic problem would result in such a disaster, but it would definitely hinder end users in IS adoption and use. Rogers' (1995) innovation diffusion theory asserts an important linkage between the communication regarding innovation and the rate of adoption. A change management practice dictating proper communication of such events would definitely help service centres to provide improved service to the end users, which will eventually improve rate of IS adoption.

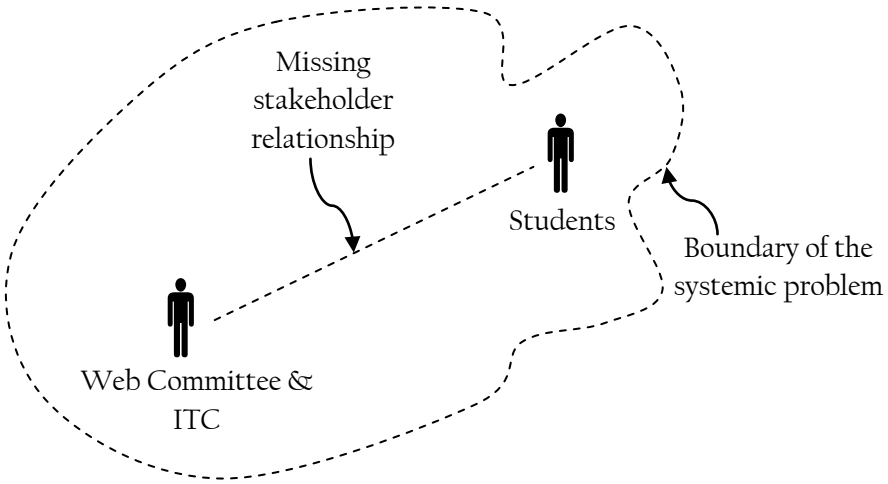
Systemic Problem Scenario#4:



Initial cause	***Ultimate effect***
Lack of user involvement	Reduced system usage

Figure 4.7(a): Problem scenario#4

Stakeholder Mapping



Involved	***Affected***
Web Committee (C1) , ITC (C1)	Students (C2)

Figure 4.7(b): Stakeholder mapping for problem scenario#4

Analysis of the problem

Lack of user involvement is regarded as one of the major factors contributing to IS project failures (Krauth, 1999; C. Standing, et al., 2006). This may cause perception pertaining to the lack of ownership among the users, influencing on their intentions to use the system. This would affect the system's usage, as intention to use the system determines the system's usage (Kim & Malhotra, 2005).

The system usage does not only imply initial use, as continued use of IT within an organizations is deemed to be the key force of long term productivity (Bhattacherjee, 2001; Venkatesh, Morris, & Ackerman, 2000). While user requirements keep on evolving in today's dynamic world, a continuous user involvement in IS projects is the order of the day. Raza and Standing (2010) discuss user involvement using boundary critique throughout IS project life cycle.

This study considers insufficient or lack of user involvement in terms of marginalization of perspectives. Marginalization does not only relate to the stakeholders but also includes issues or concerns related to them (Midgley, Munlo, & Brown, 1998). The question here arises as to how this 'lack' could be measured, because:

> "...you can't obviously talk to 4000 staff members and 22000 students individually, so there should be a process of dealing with as many people as you can in certain sort of structure...structured format... through workshops or forums or whatever."
> (Director IT Centre)

> "I am not a democrat that believes that every single person should be involved otherwise we'll be here in the next fifty years. It has to be done on the representative basis. But they [project management/Developers] have got to do it with the interests of those people very much in mind not just their own interests."
> (Director HR)

In the context of an organizational IS project, this problem may result in project failure. The experts and decision makers, instead of using a complex jargon, need to communicate to the users in a language free of vagueness and ambiguity. If complex theories like the theory of relativity can be explained in simple words why not the IS theory and implementation issues be easily explained. In case the user community is "omitted" or marginalized, the resultant system will most possibly be deviant from its intended purpose as shown in Figure 4.8.

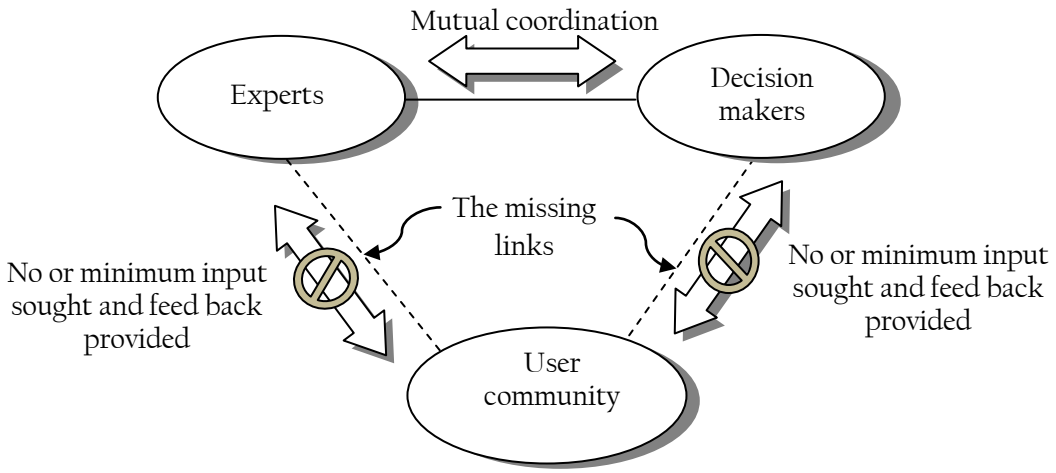


Figure 4.8: The omission/marginalization of users, a potential cause of IS failure

Popular IS adoption theories consider lack of user involvement without any gauge which can determine how much this 'lack' was. Critical Systems Heuristics (CSH), considers 'marginalization' or absence of user involvement as one of the extremes, while the other extreme could be understood as 'total or close involvement'. This can be seen in the same light as the spectrum of action research, discussed by Walsham (2006), as shown in Figure 4.9.

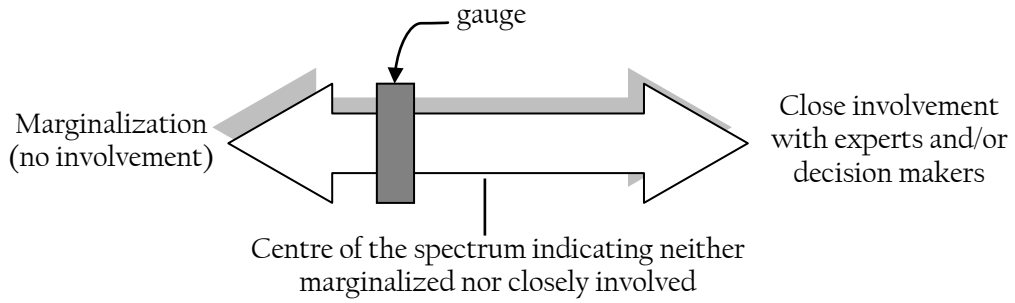


Figure 4.9: Gauge of involvement for concerned stakeholders

I propose that this could be used as a yard stick by the people in authority such as decision makers and/or experts to decide about the level of involvement for a particular stakeholder group for practising ethically defendable boundary judgments. Marginalization refers to completely ignoring, while close involvement does not mean that a stakeholder group is supposed to physically work with the ones in charge but having a say as much as those who are experts and decision makers. The centre of the gauge refers to some of the stakeholder issues being considered in decision making and some being ignored. Since the gauge is underpinned by CSH, justification on ethical grounds will still be required as to why some issues were not taken into account.

Since it is impossible to satisfy the needs of all stakeholder groups, a balance is still required. I suggest experts and decision makers to use this for each stakeholder group as the level of involvement should be decided on the criticality or importance of the stakeholder perspectives.

4.7.4 Classification of systemic problems

In the interconnected world of ours, our problems or errors are also interrelated. Analogy between Figures 4.5(b) and 4.6(a) clearly demonstrates the gravity of such issues. This section attempts to classify systemic problems, revealed through this study. This is not a comprehensive classification in the context of organization IS adoption and use, as this research encompasses issues related to a specific IS project. Further research is needed to explore diverse problem scenarios to expand this list.

Ackoff (2006) identifies two types or errors or problems viz “errors of commission” and “errors of omission”. The first occurs in doing something an individual or organization should not have done, while the latter happens when one fails to do what should have been done. According to him, the errors of omission, in the majority of cases, result in the major malfunction or collapse of organizations. He attributed Kodak’s current instable condition as a cause of not appreciating the digital photography into its products (For a more recent analysis, also see Dobbin, December 3, 2011).

Similarly, Ford and General Motors are also struggling in the motor industry for not being able to adopt innovative ways like their competitors such as Honda and Toyota. The airline crash incident discussed in the context of problem scenario#3 is also an example of an “error of omission”.

Errors, specially emerging from omission are hard to identify as they may easily go unnoticed. Problems or errors going unacknowledged may spark something in one part of the organization which may result in something serious on the other side. It is like a domino effect which keeps on repeating itself under every block in the way is grounded. This requires a radical change in the way managers think. It urges for more people having inclination towards systems thinking not to ignore reductionist techniques altogether, but to provide an alternate view of looking at things.

Based on the information gained from the above mentioned problem scenarios, I classify systemic problems into two categories i.e. problems caused by perceptions, and problems caused by actions.

a) Problems caused by perceptions

Such problems emerge from the perceptions of those involved in or affected by the context. These also include issues from cognitive philosophy (Corey, 1996), such as ‘cognitive distortions’ (Matlin, 1995), which are faulty perceptions, leading to shape up in resistance to change (Coghlan, 1993; Miller & Yeager, 1993). Thus, they impair an individual’s relationship with the organization, creating conflicting situations in teams and/or inter-departmental group work. Problem scenarios 1 and 2, discussed above are those which fall into this category.

I argue that these perceptions in some cases may also be based upon realities pertaining to change the process. The study of resistance factors should, therefore, improve understandings and assist change proponents in building intervention strategies as required. The details about factors causing resistance, and the intervention strategies are presented in chapter five, in which a systemic model for conflict management in an organizational change is presented.

b) Problems caused by actions

Such problems surface due to the actions taken by those who are involved in or affected by the context of a situation, such as innovation diffusion. Problem scenarios 3 and 4, discussed earlier, fall into this category. Problems caused by actions may also be the consequence of a scenario of a problem caused by perceptions or vice versa. For example, 'cognitive distortions' (Matlin, 1995) of some stakeholders may result in resistance factors, giving birth to certain actions, which ultimately cause other problems. Similarly, actions taken by those in authority, for instance, may shape up perceptions in a way which may cause resistance.

I propose that Ackoff's (2006) categories of "problems of commission" and "problems of omission" can be classified under the problems caused by actions, as these respectively refer to what actions should have not been taken and what should have been taken. As mentioned earlier, further research is needed in this direction, as the purpose of this research was not to come up with an absolute classification of problems.

4.8 Summary

This chapter addresses the first research question by presenting a qualitative analysis of the data collected using the support of a software tool called NVivo8. The research methodology of Critical Systems Heuristics (CSH), as mentioned in chapter three, underpins the analysis. It also presents discussion on the inferences made from data analysis. The outcomes of data analysis have been discussed into two phases. Phase one comprises of boundary judgement for establishing the system of stakeholders, and the exploration of the information needs through stakeholder perspectives of project management/IS developers represented by C1, and the entire set of end users denoted by C2. The second phase identifies systemic problems emerging from the conflicting viewpoints of these stakeholder categories. Each systemic problem is analysed as a scenario comprising of the key issues and the set of stakeholders involved and affected by it. Each problem scenario is analysed separately. In the end, an attempt is made to classify systemic problems based on their root causes.

CHAPTER FIVE
RECOMMENDATIONS & DISCUSSION

5.1 Introduction

This chapter addresses the second research question and presents a formative evaluation of the research by proposing some recommendations in response to the *systemic problems*, identified and analysed in the previous chapter. A systemic conflict management model, and a model for incorporating boundary critique in an IS methodology are proposed, followed by a discussion about the research contribution they make. The conflict management model is the augmentation of a systemic model presented by Pinzón and Midgley (2000), while the IS adoption model extends the traditional Systems Development Life Cycle (SDLC). This model demonstrate the applicability of boundary critique in the context of IS development and adoption. The limitations and the implications of the proposed models are discussed separately.

5.2 Recommendations

To address the second research question and to carry out a formative evaluation of this study (see section 4.2), following are some recommendations in light of the *systemic problems* identified and analysed in chapter four.

5.2.1 Treating conflicts holistically and dynamically

Due to constant technological advancements, and ever changing user needs and priorities, organizations have to keep up with these changes. This study looks at IS implementation as a change project. Such changes are naturally resisted resulting in systemic problems, which ultimately lead to conflicts. This section proposes a conflict management model to observe a smoother pace for conflict management and organizational learning in an organizational change scenario. In particular, this model is

also applicable to an IS project such as web portal implementation in case of this research.

Successful resistance management is arguably the most important challenge in the change exercise (O'Connor, 1993). Resistance mostly surfaces due to the way in which people are handled in the change process (Cooper & Markus, 1995). Section 2.8 provides a detailed overview on this subject. I argue that identifying stakeholders and knowing how they are affected is essential to understand the overall picture of the change process. This shall help in identifying the factors underlying resistance and consequently in managing conflicts. I regard conflicts as a consequence of resistance which in turn can cause further conflicts, as shown in Figure 5.1.

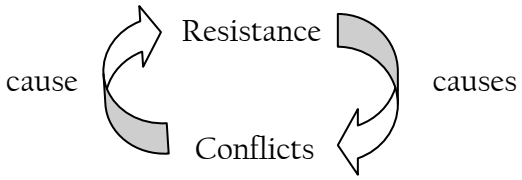


Figure 5.1: Resistance and conflicts

I recommend that treating change and conflicts holistically with Ulrich's notion of boundary considerations (boundary critique), based on the involvement of multiple stakeholders, can effectively help in successfully addressing the challenging nature of such problematic situations providing a smoother pace for organizational learning and change. Since various patterns of a conflict evolve over time (Jehn & Mannix, 2001), I suggest to analyse conflicts through a *system of conflicts* over time dimension including participants or stakeholders (involved and/or affected), as shown in Figure 5.2.

Furthermore, I suggest that the stakeholders participating in the *system of conflicts* comprise of a subset of the complete stakeholder set determined to formulate the *system of stakeholders* using boundary critique at a certain point of time t_n, during the organizational change process. Hence, both of these systems are the function of time. Moreover, *system of conflicts* is a subsystem of the *system of stakeholders* throughout organizational change.

From a change perspective, those involved can influence on the achievement of the objectives pertaining to the change effort, where as those affected are influenced by the achievement of these objectives. Furthermore, I argue that there could be some stakeholders who are involved and affected by the change process at the same time, as the achievement of the objectives may influence them in terms of their organizational processes, reputation or goodwill, for instance. Such stakeholders are shown at the intersection of the two categories in Figure 5.2.

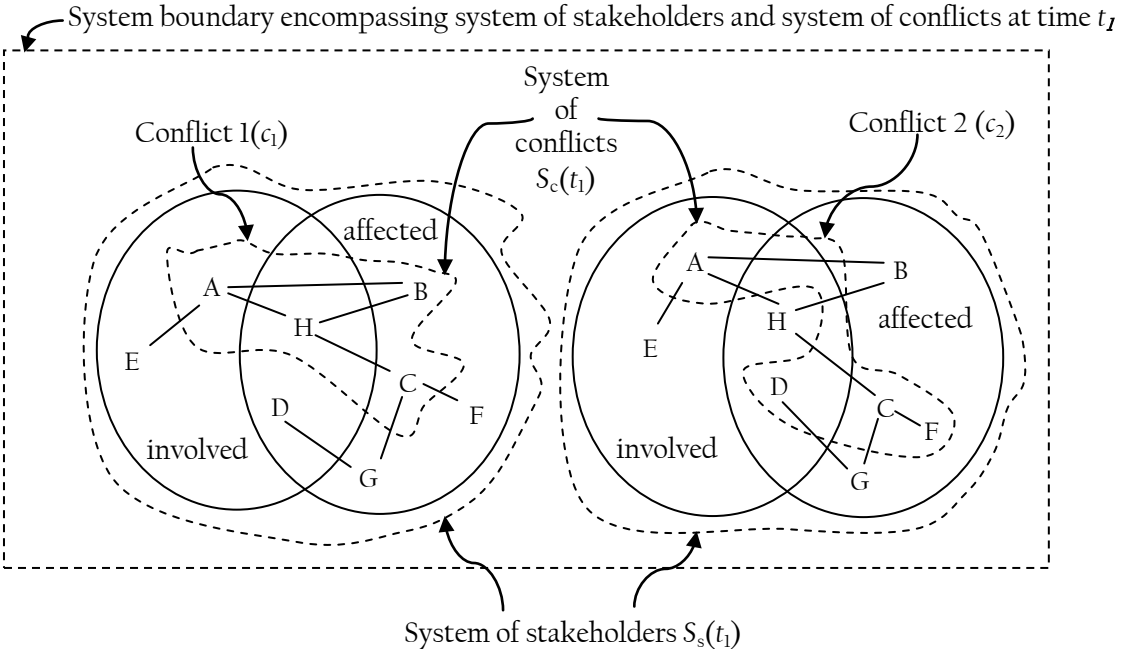


Figure 5.2: System of stakeholders and system of conflicts at time t_1

Although the term 'conflict' has diverse meanings (see for example Ackoff, 1978; Borisoff & Victor, 1998; Peter, 2002; Pruitt & Rubin, 1986; Tillett, 1991), this study treats it as a dynamic process within a social context. It sits inside the circumference of an organizational change scenario and is underpinned by its management rather than resolution as a conflict may or may not have a well-defined ending. In a social context, conflict is a state of disagreement perceived by two or more parties on issues such as interests, values, actions, objectives, positions, beliefs (Pinzón & Midgley, 2000).

By *sweep*ing-*in* the beliefs related to the values and interests (see laws of complexity in section 2.6 and Figure 2.7), and the significance of resistance in organizational conflicts, as mentioned in this section, a comprehensive conceptual framework emerges for the proposed model. This framework is illustrated in Figure 5.3, which is a sequel to Figure 5.2. This conceptual framework when woven together with social network mechanisms (see Table 5.3) and intervention strategies (see Table 5.4), results in a methodological model as shown in Figure 5.6. This combination could serve as a nucleus for innovation diffusion and conflict management in organizational change. The next section presents the proposed model.

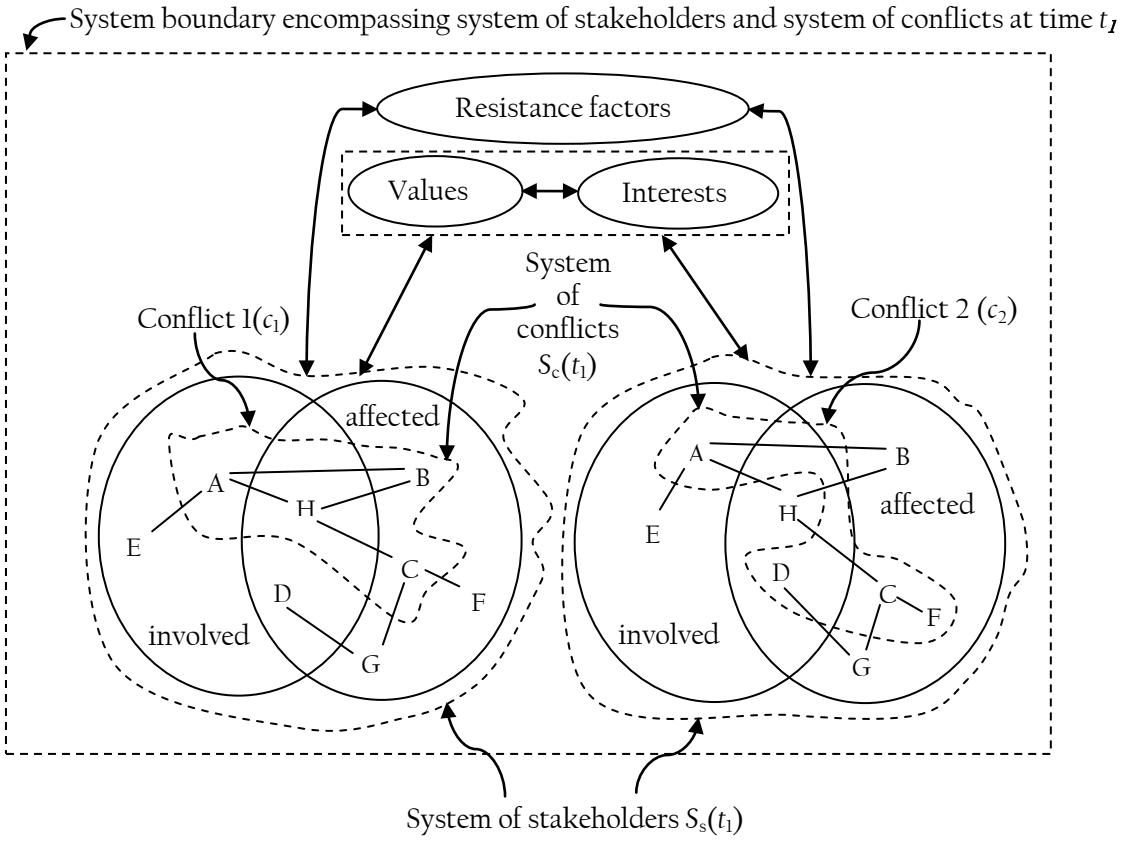


Figure 5.3: Conceptual framework for the proposed model

a) The model

An axiological subjectivism-based model that is most commonly used for conflict evaluation in alternative dispute resolution (ADR) literature is shown in Figure 5.4. Mentioned as F1 by Pinzón and Midgley (2000), this model considers to identifying the

actors or stakeholder directly involved in the conflict; and their interests in relation to the substance of the conflict. The poverty of this model lies in the fact that it carries out conflict evaluation only from the perspective of the interests of those directly involved or participating in the conflict. So, it attempts to reach at negotiation in light of the influence or impetus provided to the body of conflict by the dominant actors without any guidelines sought from the 'affected' category of people. Putting these 'victims' beyond the boundary of the model may result in serving the interests of those who are dominant and influential, without *sweep*ing-*in* any ethical considerations for those affected while making boundary judgements. Bazerman and Lewicki (1983), and Lewicki (1997) involve materials that reinforce the use of F1. While the term 'interest' in the ADR literature is sometimes used interchangeably with words like 'desire', 'preference' or 'utility', they in fact mean the same (Pinzón & Midgley, 2000).

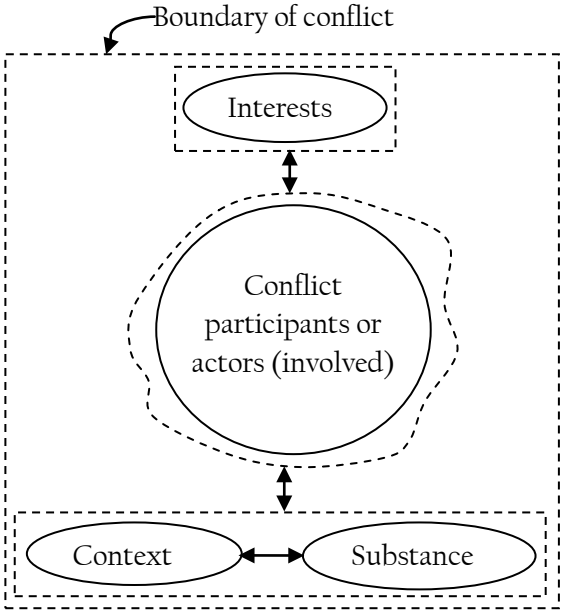


Figure 5.4: Conceptual framework for F1

Pinzón and Midgley (2000) evaluated F1 using 'Colombian guerrilla conflict', while proposing a systemic model (F2) for conflict evaluation in social contexts. Figure 5.5 shows the conceptual framework underlying F2.

In both of these models, the substance is seen as the object of dispute or 'the bone of contention' while the context surrounds the entire dispute in terms of actions or understandings pertaining to culture, politics or religion. A context can make same actors value substances in different ways (Midgley, 1993). A discussion about the concepts related to values and interests and their relation with each other is provided in section 6.5.

F2, while providing a basis for the model proposed here, cannot be directly applied in an organizational change scenario as it only provides a conflict evaluation scheme and not a mechanism for conflict management. It helps in evaluating conflicts at a certain point in time, but falls short of proposing how different approaches or mechanisms could be employed for a desired output e.g. how conflict evaluation could be geared towards conflict management for the success of an organizational change project.

The proposed model, as shown in Figure 5.6:

- couples F2 with network stakeholder theory to establish a *system of stakeholders* $S_s(t)$ (see Figure 5.7) along with the roles stakeholders play during organizational change (see Table 5.1).

- highlights the importance of determining the resistance factors (both organizational and individual) as a substance for the body of conflict(s) (see section on determination of resistance factors), as most studies on organizational change have discussed organizational perspectives as opposed to individual ones (Bovey & Hede, 2001).

- establishes a *system of conflicts* $S_c(t)$ as a subsystem of the *system of stakeholders* $S_s(t)$ (see Figure 5.8), both systems being the functions of time.

- recognises the applicability of network-based mechanisms (see Table 5.3) and intervention strategies (see Table 5.4) over the *system of conflicts* for conflict management and resolution.

- provides a methodological model for going about identifying and managing conflicts in the context of organizational change at various complexity levels of an organization involving individuals, face-to-face teams and inter-departmental groups (see Figure 2.6).

The components of the proposed model, shown in Figure 5.6 are explored below.

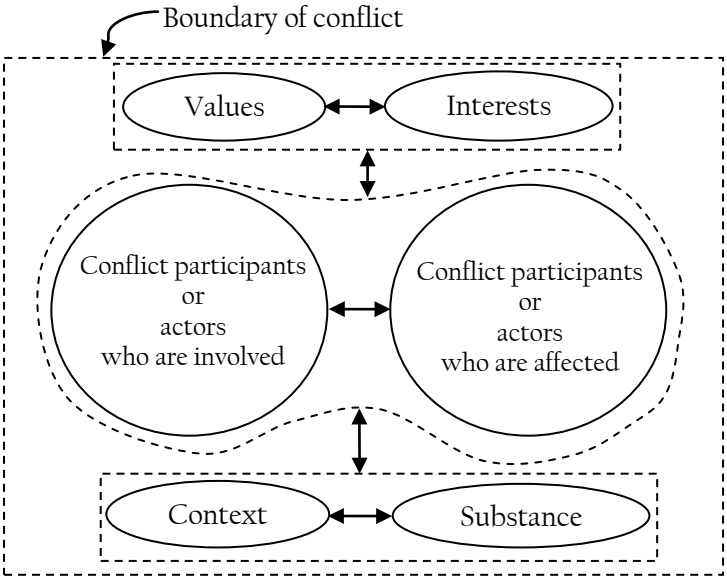


Figure 5.5: Conceptual framework for F2

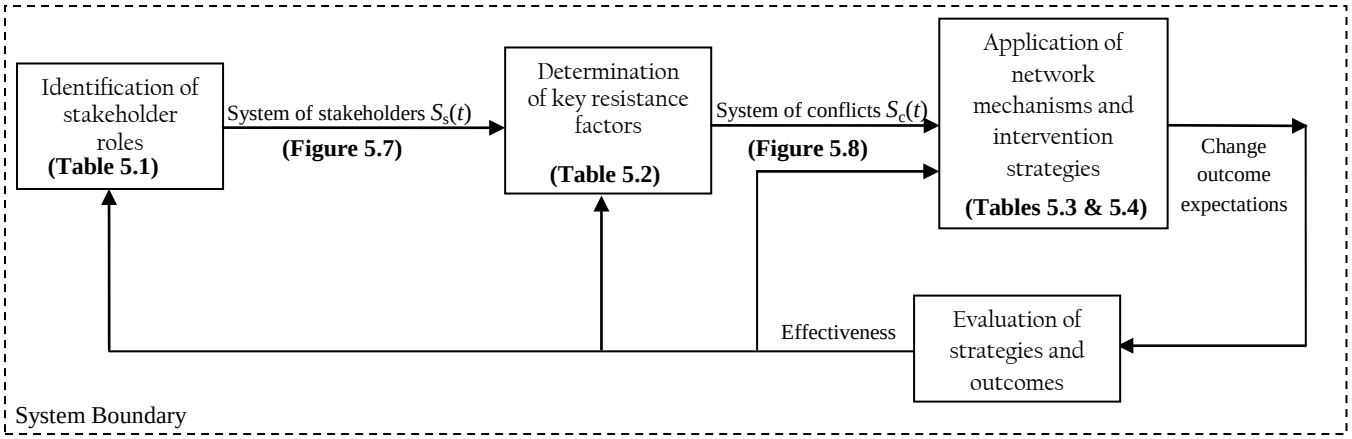


Figure 5.6: The proposed model for conflict management in organizational change

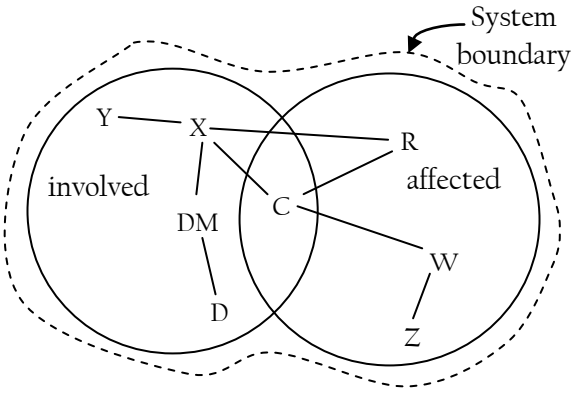


Figure 5.7: System of stakeholders $S_s(t)$ with roles of involvement at time t_0

i) Identifying stakeholder roles

Identifying stakeholders corresponds to differentiating between people to be involved and not to be involved (Vos, 2003). As mentioned in section 2.9.2, using the methodological guidelines of boundary critique (Ulrich 1983), Achterkamp and Vos (2007) have proposed a project-based stakeholder identification method, focusing on the: *roles of involvement* and *phasing this involvement* during the phases of *initiation, development, implementation,* and *maintenance.*

This model does not use this approach as change implementation strategies may differ among organizations, based on the organization size and the nature or degree of change. I, however, emphasize on the ongoing requirement of the identification of stakeholders and its repetition as required with the progression of change, as shown in Figure 5.6. This identification will generate the *system of stakeholders* (see Figure 5.7), while its repetition will *sweep-in* more information based on the effectiveness of the conflict management strategies applied in the previous cycle(s). This will eventually result in the re-definition of the boundaries under consideration, establishing the *system of stakeholders* as a function of time. Figure 5.7 shows the *system of stakeholders* at time t_0. Table 5.1 maps the roles stakeholders play in the context of the proposed conflict management model to the categories mentioned by Achterkamp and Vos (2007).

Table 5.1: Definitions of the roles of involvement – based on Achterkamp and Vos (2007)

Role	***Definition***
Party involved and affected (the two basic categories)	A *party involved* is any group or individual who can affect (1) the achievement of the change objectives or (2) who is affected by the achievement of these objectives.
Client (C)	A *client* is the party whose purposes are being served through the change process.
Decision maker (DM)	A *decision maker* sets requirements regarding the change process outcomes and evaluates strategic effectiveness whether these requirements are met.
Designer (D)	A *designer* contributes expertise in the identification of stakeholders, determination of resistance factors, application of strategies, and is responsible for the (interim) deliverables.
Affected, representative (R) or Witness	A party which is affected by the project outcomes or project process without being able to influence the process or these outcomes. A *representative* is a person who has been chosen to act on behalf of that party.

Achterkamp and Vos (2007) refer to the roles of involved and affected as 'actively involved' and 'passively involved' respectively. However, in order to maintain consistency throughout this thesis, I will refer to them as involved and affected.

ii) Determination of resistance factors

Resistance, on one hand, is a phenomenon which can undermine organizational change by delaying or slowing down its beginning, hindering its implementation, and increasing its costs (Ansoff, 1990), but on the other hand, it can also be an information source for developing a more successful change process (Beer & Eisenstat, 1996; Goldstein, 1988).

It is suggested that the factors causing resistance must be determined, assessed and managed as a part of the conflict management strategy, such as the difference in perception about the web portal's main objective presented as problem scenario#1 in section 4.7.3. McIlduff and Coghlan (2000) point out that organizational change involves the responding behaviour from individuals, teams and groups in the light of their perception of the change process (see Figure 2.6). They mention *perception of change*, *assessment of the impact of change* and *response* to be as three critical elements in the dynamics of change process for individuals, teams and interdepartmental groups. The numerous causes of resistance mentioned in the literature can be broadly classified as individual and organizational factors. The former include selective perception and retention, self interest, frustration, fear of unknown, low motivation, feelings of failure, self-distrust, conservatism, and loss of control (Coch & French, 1948; Conner, 1998). The latter can encompass conformity to norms and values (culture), past experiences and threats to power or influence (Mullins, 1999).

Trader-Leigh (2001) conducted a study for identifying resistance factors for change management in US State Department using variables identified by O'Toole (1986). Trader-Leigh (2001) suggests that identification and understanding of the factors underlying resistance may improve outcomes of change implementation and proposes a model with an organizational analysis of resistance factors as its basic ingredient. Table 5.2 provides a summary of the resistance factors identified in her study.

Table 5.2: Resistance factors in change management – information drawn from Trader-Leigh (2001)

Resistance Factor	***Description***
Self Interest	People offer resistance if they see ways they benefit from being eroded by change.
Psychological impact	Perceptions of threat in the form of job sAus-Unirity, professional expertise and one's social status
Tyranny of custom	Despotism of custom inhibits change
Redistributive factor	Changing policies, procedures, funding strategies
Destabilization effects	Change of assignments, posts or designations disrupting service levels
Cultural incompatibility	Conflicts with bureaucratic structures having traditional monopolies
Political effect	Upset in the balance of power and control

In addition to identifying the resistance forces emerging from the organizational factors, such as cultural incompatibility and threats to power or influence (political effects), I also emphasize the importance of individual resistance causes, which can be positioned in the four complexity levels of organizational participation, shown in Figure 2.6. An individual's disaffection with themselves and/or with their organization results in dysfunctional behaviour hinders team effectiveness and impacts negatively on the bonds within the organization. Team dysfunction then limits the effectiveness of the inter-departmental group co-ordination, ultimately obstructing the organization's capability to compete effectively. This makes these levels dynamically and systemically inter-related (McIlduff & Coghlan, 2000). This shows that individual behaviour is also a major cause of conflicting situations and thus cannot be ignored. Later in this chapter, I present some propositions for outlining intervention strategies to mitigate resistance by targeting both individual behaviour and team/group work in the system of conflicts.

As mentioned by Bovey and Hede (2001), most studies on organizational change have discussed organizational perspectives as opposed to individual ones. This section briefly explores the role of individuals' perception (cognitive and affective processes (Bovey & Hede, 2001)) in offering resistance to organizational change. More detailed analysis is provided by Sullivan and Guntzelman (1991), Spiker and Lesser (1995), and Sekaran (1992).

The basis of cognitive philosophy lies in the fact that individuals tend to have automatic thoughts largely based on misconceptions and faulty assumptions leading to emotional and behavioural disturbances (Corey, 1996). These 'cognitive distortions' (Matlin, 1995) are creations of mind rather than representations of reality and impair an individual's relationship with the organization (Coghlan & Rashford, 1990). As claimed by Coghlan (1993) and Miller and Yeager (1993), failing to correct these dysfunctional processes will increase resistance to change, thus creating conflicting situations in teams and/or inter-departmental group work. I, however, argue that these perceptions in some cases may also be based upon realities pertaining to change the process. The study of resistance factors should, therefore, improve understandings and assist change proponents in building intervention strategies as required.

The determination of resistance factors will bring about the *system of conflicts* (see Figures 5.6 and 5.8), comprising of conflicts emerging both from individual and organizational resistance forces. Similar to the *system of stakeholders*, it is also a function of time. Each conflict is considered to have two sets of elements (Pinzón & Midgley, 2000):

1. The subjects/actors who participate in the conflict; the substance or object seen as having characteristics of triggering specific actions/reactions (e.g. resistance) in individuals (Maturana & Varela, 1992) and the context pertaining to culture and politics.

2. Interests and values related to the conflict's participants. Figures 5.8 and 5.9, instead of showing values and interests for each conflict, portrays them as a collective set of understandings for the whole *system of conflicts*.

Let us now discuss about the anatomy of the *system of conflicts* exemplified in Figures 5.8 and 5.9 (a zoomed-in view to the *system of conflicts*). It comprises of two conflicts involving W, X, Y, Z and the client (represented by C). In Figure 5.9, the connection between C and Z has been shown as a dotted line for conflict 1as there is no direct link between these two stakeholders in the stakeholder network (see Figure 5.7). Stakeholder X is involved in both of the conflicts. The client is a stakeholder whose purposes are being served by the change process (see Table 5.1), and as such is involved in and affected by all of the conflicts hindering the change progress. So, in case of a conflict purely rising from 'cognitive distortions' (Matlin, 1995), as discussed above, the conflict shall be considered between the client and individual, provided that the individual in that case is not involved in any team or group work contributing to the change process.

iii) Intervening with the Conflict Participants

After discovering *who* is resisting and *why*, the next challenging issue is to use this information for conflict management. This section discusses how resistance can be managed in conflict situations during organizational change. Based on the literature, I first construct a set of propositions for the *system of conflicts* that change proponents need to consider. The utility of network mechanisms and interventions in a 'networked organization or community', in dealing with the conflict situations are provided in Tables 5.3 and 5.4 respectively.

Proposition 1:

Every change creates some resistance and it surfaces at each stage of the change process (O'Connor, 1993).

Proposition 2:

Resistance, instead of being negative, is a contributor to organizational learning. If wisely tackled it may serve as a valuable source of information in managing change (Piderit, 2000; Waddell & Sohal, 1998).

Proposition 3:

Discovering *who* is resisting and *why* is the real task in change management (O'Connor, 1993).

Proposition 4:

Entering into non-emotional debate with resistors can reveal new ways to improve the change project and guide resistors in reframing their thoughts related to that process (Bate, 2000).

Let us now discuss the impact of communication on opinions about the change process. Innovation diffusion theory suggests that media as well as interpersonal contacts are the means of providing information and influencing opinions and judgement. As indicated by Rogers (1995), innovation diffusion has four main elements: invention, diffusion or communication through the social system, time and consequences. The social system illuminates the concerns of parties or stakeholders by regarding them as one of the vital ingredients to be considered into the recipe of innovation diffusion. The above listed elements are heavily influenced by the availability of information about the change and the communication process between the change proponents (involved) and those who are affected by it (McIlduff & Coghlan, 2000). Beckhard (1969) mentions organization development, as an approach for planned organizational change that encourages collaboration and co-ordination between organization leaders and members in managing the change process. It focuses on the aspects of culture (values, beliefs and assumptions) and processes. I emphasize on the establishment of a 'networked organization or community' of stakeholders as a part of an overall organization effort for communicating information regarding change. This will bring about transformations in

culture, relationships (pertaining to teams and group work) and skills to effectively deal with conflict situations.

Cao, Clarke and Lehaney (2003) indicate about a shift taking place in the study of organizational form from rational bureaucratic composition towards a network-based configuration. This configuration is characterised by a flat authority structure and multiple horizontal linkages between the inner core of a firm and its outside suppliers, contractors and customers. This framework of stakeholder relationships can be studied and analysed using social network analysis. This analysis has been used by researchers to refine and extend the human understanding of various behavioural and social phenomena, including community elite decision making, social influence, power and innovation diffusion (Cao, et al., 2003; Rowley, 1997). Nohria and Eccles (1992) regard this network to be a more flexible, innovative and change-friendly than the 'seriously maladaptive' bureaucracies as described by Mintzberg (1979) and others. In similar fashion, Ciborra (1996, p. 104), describes network as a chameleonic organization, capable of taking up the 'colour' in response to the changes occurring in its environment. According to Cummings and Worley (1993), a network setting is adaptive in nature, as it can be rearranged as required.

In the context of the proposed model, a 'networked organization' is about the establishment of a 'network of little niches' for looking at conflicts more closely in terms of their participants (involved and/or affected), the issues related to resistance (organizational and individual) governing them and yet not losing the holistic view of how these may be interconnected and also linked to the other stakeholder set not participating in a conflict. Figures 5.8 and 5.9 (zoomed-in view) show these 'niches' as conflict 1 and conflict 2 and their interconnections through stakeholders C and X as they participate in both of these conflicts. These 'niches' give birth to polycentric decision-making processes for conflict resolution and management. This sharing of power results in partnerships, which may not always lead to an end to a conflict but engages co-operation and negotiation between its participants (Bate, 2000). Network theorists argue that such networks influence perceptions and opinions and are capable of changing interpretations associated with and reducing uncertainty about an event, idea or phenomenon (Rogers & Kincaid, 1981). This capability of networks can be used in

managing conflicts by influencing perceptions of conflict participants about the change process.

Table 5.3: Network mechanisms and their functionality

Network mechanism	***Functionality***
Relational proximity or communication proximity	It views organization as a communication network in which stakeholders repeatedly interact (directly and indirectly) to process resources and information (Dow, 1988, p. 56; Rogers & Kincaid, 1981). As mentioned by Erickson (1988), people most likely to compare and agree with whom they are more strongly tied.
Positional proximity	It refers to the network of structurally proximate individuals, who may not have links with one another as in relational proximity but they are linked to others with similar attributes like roles and obligations, status and expectations (Burt, 1980). "Individuals may be the focus of similar information, requests and demands from members of their role set, creating an information field in which they are embedded," (Hartman & Johnson, 1989, p. 525).
Spatial proximity	It is based on the likelihood of interaction and exposure to social information due to living or working close together, which influences one's attitudes (Festinger et al. cited in Rice & Aydin, 1991). Unlike direct interaction it may affect social information processing through exposure to or inaccessibility of the individuals to the organizational sub-climates, task materials and events (Hackman cited in Rice & Aydin, 1991).

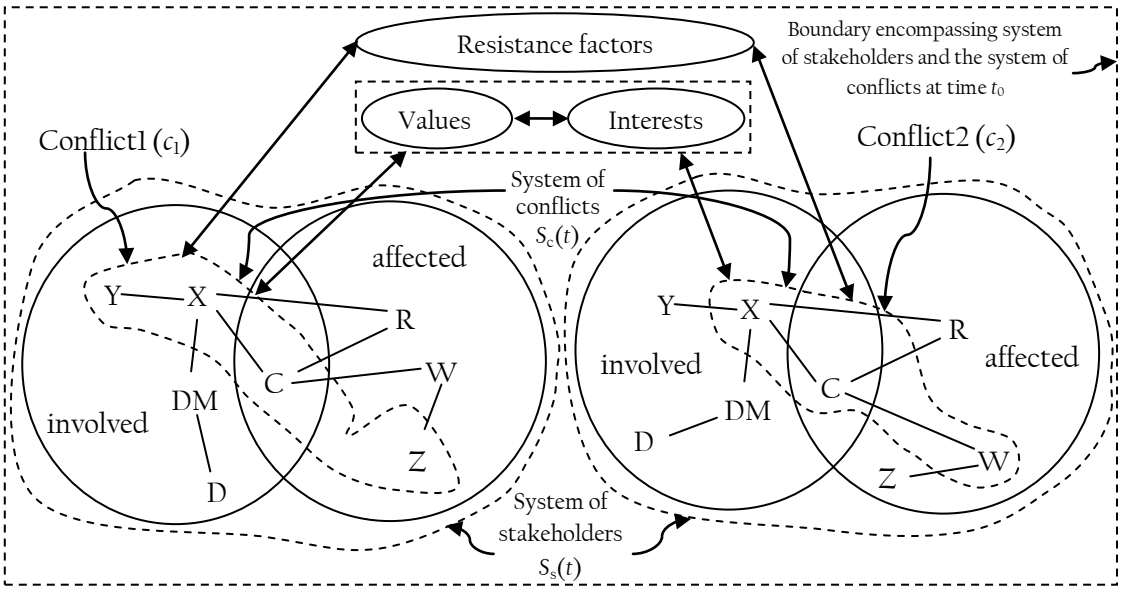


Figure 5.8: System of stakeholders and system of conflicts with the roles of involvement at time t_0

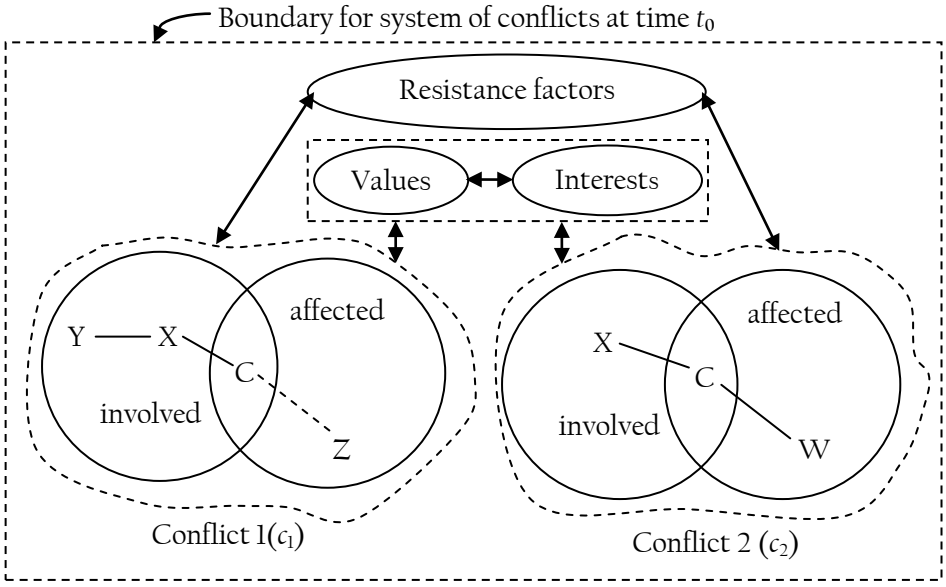


Figure 5.9: System of stakeholders zoomed-in to show c_1 and c_2 as network niches in the stakeholder network

A detailed description as to how influence propagates in a network setting is restricted due to space limitation. Together with these network mechanisms, I suggest the use of interventions for information propagation through these 'niches' about the change process. In the context of change process, an intervention is an action or event that influences the individuals (positively or negatively) involved or expected to be involved in the process (Hall & Hord, 1987, p. 143). McIlduff and Coghlan (2000, p. 724), view interventions as "...all conscious and deliberate actions and behaviours on the part of a

manager, consultant or facilitator ...". I argue that network mechanisms combined with appropriate intervention strategies will influence attitudes and behaviour of participants in conflict situations. The network mechanism will serve as a medium for information flow while the nature of intervention and the roles played by opinion leaders during these interventions will collectively determine the likelihood of innovation adoption success. Focusing on various intervention types is not the subject of this writing. Table 5.4 outlines some of the useful interventions in the context of organizational change. If used well, these become powerful tools for innovation diffusion, but when used poorly, resistance develops and the change approach loses its credibility (Hall & Hord, 2006, p. 86).

Table 5.4: Some useful intervention strategies

Intervention Strategy	***Description and function***
Survey feedback	To collect information about attitudes and opinions to use this information to design corrective actions. Data collection mechanisms include questionnaires, interviews, telephonic surveys etc. Questionnaires may use *Likert scales* (Mann & Likert, 1952).
One-legged interview	A brief conversation about the innovation project between the change facilitator and the other change participant(s). The focus of the intervention needs to be on helping to resolve current concerns and anticipating the arousal of others (Hall & Hord, 2006).
Exercises	To help participants, individually and/or as groups learn new skills and to reflect on their learning. Once the exercise is over, there needs to be a review and critique of how the process of exercise was carried out. An example could be *Five Squares* (for details see Bavelas, 1950).
The open-ended statement	To collect information about the concerns regarding innovation on a blank piece of paper. The papers are collected and the content is analysed as described in the manual by (Newlove & Hall, 1976).

Now, I provide a discussion about understanding, appreciating and evaluating the perspective of those in conflict (involved and affected) about interventions involving individuals and team/group situations. As indicated by Coghlan (2000), the dynamics of change for individuals, teams and inter-departmental groups (see Figure 2.6) comprise of: *perception of the change*, which encompasses the meaning of change, the degree of having control over it and the degree of trust in those promoting it; *assessment of the impact of change*, which involves impact perception along a continuum, ranging from positively enhancing at one end, through uncertain to threatening or destructive at the other; and *response*, which comprises reactions such as denying, opposing, tolerating, accepting, supporting or embracing the change.

I recommend that the following observations should be made while conducting interventions for managing individuals and/or teams/inter-departmental groups in the *system of conflicts*. The word participants in the following points, encompasses both involved and affected categories of stakeholders.

- Reaction and view of conflict participant(s) about the intervention.

- Perception of conflict participant(s) about the way change process is being carried out.

- Perceptions about the impact of change on values and interests of the participant(s) of the conflict.

- Any indication (positive or negative) from the conflict participant(s) about the change in attitude(s) about or level of involvement in the change effort, as compared to the one observed in previous cycle(s) (if applicable).

- Need for boundary refinement to redefine *system of stakeholders* $S_s(t)$ and/or *system of conflicts* $S_c(t)$.

- Need for refining or changing currently or previously applied intervention strategy.

It is emphasized that an intervention must be characterised by the philosophy underpinning a helping and supportive attitude for reducing learning anxiety and creating psychological safety for the conflict participants.

b) Discussion

A systemic model, proposed earlier by Pinzón and Midgley (2000), for conflict evaluation in social contexts cannot be directly applied in organizational change scenario as it only provides a conflict evaluation scheme. It thus, deprives of providing any mechanism for conflict management. The proposed model extends it for organizational change management by combining it with change and network stakeholder theories.

This section highlights the impact of proposed model on the management of conflicts in organizational change. The main questions addressed in this section are: what are the guidelines offered by the model in the comprehension and management of organizational conflicts? What are the overall implications of these guidelines?

Certain clarifications are to be made before going into any further discussion. Firstly, the proposed model is not intended to provide a definite solution to conflict management, but it is rather an attempt to looking at conflicts in a more holistic way. This will definitely pave the way for the development of such models in the future. Secondly, like other models, it is a simplified version of the complex nature of conflicts involving multiple stakeholders and thus, has some limitations which are presented at the end of this section.

Coming down to the above mentioned questions leads us to discuss about the two closely interrelated concepts of ‘systems’ and ‘complexity’. As a system taken as a whole can enable and/or disable the functioning capacity of its parts, so conversely the parts can also contribute to and/or challenge its functionality. Systems thinking deals with considering the ‘wholes’ that are relevant to a problem situation and studying their multiple cross level interactions over time (Waldman, 2007). Complexity, on the other hand is not only related to the number of parts and their interactions, but also to systems

which are dynamic in nature and exhibit 'emergent' properties over time. Allen (1988) has discussed this phenomenon quite in detail. Social systems become complex by the introduction of different normative or subjective perspectives about a situation (e.g. a conflict) where people have to reconcile and shun their taken for granted perceptions (Midgley, 1992). Analysing these perceptions from a dynamic frame of reference makes it even more complex and thus limits our ability to understand the overall scenario and predict system's behaviour.

The proposed model presents some guidelines for conflicts and their management by considering both of these as dynamic processes in form of *system of stakeholders* (see Figure 5.7) and the *system of conflicts* (see Figure 5.8). Emergence, in this context, sees today's most relevant criteria for conflict management to be ineffective, redundant or in need to be supplemented by others tomorrow. The implication of this guideline provided in the proposed model opens up a venue for decision makers, evaluators and change leaders to regularly rethink about the variables (e.g. resistance) as a system's comprehensiveness cannot be grasped at only one point of time. It rather needs viewpoints to be revisited and boundaries redefined. A different system boundary may result in the problem analysis from a new and entirely different angle and, accordingly in different solutions or changes. Care, however must be taken that the redefinition of boundaries does not ever miss out on the ethical responsibility change proponents have on the rest of the stakeholder set. Their role must always be as change facilitators rather than change enforcers.

The other guideline is related to the practice of boundary critique. The model applies it beyond the matter of just including or excluding stakeholders. Flood and Jackson (1991) mention that boundary critique may not produce effective social analyses until used in combination with other planning and evaluation methods. To generate an effective knowledge flow about change or innovation project, the proposed model couples boundary critique with the application of network mechanisms and interventions over the mesh of stakeholders to mitigate the effect of conflict generating causes. Singh (2005) has empirically shown the effectiveness of collaborative networks in knowledge flow and its diffusion. The implication of this guideline, at one hand, makes change initiators to not only define the relevant roles stakeholders play overtime inside the *system of*

stakeholders and the *system of conflicts* but also to refine their knowledge about these two dynamic systems. This continuous learning will make change managers to be exactly aware of the concerns of the conflict participants (involved and/or affected) and eventually help them to reevaluate their intervention strategies applied in the previous cycle(s) and to revamp the network structure for an improved knowledge flow.

Since Critical Systems Heuristics is applicable to areas like planning and evaluation, education, business and management, public health, psychology etc. (see for example Midgley, et al., 1998), I, now present a scenario where the proposed model is worth-applying. It is broadly accepted that Information Systems (IS) adoption in organizations is cumbersome due to frequent failures of IS projects (Azzara & Garone, 2003). An organization when viewed as a political system requires to considering concepts related to interests and conflicts (Taylor-Cummings, 1998). IS methodologies like waterfall, prototyping, and evolutionary models fall short of addressing issues of internal or external politics, perception, expectancy, and cognitive processes resulting in IS projects failure (Yardley, 2002). Hence, IS adoption which brings about change in organizational processes and procedures is not only confined to the technical issues but it also revolves around the needs and interests of various stakeholders creating conflicts among various stakeholder groups. It is, therefore, quite critical to identify stakeholders and look IS adoption through the eyes of those involved and affected by it. S. Standing and Standing (2007) have identified various conflicting issues named as 'systemic issues' while discussing mobile technology adoption in healthcare sector. They conducted a case study involving 500 nurses, 600 home help personnel and 710 care aid workers. Some of the factors causing resistance between these stakeholders and the administration, as identified by their study, comprised of conservatism, poor communication about a clear rationale for mobile technology adoption, lack of training and support and privacy issues. It is believed that the proposed model when applied in consideration with the above mentioned resistance factors and appropriate network mechanisms and interventions, has the capability of providing a smoother pace for such IS adoption projects.

c) Limitations of the model

The model presented in this paper uses change theory, critical systems thinking, conflict management and network stakeholder theory to provide guidelines for conflict management in an organizational change scenario, not something prescriptive to reach at the final destination.

Change or innovations cannot be implemented in an organization until attitudes towards change are changed. Resistance to change in inevitable and is not something to beat down. It tends to undermine change implementation particularly if the scope of the change affects roles, boundaries and resource allocations. This makes it essential to understand *who* are those affected and *how* they are involved in various conflict situations. The model regards the identification of stakeholders and the determination of resistance factors related to those stakeholders as the key steps to be undertaken before the interventions are carried out. The proposed model which includes analysis of these resistance factors (both individual and organizational) as a component of the conflict management plan does not, however provides a step-by-step method as to how these resistance factors could be determined. The model suggests the use of interventions as a participative or cooperative inquiry in which research is done with people rather than to them. But neither does it recommend any particular intervention plan to cope up with the emerging conflicts as change progresses nor any yard stick to measure the effectiveness of an intervention strategy. It also does not provide a mechanism to indicate when these interventions transform from change facilitation to change manipulation.

In spite of all these limitations, the model provides an organized methodology, based on a systemic or holistic perspective, for managing organizational conflicts that emerge during change or innovation diffusion. The model considers various categories of stakeholders, their involvement in conflict situations and the refinement of boundary definitions over time. The *systems of stakeholders* and the *system of conflicts* are the lenses which provide an insight to the different interests and perspectives to facilitate the development and implementation of collaborative strategies for change. It urges on the need of critical attitudes for carrying out the interpretation and evaluation of

conflicts, recognition of marginalized perspectives and demonstrates the need to gain a deeper understanding of the complex character of organizational affairs.

5.2.2 Observing boundary critique throughout a project

This study views IS adoption as a purposeful innovation project. The innovation literature dictates that diffusion of innovation is a phased process (Rogers, 1995). During the project related tasks accomplished overtime (project lifecycle), very little attention, historically speaking, has been given to the business users prior to the user acceptance stage. This forces the users to adopt inefficient and unhealthy methods of working (Yardley, 2002, p. 113). The proposed model suggests the determination of stakeholders using 'boundary critique' as an ongoing process, based on organizational learning. It is argued that exercising 'boundary critique' throughout the project lifecycle will facilitate change dynamics and the exploration of systemic problems. Grounding upon the reviewed literature, I formulate the following two basic principles; the proposed model is laid on.

Principle 1:

IS adoption is a multi-phase innovation project, consisting of a series of steps viewed as change processes, not events (Hall & Hord, 2006; Rogers, 1995).

Principle 2:

Change being a dynamic process (Cao, et al., 2003), renders identification of stakeholders as an ongoing process based on organizational learning, resulting into the redefinition of boundaries of the system as IS adoption process progresses.

a) Composition of the proposed model

This section discusses the building blocks that constitute the proposed IS adoption model.

i) Methodology

As per principle 1, IS adoption is viewed as a purposeful innovation project. The innovation literature dictates that diffusion of innovation is a phased process (Rogers, 1995). The phases underpinning the process of Information System Development (ISD) vary radically depending on the chosen methodology. However, there are five basic activities or phases that are shared – albeit with different names – by most methodologies. These are: (1) Identification and Concept (2) Requirement Definition (3) System Design (4) Implementation (5) Testing and Operation (Carugati, 2008).

Due to the handicap of Critical Systems Thinking in providing guidance on issues like process re-engineering, product quality improvement, applications development (Cao, et al., 2003), Systems Development Life Cycle (SDLC) has been used to engage the methodological component of the model. It, in fact, has been used as an innovation diffusion strategy to serve as a road map for the IS adoption process. It provides guidance to critically examine the progress of the whole project and the decision making process. The reason for opting a methodology for the IS adoption process can be justified as it keeps people focused on the proper tasks and activities required at a specific step of a transformation project (Paper, et al., 2000). It serves as a rallying venue for cross-functional teams, facilitators and managers by keeping them informed regarding projects progress and its whereabouts (Kettinger, Teng, & Guha, 1997).

The proposed model considers these activities under SDLC methodology as an example for IS adoption in an organizational context. SDLC is a traditional systems development methodology, having a well-defined process of conceiving, developing and implementing an information system (Mahmood, 1987). Figure 5.10 illustrates these activities carried out at each stage of SDLC. It also highlights their relationship and interdependence. There are, however, problems of systems delivery and communication

pertaining to SDLC (Berrisford & Wetherbe, 1979; Gremillion & Pyburn, 1983), which shall be addressed later.

SDLC, therefore, has been exemplified to act as a roadmap for IS adoption to progress as it passes through its various phases, as shown in Figure 5.10. It also shows that on the basis of learning, the IS project activities may also be recycled back at anytime to repeat previous activities for the modification and improvement of the system being developed (O' Brien, 2005).

ii) Phase-stakeholder-identification using boundary critique

Based on the stakeholder roles defined by Achterkamp and Vos (2007), Table 5.5 defines these roles that stakeholders play in the context of the proposed model. These roles fall into two main categories of involved and affected, while the other roles may fall into either of these categories. In Figure 5.12, W, X, Y, Z, and in Figure 5.13, S, T, U, W, X, Y, and Z have been shown to exemplify stakeholders in the involved or affected categories, playing the roles neither of a client (C), nor a decision maker (DM) nor a designer (D). Client has been shown at the intersection of involved and affected as an example, as this may vary among different project scenarios.

Table 5.5: Definitions of the roles of involvement – based on Achterkamp and Vos (2007)

Role	***Definition***
Involved and affected	(1) A party *involved* is any group or individual who can affect the achievement of the project objectives (2) A party *affected* is the one bearing the side effects of the project outcomes or project process without being able to influence the process or the outcomes.
Client	A *client* is the party whose purposes are being served through the project
Decision maker	A decision maker is responsible for: (i) Identifying business opportunities and priorities in relation to IS project

	(ii) Conducting a feasibility study about the new or improved IS (iii) Analysing the information needs of stakeholders; setting project requirements in terms of process and outcomes; assessing the achievement of these requirements (iv) Managing the effects of system changes on end users (v) Monitoring and evaluating post-implementation review
Designer	A designer contributes expertise within the IS project and is responsible for the: (i) Interim deliverables (ii) Development of the project management plan and its approval (iii) Development of functional requirements that could meet the business priorities and the needs of stakeholders (iv) Development of specifications for the hardware, software, people, network and data resources (v) System testing and user training (vi) Modifications to IS based on post-implementation review
Representative or Witness	A *representative* is a person who has been chosen to act on behalf of the affected

Unlike four project phases, identified by Achterkamp and Vos (2007), this model considers IS adoption under the five basic activities of ISD (Carugati, 2008) or project phases, as defined under SDLC i.e. investigation, analysis, design, development and maintenance (O' Brien, 2005). It also emphasizes on the ongoing requirement of the identification of stakeholders and its repetition as required with the progression of the IS adoption project (see *principle 2*), as shown in Figure 5.11. This has been named as *'phase-stakeholders-identification'*. This identification will generate the *systemic network of stakeholders* (see Figure 5.12) while its repetition will *sweep-in* more information based on the effectiveness of the strategies for innovation diffusion, applied in the previous cycle(s) or phases of ISD. This will help in revealing problems related to multiple stakeholders and, thus, in formulating solutions for their resolution.

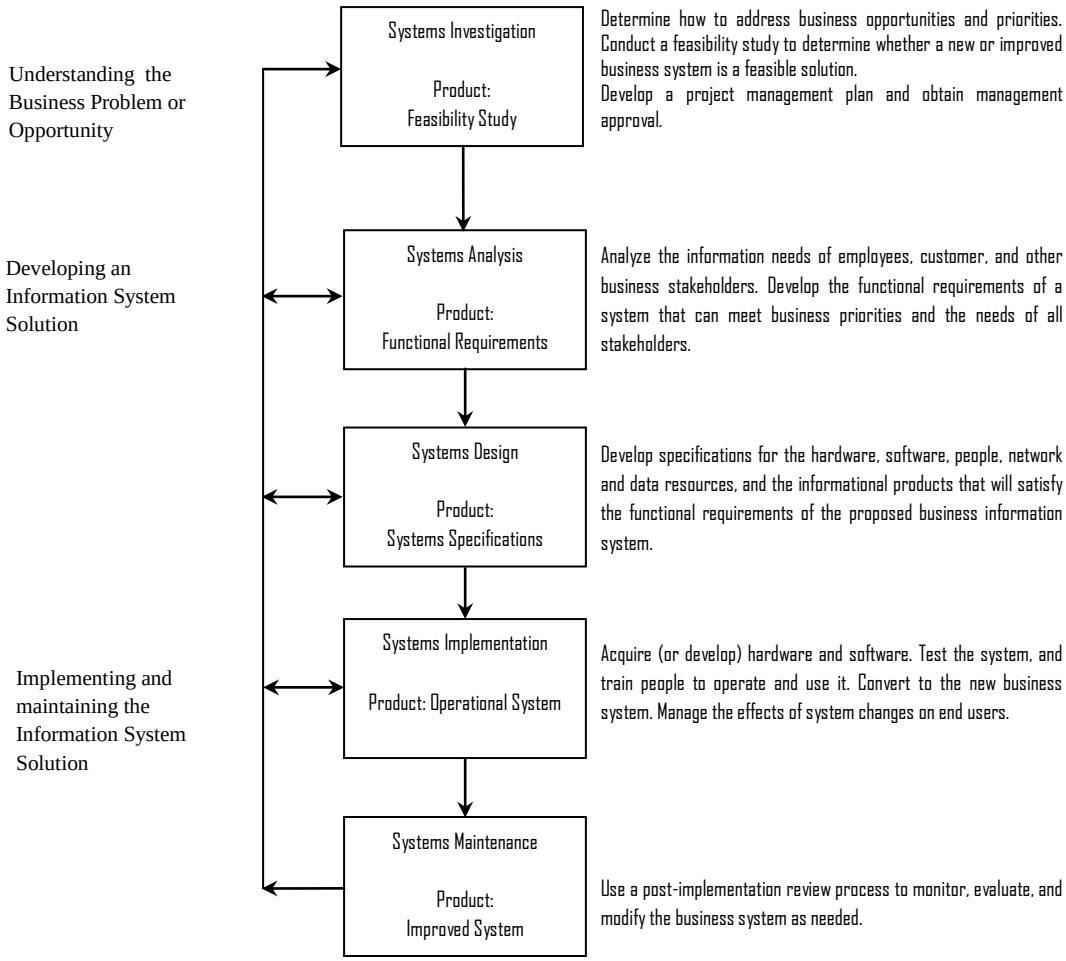


Figure 5.10: The traditional information systems development cycle

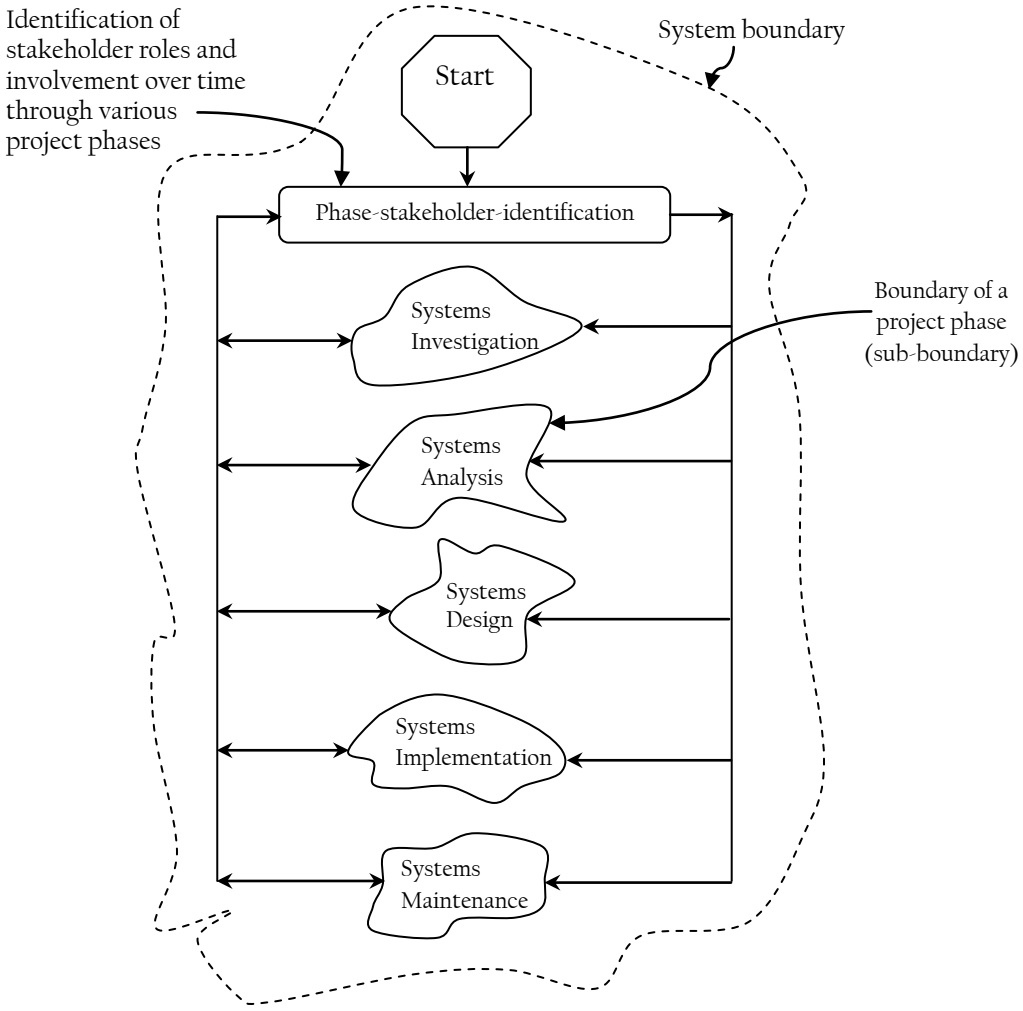


Figure 5.11: The proposed Critical Systems Thinking based IS adoption model using SDLC phases

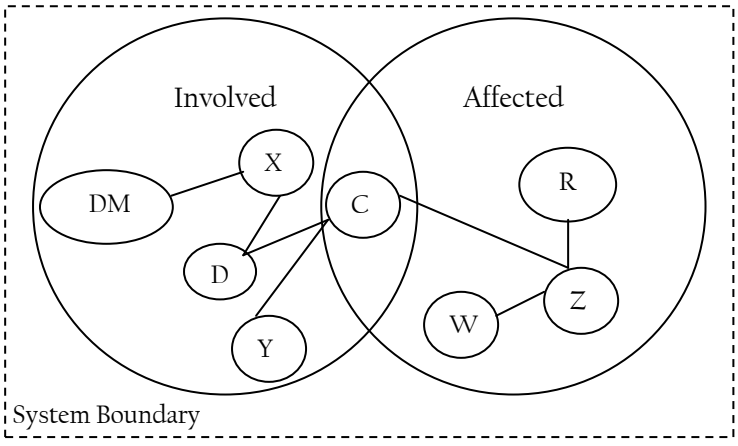


Figure 5.12: Systemic network of stakeholders

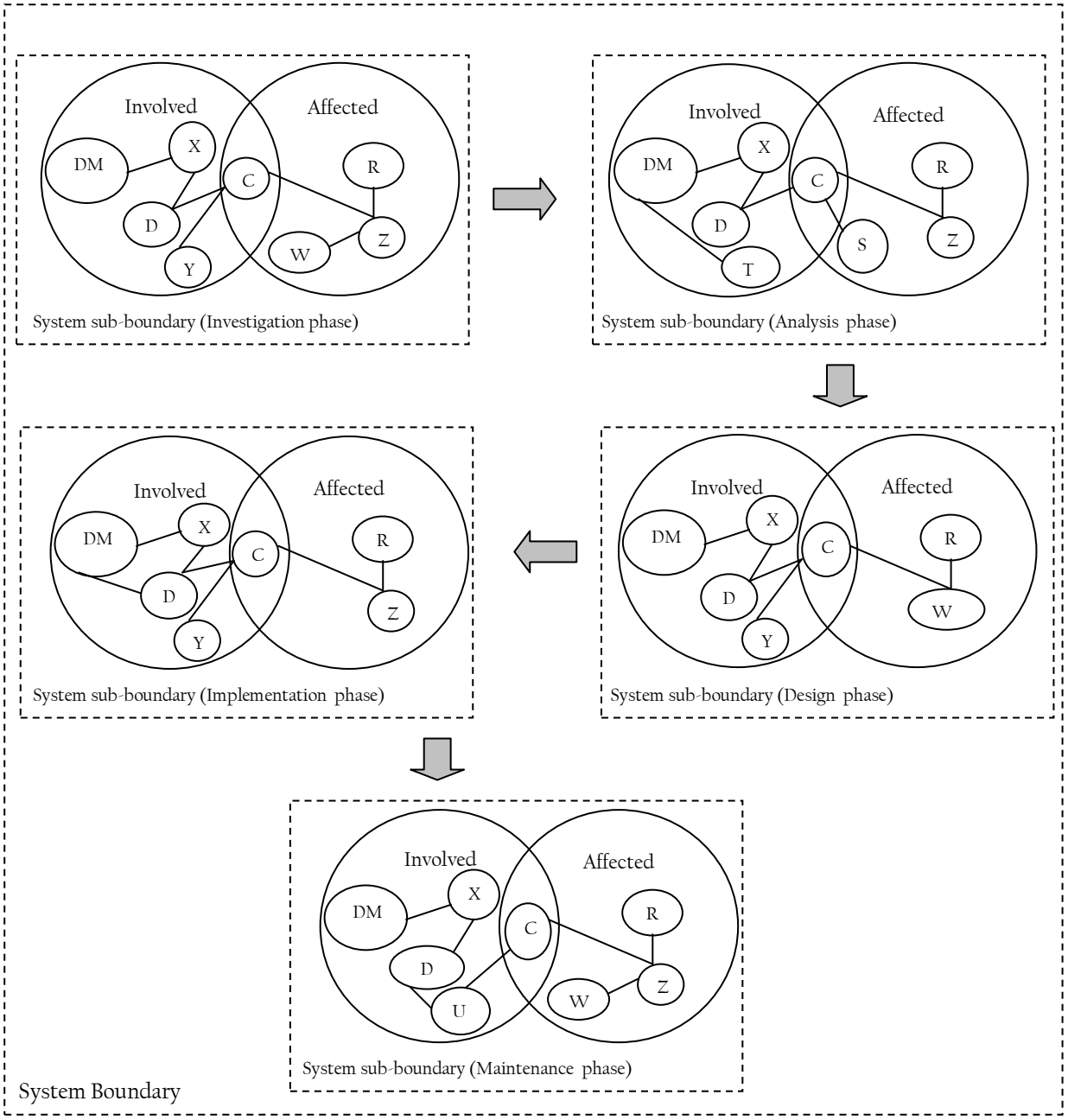


Figure 5.13: Emergence of systemic stakeholder networks over time through various SDLC phases

Since SDLC phases have just been used to exemplify the five basic activities of ISD as identified by Carugati (2008), the process of *'phase-stakeholders-identification'* can thus also be coupled with methodologies other than SDLC. The discussion on as to how it may be achieved is not the objective of this study.

This will eventually result in the re-definition of the boundaries under consideration, establishing the *network of stakeholders* as a function of time, as shown in Figure 5.13. These networks emerging over time have been named as *systemic network of stakeholders.* This process, based on the idea of *progressive boundary refinement* is proposed to be consisting of the following steps:

1. Defining the goal of the project phase.

2. Critically identifying stakeholders for a particular SDLC phase on the basis of *phases of involvement* (see Figure 5.13) and *roles of involvement* (see Table 5.5).

3. Representing stakeholders in form of a *systemic network of stakeholders* over time (see Figures 5.12 & 5.13).

4. Applying network mechanisms (Table 5.3) for influencing attitudes of the stakeholders in the network, regarding IS adoption.

iii) Communication of innovation

Innovation diffusion, according to Rogers (1995), is the process by which an innovation is communicated among the members of a social system through certain channels over time. Now, I highlight the applicability of network mechanisms to the systemic network of stakeholders to influence the opinions about the IS adoption process. The availability of information about the innovation and the communication process heavily influence the diffusion process between the change proponents (the ones involved) and those who are affected by it (McIlduff & Coghlan, 2000).

As indicated by Cao, et al. (2003), a shift is taking place in the study of organizational form from rational bureaucratic composition towards a network-based configuration, characterised by a flat authority structure. It comprises of multiple horizontal linkages between the inner core of a firm and its outside suppliers, contractors and customers i.e. its stakeholders. This network of stakeholder relationships can be studied and analysed using social network analysis. This analysis has been used by researchers to refine and extend the human understanding of various behavioural and social phenomena, including community elite decision making, social influence, power and innovation diffusion (Cao, et al., 2003; Rowley, 1997).

For communicating information regarding IS adoption, the model emphasizes on the establishment of 'systemic networks' of stakeholders (see Figures 5.12 & 5.13) over time by using 'boundary critique'. Network theorists argue that such networks influence perceptions and opinions and are capable changing interpretations associated with and reducing uncertainty about an event, idea or phenomenon (Rogers & Kincaid, 1981). It is argued that this capability of networks can be used in managing IS adoption and can influence perceptions of stakeholders about the process. An overview of the network mechanisms has been provided in Table 5.3.

Together with these network mechanisms, I suggest the use of interventions for information propagation about IS adoption process. In the context of innovation diffusion, an intervention is an action or event that influences the individuals (positively or negatively) involved or expected to be involved in the process (Hall & Hord, 1987, p. 143). Table 5.4 exemplifies some intervention strategies. The network mechanism will serve as a medium for information flow while the nature of intervention and the roles played by opinion leaders during these interventions will collectively determine the likelihood of innovation adoption success.

b) Discussion

The proposed model revolves around innovation diffusion in the context of IS adoption. Rogers (1995) considers members of the social system (people), communication channels and time to be the main ingredients of innovation diffusion process. Azzara

and Garone (2003) and C. Standing, et al. (2006, p. 1154) regard the following as the key factors for the success of an IT/IS project.

1. Stakeholder support and involvement
2. Project management and leadership
3. Effective planning
4. Executive's commitment
5. Project team's commitment

The current section discusses how the proposed model suggests to addressing these key factors. These factors shall now be referred to as key factor#1, key factor#2 and so on. The proposed model has three main components – methodology, phase-stakeholder-identification, and communication. It is argued that CSH is applicable in IS adoption due to its commitment to human/stakeholder involvement (key factor#1), through the use of boundary critique. IS adoption inside an organization impacts its actions due to its orientation to the roles and responsibilities of its stakeholders over time. Therefore, it is further argued that the adoption process does not prove successful until stakeholders and their roles are identified during various phases governing IS adoption, based on the boundaries under consideration. The proposed model, thus, applies boundary critique over the time dimension, addressing key factor#1.

Systems Development Life Cycle (SDLC) has been used to engage the methodological component of the model. It, in fact, has been used to serve as a road map for the IS adoption process. It provides guidance to critically examine the progress of the whole project and the decision making process. The reason for opting a methodology for the IS adoption process can be justified as it keeps people focused on the proper tasks and activities required at a specific step of a transformation project (Paper, et al., 2000). It serves as a rallying venue for cross-functional teams, facilitators and managers by keeping them informed regarding projects progress and its whereabouts (Kettinger, et al., 1997), addressing key factors 2 and 3.

Since diffusion of innovation is affected by the sources of information and channels of communication (Nilakanta & Scamell, 1990), the third component of communication is taken care of by the continuous determination of the stakeholder interactions in form of *systemic stakeholder networks* that emerge over time as the IS adoptions progresses through the SDLC phases. It is believed that repetition of defining/redefining stakeholders and their roles and the application of the network mechanisms to *systemic stakeholder networks* has the potential to serve as a rudder for the IS adoption process throughout the project lifecycle (see Figure 5.13), resulting in effective communication management. This also shows the commitment and concern of opinion leaders or executives and the project team's about the success of the IS adoption project by keeping the stakeholders (involved and affected) well-informed about the project objectives and progress, addressing key factors 1, 4 and 5.

As shown in Figure 5.11, SDLC has been coupled with *phase-stakeholder-identification* prior to each project phase. The irregular shapes illustrated around project phases (Systems investigation, analysis, design, implementation and maintenance), represent each phase as an 'amoeba'; a microscopic organism which has no specific shape and changes it overtime, depicting variable boundaries (sub-boundaries) of the project phases due to their continuous re-definition with the project's progression. The capability of these sub-boundaries to expand for *sweeping-in* relevant information, and contract to avoid its *over-inclusion*, make *phase-stakeholder-identification* a rigorous ethical exercise. Moreover, like specific SDLC phases (investigation, analysis, design, development and maintenance), this process, based on learning, may also be repeated or recycled any time, as required. This, in essence, does not damage the basic setting of SDLC as a development methodology as project activities may be repeated at anytime for seeking modification and improvement of the system being developed (O' Brien, 2005). *Sweep-in*, thus becomes an integral part of the traditional SDLC, making it compulsory to define an ethically justified systemic stakeholder network before initiating a new IS adoption phase.

It is, therefore believed that the process of *phase-stakeholder-identification* will help project managers to:

1. Justify/re-define the *roles* (Table 5.5) of each stakeholder before a project phase is initiated (Figure 5.13).

2. Manage stakeholders by looking deeply into the interactions or problems occurring inside the *systemic stakeholder networks* (Figure 5.12), employing social network mechanisms (Singh, 2005) and/or altering the network structures when required (Cummings & Worley, 1993).

3. Glide through various phases, ideally speaking, in a conflict-free environment.

4. Address the problems of systems delivery and communication pertaining to SDLC (Berrisford & Wetherbe, 1979; Gremillion & Pyburn, 1983) by clear definition of roles and responsibilities and communication management on stakeholder networks.

c) Limitations of the model

Based on the preceding analysis and discussions, a practical procedure incorporating Critical Systems Heuristics, network stakeholder theory and innovation diffusion for systematically conducting the IS adoption project has been presented. However, it should be noted that the model is not a wizard's wand to lead project managers to triumph. The proposed model, however, is capable of assisting project managers along the road to success, as it addresses key factors that are essential for a successful IS adoption project.

Traditional approaches (like SDLC) to IS development over-emphasize on the design and construction of computer-based artefacts without giving sufficient attention to the social and contextual sides of it (Avison, Wood-Harper, Vidgen, & Wood, 1998). A perspective based on CSH is seen as beneficial to engage these in IS adoption in an organizational context.

Boundary critique and systemic stakeholder networks provide the knowledge base and the strategic view for managing stakeholder related issues in IS adoption and their impact on organizations during innovation diffusion. The model, however, still needs to be empirically tested. However, the practicality of the model lies in the fact that CSH, SDLC and network mechanisms are the procedures or methods that have previously been applied and tested in real life scenarios.

The model suggests the use of interventions to influence people's attitudes towards IS adoption to mitigate resistance. But neither does it recommend any particular intervention plan nor any measure of effectiveness for an intervention strategy. It also does not provide a mechanism to indicate when these interventions transform from facilitating innovation diffusion to its manipulation.

The model uses SDLC as a roadmap for the IS adoption project. This paper does not discuss as to how the proposed model can be modified to accommodate with the phases associated with some other system development methodologies like Rapid Application Development (RAD), Joint Application Development (JAD) and spiral model etc. It also does not discuss its applicability or coupling with other technology acceptance models such as TAM or TAM2. However, these two aspects can be considered as future research directions in the development of such models.

5.2.3 A general recommendation for practising CSH

The major incentive for this recommendation is that the problems should be seen from a positive viewpoint as they serve for us as the sources of learning (Ackoff, 2006). This means that doing things right does not lead to learning. Problems are always perceived as something negative as managers consider them as the indicators of failure for their employees. The employees, therefore, tend to hide them while managers try to transfer them to others to evade responsibility and accountability and no body determines whether they have been used as a means of learning.

Problems emerging from certain practice or implementation should be forgiven if we discover new things and learn from them.

While observing CSH, I recommend the following steps to be practised in decision making to mould our problems or errors into something we can learn from. This applies to an IS project in particular, and in other contexts in general.

1. Since the major issue is to know about the occurrence of a problem, every single decision made by experts and decision makers needs to be recorded (see attributes of decision maker and expert in Table 5.1). The recording of a decision must include the following:

    i) Which sources of knowledge were used as an input made to the decisions inside the boundary of analysis i.e. which viewpoints or perspectives were considered as CSH considers stakeholders and the sources of knowledge as the fundamental parts for the boundary of analysis. This should also consider which of the sources of knowledge and perspectives were not considered and why.

    ii) Which limitations such as social and/or technological in an IS project, surrounded the decision making process.

2. The decision making must be monitored over time to detect for the occurrence of any deviations and systemic problems, and to explore their causes.

3. Corrective measures should be designed, yet again with the knowledge of their limitations.

4. The corrective measures must be recorded, initiating a new cycle as of step 1. Furthermore, a log must be maintained as to what was learnt during the previous cycle, so that the same error must not be repeated in the upcoming cycles. This will result in generating a cycle of learning, as shown in Figure 5.14, and creating organizational knowledge for pursuing such projects. Such organizational knowledge could be used as experience and/or as a documented piece of evidence for successful professional practice. The earlier recommendations have proposed such learning cycles in tackling with conflicts and systemic problems in the context of organizational change and IS projects.

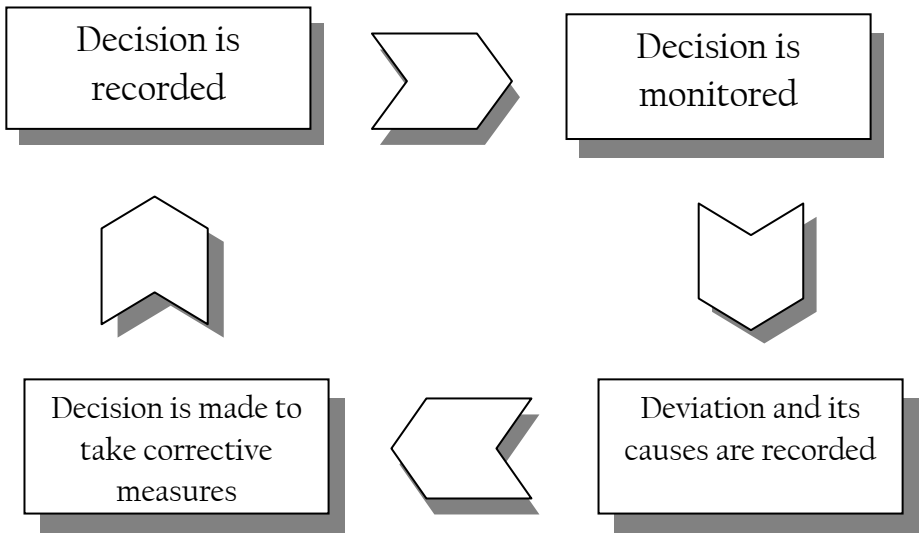


Figure 5.14: The recording and monitoring of decisions to avoid errors or problems going unnoticed

5.3 Summary

This chapter addresses the second research question by presenting recommendations to deal with organizational problems, conflicts and IS adoption projects. It proposes two systemic models for a systematic conduct of boundary critique. The first model is for dealing with conflictual situations in an organizational change scenario, while the second model is to deal with multiple stakeholders in an IS adoption project in an organizational context. The limitations of the proposed models have also been discussed. In the end, some a general recommendation for practising CSH has been made.

CHAPTER SIX
RESEARCH EVALUATION & CONCLUSION

6.1 Introduction

This chapter presents research contribution and the limitations of the study, followed by conclusion. In the beginning, it provides a preamble to the needs and challenges that led to this research. It also summarizes why CSH was opted as a method of inquiry. It then highlights research evaluation and contribution. The evaluation of the research is made on the basis of the framework proposed by (Weber, 2010). In addition to the limitations mentioned for each proposed model discussed in chapter five, some overall limitations and conclusions are also presented at the end.

6.2 Preamble

Management in today's world deals frequently with the management of change. Technological advancements have marked their changes in social and psychological domains. The adopters of technology have to undergo changes in their skills, current practices or working habits. The personnel responsible for change management have a challenging task of more than convincing the users about the use of technology.

Experts in our societies by regrading us as lay men, refrain from talking about what they do (Ulrich, 2001), and IS professional are no exception. By avoiding self reflection, these experts are more prone to falling into the trap of claiming beyond what they hold expertise in. Furthermore, experts while applying a methodology or practice (EIP implementation in case of this research), must have an appreciation and respect for the limitations of the method for a true competence in their research. Failing to do so may simply result in deceiving those who put their trust in their expertise (Ulrich).

Information systems (IS) and Information Technology (IT) weave out a complex relationship with an organization, especially in large organizations where such implementations are targeted to address the information needs of a diverse range of

stakeholders. These implementations trigger change processes at various levels of the organization. Experts and decision makers for organizational IS may or may not be the ultimate users of the innovation being opted, or they may interact less frequently with the adopted technology as compared to the other users. Hospitals, for instance, adopt technologies for the well-being of the patients, and dispense information about these innovations which is convincing for those to be treated. In an operation theatre, the "user" (patient) of the technology or the one the technology is used on, if said bluntly, has in fact no control over the equipment and processes being used for his/her treatment. The situation becomes even more complex when such systems become inter-connected, producing a larger user base and those who are experts and/or involved in decision making. In such a case, multiple mutually interacting medication systems with a variety of processes may even sometimes disregard clinical standards. This results in non-standardized self practices, leading to errors and by passing safe guards. The following questions arise as a consequence:

1. Are adopters (experts and decision makers) are same as users?

2. If not, is there any way their expertise or decisions, which they make on behalf of the users, can be challenged?

3. If not, is there any way so that the concerns or needs of these users could be taken into account or at least heard?

4. How can errors or problems in such cases be formally identified and taken care of?

These questions are supposed to be raised whether the IS/IT innovation is to be in-house built i.e. the adopters build their own solutions, or a customizable solution is purchased. Kroenke (2009) notes that organizational IS are never off-the-shelf as they need to consider the needs of organizational people or stakeholders and incorporate organizational procedures. Whatever the case may be, the importance of the above questions remains uncontested.

Organizational software, as discussed by Day (2000, p. 349) sits inside an environment inhabited by humans, the negligence of which has led to the software crisis. The findings of *Chaos* survey, conducted by the Standish Group in 1995, came up with a 100 point count method for the assessment of IS projects' success or failure. This survey, in addition to other factors, identified a highest point count of 19 for user involvement to acquire a higher chance of a project's success. TAM based technology adoption models examine it in terms of top management support, facilitating conditions, training, user involvement, but in essence, do not offer any formal mechanism as to how the voices of the "affected" could be represented and heard.

Following were the key understandings behind undertaking this study:

- The scope of changes in terms of procedures and processes caused by the design and implementation of a university web portal are organization wide and dynamic.

- The people encompassed by this project come from all organization hierarchical levels.

- The project outcomes and problems need to be analysed through a holistic lens.

The above mentioned key understandings guided me to choose a systemic/holistic methodology which is capable of addressing the following issues:

6.2.1 Tackling with and managing multiple stakeholders

This relates to conducting a thorough analysis of various people's interests. An evaluation involving different people or subjects with different priorities provides diverse perspectives about the matter under study. The economy-governed competitive environment, surrounding the organizations in today's capitalist minded societies, forces these organizations to follow only the technical and mechanistic trail to keep up with the ever-increasing competition. In the context of an organizational IS/IT, evaluation must be carried out with the following two components:

(1) People, participating in IS/IT adoption including those "involved" (experts and decision makers) and those who "affected" by the adoption of IS/IT innovation.

(2) Consideration of the values and interests, inclusive of technical, moral, practical and ethical issues.

These components address questions one and three, mentioned above.

6.2.2 Chalking out an intervention strategy

Managing multiple stakeholders requires an intervention plan which facilitates public debate and self-reflection, as people's needs are rarely understood by those who are not in need. Moreover, if the intervention strategy is also capable of challenging those "involved" for the decision they make and the options they take then it will address question two as well.

As question four goes unaddressed, there is a need of a holistic vision which, ideally speaking, does not let any problems or issues go unnoticed. Problems or errors must be conceived as the sources of learning rather than a justification for punishment or firing people, as if no problem is uncovered or unleashed then we can never continue on the learning process (Ackoff, 2006).

6.3 Critical Systems Heuristics (CSH) – My choice of inquiry

The quest for finding answers to the four questions, mentioned in section 6.2, led me to Critical Systems Heuristics (CSH) based case study as a part of my research for a PhD in information systems. The attributes of CSH are discussed as under.

Critical Systems Heuristics (CSH) is an endeavour to provide vocals to the user needs; and to surmount traditional constraint in the scientific observation which is devoid of the users as participants in the study. It considers the whole set of stakeholders along with their roles and perceptions, interpretations or viewpoints to be included inside the boundary of analysis. In this way, it puts users in a position to challenge the steps taken

by the experts. This democracy prevents experts and/or decision makers to avail no undue benefit over ordinary users.

Moreover, CSH provides a set of twelve questions to systematically pursue such user involvement in form of an intervention. This methodology, thus, kills two birds with one stone; by managing multiple stakeholders; and by providing a strategy for intervention for conducting the research inquiry at hand. These, as mentioned above, were the two requirements in my quest for a suitable methodology.

6.4 Research Contribution

This study uses systems thinking in general, and Critical Systems Heuristics (CSH) in particular to investigate and analyse systemic problems in organizational IS/IT adoption. It provides the following two main contributions to theory and practice:

6.4.1 Employment of a new paradigm

Systems thinking as a new paradigm to the research problem has been employed to open a window to new perspectives and insights to the IS/IT innovation adoption research. Applied disciplines related to social issues like management science cannot be professionally practiced due to ill-defined or qualitative nature of problem situations (Ulrich, 1996, 2000). The unavailability of a definite answer points out to the need of a critical approach capable of taking personal views, interests and value assumptions into account. It may not result in a single solution to a problem, but it must be inherently capable of accommodating views through debate about the problem situation.

The advancements in systems thinking paradigm have been marked by three major stages or waves, with every stage adding to the wealth of this paradigm with new set of concepts (see section 2.4). The methodology of Critical Systems Heuristics, which emerged in the third wave of systems thinking (Midgley, 2007), has been used in a web portal implementation project to resolve and prioritize upon a diverse range of interests. Following mile stones were achieved in the application of this new paradigm.

- Boundary judgements for Aus-Uni's web portal project, as a 'reference system' or 'system of interest' (SoI) (See section 3.7), were conducted systematically by identifying roles of involvement i.e. involved and affected as the two basic categories and the sources of knowledge or expertise.

- Boundary judgements of current (the *is* scenario) were linked with value judgements (the *ought to* scenario) in view of multiple perceptions.

- A forum for argumentation was provided for the affected by providing them critical competence with the experts and decision makers.

- An overall picture of the EIP implementation was presented for the ones in charge to pursue mediation among the conflicting interests and perspectives.

- A sense of improvement was established by capacitating the affected to challenge the perception of improvement of experts and decision makers by voicing the concerns of the affected about the portal's implementation.

6.4.2 Informing current adoption theories

The purpose of this research is not to offer a replacement to the widely accepted and empirically tested adoption theories, but to provide a qualitative study based approach to delve deeper into the understanding of the issues and problems in IS/IT adoption from a new angle. Technology adoption models and theories provide a picture as to how various factors influence in such a context. They, however, do not provide an approach as to how various stakeholders in various roles are involved in and affected by these in a situation taken as a whole. Although, this research has also come up with the factors such as usability (see problem scenario#1 in section 4.7.3), which have already been mentioned by these theories, Critical Systems Heuristics (CSH) has further informed us as to how these are related to various stakeholders playing major roles in IS/IT adoption. Boundary critique has been the primary tool for this contribution.

TAM based theories are based on a method governed by scientific observation, which treats IS/IT adoption as an observable and testable event through a quantitative inquiry. Inquiries merely based on observation are against intervention as this could influence the matter under study through the activities of the researcher. Action research, however, is underpinned by intervention. It was Kurt Lewin who advocated the importance of action research. According to him, scientific inquiry based purely on observation was incapable of addressing and satisfying human needs in a social context (Midgley, 2003). In Lewin's viewpoint, when problems surface in an organization, the research must be geared towards finding issues that need addressing rather than testing hypotheses. However, he does not recommend observation to be completely ignored. "Field theory" of Lewin (1951) considered "field" with a boundary in which a phenomenon occurs in direct interaction with some human, organization or any other object. According to him, the boundary marks the relevance of what is important to analysis.

Although various critiques have been launched on both types of inquiries, Lewin however does not regard observation and intervention as opposing each other, but observation rather assisting intervention. This study takes the similar stance. It emphasizes that the empirical inquiry providing insights to the key factors influencing IS/IT adoption should be further enhanced with some intervention based study (CSH, in this research) for the sake of improving the condition of mankind.

The objective of Critical Systems Heuristics (CSH) lies ahead of the mechanistic function of just upgrading the value of a scientific observation as it also attempts to empower lay people to question the experts for their competence in the conduct of the inquiry. It brings in the normative perspective of what *ought* to be done and what *ought* to be considered as knowledge through democratic participation in the debate among experts, decision makers and the common citizenship.

6.4.3 Model development

Two systemic models, one for conflict management in organizational change (Raza & Standing, 2011), while the other incorporating boundary critique with an IS development methodology (Raza & Standing, 2010), have been proposed. Both of these models emphasize the application of boundary critique over time. They make a theoretical contribution to the literature related to IS and change management. It is believed that these models will help organizations in a smoother implementation of change in general, and in implementation IS in particular. The compositions and limitations of these models have already been discussed at length in chapter five.

6.5 Research Evaluation

This section presents an evaluation of the quality of the theoretical contribution made by this research using a framework proposed by Weber (2010). He proposed theory to be evaluated from the perspectives of "parts" and the "whole" as both of these provide useful normative criteria for theory evaluation (Weber, p. 3). Parts or components of a theory comprise of its constructs, associations and its boundary, while the "whole" is perceived in terms of the "emergent" properties which appear as a result of the interaction between the parts.

6.5.1 Parts

This section evaluates the constructs, associations and boundary in the context of my research.

a) Constructs

The two main constructs of this inquiry are related to *what* and *who* i.e. what sources of knowledge (values and interests) are considered to be important and who is/are to be considered with these issues. The inquiry comprises of boundary judgements about these issues in light of the stakeholder viewpoints, as shown in Figure 6.1.

The stakeholders are basically divided into the categories of involved and affected. The other categories or roles include client or beneficiary, decision maker, expert or designer and witness. These stakeholder roles have been considered on the basis of the methodology of Critical Systems Heuristics (CSH). These roles, along with their related attributes or responsibilities in the context of IS/IT adoption, are listed in Table 5.5.

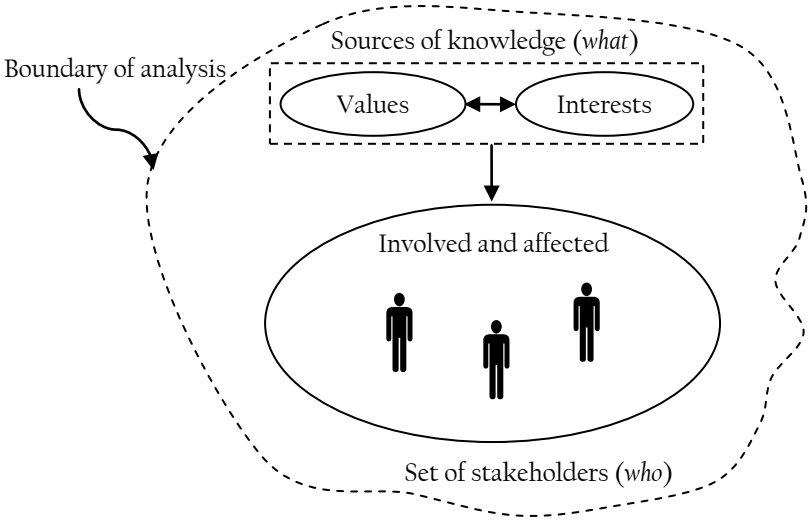


Figure: 6.1: Components or constructs of the current research

b) Associations

An organization is a collection of people with diverse issues and interests, and thus can be visualized as a number of stakeholder groups, each one pursuing for its goals (Cao, et al., 2003). Each stakeholder, as an individual or in a group, is connected to his/her own set of values and interests. These values and interests, therefore, drive the views and actions of these stakeholders in a certain context, as shown in Figure 6.1. An organization as a stakeholder in the big stakeholder group strives to align these stakeholder interests with its own objectives. This is undoubtedly a challenging task as the coexistence of multiple objectives tends to develop conflicts (Trader-Leigh, 2001). Unlike systems thinking, the compartmentalized or reductionist thinking is incapable of grasping the comprehensiveness of the entire situation. Hence, systems thinking, in form of CSH methodology, has been found applicable in this scenario.

Here, I feel necessary to touch on some representative ideas for providing some discussion on the nature of values and its relation or association with interest from the positions of axiological objectivism and axiological subjectivism. I use the words *objective* and *subjective* for the two terminologies respectively. Values are said to be *objective* in nature if they are thought to exist independently of an individual having an evaluation consciousness, and considered *subjective* if they are said to owe their existence to the act of evaluation of one or more individuals (Pinzón & Midgley, 2000). Scheler (1973, p. 19) regarded objective values as true objects free from the state of feelings and are immutable, absolute and unconditional. For example, one can expect a true ethical conduct from its political opposition or enemies in war. Frondizi (cited in Pinzón & Midgley, 2000), talking about the association of value and interest described that an object has a value or is valuable as long as it attracts interest. While both of these concepts have been criticized (Pinzón & Midgley, 2000), I consider both of them to be useful for underpinning my research.

This study considers values and interests as shared understandings of a community or a culture. This assertion relies on a *subjectivist* stance which is the basis for many modern writings on negotiation (see for example, Lewicki & Litterer, 1985; Ury, 1991). Nevertheless, on the basis of CSH as a driving force for this study, I have also coupled this understanding with the concept of judgement as it is crucial to acknowledge the multiple possibilities of viewpoints by *sweep*ing-*in* a variety of judgements as part of boundary critique. The challenge lies in mollifying, if not completely satisfying the interests of various stakeholders by creating a culture that encourages expression and avoids suppression of viewpoints of the participants in the context of IS/IT adoption. This stance brings with it some ethical responsibility and the need for a people-centred approach for attending not only to the individual behaviours but responding to the attitudes at a collective level in form of teams or groups as well.

The associations among stakeholders exist in forms of face-to-face teams and inter-departmental groups (see Figure 2.6). The stakeholders, in fact lie inside a network of influences which shape up their views and perceptions about the context, IS/IT adoption in case of this research. Although, the scope of this study does not cover as to how these network mechanisms operate, they still shape up the issues related this study, as shown

in Figure 6.2. In this figure W, Y and Z have been shown to exemplify stakeholders in the involved or affected category playing the roles neither of a client (C), nor a decision maker (DM) nor a designer (D) and nor being represented by a witness (W). It should be noted that the network of stakeholders shown in the figure may vary among different project scenarios. These network mechanisms have been illustrated in Table 5.3.

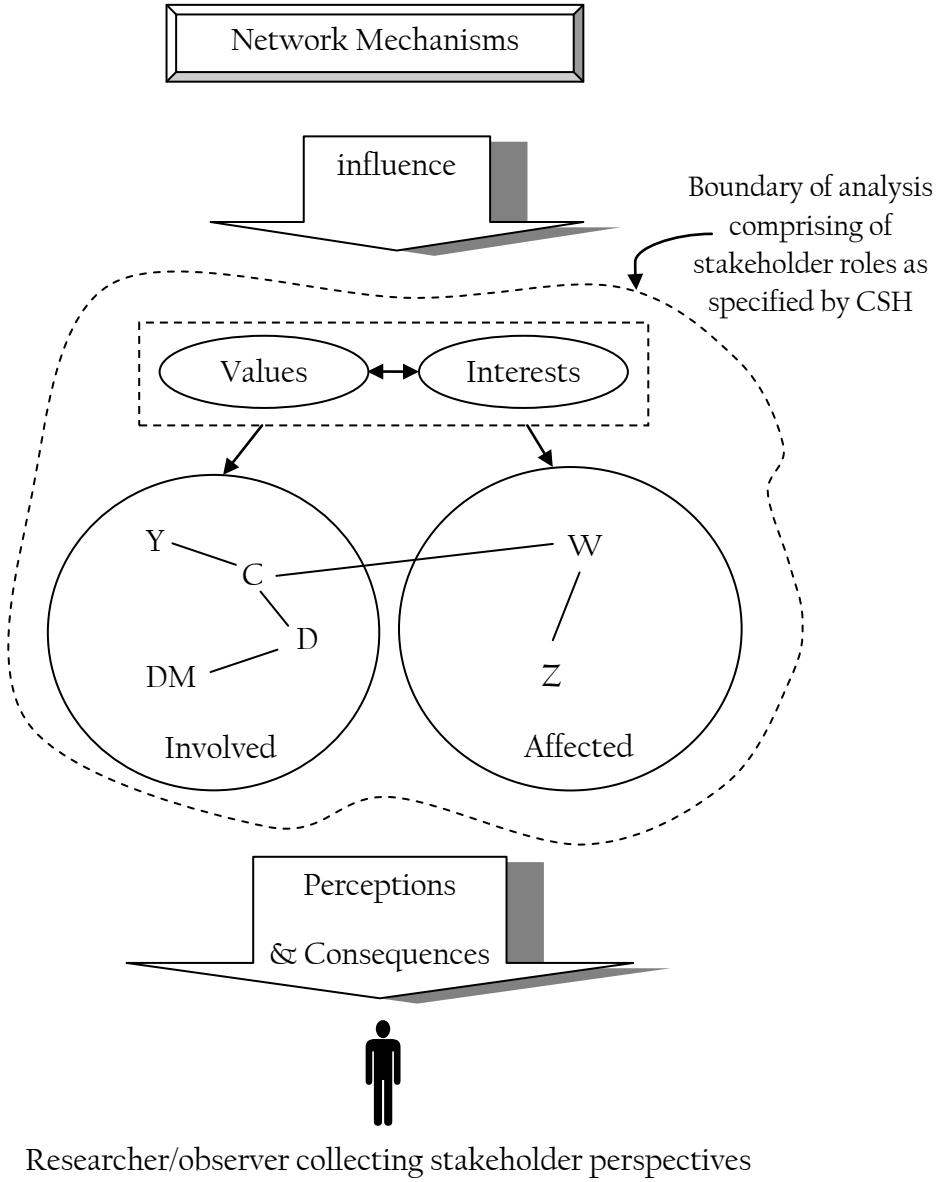


Figure 6.2: Researcher observing the perspectives of human subjects at this end about the context under study

c) Boundary

In CSH, boundary is established through the collection of critiques of those involved and affected by the situation under study also called the system of interest (SoI). This process of practising the boundary of analysis is also known as "boundary critique". The selection of boundary affects the analysis (Yolles, 2001) and consequently the results. As shown in Figure 6.1, a boundary comprises of the knowledge and all the stakeholders pertinent for analysis (Churchman, 1970).

In the context of an IS project, a wider stakeholder classification outlines end users and specialists or IS professionals. These two categories have been considered with the web team and IT people as IS professionals (C1), and the students and staff as end users (C2). Furthermore, this investigation, through the lens of "boundary critique", seeks to classify them further as involved or affected for gaining deep insights for the boundary of analysis under consideration.

The boundary is considered to be broad in terms of Churchman's *sweep-in* which requires the inclusion of maximum amount of information deemed pertinent for the study. As the study progresses, boundary refinements may also be carried out in terms of what to be included further to enrich the analysis and what to be regarded unnecessary, and therefore, should be excluded from the current boundary of analysis. Thus, CSH starts with a wider system as opposed to an initial narrow boundary other methodologies may reckon.

6.5.2 Whole

a) Importance and Novelty

Systems theory, as mentioned earlier, aims for the whole systems' improvement. This study uses a systems thinking framework of Critical Systems Heuristics (CSH) for improving information systems adoption and use in an organizational context. The "focal phenomenon" of the study is about exploring "systemic problems" which hinder

IS adoption and use. The study identifies these problems from a multiple stakeholder perspective.

The study does not provide a replacement for the existing technology adoption models but uses a new methodology for looking at the other side of the same coin. It provides a paradigm change by supplementing IS theory with a new angle for the researchers to look at the phenomena of IS adoption and use. A detailed discussion on the novelty of the research contribution has already been presented in section 6.4.

b) Parsimony

Although the study deals with multiple stakeholders, the exact number of which may be in thousands, as in case of large organizational IS, this study considers them as two broad categories of IS professionals or experts, referred to as C1, and students and the staff (Academic and non-academic) referred to as C2. Further classification of these stakeholders has been considered as specified by the methodology of CSH. The consideration of issues or the sources of interests connected to them are also included inside the boundary of analysis.

CSH, is therefore considered parsimonious as it deals with a fewer number of constructs in terms of the stakeholder roles and the sets of interests connected to them but still efficient to provide deep insights into social matters for IS adoption and use in organizations.

c) Level

This corresponds to the scope of coverage, narrow (micro) or broad (macro), which is matter of judgement (Weber, 2010). This study does not aim to explore and identify the needs or concerns of every single individual in the context of Aus-Uni's web portal, but to treat these individual stakeholders and their interests in a collective fashion. The study deals with a "tug-of-war" among the stakeholder categories of C1 and C2 and various roles within, and highlights their concerns at the macro level.

d) Falsifiability

Interpretive studies involve observers to develop their interpretation of a focal phenomenon occurring with the human subjects. Positivist research, in contrast, not only deals with variables, independent and dependent, their mutual relationships but also complies with the rules of logic and empirical testing, which are testifiable and replicable (A. S. Lee, 1994). In contrast, interpretive studies are not easily falsifiable as they are context-bound. Thus, creating or replicating a similar context, in most of the cases, is impossible. It provides new understandings to the same focal phenomenon which positivism offers, which are simply not comparable on one-to-one basis.

The current study, based on interpretivism, is a research on human subjects in form of multiple stakeholders in the context of a web portal project of a West Australian University (Aus-Uni), and is not replicable. Although this study produces deep understanding of the context from a holistic perspective, it is not easily falsifiable.

6.6 Limitations and Conclusion

This study regards the roles of stakeholders within the system of stakeholders and the determination of 'systemic problems' related to the information needs of those stakeholders as the key steps to be undertaken as a part of EIP implementation strategy. The study uses Critical Systems Heuristics (CSH) and management stakeholder theory to provide guidelines for content management in an organizational change scenario pertaining to EIP implementation. This study has the following limitations:

1. It is asserted that information needs and problems related to stakeholders cannot be determined until boundaries of analysis are identified, comprising those who are *involved* and those *affected* by them. This study applied boundary critique which is based on Ulrich's twelve questions (Ulrich, 1983). However, this study does not identify how boundary critique may be coupled with a particular EIP implementation strategy as such strategies may differ from one project to another. It, however suggests it as a participative or cooperative inquiry in which research is done with the people and for the people.

2. Due to time limitation and accessibility constraints, the study did not involve constant boundary refinement for the system of stakeholders and the systemic problem scenarios.

3. This research does not suggest any solutions to the systemic problem scenarios presented in chapter four. It, however, proposes two systemic models for dealing with conflicting situations and implementing an IS project with a continuous observation of boundary critique.

4. It also did not seek for the views of stakeholders in the community external to Aus-Uni. The study involved face-to-face interviews and no dialog was held among these stakeholders within Aus-Uni due to confidentiality issues.

5. This study should be regarded as an exploratory one, the outcomes of which are situational specific. Thus, the findings and conclusions emerging from this research cannot be generalized across the entire range of portal projects within academic or enterprise community as it represents views of those stakeholders participated in portal implementation project in Aus-Uni.

6.7 Future Research

This study requires IS professionals and project managers to be educated about the practical implications of systems thinking in real life situations in general, and 'boundary critique' in particular. It needs managers and IS professionals to be 'critical and reflective thinkers', more open for considering multiple viewpoints. The education programs across the globe are, therefore, required to raise awareness about 'system thinking' and their applicability in various problem scenarios. Vo, et al., (2006) discuss about the integration of systems thinking into IS education. There is also a need for discussion forums and seminars to open up the minds of current and future managers towards more holistic or systemic approaches for resolving social issues.

Moreover, due to the swift advancement in the world of technological innovations, which are constantly moulding user requirements and expectations, the EIP implementation requires stakeholder identification and their requirements analysis on a continuous basis throughout the change implementation strategy. This would require boundary critique to be applied over the time dimension as a system's comprehensiveness cannot be grasped at only one point in time.

Further research is needed to assess the applicability of boundary critique in other contexts such as organizations with comparatively larger user bases. Furthermore, the case evidence reported pertains to intra-organizational users. In future, the boundary considerations should also encompass extra-organizational stakeholders. Additionally, this type of work can establish a rigorous process of involving stakeholders and obtaining their input on a continuous basis, but it cannot guarantee win-win outcomes for all of them.

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