MAKING SENSE OF THE INFORMATION SYSTEMS USE FIELD

SINA JONEIDY

School of Business
College of Art and Social Sciences
University of Salford, Salford, United Kingdom

Submitted in Partial Fulfilment of the Requirements of the

Degree of Doctor of Philosophy May 2015

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS

IS	Information Systems
SST	Social Shaping of Technology
SCOT	Social Construction of Technology
TD	Technology Determinism
SST	Soft System Thinking
HST	Hard System Thinking
CST	Critical System Thinking
TAM	Technology Acceptance Model
TTF	Task-Technology Fit
TRA	Theory of Reasoned Action
GM	Ground Motives
UTAUT	Unified Theory of Acceptance and Use of Technology
DTE	Down-to-Earth

DECLARATION

Some ideas have appeared previously in the following publications:

Joneidy, S & Basden, A.(2013) Five Paradigms of Information system use: Affirmation, critique and enrichment, UK Academy for Information Systems (UKAIS): Oxford.

Joneidy, S & Basden, A. (2012) An Exploration of The Paradigm of Information Systems Use; Proceedings of the 18th Annual Working Conference of the IIDE, Maarssen, Netherland.

Joneidy, S & Basden, A. (2011) Exploring Dooyeweerd's aspects for understanding perceived usefulness of information systems; Proceedings of the 17th Annual Working Conference of the IIDE, Maarssen, Netherland.

ACKNOWLEDGEMENTS

I would like to express sincere gratitude to my supervisor Professor Andrew Basden for his support and guidance throughout my research project. His professional advice and patience helped tremendously with all stages of my study.

For continuous motivation and support my profound gratitude goes to my family. To my brother who has been always supportive. To my father for letting me follow my heart and chase my dreams. To my mother for her long-suffering, patience, and support, there is no way I could have gotten here without my family.

I would like to thank The Association for Reformational Philosophy in the Netherland and the Selwyn Trust for funding this research.

My gratitude also goes to all the participants and people who contributed to the success of this research. I particularly thank Dr Maria Burk, Dr Thoralf Dassler for their comments on my Internal Evaluation report. Thanks are due to Dr Gordon Fletcher and Dr Alex Avramenko for helping me to set the direction for this thesis with their feedback on my Interim Assessment report.

In addition to this, I would like to thank vast multitudes of colleagues and friends who have provided encouragement and moral support over this four year journey.

Above all, I thank my Lord, Jesus Christ who, by his Love and Sacrifice, sustained me throughout my PhD and imparted a fruitful attitude to it.

ABSTRACT

Information Systems (IS) Use has been discussed for more than three decades. During this time various perspectives of IS Use are found in the literature, which leads to a complex picture. Thus the main research question is "How to make sense of the IS Use field?" To begin to address this question I discuss the diversity and development of IS Use discourses as contributing to this complexity. The standard ways of understanding diversity and development of perspectives or discourses as paradigms (Burrell and Morgan, etc.) are found to be insufficient. A deeper understanding of what paradigm means is required. Yet, discussion of what paradigms are in philosophy of science (Kuhn, etc.) is controversial and is unable to address both diversity and development in the IS Use field. This thesis argues that Dooyeweerd's philosophy can provide fruitful understanding of these. This is given an indicative test by investigating 'what is important' to the authors of seminal papers who stimulated the main IS Use discourses. A desk study approach was used to aspectually analyse the relevant texts in these papers.

The findings are that I) Dooyeweerd's philosophy can provide new insight into the nature of paradigms. II) Dooyeweerd's aspects can provide a rich understanding of the diversity and development of Information Systems Use paradigms. These give one way of making sense of IS Use field that overcomes problems of existing approaches.

This way making sense of the IS Use field can contribute: I) To theory, first in IS, by bringing integration to the field of IS Use and stimulating new avenues of research, Second to philosophy of science, by Dooyeweerdian insight into the nature of paradigms; II) To methodology in IS by using Dooyeweerd's aspects as a tool to investigate what is implicitly held as important to the authors; III) To Dooyeweerd research community by showing the application of it in addressing the diversity and development of IS Use perspectives. Limitations of the research and possible further research are discussed in the conclusion.

Chapter 1 INTRODUCTION

1.1 Introduction

This chapter begins with an overview of the key issues, which looks into the rationale for conducting this research and how it is being structured. The research suggests that a better understanding of the field of Information Systems Use requires giving attention to different IS Use discourses that shapes our current understanding of IS Use.

This chapter is organised as follows. It begins with a background of IS Use field (section 1.2), scopes it as a subset of the general Information Systems field (section 1.3), introduces two main problems (sections 1.4, 1.5), explains that philosophy will be used (1.6), sets out the aim and objectives (1.7) and concludes with an outline of the thesis structure and an argument-based mind-map demonstrating the conceptual model of the thesis (1.8).

1.2 Background

It is truism to say that Information Systems (IS) are ubiquitous in today's organisations. Since their application in administrative data processing in the mid-1950s, they have become one of the key instruments for improving the formal information processing activities of organisations. In less than four decades, computer-based IS have evolved from supporting back office, to penetrating the entire organisation. New applications have emerged and enthusiasm for Information Systems in research is high. IS research is now a broad field with many sub-communities within it.

After four decades of research into IS Use, Information systems (IS) are increasingly in use beyond professional workplaces and previous decades have witnessed a massive penetration of Information systems into people’s day-to-day non-professional lives. Yet, Information Systems literature has felt the limiting view of dominant theories in addressing an understanding of IS use, mostly in professional workplaces, and there has been a call for new

theories to investigate multi-dimensionality of IS Use (Tachatassanasoontorn & Tanvisuth 2010).

Some scholars in the IS community have recognised that IS research is a general term including different major areas of research. For example Basden (2008) divides it into five areas: 1) Human use of Computer 2) Nature of Computers and Information 3) Information Systems development 4) Information Technology Resources 5) Information Technology as Ecology. Others have different categories, for example, Iivari *et al* (1998) believes IS science consists of all contributions to the body of knowledge produced by different research traditions that are typically concerned with the development, operation, use, evolution, evaluation, and impacts of IS. In all of them we see IS Use has been treated as an area on its own but of course interconnected.

1.3 The field of Information Systems Use

IS Use (ISU) is not the same as IS in general. IS in general is concerned with IS in society, IS development, some of the technologies involved in IS, as well as IS Use. In this thesis, IS Use covers the use of ICT by people both in organisations and outside organisations, its purposes are varied and by no means confined to work-related use, the contexts may be diverse, and the technologies many and varied. For example, a child playing a computer game would be included in IS use.

A number of scholars in the field distinguish IS Use as a separate research area under IS research (Bhattacherjee, 2001; El-Khatib & Barki,2009; Mora-Monge *et al*.2010;Clements & Bush, 2011; Eckhardt et al. 2013; Tennant, 2014). This is mainly because IS Use literature has been extensive on its own, and has covered a significant amount of variations in perspectives of IS Use. This study chooses IS Use Literature as a collection of all IS Use related research, distinguished from IS research in general, yet not separated from it. Many of

the authors cited in this thesis, though they refer simply to "IS", will be deemed relevant to this study on ISU

Various understandings of IS Use has proliferated over the past forty years. Yet, a major thrust of ISU research conceives IS Use with the assumption that it brings benefits and must be utilized. Proponents of this view assume that IS Use problem can largely be resolved by more sophisticated models.

Though the field of IS Use has amassed an impressive amount of research models during the past four decades, it currently lacks a holistic perspective and interpretation. A wealth of research in this field has produced an astonishing array of empirical results and practical insights, conceptual and terminological diversity and confusion, and a large suite of tools and methods. But as many researchers and practitioners alike feel, these form an isolated, disjoint, and often contradictory amalgam of knowledge. This leads one to think of IS Use field as highly complex.

The IS Use field in its complex form is the focus of this thesis. Because there are conceptual differences in how scholars represent IS Use in their research, this has led to the emergence of various ISU discourses centred on research problems. The discourses are not without limitations. The complexity of the IS Use field may be categorised into two characteristics as follows:

- Diversity: There is a diversity of discourses of IS Use which needs to be recognised, understood and accommodated.
- Development: There are changes of understanding which have led to development of discourses overtime which needs an account in order to be understood.

1.4 Diversity of IS Use Discourses and Perspectives

The first problem that would be outlined here is that IS Use literature shows diversity of IS Use discourses. This reflects fragmented understanding of IS Use which certainly needs attention of the scholars in this particular sub-community. Over time various attempts have been advanced to address an understanding of IS Use, with new perspectives being born. Different understandings of IS Use are shown by discourses. Discourses come to being because different group of researchers' understanding about IS Use is centred on a specific kind of research problem.

We can see the emergence of several IS Use research problems under which IS Use is researched. As will be seen in Chapter 3, today we have a diversity of ways of understanding of IS Use, each centred on a different kind of research problem associated with IS Use. Much research has relied on theories predicting IS Use and explaining it in terms of frequency and duration of use, especially influenced by Davis (1989) Technology Acceptance Model. Then Burton-Jones and Straub in 2006 suggested that to reflect the complexity of IS Use, IS research needs to try to capture the multi-dimensionality of IS Use as system, task and user (Burton-Jones & Straub, 2006). Subsequently, other researchers have begun to explore the various dimensions of system, task and user at the work place (Tenannt *et al*. 2011). Some focus on deepened use of system features (Al-Natour & Benbasat, 2009), others on "meaningful use" (Wills *et al*. 2011) and resistance to use (Eckhardt *et al*. 2009). Others introduced new conceptualisations of IS Use on everyday life issues of the user in various life domains (Platzer *et al*.2010).

It is important to understand such diversity because the field lacks a clear identity: a shared concept of who we are and what we do (Hirschheim & Klein, 2010).A discussion about the identity of IS Use field cannot seriously proceed without having a shared understanding of the

proliferation of discourses. With many different sub-communities working on their own specialist topics in the field, the field's whole picture has been largely ignored. Perhaps the reason is that many in the field believe that as technology develops so rapidly, there is little reason to gain a whole picture in an integrated way so much as updating our field with advancement in technologies is needed. But, as the field has evolved, the diversity increased.

Diversity in research has been both the accepted norm by many in the Information Systems discipline for over two decades, with much of the debate on diversity skewed towards IS identity crisis (Benbasat & Zmud, 2003). The debate continues on whether diversity brings is beneficial or problematic to IS as a discipline. For example Baskerville & Myers (2002) show the dilemma as following:

> *"The conventional wisdom amongst information systems (IS) researchers is that an information system is an applied discipline drawing upon other, more fundamental, reference disciplines. These reference disciplines are seen as having foundational value for IS. Shall we continue thinking of the idea of reference discipline for IS, or has the time come for IS to become a references discipline for other" (Baskerville & Myers, 2002)*

Though a discussion of this sort is quite dominant in IS field, few researchers have tried to work out what types of diversity there are in the IS Use field. Benbasat & Weber's (1996) study on types of diversity is seen as pioneer in IS research. They identified three types of diversities in IS research; Diversity of research problems, diversity of reference discipline and diversity of research methods. Though they provide a clear understanding of diversity of reference discipline and research methods, their treatment of research problems is ambiguous. It is important to understand the diversity of research problems because it is different kinds of

research problem that differentiate the discourses in Chapter 3. So this research seeks a way to understand the diversity of research problems and the discourses around them.

The diversity of discourses around research problems emerges over time as new discourses are born; this relates to the second issue, development.

1.5 Development of IS Use discourses

As mentioned in the previous section, and shown in Chapter 3, over the past four decades several discourses of IS Use have emerged. It happened through the changes in research problems which altered the perspective of IS Use community. Development of discourses implies changes of what is meaningful to different groups of researchers. Development might happen through emergence of alternative perspectives in response to their predecessors, but not all changes have been sequential in time.

Alternative perspectives of IS Use implies the changes in research problems associated to how IS Use is understood. This sort of change might imply progress of knowledge in the IS use field. However, if our understanding of IS Use is indeed changing, research is needed into just how this change is perceived and experienced by a whole range of stakeholders within IS Use field. Though there are external conditions such as technological advances, political agenda, financial resource and living conditions that might affect development of a research field, it is the changes of perspectives which are considered in this thesis.

Having identified the diversity of discourses above, the question remains, how these developed from one another. It seems clear that many of them developed partly as a reaction to the discourse around predicting IS Use and Acceptance, and this is explicitly so in the case of the multidimensional perspective of Burton-Jones & Straub (2006). The others discussed in

Chapter 3, however, do not so easily fit such a pattern. The development of discourses in the IS Use field is not clearly understood.

To provide a clear account of development is important for several reasons. First, in any academic field of research how well we understand, develop and present a phenomenon is a key to success for that field. Doing do for the IS Use field will have implications for the IS discipline. Second, our ability to inspire others for research in a specific field depends on how we give a wider picture with detailed account of how it came to being. It is needed if the field aims to develop an understanding and interest in research among small groups of IS Use researchers. It is important because the change of understanding affect the structure of textbooks and future publications.

Providing an account about development of IS Use discourse in the field helps in many ways. Finding a way for explaining the development of thoughts helps to understand how a particular field is progressing. This progress could be well-explained on the basis of something that is fundamental to researchers understanding. IS Use literature shows there is instinctual ambition, the desire to know and understand more of IS Use , it is to appreciate the best that has been said and continue on improving and bringing the best out of the perspectives of IS use. Researcher go extra mile because they believe in what they are doing, and feel inspired by it. They share their insight and commitment to the field.

Some researchers appeal to Kuhn's (1962) notion of ‘paradigm’ shift to account for the development of the Information Systems field, and several sets of ‘paradigms’ have emerged, such as those based on Burrell & Morgan (1979). Chapter 4 explores to what extent it is possible to use four existing standard sets of ‘paradigms’ to make sense of diversity and development of the IS Use field, but it is found that none of the sets can do so adequately.

So in Chapter 5, Kuhn's idea of ‘paradigm’ and ‘paradigm’ shift is examined in more depth than usually occurs in the Information Systems literature. However, Kuhn's idea too is found to be ambiguous, so it is necessary to fall back on philosophy.

1.6 Philosophy as a way of making sense of the field

One way of making sense of a field is historical review. Hirschheim & Klein (2010) employ this method to try to make sense of the Information Systems discipline, dividing it into different eras and considering five important factors in each era: technology, school of thought, research themes, research methodology, education, and infrastructural advancement. Though their historical review is an invaluable approach for understanding what has happened and how the IS field developed, it is limited in the range of factors Hirschheim and Klein chose to consider. Other factors, such meaning and motivation, language and relationships, which might be considered important, are omitted as factors. A more important limitation of their approach is that they provide nothing with which the future can be thought about. They deliberately avoid any attempt to draw out any general principles that guided the development of the field.

This thesis takes a different approach, which is more suited to considering future development of the field. Not only does this thesis restrict itself to the IS Use field rather than the IS field in general, but the way it makes sense of IS Use field is by using philosophy rather than history. It uses philosophy to resolve the ambiguity in the notion of ‘paradigm’ and then to understand both diversity and development via broad general principles. These are discussed in Chapters 6, 7 and 8.

The IS Use field could be understood in a way that is sensitive to what is meaningful to the researchers in the field and provides them, and those who follow them, with a fresh insight into the IS Use field. In this thesis the philosophy of Herman Dooyeweerd assists and

provides a conceptual tool, consisting of a suite of aspects, which are different ways in which everyday experience can be meaningful. His philosophy, and its disambiguation of the idea of ‘paradigm’, is discussed in Chapter 6. Dooyeweerd's aspects are used to investigate the motivations of authors in seminal papers of the IS Use field in Chapter 8.

Note on Terminology: Though the word ‘paradigm’ is widely used in the IS literature, its use is not as Kuhn intended. Other words like “epistemologies”, “perspectives” and “worldviews” are also used. In this thesis, the word “discourse” is used to indicate the discussion and research around a kind of research problem, with occasional use of the word “perspective”. The word ‘paradigm’ will be used later on, after philosophy has been used to resolve its Kuhnian ambiguity.

1.7 Aim and Objectives of the Research

The title of this thesis is 'Making Sense of Information Systems Use Field'. The aim of this study is presented by the following research question:

How to make sense of the information systems use field?

One of the values of having such an aim would be showing the differences in understanding of IS Use, with possible overlaps, over the past decades. It shows changes, perhaps dramatic, that have happened and which might continue to be repeated, grow or die in future. This could be seen as basis for a shared view of diversity and development by the IS Use community.

This leads to the following research objectives:

- To find out what are the different ways of understanding of IS Use in the IS literature.
- To examine the utility of ‘standard’ IS ‘paradigms’ for understanding the IS Use field.
- To investigate what ‘paradigms’ means and the discussions associated with it

- To find a sound basis for investigating the IS Use researchers' understanding of their field.
- Using the sound basis found by objective four to address the complexity associated with IS Use discourses.

1.8 Structure of the Thesis

This thesis is structured in an unusual way which is different from conventional structure for PhD thesis. This is because the nature of study for this thesis is different, in that the research involved not one but four literature reviews, because it was necessary to develop theoretical concepts and philosophical argument.

Because of this, the balance of the research has been tipped towards conceptual research, and the amount of empirical work is less that is found in most PhD theses. The thesis is divided into ten chapters. Each chapter is briefly explained here.

Chapter 2: My PhD Journey

This chapter covers the most crucial stages and phases in My PhD journey. It explains the important stages and decisions in my research in each of the four years that influenced direction and argument of this thesis.

Chapter 3: Literature Review Part 1: IS Use field

This chapter contains a review of the literature on information systems use that shows different discourses of IS Use since late 1980s. These discourses are actively identified and organised. Several discourses have come to being because various groups of researchers perspectives about IS Use is centred on different research problems. However, diversity of research problems in IS research is rather ambiguous and their development needs an account. There is a need to look for current philosophical stances to see whether they can help. Next

chapter will examine the utility of the standard IS ‘paradigms’ in making sense of the IS Use field.

Chapter 4: Literature Review Part 2: Standard ‘Paradigms’

This chapter reviews major philosophical stances, the standard IS ‘paradigms’ which most IS research fall into them. Burrell & Morgan (1970) framework of ‘paradigms’ is discussed first. Second, three sets of three ‘paradigms’ will be discussed (i.e. Positivist-Interpretive and -Critical research ‘paradigm’, Hard-Soft-Critical System thinking, and Technology Determinism-Social Construction of Technology-Social Shaping of Technology). These fundamental bases are determining an underlying worldview of a research. These major standard ‘paradigms’ show weaknesses. And a clarification of what is ‘paradigm’ is required. The notions of ‘paradigm’ and ‘paradigm shift’ were mainly discussed in the philosophy of science by Thomas Kuhn. Next chapter examine the utility of these notions in making sense of the IS Use field.

Chapter 5: Literature Review Part 3: Discussion of ‘Paradigms’ in the philosophy science

This chapter contains the discussions associated to the notion of ‘paradigm’ shift (Kuhn, 1962) in the philosophy of science. Thomas Kuhn’s idea of ‘paradigm’ shift has received critiques by other philosophers of science and scholars interested in his work. Kuhn responded at the end to their critiques. However, Since the notion of ‘paradigm’ in itself is ambiguous, it is not clear how their contribution to the discussion of ‘paradigm’ shift would help with making sense of the diversity and development of several discourses in the IS Use field. This requires a philosophy that helps us with both notion of ‘paradigm’ and making sense of the diversity and development in the field. Next chapter draws on the philosophy of

everyday life to find a sound basis for investigating the IS Use researchers' understanding of their field.

Chapter 6: Literature Review Part 4: Dooyeweerd's Philosophy

This chapter propose the philosophy of Herman Dooyeweerd (1896-1977). It contains two parts: Part A explains two portions of his philosophy; theory of ground motives and theory of modal aspects then why his philosophy is chosen is justified. Part B contains the way the problem of diversity and development can be addressed by applying philosophy of Herman Dooyeweerd. In Part B, paradigm as meaningfulness is proposed with aiming to show its applicability in IS Use Research.

Chapter 7: Research Methodology

This chapter covers the research methodology. It describes the research 'paradigms' and reason for the chosen 'paradigm' of research. The chapter discusses the seven principles of for conducting interpretive field research in information systems for the purpose of this study. It is followed by research method for the empirical study in Chapter 8. The data collection methods and method of analysis, related to the aim of this research will be described and justified. Next chapter uses Dooyeweerd's philosophy as the sound basis to address the complexity associated with IS Use discourses.

Chapter 8: Investigation of Meaningfulness

This chapter presents the empirical study of this research. It is the application of paradigm as meaningfulness. Dooyeweerd's suite of aspects are used as a tool to analyse the seminal papers (data of the research) from each of the IS Use discourses. It looks for what is centrally motivating authors of the seminal papers. The results of analysis are demonstrated via Table 6 and the results will be discussed.

Chapter 9: Discussion of the Findings

This chapter presents the findings of the study and discusses that the Dooyeweerd's philosophy could be beneficial for the aim of this study. It identifies six paradigms of IS Use. The benefits of paradigm as meaningfulness and how Dooyeweerd's philosophy helped in making sense of diversity and development in the IS Use field is discussed.

Chapter 10: Conclusion

This chapter summarises the research, the limitation of the research will be discussed, recommendations will be made for future research, and the potential contributions to both IS Use field, philosophy of science and application of Dooyeweerd's philosophy will be described.

The structure of this thesis is highly influenced by the flow of argument in this study. The following mind-map demonstrates the chapters based on the arguments in this thesis. This is an argument-based mind-map includes chapter 3 to 10 and excludes chapter 2 which is an explanation of the PhD journey.

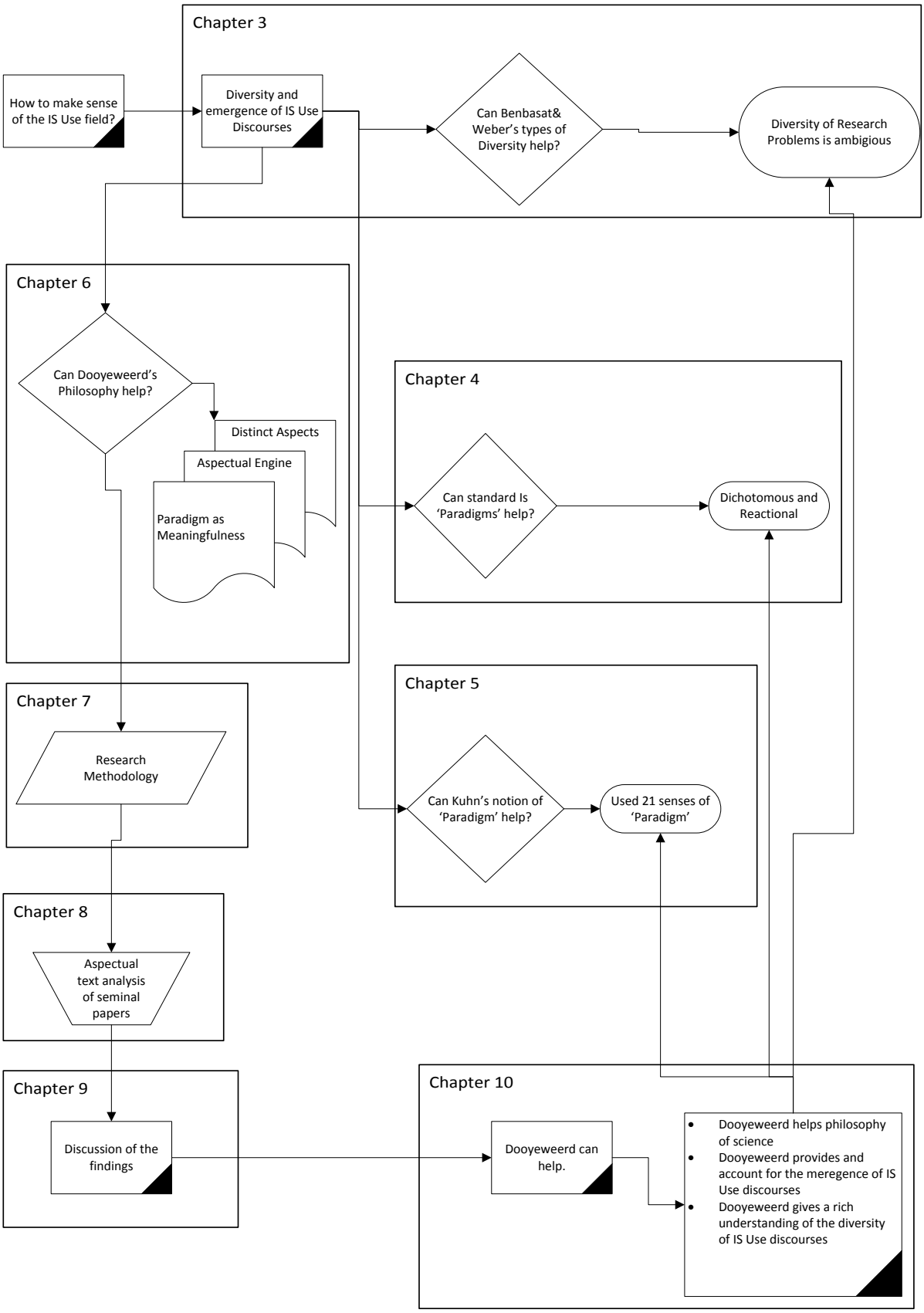

Figure 1Argument-based mind-map demonstrating the structure of the thesis

Chapter 2 MY PhD JOURNEY

2.1 Introduction

The purpose of this chapter is to show how my thoughts developed, so that the reader can understand why the thesis has an unusual structure, with more conceptual research and less empirical work.

Many of us see a PhD as a journey. It is a simple metaphor which we can easily identify with. To this end I have set this chapter out in stages and phases, not necessarily chronologically, but in emphasis. Not everything that has happened over past four years is recorded here, but certainly most of the important moments, decisions that I deemed useful in shaping this thesis. They are explaining the main events of my research in each of the four years that shaped the whole argument of this thesis.

2.2 My Background

I was born on 11th of January 1984 and raised up in an Iranian family, the second son of Hosnieh Ziaee a primary school teacher and Masood Joneidy, CEO of a manufacturing company. I grew up in the Islamic education system throughout my primary and high school years. After receiving my diploma in mathematics I joined the external programmes of London School of Economics and after two years studying Bsc Economic and Management I felt, that is not my way to go! I would have been happier to read Karl Marx books for my own to grasp the philosophy behind things than just constrain myself to accept the economic status of the 21st century and learn micro and macro analysis. I joined the Information Systems and Management at this time, and was happy of the choice I made and finally graduated from LSE in BSc Information Systems & Management in 2009.

I want to highlight three main intellectual challenges during my undergraduate years:

First, I started learning and studying in a new education system. Throughout the years of high school we used to be fed by our teachers, it was very much teacher dependent! Whereas when I started as an external student of LSE programme, I had no choice but to be a self-dependent student. This shift of perspective between two education systems was a challenge, It was hard at the beginning for me to be adapted but I knew it is useful for my future and trained myself to be an independent learner. And now I can appreciate the advantage of it.

Second, I enjoyed reading two books which dragged me more into the field: One was Avgerou & Cornford (1993) book *Developing information systems: concepts, issues and practice,* and the second one was Checkland (1981) book *System thinking, System practice.* Both value philosophy and multiple views in the field, the latter speaks of meaning. This was fascinating because I grew up with Rumi's poetic collection in which 'meaning' has specific place in our everyday life. In 2006 I read Victor Frankel's book *Men's search for meaning* and in which 'meaning' has specific places in our everyday life and now meaning has specific place in the IS field. It was speaking to me!

Third, my bachelor dissertation was my first formal research. I investigated the adoption of Learning Management Systems (LMS) by Lecturers in the Iran University of Science and Technology (IUST). It was four years after the implementation of LMS at IUST and they welcomed my research. I modified one of the modifications of the Technology Acceptance Model (TAM) as the theoretical framework. I found the model interesting because of its roots in social psychology and enabling prediction of human behaviour.

2.2.1 Motivation for Higher Education

After my bachelor I wanted to continue my studies in the IS field. I travelled to the UK to start my master's degree in Managing Information Technology at the University of Salford with lectures that covered all interesting areas associated with Managing IT. The geographical isolation from family brought me to an early realisation that I would need to be more self-reliant, self-motivated and self-directed than ever.

For my master's dissertation I decided to continue with TAM in a new context of Use, but when I took the idea to some of my lecturers they advised me on reading the critiques of TAM. I tried to practise being a critical thinker, wrote my proposal and sent it to Professor Andrew Basden. Andrew was the module leader for the Key Issues in Information Systems Development (KIISD). In this module, for the first time I discovered Dooyeweerd's philosophy and enjoyed learning about aspects, because I found Dooyeweerd's aspects giving me an easier way to grasp the idea of meaning. It was certainly distinguished itself from Rumi's, Frankel's and Checkland's ideas of meaning.

My proposal message was: "I found TAM narrow in terms of taking elements of Use into account and wondered whether a holistic approach such as Dooyeweerd's philosophy could help." Andrew agreed to be my supervisor for the dissertation. Concerning four month which is given to students for dissertation I narrowed down the whole work to one of the critiques on TAM which was the vagueness of perceived usefulness. I believed Dooyeweerd's philosophy can help to break down usefulness into different senses so that the ambiguity could be reduced. The title of my MSc dissertation was:

How the aspects of everyday life contribute to opening up the 'black box' of PU by understanding the meaning of usefulness's constructs

I decided to form the dissertation into a conference paper with Andrew and presented it at IIDE 2011 (Joneidy & Basden, 2011). In the conference I was inspired to start a PhD on IS Use.

2.3 First Stage: The Initiation

I started my PhD in July 2011 with Professor Basden. The first year of my PhD was a period of initiation to PhD study, characterised by informal and formal sessions with Lectures and other fellow PhD researchers.

To give an example of one type of informal meeting I recall the Philosophy Friday Meetings about our philosophical and methodological questions at the University of Salford, organised informally by some of my fellow PhD students in the university as a peer-support group. This was a neat way to make sense of what we know, what we think we know, and what more we need to know. From those meetings another idea started to emerge. We launched Salford Method which was a student led seminar series which happened once a month in a blended format.

Formal meetings were mostly meetings with my supervisor. But I realised that I need more training as a PhD student and there is not enough time to discuss everything with your supervisor.

2.3.1 Training

Training I had includes my attendance to most Doctoral training programme. For my fist year I attended the following sessions:

- Electronic Resources for Research
- Introduction to Endnote
- PhD process and procedure

- The PhD Supervisor-Student Relationship
- Introduction to Qualitative Research
- Introduction to Quantitative research
- Doing your Literature Review
- Writing your Literature Review
- Research Ethics
- Preparing for the interim Assessment and Internal Evaluation

2.3.2 Intellectual Challenge

To mention some of my intellectual challenges during the first stage I would recall three:

First, there was a tendency to do something big. My task was to start with scanning the whole field of IS Use for the first six months and discuss my understanding with my supervisor and receive comments on my thoughts regarding what I would intend to do as aim and objective of my research. Sometimes during the readings new and innovative thoughts inspired me and I remember one time I had this dialogue with my supervisor:

Me: I really want to bring a change in the field!

Andrew: Warning! Do not think of your PhD as a Big Bang!

Since then I tried to observe the psychological status of my mind, trying to develop a humbler attitude.

Second, I struggled with three issues:

- I did not know what my research methodology would be, empirical or conceptual.
- I did not know at that stage what my contribution at the end would be.

- I did not know at that stage about any software that could help me organise my references and bibliography and I tended to do it manually.

Third, by the end of my first year of PhD, I realised researching into IS Use has given rise to a plethora of theories, models and factors around use of the information systems. However, there is much ambiguity and overlaps, and no guarantee that nothing is missing. My question was how do I really begin to understand and integrate all these theories? This was the question directing me toward writing my second paper with Andrew and submitting it to IIDE 2012.

2.3.3 Conference/ Research Collaboration

Presenting my thoughts at IIDE 2012 (Joneidy & Basden, 2012) and receiving comments was another major step towards ensuring whether the thesis is going on the right track. I was not sure if Dooyeweerd's philosophy could help as it did in my dissertation. So my session was dedicated to questions and answers on whether Dooyeweerd's philosophy can help and why, and in what way. These questions inspired me to more thinking, reading and writing. I saw the benefit of going to the conference when I passed my interim assessment. Even in the interim assessment session I received comments which helped me to narrow down my research design.

Overall, my first year was a period in my journey that involved reflection on the nature of PhD research. I came to understand what I might face psychologically in four years.

2.4 Second Stage: Year of Metaphors

During the initiation stage, I felt intimidated by the amount of work and construed the PhD as a monster which dominated me, a metaphor shared with me by year four PhD students. Because this metaphor left me feeling overwhelmed, I started using a new a metaphor from the beginning of my second year: the God's work on earth which is given to me to fulfil. This

arose from the book called "I AM NOT BUT I KNOW I AM" written by Giglio (2009). The second metaphor helped me reframe the PhD in a positive way, as recorded in my journal:

> *"Love the mission given to you! Fight for it every day, Sacrifice yourself for it!*
>
> *And wait for God!"*

2.4.1 Training

After Interim assessment, for my second year I decided to attend some other Doctoral training programme relevant and helpful for the second year and third year

- Qualitative Data Analysis Using Nvivo – Theory and Practice for Qualitative Data Analysis
- The Ethical approval process
- Writing a Manuscript for Journal Submission
- Preparing for the Viva
- Research Design
- Case Study Research
- Ethnographical Research

2.4.2 Intellectual challenges

I would mention two major challenges:

First, during my second year of my PhD, I realised that these scattered bits of IS Use understandings in the literature only makes a researcher confused about what IS Use could be. In addition to that, I read papers which mentioned the complexity of IS Use and believed that it has been treated as a black box (Benbasat & Barki, 2007; Straub & Burton-Jones, 2007; Elie-Dit-Cosaque & Straub, 2011). Therefore I aimed at opening up the black box of IS use by understanding them and finding a way of integrating them into a wider picture. I believed that Dooyeweerd can help with this.

Having this aim, more reading of the literature was necessary in order to achieve a wider picture of the IS Use field. I continued reading literature more until I had different groups of similar papers. I wondered whether these groups indicate different ‘paradigms’, because each seemed to show a different way of seeing IS Use. (Note: 'paradigms' was used loosely at that time, as it was by several writers.) They cannot be seen as substitutes for each other, it seemed they have overlaps and each has its own limitations.

Second, at this stage I was unsure whether my research is going to be field study or literature based. I realised that IS Use researchers are not very clear in explicitly explaining their ‘paradigm’ of IS use, which invited me to read their text deeply and try to understand what is their fundamental view of IS Use. Also I was not sure if the way I grouped similar studies of IS Use together had any fundamental criteria. This was the point at which I decided to treat literature as my data to be analysed.

From this reading, I identified five ‘paradigms’ of IS Use, and realised that, to address the critiques in each paradigm, philosophy can help. Therefore I applied the HUC framework of Basden (2008) as a framework which is one of the applications of Dooyeweerd’s philosophy in IS. Using Dooyeweerd’s philosophy helped in addressing each paradigm by going through the three stages of affirming, critiquing and enriching each paradigm and then situating them into the HUC framework as a way of integrating all five paradigms into a wider picture.

2.4.3 Conference, research collaboration

I believed this idea was worth a paper, and presented it at UKAIS 2013 (Joneidy & Basden, 2013). The paper's major contribution was to propose and classify research in terms of a new and diverse set of motives, that is, “what is meaningful to researchers". UKAIS 2013 was a major breakthrough on my PhD journey. I was confident that this approach to the IS Use field is encouraged by well-known IS researchers and applying Dooyeweerd’s philosophy is

helping the IS Use field. The paper has been cited thrice since then. I then prepared my thesis for internal evaluation for the end of the second year.

2.5 Third Stage: Deeper

I received some comments in the internal evaluation which was encouraging me but I thought it is not sufficient. So I tried to be self-critical of my work and go deeper in the argument.

2.5.1 Intellectual challenges

I mention two major intellectual challenges for the third satge.

First, the first six months of my third year of PhD I tried to read and learn about other well-established ways of setting up paradigms in IS research in order to discover if there is any better framework of thinking for understanding the IS Use field. The Burrell and Morgan framework, three main paradigms of IS research, three paradigms of system thinking, and three paradigms about IS and society (which are discussed in chapter 4) are dominant paradigms, into which much IS research tries to fit itself. I found weaknesses in them and that they are not enough to help me to address the complex picture shown by my groups of papers. I found that Dooyeweerd's philosophy can help to explain for their weaknesses as well as dealing with IS Use paradigms. Through aspectual analysis I found that the dominant IS Use Paradigms could be explained as meaningfulness. This was inspiring as it is introducing a new way of identifying paradigms, different from the standard ones (i.e. those of Burrell and Morgan, etc). This is discussed in Chapter 6, part II.

Second, I planned to make this argument into a paper as "A New Way Of Identifying Paradigms in IS Research" and submitted it to the European Conference on Information Systems (ECIS) 2014. The paper was not accepted but I received very constructive and insightful comments from three reviewers. I share some of those comments here, since they have contributed significantly to my thought.

From the first reviewer:

> *"..The paper contributes to the important discussion of the assumptions made by IS Researchers regarding epistemology, research paradigms and motives for doing research. It is thoughtful and thought provoking and introduces the reader to some aspects of the work of Dooyeweerd which they may not be aware of. In particular it strives to classify research approaches in a way that is deliberately less divisive or exclusive than other classifications. Unfortunately, this discussion relies heavily on the term "paradigms" and it is the contested use of this word that is the basis of much of the criticism of the paper..."*

From the second reviewer:

> *"The merit of the article lies in its attempt to address simplistic ways in which paradigms are used in IS research and in its attempt to develop a holistic and non-reductionist approach. It provides an account of various systems of paradigms by identifying their underlying beliefs. A further merit is the recognition of the important of the everyday as the basis of theorising. It is also important to argue that IS research should be multi-'aspectual' and holistic"*

From the Third Reviewer:

Here the third reviewer reveals his or her understanding of what the paper is about.

> *"This paper is essentially an attempt to introduce Dooyeweerdian thought into the paradigm discussion in IS, stating that the dualistic and dialectical thinking that pervades existing paradigms fail to describe major IS*

phenomena. Examples are given in the case of TAM and a few other IS-related researches"

"This is an advance paper on paradigms and theory and is difficult to grasp without a lot of understanding of the discussion on philosophy and paradigms. The authors are commended for writing at this level of discussion."

Here the third reviewer makes some suggestions for improvement:

"Notwithstanding what I've said above, actually the Dooyeweerdian method of asking the question "What is of primary meaningfulness to researchers" brings the discussion closer to the real paradigm concept because it highlights what the researchers might agree upon and what they are basing their research on (the social and conceptual paradigms described by Masterman (1970)).

So I would recommend going in these path to develop this paper further although I disagree with the authors choices of paradigms suggested in the paper. The five or six paradigms suggested don't qualify either of the Kuhnian criteria of agreement and "result of research"."

Receiving these comments was even more important than having the paper accepted. As a result of them, I sought to investigate the term 'paradigms' from the original sources (See Chapter 5).

2.6 Fourth Stage , Writing up

I commenced writing my thesis from July 2014 and struggled with every chapter. I found over the period of writing it was particularly important to spend time every day with my thesis. In

this way I sustained continuity and maintained an on-going dialogue, which was crucial for linking the different parts of the story. I also learnt that different parts of my thesis have to be developed at their own pace and could not be rushed. I had fallen into the urgency trap to complete the writing as fast as I could and meanwhile had missed the whole point of what I was doing. Unwittingly, I was trying to fit the thesis into the ECIS paper 2014 as my preconceived container, but that was wrong! It was suffocating the thesis potential.

I tried to mind-map the whole picture. Because I realised my argument of the thesis needed to emerge more clearly, I discussed several mind maps with my supervisor. It helped me first to draw the whole argument, second to see the links between different parts of the thesis.

The metaphor I developed in the second stage helped me specifically at writing stage and stretched me intellectually as I learned the powerful process of thesis building and argument. I also realise, now that the journey is complete, that a thesis like this has unknown potential which only emerges from interpretation of the data analysis in the later stages of the journey. The mission future would not be determined at its birth nor in its early stages. Like any other mission in the world it has its own highs and lows, but only through unconditional love and commitment, it comes to the end.

2.6.1 Attending the David Avison Lecture

I attended the David Avison lecture at the University of Manchester, which happened at the right time because it was a time for me writing my drafts of discussion and conclusion chapters. I made some notes regarding the contributions of a research:

What is my contribution to theory?

What is my contribution to methodology?

What is my contribution to practice?

I subsequently redrafted my thesis question and re-articulated the contribution.

The following sections of this paper reflect on my learning.

2.7 My Learning

There are many things that I learned along the PhD journey. Some which I tend to think of them as directly associated with my thesis are:

- Stress Management
- Expectation Management
- Time Management
- Task Management
- Maintaining a positive attitude

In addition, my professional experiences in lecturing and dissertation supervision was another source of learning.

I learned the importance of retreats from the PhD to keep faith in every steps of my life whilst undertaking the journey. Faith in Christ safeguarded my spiritual, my emotional and physical health. Retreats gave me space for self-renewal and helped me overcome the feeling of constantly living in my head. Retreats also enabled me to achieve focussed concentration and reflection on my thesis within an otherwise busy schedule.

I used several different kinds of retreats:

- These included study retreats where I virtually locked myself away for a period of time to concentrate on my thesis writing. Study retreats ranged from a few hours to days and they were especially useful when planning a chapter.
- I also used emotional retreats to be, that is, to engage in peaceful fellowship with Christians at church or house groups, this improved my focus and relaxation.

- Further, for physical health I took time-out for weekends away, going for a walk on Pennine. Meeting some friends,
- Also as my PhD journey intensified in the writing period, I appreciated 30 minutes' walk to university everyday morning as small rests or one hour swimming retreats during the day or week of writing.

Finally, as I approached the end, I came to realise the significance of planning retreats to think about the post-doctoral stage. I found that my plans for the post-PhD period excited me and spurred me on to complete the project.

2.8 Conclusion

This has led this thesis to consist of more theoretical work and less empirical. It consists of four literature chapters (Chapter 3 to 6) with conceptual arguments, followed by small empirical study (chapter 7 and 8). Owing to limited time available for PhD, it is appropriate that each of these parts maybe less detailed than would be the case if they had been the sole focus of the PhD.

Chapter 3 LITERATURE REVIEW, PART 1: IS USE FIELD

3.1 Introduction

This chapter will review extant studies on Information Systems Use. These are originally identified intuitively from reading over 150 papers on IS Use. The pool of literature associated with IS Use is very wide and includes several discourses. Not all of them would be included in this chapter. For the purpose of this research those papers that show authors' attempts on conceptualising and reconceptualising IS Use were selected. This chapter excludes studies concerned with research methods appropriate for studying IS Use, determinants of IS Use, and specifically impacts of it on individuals, organisations and society, but do not try to conceptualise the IS use field. Conceptualisation and reconceptualization of IS Use was searched, for it indicates the core of understanding of the authors in the IS Use field.

This chapter sets the tone for the rest of the literature on subsequent chapters where a deeper understanding of each of these different understandings of IS Use is sought. It starts with various discourses of IS Use (from section 3.2 to 3.7), then it is followed with an overview of the IS Use literature and a justification for identification of the discourses (section 3.8) and it is followed by discussion around diversity in IS research (section 3.9).

3.2 Discourse 1, on IS Acceptance and IS Success

IS Use has long been a research issue in the IS field (Delone & McLean, 2003). Past research shows implicit conceptualisations of IS Use. This is seen in the main two streams of IS Use research: IS Acceptance, and IS Success.

3.2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) (Davis, 1989) is an application of attitude theories regarding IS Use context, has been one of the most widely applied models for explaining user intention regarding IS Use (Pedersen& Ling , 2002; Liu *et al.*2009). TAM enjoys an excellent reputation with regard to its robustness, parsimony and explanatory power. Liao et al (2009) state TAM has a strong foundation in Social Psychological field. Taylor & Todd (1995) believe it is parsimonious and can be used as a guideline to develop a successful information systems (Venkatesh & Davis, 2000), and the robustness of TAM is supported by large amount of research time, settings, populations, and technologies (Liao, *et al.* 2009; Venkatesh & Davis 2000).

In the late 1980s, TAM was developed for the IS discipline by Davis (Davis 1989; Davis, *et al* .1989). It is rooted in social psychology Theory of Reasoned Action (TRA) (Fishbein & Ajzen 1975), an intention theory that has been widely accepted for more than three decades. TRA postulates that beliefs affect attitude, which influences intention, while intention, in turn, brings about behaviours (Fishbein & Ajzen, 1975). TAM is a theoretical model for identifying the casual links between two key cognitive beliefs (Perceived usefulness and Perceived ease of use), and their relationships to IS users' attitude, behavioural Intention and actual use of Information Systems. TAM adapts a belief-attitude-intention-behaviour relationship in TRA and posits that users' behavioural Intention to use IS could be determined by their cognitive beliefs, such as perceived usefulness and perceived ease of use , together with their attitude toward using IS. Attitude and behavioural intention are two internal psychological variables that have direct effects on users' actual use of IS.

To give justice to this influential model, the main constructs of TAM needs to be explained. By definition, behavioural intention is a measure of the strength of one's willingness to try

and perform a certain behaviour (Ajzen, 1991), which is expected to lead to actual IS Use. Attitude refers to "the degree of a person's positive or negative feelings about performing the target behaviour" (Davis, *et* al. 1989, p.984). TAM postulates that perceived usefulness and perceived ease of use are the external factors that motivate both IS user's attitude and intention. Perceived usefulness is defined as " the prospective user's subjective probability that using a specific application system will increase job performance" (Davis, *et al.*1989,p.985). Perceived ease of use refers to "the degree to which the prospective user expects the target system to be free of effort" (Davis, *et al*. 1989, p.985).

TAM posits that perceived ease of use and perceived usefulness determine users' intention to use of IS, which, in turn, determines the actual use of IS with intention to use IS serving as mediator of actual IS Use. Attitude towards IS Use is expected to mediate the effects of the beliefs of both perceived ease of use and perceived usefulness, and determines users' intention to use IS together with perceived usefulness. Perceived usefulness is expected to be directly impacted by perceived ease of use. Figure 2 presents the relationships between the core constructs in TAM.

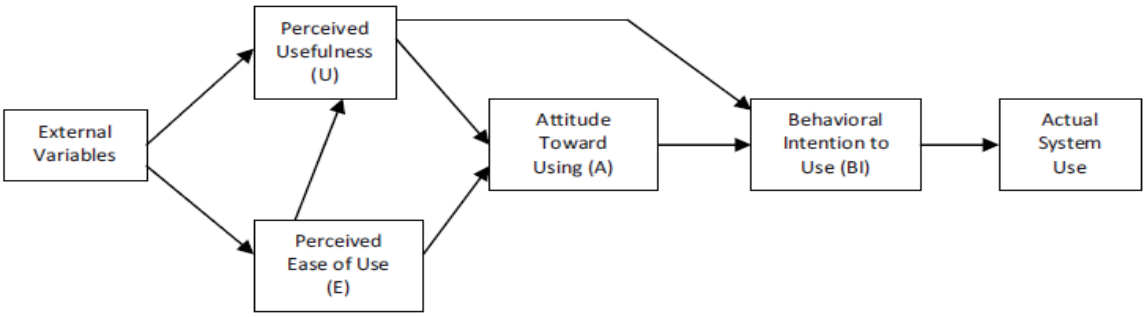

Figure 2 First modified version of TAM (Davis et al. 1989)

All the constructs in TAM are seen as being able to be measured quantitatively. The model posits that the higher the perceived ease of use and perceived usefulness, the higher the attitude, which leads to a higher degree of behavioural intention to use Information Systems and, through that, to a higher degree of actual IS Use. It is thus expected that a higher degree of perceived usefulness and perceived ease of use will lead to a higher degree of behavioural intention to use IS.

3.2.2 Model Extensions

TAM is initiated from work-related innovations by employees in office contexts, and some attempts have been made to enhance the explanatory and predictive power of TAM in various contexts since its original publication (Legris *et al*. 2003; Liao, *et al.* 2009), but they are all work related context. Prior research extended TAM by incorporating some other important variables or constructs into it, such as the antecedents and moderators of beliefs, additional or alternative belief factors, and different dimensions of IS Use as well as factors from related IS models.

One of the most important extensions of TAM was made by Venkatesh & Davis (2000), who proposed an extended model of TAM , named TAM 2. TAM 2 adds the five constructs for perceived usefulness into the original TAM. These constructs are subjective norms, image, job relevance, output quality and results demonstrability. Further, experience and voluntariness are included in TAM 2 as moderators for the relationship with subjective norms (see Figure 3). TAM 2 explained up to 60% of the variance in perceived usefulness

(Venkatesh & Davis 2000), and has been empirically tested in IS research.

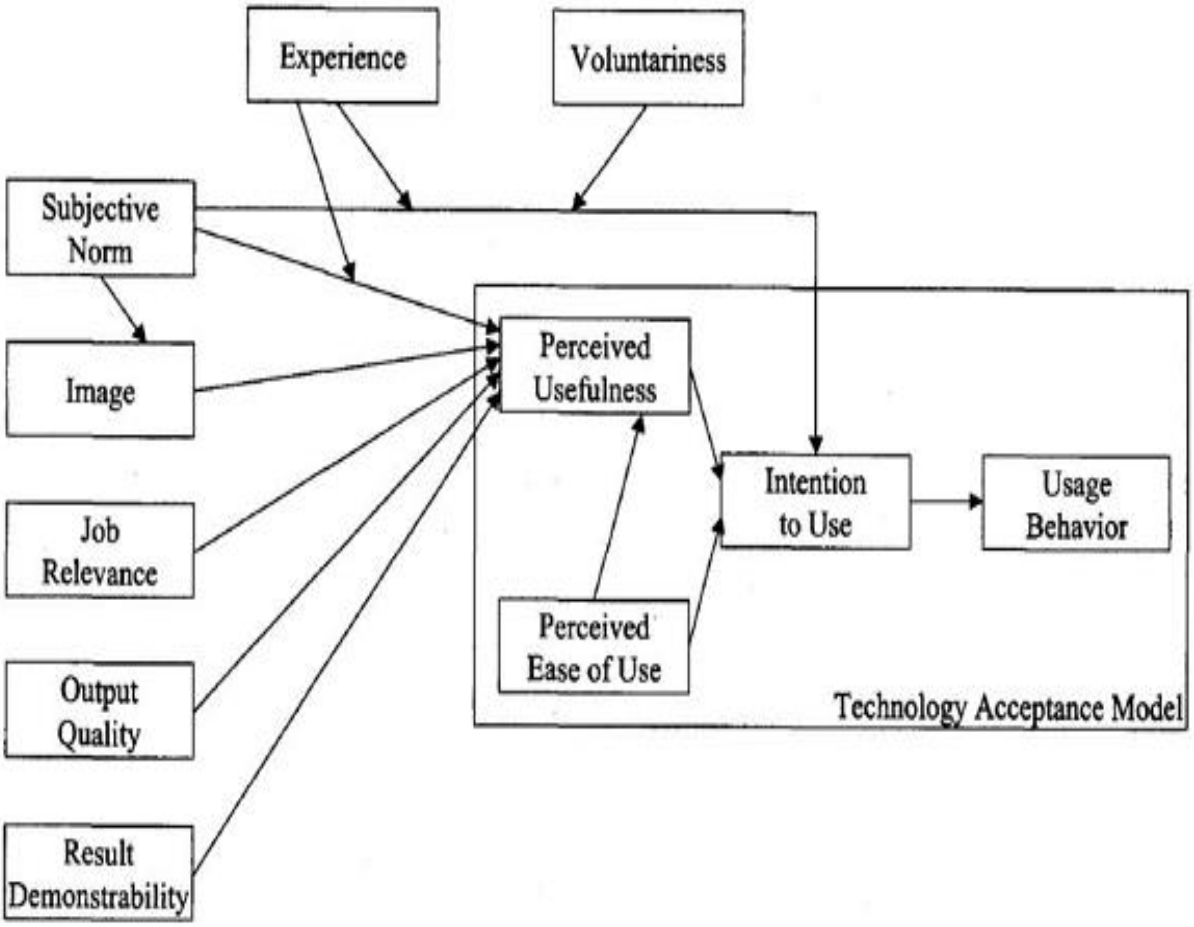

Figure 3 TAM 2 (Venkatesh and Davis, 2000)

Later, Venkatesh & Bala (2008) extended TAM 2 (Venkatesh & Davis 2000) by incorporating the model of the determinants of perceived ease of use into it (Venkatesh, 2000), titles TAM 3 (see Figure 4).

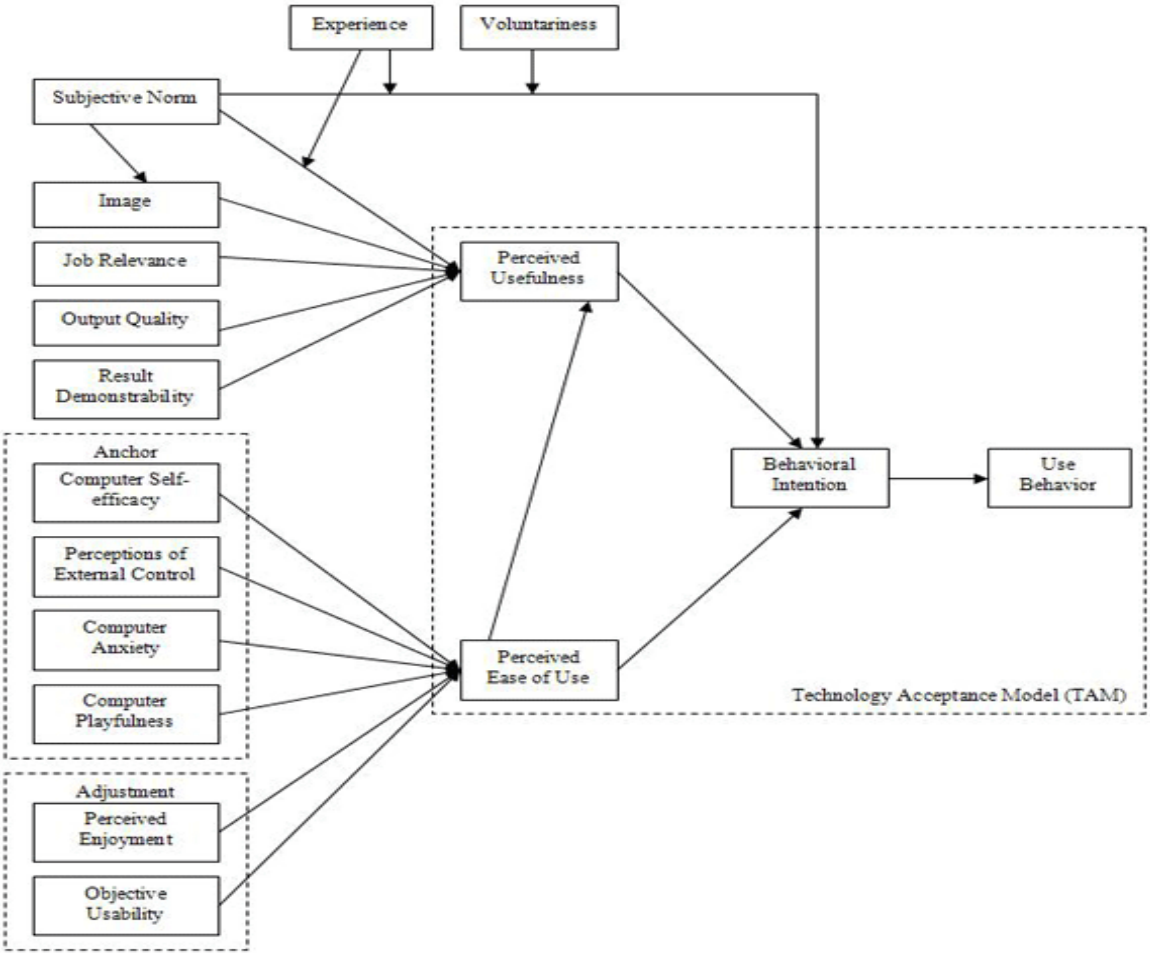

Figure 4 TAM 3 (Venkatesh & Morris,2000)

In TAM 3, the determinants of perceived ease of use are suggested to exert no influence on perceived usefulness, and the determinants of perceived usefulness have no influence on perceived ease of use. TAM 3 presents a new theoretical extension which moves beyond TAM 2 (Venkatesh & Davis 2000) and the model of the determinants of perceived ease of use developed by Venkatesh (2000). TAM 3 supports the proposed relationship in both TAM 2 and the model of the determinants of perceived ease of use, and further extends the intervention of experience on three relationships. In TAM 3, experience is posited to moderate the relationships between: i) perceived ease of use and perceived usefulness; ii) computer anxiety and perceived ease of use; and iii) perceived ease of use and behaviour intention

(Venkatesh & Bala, 2008). TAM 3 presents a complete nomological network of the determinants of IS Use.

The literature also reveals more theoretical extensions to TAM. Taylor & Todd (1995) proposed a decomposed version of the Theory of Planned Behaviour (TPB) by integrating TPB (Ajzen, 1991) into TAM. Roca *et al*. (2006) proposed a decomposed model of TAM using Expectation-Confirmation Theory (ECT) as background and incorporating information quality and system quality. Some other studies have extended TAM by integrating the variables from the Innovation Diffusion Theory (Rogers 1995) with TAM or the variables from other intention models. TAM has been extended by incorporating some other constructs to examine IS intention as well, such as trust, self-efficacy, perceived enjoyment and playfulness (Gefen, *et al.* 2003; Mao & Palvia 2006; Shih 2004; Vijayasarathy 2004).

Despite the improvement in the explanatory and predictive power of these extended models based on the basic Technology Acceptance Model, IS Use researchers still maintained their great interest in TAM due to its parsimony and reliability in the IS domain (Lai & Li 2005). Variants of TAM have been employed to explore the determinants of IS continuance and post-adoption use of IS in different IS setting, such as Internet usage, e-commerce, e-learning, e-government, e-banking and mobile services (Gefen et al.2003; Hsu and Chiu 2004; Karahanna, et al.1999; Liao, *et al.*2009; Roca & Gagne 2008; Wixom and Todd 2005).

Another important development from TAM is made by Venkatesh *et al.* (2003) to become the Unified Theory of Acceptance and Use of Technology (UTAUT). Venkatesh *et al*. (2003) conducted a review of the constructs in eight different models which have been employed to explain IS adoption, such as TRA, TAM, the motivational model, Theory of Planned Behaviour (TPB), a combined theory of planned behaviour /technology acceptance model, the

model of PC utilization , Diffusion of Innovation Model, and Social Cognitive Theory , and consolidated some constructs from the eight different models as the variables in UTAUT to predict both IS users' intention and their subsequent IS Use. UTAUT formulates that user intention and use behaviour are determined by four key constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions , together with four moderators of key relationships, namely gender, age, experience, and the voluntariness of use (see Figure 5) (Venkatesh *et al.* 2003). The importance of UTAUT could be also seen as a pioneering attempt in integrating theories giving fragmented view of human behaviour into one.

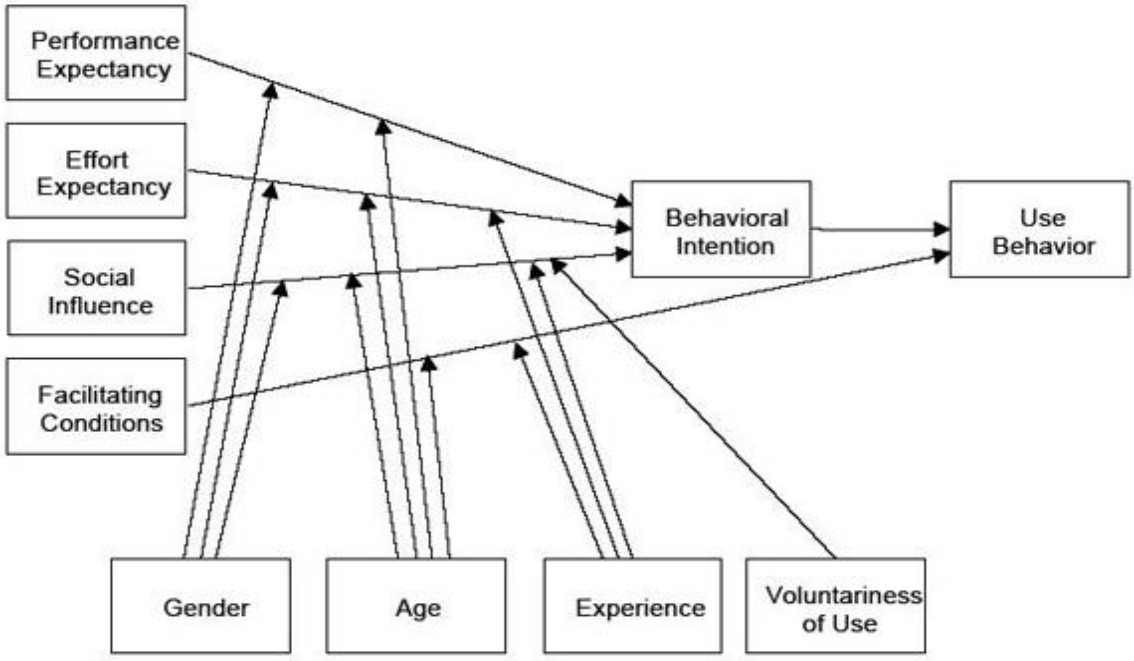

Figure 5 UTAUT (Venkatesh et al.2003)

According to UTAUT, performance expectancy refers to "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh *et al.* 2003, p.447); effort expectancy is defined as "the degree of ease associated with the use of the system" (Venkatesh *et al.* 2003, p.450); social influence refers to "the

degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh *et al.* 2003, p. 451) and facilitating conditions are defined as "the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system" (Venkatesh *et al*. 2003, p.453). According to the definitions, the concepts of performance expectancy and effort expectancy in UTAUT are similar to the definition of perceived usefulness and perceived ease of use in TAM. As lee *et al* (2004) note UTAUT is the most intensive model elaboration of TAM. UTAUT was found to account for 69% of the variance in usage intention (Venkatesh *et al*.2003).

UTAUT has since been employed widely in IS research. The seminal paper representing UTAUT by Venkatesh *et al* (2003) has been cited over 10000 times. But, similar to TAM, all these extensions of TAM (i.e. TAM2, TAM3, and UTAUT) are assumed to be quantitatively measured and these models assume the work context.

3.2.3 Information Systems Success (ISS) Model

IS Success model proposed by Delone & McLean (1992) place IS Use in a wider picture as one of the success dimensions. This model is consisted of six major constructs- System-Quality, Information-Quality, Organizational-Impact, Individual-Impact, Satisfaction, and Use (see Figure 6). IS Success model is a multidimensional measuring model with interdependencies between the different success categories. It assumes that the quality of IS influence its use and user satisfaction which in turn affects individual and organisational performance. Delone & Mclean's (1992) model was criticised for mixing process and causal relationships, and they modified it to give a model shown in Figure 6.

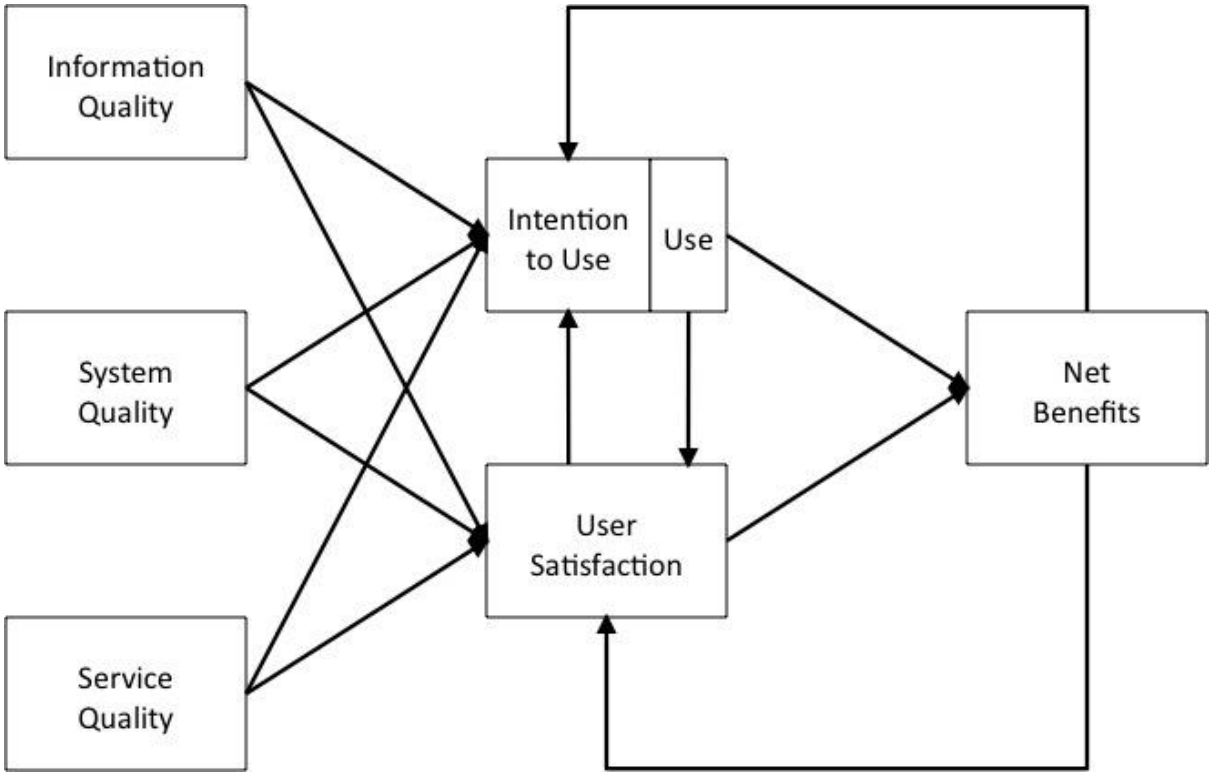

Figure 6 IS Success Model (Delone & McLean,2003)

Like TAM and all its extensions, ISS model is a predictive model that assume work related context of IS Use.

3.2.4 Task-Technology Fit (TTF)

The essence of this model is the assertion that for an information technology to have a positive impact on individual performance, the technology must be utilized, and the technology must be a good fit with the tasks it supports (Goodhue & Thompson, 1995).in TTF IS Use is defined as 'the behaviour of employing the technology in completing tasks', while the measures of the IS Use often emphasise the frequency of use or the diversity of applications employed (Goodhue & Thompson, 1995, p.218).

TTF model goes beyond the Delone & McLean model in that, it highlights the importance of *Task-Technology Fit(TTF)* which was missing in previous models. According to Goodhue & Thompson(1995) by recognising that technologies must be utilised and fit the task they

support, to have a performance impact, this model gives a more accurate picture of the way in which technologies, user tasks, and IS usage relate to changes in performance (see Figure 7).

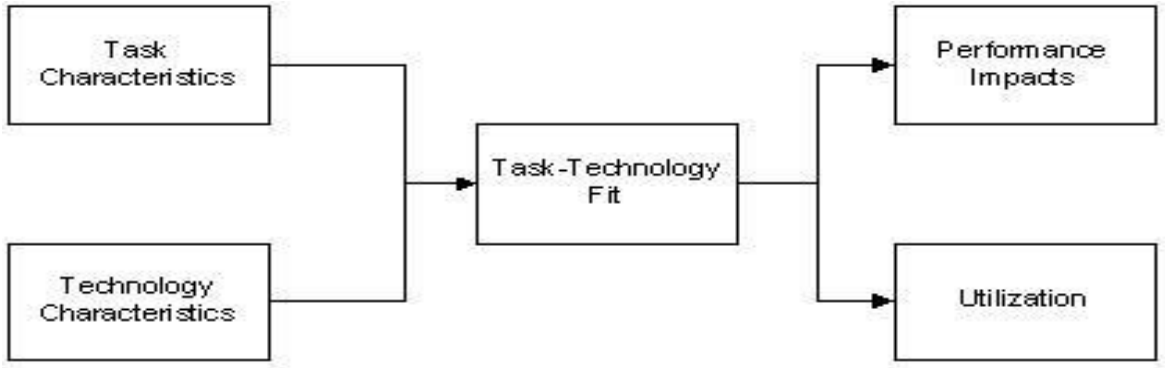

Figure 7 Task-Technology Fit Model (Goodhue & Thompson,1995)

A review of these theories shows their struggling to find important factors ignored in early version due to the partial view they had towards explaining IS usage. Recent critiques by other scholars in the field depict some of the weaknesses of these traditional frameworks.

3.2.5 Critiques of the streams

There have been many criticisms of these models, especially of TAM. Although, in the last 20 years TAM has become well established as a robust, parsimonious, and powerful model for predicting users' acceptance of technology (Venkatesh, 2000).Few studies have attempted to validate the full TAM model with all of its original constructs. Furthermore, the many TAM studies are characterized by different methodological and measurement factors, resulting in conflicting and somewhat confusing findings which vary considerably in terms of statistical significance, direction and magnitude (Yousafzai *et al.* 2007a).

Reviews of the TAM (Lee et al., 2003a, b; Ma and Liu, 2004) reveal that these mixed findings not only undermine the precision of TAM, but also complicate efforts for IT practitioners and academicians to better understand users' technology acceptance behaviour. However, the

cause of such inconsistencies and the extent to which the existing body of research reflects significant and cumulative development is not completely clear.

Many have attempted to address this problem by providing Meta-analysis to the IS Use field. Meta-analysis is ‘‘the statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings’’ (Glass, 1976). Although meta-analysis still encounters problems, like ‘‘oranges and apples’’, ample research proves it is rigorous and robust. King & He (2005) compared it with other three methods of reviewing a body of literature, and confirmed it as objective and effective. In addition, they found meta-analysis underutilized in IS research. Many scholars have conducted meta-analysis in TAM research. Ma & Liu (2004), Yousafzai *et al* (2007a, 2007b), and other researchers conducted meta-analytic reviews of TAM studies, aiming at integrating the conflicting and somewhat confusing previous findings with mixed statistical significance, direction, and magnitude.

Goodhue (2007) believes IS Use research has reached to the point where scholars in the field have realized it is time to have a critical look at TAM an its variants and extensions, because a significant body of research has been extended into refining and expanding TAM over the last two decades. Goodhue (2007), one of the contributors to TAM over last 2 decades, states that TAM is like any good theory, in that it is a lens that lets us focus on one view of reality and see important relationships, but like any lens, it brings some things into focus and blurs others. Persisting in his critical view ,he argues that this has bothered the field and TAM has left us with some significant blind spots, largely because it only asks a limited question of “what causes users to utilize a technology?” while the question of “by what means do technologies affect performance?” is ultimately more important.

The last point is partly addressed by ISS and TTF. However all these models and their refinements have two limitations in common:1) they assume work related context of IS Use 2) they all see IS Use as something to be predicted and measured, usually by quantitative amount (frequency, duration and extent of use), which is of interest to ICT suppliers and accountants. Burton-Jones & Straub (2006) call it 'one-dimensional' and Doll & Torkzadeh (1998) suggest that what was missing was to understand the multi-dimensional nature of IS Use. What is needed is ways to understand IS Use as such, not just to measure it.

3.3 Discourse 2, on multi-dimensionality of Use

Most of the studies on the past discourse of IS Use are mainly focusing on IS adoption, IS acceptance, IS Success and failure of which IS use is a part. These studies are not focusing on understanding IS Use, however. How they grasp IS Use is a by-product of their studies. In TAM based studies mentioned above, behaviour (e.g., the use of computers) is viewed as the result of a set of beliefs about technology and a set of affective responses to the behaviour. Of the limited research studies focusing on the use side, very few used appropriate reference theories that address system use as a behaviour (Trice & Treacy, 1988).

Trice & Treacy (1988) asserted that information system use is a behaviour whose determinants are not well understood in IS Use research, and that system use can best be explained by referring to an appropriate reference theory. In fact it was this assertion, if not the only one, that has guided some IS Use studies in IS Acceptance discourse (e.g., Davis *et al* (1989) Venkatesh & Morris (2000)) with Theory of Reason Action (TRA) as the conceptual framework of choice employed to link user beliefs and attitudes to behaviour.

Seddon (1997) also modify DeLone & McLean's model and proposes an alternative model that focuses on the causal (variance) aspects of the interrelationships among the taxonomic categories and separates the variance model of IS Success from the variance model of

behaviours that result in IS Success. Seddon's (1997) version of IS Success model includes three classes of variables: (1) measures of Information Quality and System Quality; (2) general perceptual measures of net benefits of IS use (i.e. Perceived Usefulness and User Satisfaction); and (3) other measures of net benefits of IS use. Seddon (1997) claims that IS Use is a behaviour, not a success measure and replaces DeLone & McLean's (1992) IS Use with Perceived Usefulness, which serves as a general perceptual measure of the IS use, to adapt his model to both volitional and non-volitional usage contexts.

Some other researchers (e.g., Thompson *et al.* 1991), however, have sought to explain IS Use by grounding their research models on a similar but richer theoretical framework developed by Triandis. Triandis' framework is a theoretical model from social psychology and organisational behaviour, explicitly addresses the net beliefs as well as the social, Cultural and organisational factors that influence/explain behaviour. This framework has some similarity with Fishbein & Ajzen's Theory of Reasoned Action (TRA) from which the Technology Acceptance Model (TAM) was derived and commonly used as a theoretical foundation for most IS Use studies until now.

Based on Triandis' framework, Ditsa (2002) seeks to explain behaviour towards the use of EIS but not to predict it. Ditsa (2002) conceptualise behaviour in terms of:

- Frequency of use and
- Internalization of use

The results of Ditsa (2002) study indicate internalisation of EIS use is a more appropriate understanding of user behaviour than Frequency of EIS use.

Buffo & Barki (2003) introduce a need for conceptualising the IS Use based on direct and indirect usage behaviours plus user's perceptions influencing these behaviours. They provide us with two frameworks:

- A behavioural framework of IS Use: usage behaviours are categorised into IS Use as task accomplishment, as adaptation and as learning.
- A perceptual framework of IS Use: this framework shows the importance of users' perceptions, about power and compatibility, when they interact with technology. Power reflects how powerful or powerless an individual feels with respect to an IS which has been implemented in his or her organisation. Compatibility reflects how compatible an individual perceives an IS to be with the tasks he or she needs to accomplish in his or her job.

Burton-Jones & Straub (2006) likewise see IS Use as human behaviour, even though in their paper they still talk about measurement. They define IS Use as, "....An individual user's employment of one or more features of a system to perform a task." While they do not go into the same detail concerning behaviour and perception, they broaden to three dimensions:

- User: an individual who employs an IS in a task,
- System: an IS that provides representations of one or more task domains, that is, the IS provide features designed to support functions in those task domains, and
- Task: a goal-directed activity performed by the user.

This simple triad addresses what IS Use is rather than how it can be measured. That Burton-Jones & Straub (2006) has been frequently cited since then suggests that it expressed what many had been feeling intuitively - that it is important to understand the nature of IS use itself, not just measure it. (Burton-Jones & Straub (2006) do discuss how this can be used to measure IS Use, but that may be seen as an attempt to make their view acceptable to those working within conventional discourses, among whom they previously worked.

Buffo & Barki (2003) might be seen as exploring the multi-dimensionality of the user, as behavior; However, Burton-Jones & Straub's triad seems rather static. McLean et al. (2011) argue "the system and its users will define patterns of system use", seeing IS Use as a value added activity that depends on the type of the system. The triad might be incomplete, with inadequate attention to context, possibly because it is conflated with the task. It assumes the task is worth doing. Some of these issues are partly addressed in the next two discourses. Next discourse might be seen as opening up the user-system relationship.

3.4 Discourse 3, on Enhanced Use of Features

Jasperson *et al.* (2005) found that much prior research has treated IS Use as a black box and there are only a few studies that have incorporated system features in the operationalization of IS Use. A feature-based view is interested in how users use the features of the IS to gain benefit. McLean *et al.* (2011) differentiate depth of use from what they call requisite IS Use, on the basis of how users explore, and develop creative use of, system capabilities. Saga (1994) developed the concept of 'infusion' as "Embedding an IT application deeply and comprehensively within an individual's (or organization's) work systems", which has been adapted by Tennant *et al.* (2011) as a multi-dimensional IS Use construct, compared with the simpler version of Saga. Bagayogo *et al.* (2010) develop a similar idea called 'enhanced use'.

These deepen in phases - adaptation, acceptance, routinization to infusion (Cooper & Zmud, 1990), or emergent, integrative to extended use (Saga & Zmud, 1994). The Information systems is used to its ‘full potential’ (Fadel, 2006). Subsequently, Tennant *et al* (2011) question what defines 'full potential' and link it with productivity within the work system, making it multi-dimensional by using Burton-Jones & Straub's (2006) tripartite IS Use. This increases the level of sophistication (Jain & Kanung, 2005).

In trying to understand the nature of infusion, Saga & Zmud (1994) differentiate three types: "The use of technology to accomplish task that were not conceived or feasible prior to its implementation", "the use of the technology to establish, enhance or reinforce linkages among tasks" and "The use of more system features to facilitate a comprehensive set of work tasks". Such uses of features might not be expected by management (Hsieh and Robert, 2006) nor designers of the system in the organisational context.

Bagayogo et al (2010) differentiate four forms of enhanced use, which can be combined together while users are performing a task:

- Applying features in performing a task that were unused formerly
- Applying features for carrying out a new task
- Making extra use of some features for carrying out a task
- Developing new features,

In addition, they introduce five principal attributes characterising enhanced used: innovativeness, reflectivity, personal adjustment, interdependence, and help resources used.

Those authors, however, do not consider the social dynamics of human-IT interaction perspective and the structural features that can have an effect on IS Use.

Sun & Zhang (2006) base their study on Adaptive Structuration Theory, and propose a new construct named Adaptive IT Use (AITU) to capture the changes in an IT feature set. They argue that the five proposed dimensions of AITU (stopping, trying, switching, combining, and repurposing) conclusively describe possible feature-level appropriation moves. In contrast to the Sun and Zhang taxonomy, which focuses on feature-level appropriations Al-Natour & Benbasat (2009) suggest that appropriation of an IT artefact relates to the role the artifact performs, the process followed when performing this role, and the way in which it

communicates with its users. A new appropriation takes an upward or a downward direction. An *upward appropriation* occurs when the user chooses:

1) A richer communication mode,

2) a more prominent role for the artifact to perform (increased dependence on the artefact), or

3) more user involvement in how the artifact performs its role (user-led vs. artifact-led processing).

A *downward appropriation* occurs when the user chooses:

1) A leaner communication mode,

2) A less prominent role for the artifact to assume, and

3) Less user involvement in the way in which the artifact performs its role.

Al-Natour & Benbasat (2009) propose a model for the study of users' interactions with IT artefacts that describes why and how users interact with them in the context of a single interaction as well as repeated use over time. The model accounts for the changing nature of IT artifact utilization and recognizes the role of hedonic and social factors in affecting how artifact are utilised. Their study is guided by the two following principles:

1) IT artifact as social actors
2) Dynamic view of user-artifact interactions

They present an argument in support of regarding user-IT artifact interactions as social in nature. A wealth of studies supports the idea that users not only view their interactions with artifact as social and interpersonal, but also attribute human-like behaviours and personalities to them.

Grgecis & Rosenkranz (2010) did so, utilizing Adaptive Structuration Theory (AST) developed by DeSanctis & Poole (1994). AST is a theory that describes the interplay between

technology, social structures, and human action, and is an attempt to examine the use and the impacts of advanced technologies in organizations. They see the IT system (including its features) as a structure that affects IS Use behaviour.

They try to explain how this structuration effect occurs by Markus & Silver's (2008) reference to functional affordance and symbolic expressions. Functional affordance refers to how features of certain technical objects favour, or constrain a set of specific uses. A symbolic expression is defined as "the communicative possibilities of a technical object for a specified user group" (Markus & Silver 2008 cited in Grgecis & Rosenkranz, 2010), but Grgecis & Rosenkranz (2010) add that symbolic expression is a relational concept linking object (Technology) to a subject (user). The object (IT artefact) communicates "messages" which may intended, or not intended, by designers. The subject (user) may or may not perceive certain signs, symbols, or messages, depending on their experience and backgrounds.

Deep, enhanced, infused experience of system features is an issue that most users encounter but has been overlooked in the other IS Use discourses. There are two versions of this discourse, which may be called objectivist and subjectivist. The objectivist view emphasizes the feature as a rather static, given object, which the user must learn to use, and ignores the dynamic nature of the human-feature (subject-object) relationship. The subjectivist view of Gregcis & Rosenkranz (2010) emphasises user creativity and freedom. However it depends on Structuration Theory, which Turner (1991) criticizes as a vague collection of descriptions with little substance to the relationships between them, and lacking any useful notion of law.

This discourse suffers from the classic divorcing of subject (user) from object (features of system), and it is very difficult to see how they can be integrated or even speak to each other. What is needed is an understanding of the dynamic interaction between subject and object,

which gives dignity to both. Despite this difficulty we can see this is a very active discourse which centers on how users employ features to benefit work related tasks.

3.5 Discourse 4, on Beneficial Use

Most of the discourse in the field of Information Systems has centred on issues of interest to ICT suppliers, such as acceptance, or to academics, such as IS Success, or to management, such as productivity. However, in the health informatics arena especially, this is not enough. In health informatics, where Information Systems is specifically aimed at improving patient care, in contrast to commercial organisations, where Information Systems is aimed at improving measures like productivity, the issues that are important are those of IS users 'on the ground', such as nurses and physicians who use an electronic patient records system, and clerks that keep those records.

In the health Sector, The notion of 'meaningful use' arose due to the concern that 'use' alone would not produce 'meaningful' results, especially in terms of benefit (Linder, *et a.l* 2007). The American Recovery and Reinvestment Act (ARRA) of 2009 included a major piece of legislation related to Information Systems in health care called the Health Information Technology for Economic and Clinical Health Act (HITECH). The purpose of HITECH is to improve patient outcomes and increase the efficiency of health care in the United States by providing financial incentives to hospitals and eligible professionals who use a certified electronic health record (EHR) in a `meaningful way.' 'Meaningful Use' is, for example, ensuring that the EHR technology improves the quality of care, and that the provider submits to the Secretary of Health & Human Services (HHS) information on quality of care and other measures.

Their concept of 'meaningful use' rested on '5 pillars' of health outcomes policy priorities, namely:

- Improving quality, safety, efficiency, and reducing health disparities
- Engage patients and families in their health
- Improve care coordination
- Improve population and public health
- Ensure adequate privacy and security protection for personal health information

Under the provision of HITECH Act, Vest & Jasperson (2010) question what conceptualisation of usage might best reflect the nature and objectives of Health Information Exchange (HIE). Vest & Jasperson (2010) believe Information systems researchers frequently conceptualize information systems use to include two different aspects:

- Using the system and
- Using the information provided by the system.

First, users have access to the process of HIE through various cognitive artifact, such as software and hardware. Employing the system features related to the performance of an organizationally defined task constitutes 'using the system'. The second aspect of usage concerns the application of the information made accessible by the HIE process. They believe, DeLone & McLean conceptualized this type of usage as the recipient consumption of the output of an information system. Vest & Jasperson (2010) suggest both aspects of usage should be considered when examining 'meaningful use' of HIE systems.

Wills, *et al.* (2011) propose a conceptual framework for the evaluation of EHR. They aim to present a holistic conceptualization that is grounded in IS models for evaluating system success and integrates concepts of 'meaningful use' and outcome research. The model is based on IS Success, task-technology fit theory to redefine "system use" in accordance with the recent development of 'meaningful use' criteria. They argue that there are at least two reasons why defining use in terms of 'meaningful use' is important. First, aligning the definition of

clinician system use with 'meaningful use' criteria gives the researcher something to objectively measure. Second, orienting the model toward 'meaningful use' is helpful in that considerable future economic incentives are geared toward providers' achievement of these standards. However, Wills *et al.* (2011) and Vest & Jasperson (2010) try to find conceptual grounding for this approach in the ISS and TTF models.

Classen & Bate (2011) posits that a challenge is recognized in the HITECH Act, which included the new concept of 'meaningful use' of EHRs. The intent of 'meaningful use' was to provide incentives to providers not only to adopt EHRs but also to use them in ways that would improve quality, safety, and efficiency. However, even though the concept of 'meaningful use' is extremely attractive, it remains to be shown that the standards that are being established will result in improvement in care. As the broad adoption of EHRs accelerates, the challenge of ensuring that 'meaningful use' actually leads to 'meaningful benefits', such as improvements in safety and quality of care, remains a serious concern.

Selwyn (2003) believes 'meaningful use' is "Use that could be considered to be useful, fruitful, significant and have relevance to the individual" (Selwyn 2003, p.12). However, the focus on "useful, fruitful, significant and have relevance" (Selwyn 2003) can be extended beyond health to other sectors, but there are several problems. First, the concept of 'meaningful' is ambiguous, and even 'useful', 'fruitful', 'significant' and 'relevance' are unclear. Vest & Jasperson (2010) and Wills *et al* (2011) use the ISS and TTF models (Discourse 1) to make 'meaningful use' measureable but still do not clarify what it is. 'Meaningful use' needs to be clearly defined in a way to match the human's day to day activities (positive or negative), and given its own grounding not limited to predictive models. Second, there is an assumption, shared with all previous discourses, that IS use is an inherently desirable and beneficial activity for all involved, ignoring negative or unintended impacts which are still meaningful

and important to people. Third, the five pillars are limited. This might be because so far the IS Use discourses have presupposed utilitarian use in the work context (van der Heijden, 2004), and has not been extended to, for example, home use. This is dealt with in Discourses 6 on everyday life domains in section 3.7.

The central concern of this discourse is that IS Use should be beneficial to those who use IS (i.e. ‘meaningful, ‘useful’, ’fruitful’ and ‘relevant’).

3.6 Discourse 5, on Resistance to IS Use

While for researchers in the first four discourses there is an underlying assumption that IS Use is beneficial and should be used, researchers in this discourse pay more attention to the IS non-acceptance, rejection or resistance. Beside managerial psychology information systems research has also recognised the importance of employees’ resistance to change as a barrier to successful implementation of IS (Klaus & Blanton, 2010). IS resistance literature finds its roots in the phenomena so-called resistance to change in managerial psychology and organisational studies. The phenomenon resistance itself has long been recognised , as more than half a century ago researchers already identify in people a natural tendency to prefer keeping to what is well-known and familiar rather than to accept innovation. Laumer (2011), however, unlike the discourses on IS Acceptance, in which a lot of evidence of important drivers for an individual’s intention to IS Use is provided, believes far fewer researchers have studied the phenomenon of user resistance towards IS (Lapointe & Rivard ,2005).

Markus (1983) sees resistance as a result of the interaction of system features with the intra-organisational distribution of power. Joshi (1991) believe individuals consider the fairness. Maraks & Hornik (1996) view resistance as a passive-aggressive response to threat or stress that an individual will rightly or wrongly associate with a new system. Martinko *et al.* (1996) believe there is a dynamic associated with IS resistance that can be conceptualised within an

attribution perspective of achievement and motivation. Eckhardt *et al.* (2009) see resistance as non-adoption behaviour of users who have a social influence as a major influence on their behaviour.

According to Laumer (2011) IS Use literature like managerial psychology offers different conceptualisation of user resistance to change (RTC). Majority of them discuss user's resistance as a component of an organisational system at individual and group level and discuss RTC as a behaviour or attitude. Laumer (2011) compare these different concepts of RTC and argue that, while the literature often tends to portray resistance as a normal reaction to change, this is clearly a complex phenomenon, which cannot be described in a simple causal fashion.

Laumer (2011) believes the question of "Why do people reject technologies?" is still open for more research and as a way of doing that suggest focusing on Fords *et al.* (2008) three views of RTC, especially agent sense making and agent recipient relationship.

Selwyn (2003), however, sees beyond the resistance to use IS. Selwyn (2003) looks at the non-use of IS.

- For some people non-use of IS is primarily bound up with structural circumstances which prevent them from otherwise making use of IS which are relevant and useful to their lives.
- In other cases, non-use of IS could be seen as a 'tactic of resistance', described by de Certeau as an ordinary practice that enables disenfranchised and oppressed people to realise their variety of voices, maintain communities, and achieve practical kinds of power.
- Not using IS is one way that individuals can assert some control over their lives—in the same way that for some people there is a symbolic value to using IS.

This discourse questions the assumption that IS should be used , and explores the phenomenon of non-use including resistance.

3.7 Discourse 6, on Everyday Life Domains

Both Non-use and 'Meaningful use' are parts of wider picture which is their user's everyday life issues. This expands our consideration of IS Use. We have come to a stage when Information Systems have permeated every walk of life. Many new technologies can be used for many different purposes and in different contexts other than the workplace. Frissen (2000) argues that "knowledge of the dynamics of everyday life is indispensable to understanding the processes of acceptance of ICTs".

While IS Acceptance research has traditionally been focused on information systems that aim at enhancing organizational productivity and effectiveness, we are witnessing waves of innovative IS that encompass a broad range of usage contexts beyond the work setting. The proliferation of Internet and mobile communications services in everyday life has led to a blurring of boundaries between the public and private spheres of life (ITU 2004). The ubiquitous nature of these services and their impact on a person’s lifestyle call into question the appropriateness of applying traditional organization-centric IS Use models to understanding IS that are increasingly being used to satisfy both work and personal needs.

According to Bergman (2000), information appliances are devices or instruments designed to provide their users with various types of information: data, video, images, etc. Recognizing the increasingly diversified usage contexts of information appliances, he further defines multipurpose information appliances as IT artifact that:

1. have a one-to-one binding with the user,
2. offer ubiquitous services and access, and
3. Provide a suite of utilitarian and hedonic functions.

The first characteristic indicates the intimate relationship between the user and the artifact. It implies that the artifact is an extension of the self and is perceived as a personal possession that is not shared with others. The second describes the IT artifact's ubiquitous accessibility, independent of the user's location and time of access. The third characteristic pertains to the value generated for the user, extending beyond work-related performance gains to hedonic and enjoyment values.

Hong & Tam (2006) believe that a better understanding of how a technology is adopted to support different lifestyle purposes may provide new insights into technology usage in the workplace because these cross-purpose technologies may first be adopted for personal use and then extended to the workplace, or vice versa. Hong & Tam (2006) investigated the adoption of multipurpose information appliances that support a wide range of lifestyle purposes. They developed and empirically tested an adoption model that incorporated the usage context and the unique features of Mobile Data Services (MDS). Hong & Tam (2006) claim that their findings show that the determinants of multipurpose information appliance adoption decisions are not only different from those in the workplace! but are also dependent on the nature of the target technology and its use context.

Yoo (2010) invites the field to return to its roots, the Science of the Artificial, by decisively expanding the scope of its inquiry and establishing a new domain of research on computing in everyday life experience:

> *"Every way we turn, we see information technology. Everywhere we go, we are constantly surrounded by computers. We use them when we walk, listen to music, drive our cars, and take pictures. T-shirts and jeans that come with radio frequency identification (RFID) tags remind us that our everyday life is fully saturated with advanced information technology. Yet, as shown above*

> *they are not computers in a beige box that provide computing experiences to corporate computer users. Instead, they are portable music players, cars with navigation systems, or mobile phones with digital cameras and data access. Nor do we see users only in a traditional sense. Instead, we see music lovers, drivers, and subway passengers. These people participate in mundane, everyday activities"*

Yoo (2010) calls for new streams of research cantered on the new experiences created by this complex and evolving environment along with the advancement of technology artifacts. Their experiential computing framework supports the advancement of research on computing in everyday life experiences. In this framework, the digitally mediated experiences of people are understood through the four dimensions of:

- space,
- time,
- actors
- and artifact.

Yoo (2010) argue that experience is an essential aspect of our existential struggle. It is our experiences that shape our identity, ideals, and worldview. He argues that the IS community should take the idea of experience seriously and systematically explore how digital technologies are transforming our everyday experiences. This will open up a rich, new research avenue for the IS community.

Concerning everyday life domains, Choi *et al.* (2007) suggest that there are roughly 13 life domains important to users of IS (Table 1).

Life domain	Definition
Cultural	Activities and relationships with cultural richness
Leisure	Non-working activities, spare time activities, recreation
Work	Mental and physical activities required by jobs and tasks
Educational	Learning and teaching activities
Consumer	Purchase, preparation, consumption, possession, maintenance, and disposition activities of goods and services
Financial	Activities for pay and revenues
Health and Safety	Activities pertaining to mental and physical health and safety
Family	Activities with parents, children, and home
Friend	Activities with colleagues and friends
Social	Activities with people other than family, colleagues, and friends
Self	Activities for self-representation and self-efficacy
Neighbourhood	Relationships with one's neighbourhood
Spiritual	Religious and spiritual activities

Table 1 Life Domains (Choi et al. 2007)

In another study Platzer *et al.* (2010) categorise Choi *et al.'s*(2007) life domains into task issues (work, education, consumption, finance) people issues (family, friends, and neighbourhood) and self-issues (cultural, health and safety).

In recent years, however, there has been a growing interest in viewing IS Use as dynamic phenomenon which is not only recognised consciously, as used to be the case in 1980s and 1990s when someone sat before a Personal Computer to start working with it. It is also seen as not being constrained to business organisations any more. We can conclude that such an everyday life view of IS Use assumes such a usage in every life domains.

Tachatassanasoontorn & Tanvisuth (2010) believe limited theoretical understanding exists on how IS Use improves quality of life. They are critical of studies that lose focus of people's life domains. For example they criticise Silva & Figueroa's (2002) study due to the mere focus on IS Use impact on economic domain at macro (country) level. They believe there is a need to understand IS Use across people's life domains.

> *"ICT use should enhance a process of social inclusion by enabling individuals to fully participate in society across a variety of domains related to health, education, recreation, and culture, among others"(p.1)*

Tachatassanasoontorn & Tanvisuth (2010) employ Maslow's Needs Theory (1943) as framework for conceptualising the underlying process that explains domains of quality of life (QoL). QoL is a complex process that may involve vertical and horizontal 'spill over' effects. Vertical spill over involves relationships between domain-specific QoL, Horizontal spill over involves a particular life domain influencing QoL in other life domains (see Figure 8).

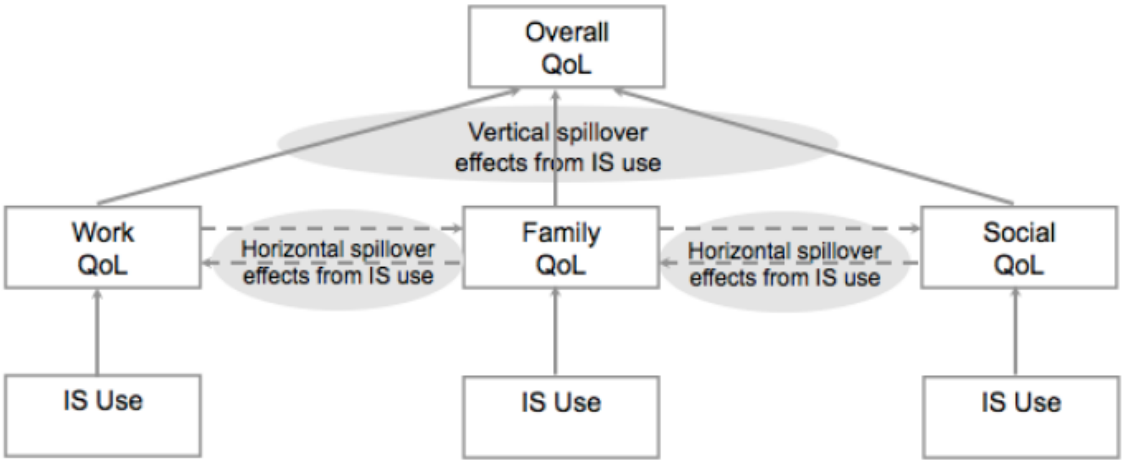

Figure 8 A Theoretical Model of IS Use and Quality of Life (Tachatassanasoontom & Tanvisuth, 2010)

Sirgy (2002) also recognises that life domains may have overlaps. For example, going to work can satisfy both economic and social needs or leisure activities may satisfy both aesthetics and social needs.

The approach based on life domains goes beyond professional use, and might be able to address such uses as social networking and game-playing. However, the concept of life domains might be too rigid, in that though some overlap is recognized; in everyday life this is more varied, dynamic, pervasive and deeper. Tachatassanasoontorn & Tanvisuth (2010) acknowledge that 'spillover' between domains presents a challenge, but their discussion of this is weak.

There is imbalance among the life domains, with some, e.g. work, being very broad while others seem narrow, e.g. the fine distinction between family, friend, social and neighborhood domains. There is a need for ontological grounding. Tachatassanasoontorn & Tanvisuth's (2010) use of Maslow (1943) as grounding is useful, but it is also problematic because Maslow over-emphasizes hierarchy and is methodologically suspect (Wahba & Bridwell 1976).

Tachatassanasoontorn & Tanvisuth (2010) state that the nature of IS Use and its impacts in everyday life setting are not yet well understood and call for additional research. Such research might benefit from reference to philosophy.

This is an active discourse which is fairly recent. This discourse is not confined to IS Use in the work context, but tries to explore IS Use in many life domains.

3.8 Overview

The literature review has covered six different discourses of IS Use, each focus on different issues. Intuitively, a tentative understanding of these discourses could be the following statements as spoken by researchers:

- "Discourses on IS Acceptance believe IS Use does not meet the expectations, let us predict the use before IS implementation"
- "Discourses on IS Use as multi-dimensionality believe IS Use is more than one dimension, let us think of it as multi-dimensional Use"
- "Discourses on feature-based use of IS Use believe IS Use as multi-dimensional use is not enough, let us explore how people use features"
- "Discourses on IS Use in health believe, IS Use only makes sense when it is beneficial to us"
- "Discourses on IS resistance and non-use believe IS Use is not necessarily beneficial. Let us see it in terms of resistance and non-use"
- "Discourse on IS Use as everyday activity believe IS Use is not limited to only organisational settings, let us see it in all life domains"

There might be more discourses but the main thing that we see from our review of discourses is its diversity.

It seems that, on grounds of intuitive understanding, no discourse can be reduced to any other. But, how they are intuitively distinguished needs justification.

Most discourses were intuitively differentiated from Discourse 1 because either they have reacted against the limitations of this traditional discourse in trying to conceptualise what they find meaningful about IS Use, or they have depicted an understanding of IS Use which shows no reliance on TAM, UTAUT, TTF, ISSM and their variants.

Discourse 2 is differentiated from Discourse 1 on the following grounds. Burton-Jones & Straub (2006) distinguish between IS Acceptance, IS Success, IS Implementation and IS for decision making as separate research domains depicting high-level conceptualisation of the IS Use construct in the associated models. Whereas Burton-Jones & Straub (2006) have looked at the domains of research to identify these four discourses, distinguishing the discourses in this thesis is based on how IS Use is understood and treated by the researchers in the IS Use field. Unlike discourse 1, Burton-Jones & Straub (2006) believe 'amount view', as a one-dimensional understanding IS Use, is not sufficient and they propose exploring the multiple dimensions of usage.

Discourse 1 is large, so the question is whether it should be split up. IS Acceptance, IS Success and TTF model are often seen as separate research domains. What is common between them however is that they are primarily interested in, and motivated by, is to find quantitative measures of some positive normative construct related to IS Use.

Discourses 2 to 6 are also differentiated from each other because there are different kinds of research problem important to each and claiming a different conceptualisation of what is meaningful to them about IS Use. For example, Burton-Jones & Straub (2006) explicitly aim to define IS Use as multi-dimensional construct, and discourse 3 represents a deep

engagement with features as usage. Discourses 5 and 6 do not limit IS Use to the professional work place but they differ from each other, in that the former is discussing the non-use and the latter is an attempt to understand IS Use in light of our life domains. Discourse 4 is trying to see the importance of IS Use to patients, nurses and physicians in the healthcare rather than managers.

We see IS Use discourses based on the research problem they intended to address. The contrast of discourses of those working in the field of IS Use may not be so sharp as often appears. There are possibly overlaps of thoughts.

Looking at the literature of IS Use, one might recognise that a lot of the extant critiques on IS Use have put finger on problem of TAM. Few critiques are available on studies which criticised TAM, partly because these studies are to some extent at the infant stage. Moreover, not necessarily all the studies criticizing TAM would fall into the same discourse of understanding IS Use. They have introduced alternative conceptualisations of IS Use, possibly different from that of TAM.

Researchers in each discourse were probably motivated by the research problem recognised in conceptualisation of IS Use within their period of research in their own or other discourses. As a result they conceptualise IS Use based on what is important to them.

These reflect diversity of discourses in the IS Use field. However diversity is not a simple matter so the next section will examine diversity in the IS use field.

3.9 Diversity in the IS Discipline

Diversity in research has been both the reality and the accepted norm by many in the information systems discipline for last few decades. Benbasat & Weber (1996) study on

rethinking diversity in IS research is considered in this section because their study has given the basic framework to others who would explore cost and benefit of diversity in IS research.

Benbasat & Weber (1996) usefully document the sources of diversity in IS research, charting the field's historical trajectory to the present. Drawing chiefly from the current debate in organization science, they focus upon the threat of diversity to the future of the IS field. They argue, IS is threatened by more established and coherent disciplines in the struggle for resources and academic legitimacy. If nothing is done, IS might simply fade away or be taken over by a more powerful discipline. However, whether we like it or not, IS research will continue to diversify. Maintaining diversity will not necessarily condemn IS to future oblivion. Robey (1996) believes our fate as a field depends less upon how diverse we become and more upon our upholding our collective responsibilities as researchers. If those responsibilities are taken seriously, diversity can help IS to fulfil its highest promise as a relevant and vital field of academic research.

This would be the responsibility of the IS Use researchers to take action about the types of diversity in this sub-community-i.e. IS Use field. So this is one reason for the author of this thesis to deal with diversity of IS Use perspective. According to Benbasat and Weber (1996) three types of diversity have been prominent in the Information Systems discipline:

- Diversity in the methods used to collect, analyse, and interpret data.
- Diversity in the theoretical foundations and reference discipline used to account for IS phenomena
- Diversity in the problems addressed

3.9.1 Diversity of research methods

In IS, the focus, instead, has been on methodological disputes-for example, positivism versus interpretivism. Given the level of generality at which these methodological disputes occur, however, there is a doubt whether they can be resolved in any agreed-upon way. In any event, for some IS researchers, disputes about methodology are a straw man. They entertain and distract a discipline when it lacks substantive theory to debate. Furthermore, to quote Keen (1980), "methodology is a choice not a tyranny." Again, methodology is not the main game. In the papers there was little discussion of the diversity of research methods.

3.9.2 Diversity of theoretical foundations

In IS, theories are the fundamental factor that shape the course of a discipline and research methods should surely be subsidiary to the theory we are seeking to articulate (Benbasat & Weber, 1996). Landry & Banville (1992) believe theoretical foundations for research and specific research methods are justified by research aims, or purposes. They should *not* be chosen because they conform to a dominant paradigm or because the researcher believes in their intrinsic value. Rather, theories and methods are justified on pragmatic grounds as appropriate tools for accomplishing research aims. Such discipline requires that researchers be clear about their aims, that they justify their choices of theory and method, and that they maintain a balance among the three positions on the triad (Robey, 1996).

The IS Use literature shows diversity of theoretical foundations but that is secondary to the aim of researchers in understanding IS Use.

3.9.3 Diversity of research problem

Diversity of discourses is a diversity of aims which is more akin to a diversity of research problems. This section will argue that diversity of problems is what we see in the review of the IS use field above. Unfortunately, diversity in the problems addressed is not well

explained by Benbasat & Weber (1996). Most researchers have examined diversity of problems addressed (Benbasat & Weber, 1996) by analysing the topics of research. For example Banker & Kauffman (2004) analyse the development of the information systems literature in Management Science in 50 years and reflects on the inception, growth, and maturation of five different research streams such as the decision support and design science research stream , the value of information research stream , the human-computer systems design research stream , the IS organisation and strategy research stream, and the economics of information systems and technology research stream.

In another study, Galliers & Whitley (2007) consider the diversity in problems addressed by reflecting on European research on Information systems as presented during the first 10 years of the European Conference on Information Systems (ECIS). They show that ECIS community has focus on social, IS organisational and strategic, system development, decision support systems, technology, research issues, economic, human and electronic market. There is also another study by Palvia *et al.* (2007) who determined the subject areas most often investigated between 1998 to 2005 in Information and Management (I&M) Journal. The results of their study show the top two most research topics in I&M were IS use and resource management/IS management issues.

Previous studies have investigated IS topics using a variety of categorical schemes, some fine-grained (see Barki, *et al.* 1993; Palvia, *et al*., 2007) and some at higher levels of abstraction. Sidorova *et al.* (2008) for instance, identify just five core research areas (information technology and organisations, IS development, IT and individuals, IT and markets, IT and groups). They argue that these core areas have remained quite stable over the past 20 odd years to 2006 but themes within these areas have moved from a focus on technical development to "the social context in which information technologies are designed and used".

While previous topic analyses have provided a surface picture of topics they have not revealed the deeper values or beliefs that "circumscribe definitions of worthwhile problems" (Chua, 1986:602). Palvia, *et al.* (2007) believes that the high level of IS use research was triggered by the enormous interest in the TAM published by Davis (1989), yet their study is limited to only I&M journal and has not aimed at addressing the changes in understanding of IS use within IS use studies since then. Sidorova *et al.* (2008) refer to diversity of themes within specific area of research, and this is almost similar to what is noticed in the historical review of IS Use studies in which we not only see the diversity of themes but also in a deeper level we see the diversity in understanding of IS Use. Different themes in a specific area of research are created because of how to identify and define a phenomenon (Sansone, *et al.* 2004:6) which, in turn, is influenced by our understanding of that particular phenomenon. In the historical review of IS use studies in previous section we have seen that IS use studies have moved from TAM to everyday life experience of IS use.

Changes within a research topic has not been addressed by Benbasat & Weber (1996) themselves and most researchers who conducted research within the three types of diversity. Benbasat & Weber (1996) consider diversity to be harmful for the long-term viability of IS as a discipline. While agreeing that diversity helped improve rigor, they feel that the diversity now threatens the existence of IS discipline. So this is not surprising why *the diversity of problem addressed* has not addressed more attention for being clarified.

While Benbasat & Weber (1996) argue for having a unified focus to deal with diversity, Vessey, *et al.* (2002, 39) state that the IS field may be too broad and too diverse to develop a unified focus. They continue by saying that pursuing the controlled diversity that Benbasat & Weber (1996) elicited would not be beneficial. Keller & Coulthard (2011) contend that what is needed is a view of research domain that is at a higher semantic level than previous topic

category schemas. However, various understanding of IS Use seems to be so much of a set of different worldviews to IS use than being confined to language. Therefore there is a need for a way of recognising, identifying worldviews (understanding of IS Use) and addressing their diversity in IS research.

So the question remains, How we can identify different understanding of IS Use and address their diversity? and clarify the nature of the transition between different understandings of IS use? To answer the question requires an exploration of the potential philosophical stances in IS research to examine whether they would be enabling us to explain the current complexity in IS Use Research.

Diversity of research problem as introduced by Benbasat & Weber (1996) shows some ambiguity. Benbasat & Weber (1996) distinguish between problems and paradigms. Benbasat & Weber (1996) understanding of Kuhn (1962) is that theories and paradigms are the same thing and are linked to problems that command our attention:

> *"The discipline is now more pluralistic and accommodating of diverse research problems, research methods, theoretical foundations, and paradigms." (p.391)*

> *"…long ago Kuhn (1962) pointed out that the problems and phenomena that command our attentions are inextricably linked to the theories / paradigms we use to understand the world."(p.392)*

Benbasat & Weber (1996) believe the way we make sense of the world and the problems we choose to address, however, most likely are influenced by our experience with and affinity

with different research methods. Research methods shape the language we use to describe the world, and language shapes how we think about the world.

Similarly, they believe the theories researchers use and the research problems they address are not independent. In this regard, In short, the forms of diversity in each of the three areas they identified are unlikely to be independent.

However, for the sake of their research, Benbasat & Weber (1996) focus primarily on theoretical diversity, because they believe that theories are the fundamental factor that shapes the course of a discipline. Moreover, they agree with Kuhn that researchers have difficulty seeing problems and phenomena in the world to research except through the lenses of the theories they employ. So they did not specifically work on problems, and let others to develop it and work on it.

In any event, recall that Kuhn (1962) has argued problems and phenomena in a discipline are perceived to be important because they are suggested by our theories. We might expect lack of agreement on fundamental issues and problems, therefore, if we do not have our own theories and we are driven instead by theories borrowed from other disciplines.

3.10 Conclusion

It seems that there are different understandings concerning the conceptualisations of IS Use in the literature that brought together researchers and shaped each of the discourses. Identification of the perspectives of IS Use plus provision of a way of explaining diversity and development of discourses might reveal valuable insights in each discourse that has led them to be accepted by part of the IS Use community.

There are already sets of perspectives available in the IS field. Whether these perspectives can be useful in making sense of the diversity and development of discourses, it is the topic of the next chapter.

Chapter 4 LITERATURE REVIEW PART 2: STANDARD "PARADIGMS"

4.1 Introduction

In Chapter 3, the diversity and development of IS Use discourses were recognised as characteristics of the IS Use field. The purpose of this chapter is to introduce and examine the applicability of the so-called IS "paradigms" or conventional 'paradigms', as they are referred to by most scholars in the IS research, on the diversity and development of discourses in the IS Use field.

First, Burrell & Morgan's (1979) framework with its four "paradigms" is explained and discussed. Second, Positivist, Interpretive and Critical research 'paradigms' (P-I-C), Hard, Soft and Critical systems thinking (H-S-C), and then Technology Determinism (TD), Social Construction of Technology (SCOT) and Social Shaping of Technology (SST) (T-S-S) are explained and discussed.

These four sets are considered in this chapter, because there is a general belief that they provide a philosophical basis for understanding, analysis and classification of alternative approaches in IS research. The intention is not to discuss the individual 'paradigm' as such, nor the criticisms that have been made of them, but to examine their capability to help with both diversity and development of various IS Use discourses. Therefore the description of each set of 'paradigms', and of each 'paradigm' in each set, will be relatively brief. The justification for each set is explained at the beginning of their assigned section.

4.2 Burrell and Morgan Framework

One of influential philosophical stance in IS literature is Burrell & Morgan (1979) framework of paradigms. I consider the framework introduced by Burrell & Morgan (1979), because their framework consisted of four 'paradigms' are viewed as a philosophical basis that capture the whole of sociological and organisational research.

Burrell & Morgan (1979) identified four main paradigms in social research, which have gained widespread acceptance in IS research (Laughlin, 1995; Lowe, 2004). They are well described by Goles & Hirschheim (2000) as follows:

- The Functionalist Paradigm is concerned with explaining the status quo, social order, need satisfaction, and rational choice. It seeks to explain how the individual elements of a social systems interact together to form an integrated whole.
- The Interpretive Paradigm seeks explanation within the realm of individual subjectivity, and within the frame of reference of the perspective. Social roles and institutions are the result of the meanings people attach to their world.
- The Radical Structuralist Paradigm has a view of society and organizations which emphasizes the need to transcend the limitations placed on existing social and organizational arrangements. It focuses primarily on the structure and analysis of economic power relationships.
- The Radical Humanist Paradigm seeks radical change, emancipation, and potentiality, and stresses the role that different social and organizational forces play in understanding change. It focuses on all forms of barriers to emancipation: in particular, ideology (distorted communication), power and psychological compulsions and social constraints; and seeks ways to overcome them.

When Gibson Burrell and Gareth Morgan wrote Sociological Paradigms and Organisational Analysis, few would have anticipated the widespread impact or resultant contestation that their four-paradigm grid would have. Though there are some commonalities between them, Burrell & Morgan (1979) argue that each paradigm stands alone and is in fundamental opposition to others. Their argument is based on the way they identify the paradigms. They see social research as either objective or subjective and society as characterised by either regulation or radical change. These two bipolar dimensions offer four combinations, with which they identify the four paradigms. Yet, there are critiques about their framework in relation to its applicability to this study.

4.2.1 Problems with Burrell and Morgan Framework:

There are recognised problems with both the way of identifying paradigms, also their suitability for addressing the diversity and development of IS Use conceptualisation in the IS Use field.

It is doubtful whether Burrell and Morgan' way of identifying paradigms would help to make sense of IS Use field, this is for several reasons:

1. It is limited to organisational analysis. Burrell and Morgan four-paradigm grid is helpful with organisational analysis. Whereas IS Use field as the literature shows goes beyond organisational life and tend to conceptualise IS Use in everyday life context as well as in organisational domains.
2. It offers only four distinct Paradigms, Burrell and Morgan' positioning is well-known for their firm opposition to paradigmatic diversity:

   "Our proposition is that social theory can usefully be conceived in terms of four key paradigms based upon different sets of metatheoretical assumptions about the nature of social science and the nature of society. (p.viii)"

So, it is not clear how it can help a researcher with explaining the diversity in the field. It is referring to one research at any given point in time and it does not tell us about a whole field with variety of paradigms. Even if we assume it can help us with the whole field, we are already limited to their four-paradigm grid which has not left the gate open for adding more paradigm, ultimately our explanation of the diversity of the field would be a repetition of their four paradigms. Review of the IS Use literature in chapter 3 makes clear that the diversity is wider than that. With Burrell & Morgan (1979), there can only ever be four distinct paradigms, since they arise from two by two dimensions.

3. In their pure forms, Burrell & Morgan's Paradigms are mutually exclusive.

"The four paradigms are mutually exclusive . . . they offer different ways of seeing. A synthesis is not possible . . . one cannot operate in more than one paradigm at any given point in time, since in accepting the assumptions of one; we defy the assumptions of all the others (Burrell & Morgan, 1979: p. 25)."

This is because Burrell & Morgan (1979) show another way of identifying paradigms which is on the basis of prior dichotomy. Burrell and Morgan selected two dichotomous dimensions, subjective-objective and consensus-conflict, the interaction of which provides four possible paradigms. The dimensions are prior to paradigm identification. The four 'paradigms' offer alternative view of social reality, and synthesis is not possible because they are contradictory in their pure forms.

This mutual exclusivity has been criticised by number of scholars. For example, Coleman (2013) draws attention to the complexity of such paradigms by pointing out that Chua (1986) argues that most philosophical traditions are not mutually exclusive.

Moreover, Willmott questions the dualistic mentality of paradigms and the validity of separating subjective from objective approaches, claiming it "transforms a dualistic tendency in organizational analysis into a metaphysical principle" (p.708). Willmott (1993, 682) also argues that the mutual exclusivity "unnecessarily constrains the process of theory development" because of "polarized sets of assumptions about science and society".

IS Use literature, however, in chapter 3 shows overlaps. Burrell and Morgan's assumed dichotomies of conflict-consensus and subject-object are not dichotomies in the reality of IS Use, as depicted in chapter 3. This is affirmed by Grint & Woolgar (1997) arguing that dichotomous dimensions leads to those working in one paradigm overlooking the insights in others, in addition this mutual exclusivity does not mirror what happens in practice.

Deetz (2006) considers the problem in Subject-object dualism which is as old as Western theoretical writings (at least as reconstructed in the modern period). The discourse of "functionalist" researchers (or what is organized as such in Burrell and Morgan) as well as that of many humanist and interpretivist reproduces a basic psychological distinction between an interior and exterior world. Phenomena can either be interior or exterior. And, the research process itself is seen as directed by either the interior (thus subjective) or exterior (thus objective). Whereas in discourses associated with feature-based use of IS both objective and subjective are taken into account.

4. Whether their four-paradigm grid could help with providing any account of the development of the IS Use discourses is not clear. Their four-grid paradigm limits us into just four categories. Development of conceptualisation would probably be pointless if we know from the beginning that the criteria to account the development is the shift from one of the four categories to another, and that ultimately we find the whole field in one of the four.so it is not leaving any room for a researcher who is motivated for exploring unknown or neglected issue, which is crucial for the progress in the field.

5. Burrell and Morgan misunderstood what paradigms are. They define a paradigm as "the commonality of perspective which binds the work of a group of theorists together in such a way that they can be usefully regarded as approaching social theory within the bounds of the same problematic" (p. 23). It means theorists within a paradigm share the underlying meta-theoretical 'taken for granted' assumptions. They refer to Thomas Kuhn's notion of paradigms as the underlying philosophy for their framework. However, they use the term "paradigm" in a broader sense than that intended by Kuhn (Kuhn's notion of paradigm is explained and discussed in chapter 5).

Regarding the influence of Kuhnian paradigm in sociology as an influential reference discipline for IS, Eckberg & Hill (1979) raised their concerned about studies in sociology being true to Kuhnian theory. According to Eckberg & Hill (1979) these four paradigms are actually confounding epistemological approaches to research, not paradigms per Kuhn they argue that most sociologists are either unaware of the differences in, and subtleties of, Kuhn's conceptualization, or that they ignore them.

To give example from another field, Deetz (1996) in describing different approaches to organisational science rethinks Burrell and Morgan's framework, reflects on the impact of 'quick categorizations', believes researchers 'missed much' with such a prescriptive grid view, and that the subjective objective problem is simply boring and misleading and reproducing simplistic distinctions and that it is not a very interesting way of thinking about research programme differences. Deetz (1996: p.199) argue that Burrell and Morgan's four-paradigm grid does not help to better display the discourse differences in the organisational science and give insight to the field, and It would be a mistake to call these (organisational) discourses paradigms in Burrell and Morgan's sense.

4.2.2 In the IS Discipline

In the IS discipline, Goles & Hirschheim (2000) admit that the version of paradigm Burrell and Morgan uses deviates from what Kuhn had suggested. Also, Hirschheim *et al.* (1995) affirm the difference between Kuhn's definition of paradigm and Burrell and Morgan's. They state:

> *"Paradigms are defined by Burrell and Morgan (1979) as: 'meta-theoretical assumptions about the nature of the subject of study' (p.35). This differs somewhat from Kuhn's (1970) classic conception of paradigms which were defined as: 'universally recognised scientific achievements that for a time provide model problems and solutions to a community of practitioners' (p.viii)"*

Though affirming the difference, Hirschheim *et al.* (1995) heavily rely of Burrell and Morgan's framework and take the word paradigm in Burrell and Morgan's sense. Hirschheim *et al.* (1995) see Burrell and Morgan Framework as a fruitful way to classify approaches to systems development.

In another seminal paper in IS field, Hirschheim & Klein (1989), studying the kinds of implicit assumptions made during Information systems development, identify four paradigms therein, which lead to different system outcomes. Though they acknowledge that Burrell & Morgan's definition of paradigms differs from Kuhn's conception of paradigms, they believe Burrell and Morgan's framework allow them "to capture the distinguishing assumptions of alternative approaches to information systems development in a simplified yet philosophically grounded way"(Hirschheim & Klein 1989, p 1201).

In contrast, in the IS discipline there are examples of scholars trying to be faithful to Kuhn's version of paradigm. This can be read in Iivari (1991) study on a paradigmatic analysis of contemporary schools of IS development. Iivari (1991) rely on Kuhn's conception of paradigm as textbooks and journal articles available to the scientific community.

The main point here is that most IS research rely on Burrell and Morgan idea of paradigm, or sociological version of Kuhn, whereas these versions of Kuhn are criticized of not being faithful to Kuhn's main idea. Even those who rely directly on Kuhn (for example Iivari, 1991) they are not trying to see Kuhn in a wider picture. They rely on Kuhn idea from *The Structure of Scientific Revolution*, but they probably ignore critiques of it. Willmott (1993) invites to Kuhn's understanding. Seeing Kuhn in Wider picture is necessary for the IS Use field, and this is discussed in Chapter 5 of this thesis.

4.3 Positivist, Interpretive and Critical Research 'Paradigms' (P-I-C)

In IS discipline, there are three broad research 'paradigms': Positivist, Interpretive and Critical (Chua, 1986; Orlikowski & Baroudi, 1991; Klein & Myers, 1999). They are three different generic research approaches for conducting research and it is worth considering and examines their capability for aim of this research.

4.3.1 The Positivist

The positivist research 'paradigm' is also called the scientific 'paradigm'. The term positivism was first coined by the founder of positivism, Auguste Comte, the French philosopher who believed that reality can be observed. He claimed that all genuine knowledge is based on sense experience and can be advanced only by means of observation and experiment (Cohen et al. 2007).

The purpose of research in this 'paradigm' is to prove or disprove a hypothesis. Other characteristics of positivist research include an emphasis on the scientific method, statistical analysis, and generalizable findings. Moreover, positivist research usually has a control and experimental group and a pre/test post method.' It explains reality in causal way and has an objectivist view of a phenomenon. This means positivist position assumes that world is a universe of facts that exists independently of the observer, and inductive logic is used to discover causal generalized relationships to predict patterns of behaviour across situations. In this stance, knowledge is achieved through sensory experiences and is value-free (Hirschheim,1985; Orlikowski & Baroudi, 1991).

There has been criticism of the positivist 'paradigm' for applying the scientific method to research on human affairs. The opponents argued that uniform causal links that can be established in the study of natural science cannot be made in the context where human being constructs meaning.

4.3.2 The Interpretive

The interpretive research 'paradigm' can be also called the "anti-positivist" paradigm because it was developed as a reaction to positivism. It is also sometimes referred to as constructivism because it emphasizes the ability of the individual to construct meaning. The interpretive 'paradigm' was heavily influenced by hermeneutics and phenomenology. Hermeneutics is the

study of meaning and interpretation in historical texts. This meaning-making cyclical process is the basis on which the interpretivist paradigm was established (Ernest, 1994). A phenomenologist advocates the "need to consider human beings' subjective interpretations, their perceptions of the world (their life-worlds) as our starting point in understanding social phenomena" (Ernest, 1994, p. 25).

Unlike Positivism, Interpretive' main tenet is that research can never be objectively observed from the outside rather it must be observed from inside through the direct experience of the people. Furthermore, uniform causal links that can be established in the study of natural science cannot be made in the context in which human being construct meaning. Therefore, the role of the scientist in the interpretive 'paradigm' is to, "understand, explain, and demystify social reality through the eyes of different participants" (Cohen et al, 2007, p. 19).

One of the criticisms of interpretive is that it does not allow for generalisations because it encourages the study of a small number of cases that do not apply to the whole population. Moreover, by selecting this paradigm the researcher would be subjectively oriented towards one way of doing research, and cannot be divorced from this perspective as the researcher.

4.3.3 The Critical

Critical research 'paradigm' has its origins in critical theory, attributed to Georg Hegel (eighteenth century) and Karl Marx (nineteenth century). These influential figures focused on eliminating injustice in society. Critical researchers today also aim to transform society to address inequality, particularly in relation to ethnicity, gender, sexual orientation, disability, and other parts of society that are marginalised (Mackenzie & Knipe, 2006)

Critical research 'paradigm' tries to transcend both Positivist and Interpretive positions assuming that social reality is produced by humans, but also exists objectively and dominates human experience (Hirschheim, 1985). In relation to IS research, Orlikowski & Baroudi

(1991) explain that the aim of this position is to critique the status quo where the assumption about organisations and information systems are taken for granted. This is conducted by disclosure of fundamental beliefs and contradiction within social systems. The belief is that research is conducted for "the emancipation of individuals and groups in an egalitarian society" (Cohen et al, 2007, p. 26). The critical researcher aims not only to understand or give an account of behaviours in societies but to change these behaviours.

Similar to interpretivist researchers, critical researchers recognise that research is not value free, but they go further in that the goal of the research is to actively challenge interpretations and values in order to bring about change. However, Critical theory is criticized for its elitism. By assuming that everyone needs to be emancipated, critical theorists assume that they have been emancipated and therefore are better equipped to analyse society and transform it than someone else (Mack, 2010).

4.3.4 Overview

Positivism, Interpretive and Critical research 'paradigms' can help us to understand how we gain knowledge of the reality. In addition, they could be seen in more harmony with researcher's epistemology and help the kinds of research methodologies that emerge from them. Table 2, for example, shows what Vessey *et al.* (2002) call the Diversity of Generic approaches within IS Use discourses.

Discourses	Diversity in Generic Approach
Discourse 1	Positivist (Davis,1986,1989,1993; Davis et al, 1989; Delone&McLean, 1992,2003; Goodhue&Thompson, 1995;Venkatesh, 1999, 2000; Venkatesh&Davis,2000;Venkatesh&Moris,2000;Venkatesh et al,2003) Interpretive(Delone and McLean,1992)
Discourse 2	Interpretive(Ditsa, 2002; Buffo&Barki, 2003) Positivist (Ditsa, 2002; Ilie, 2005; Burton-Jones& Straub, 2006)
Discourse 3	Positivist (Saga&Zmud, 1994; Fedel, 2006;Al-Natour&BenBasat, 2009; Grgecic&Rosenkranz, 2010, Tennant et al,2011)
Discourse 4	Positivist (Wills et al,2011) Interpretive (Classen&Bates,2011;

	Vest&Jasperson,2012)
Discourse 5	Positivist (Selwyn *et al.* 2003, 2005; Cenfetelli,2004; Kim and Kankanhalli,2009: Carroll&Fidock,2011) Interpretive (Ferneley&Sobreprez,2006; Markus, 1983; Gattoni and Tenzek,2010)
Discourse 6	Positivist (Hong & Tam,2006;Choi et al,2007; Connelly, 2007; Zamani et al,2010, Platzer et al,2010; Techatassanasoontorn & Tanvisuth,2008) Interpretive (Weiser, 1991; Frissen,2000; Haythornthwaite & Wellman, 2002; Abdualrazak et al,2010:Yoo,2010 Perotti and Hair, 2011)

Table 2 Diversity of Generic Approaches in the IS Use Discourses

Each of the six discourses has positivist and interpretive generic approaches. The field of IS Use usually employs research methods from psychology or of design science, and there is little reflection on these. During the 1980s a positivist approach had been taken to IS Use research, in which models like TAM (Davis 1989) had been constructed and tested by forming hypotheses and testing them to a degree of statistical significance. However, as awareness of the complexity of IS use increased - as exemplified in over 70 external variables attached to TAM (Yousafzai et al.'s 2007) - it became clear that this was unserviceable if genuine understanding of IS Use was to be achieved.

Information systems Use researchers began turning to qualitative rather than quantitative methods. Buffo & Barki (2003), for example, conceptualised IS Use as direct and indirect usage behaviours and suggested that different frameworks are needed for understanding behaviours and perceptions. Many IS Use researchers turned to an interpretivist approach, which is more radical than merely changing to a qualitative method, and sizeable and influential communities developed.

There has been, however, considerable reflection and debate about research approaches in the field of Information Systems. Interpretivism is seen as antithetical to positivism. The dialectical development of this generic approach causes them to overlook the insights in each. So P-I-C is not suitable to making sense of the Diversity and Development of discourses in the IS Use field. This dialectical process is seen within each discourse and scholars within the same discourse might fall into the dialectical tension between them. Take the example of IS acceptance research. While TAM-like theories intuitively seen as being developed and tested under a positivist research 'paradigm', but to classify it under positivist research 'paradigm' misses much of what they were trying to do. Silva (2007) believes IS researchers have not carefully scrutinized the philosophical and epistemological foundations of TAM, and consider approaches in the philosophy of science might be helpful.

While P-I-C help with the research process, it is not clear how they can help to understand diversity of research aims (i.e. the research problem which motivates the researchers in each discourse). According to Benbasat & Weber (1996) research approaches can help to collect, analyse and interpret data. In most cases they are used in isolation in individual research helping a researcher to conduct the research, whereas what is needed is a way of addressing the diversity of the research problems.

Next, Hard, soft and Critical System Thinking are considered.

4.4 Hard, Soft and Critical System Thinking (H-S-C)

The field of system thinking is both broad and diverse (Jackson,2001), usually separated into three main paradigms, Hard System Thinking (HST), Soft System Thinking (SST) and Critical System Thinking (CST). In relation to IS, they are usually directed towards problem solving

Whereas Positivism, Interpretivism and Critical research 'paradigm' are concerned with our philosophical stance to research, System Thinking 'paradigms' are concerned with practice. These need to be considered here, because they represent fundamental way of thinking which intend to shape our belief about a 'system'[1].

4.4.1 The 'Hard' System Thinking (HST)

An early analysis of the work of the systems community was undertaken by Lilienfeld (1978), who, as an external critic, identified six distinct applications of systems ideas and categorised them as 'hard' systems approaches.

Hard system approaches deal with hard, tangible data ('facts') relating to situations in which the goals and means can readily be identified. Additionally, they all rely on quantitative methods for resolving the problems as stated, and take for granted the possibility of maximising or optimising some entity related to the problem. However, the systems community continued to be influenced by ideas from other sciences.

It is not surprising to find, therefore, that by the late 1960s systems thinkers (especially those in the 'management' area of the discipline) had begun to develop different views about their subject area. To a large extent the orientation was still toward applying quantitative methods, although the subjective nature of the object of investigation was recognised. Instead of 'maximising' essentially determinate objects (machines, processes, components, materials) the aim turned towards other 'variables' - for example, improving the motivation of workers. But the application of quantitative approaches persisted.

[1] What 'system' means depends on the very paradigm of scholar and practitioners in IS. This could be a computerised information systems, or an ill-structured human activity, or system is seen as a context involving human and technology.

The 1970s was a period of re-evaluation for the systems community, with critics like Ackoff (1979) finding that the ‘predict-and-prepare’ ‘paradigm’ of O.R. was unsuitable as well as being 'irresponsible, unprofessional, and unethical' (Ackoff, 1979:103). The drive was on to develop a new ‘paradigm’ which would transcend the problems being experienced by systems practitioners and theorists alike.

HST stems from natural science and seeks to study a phenomenon by means of analytic-mathematical methods, which assume there is an optimal solution to solving a problem. It often seeks deterministic models and may be useful for engineering-type problems, but has limited applicability (Eriksson,2006), especially with 'soft' problems, where involved parties are likely to view the problem situation differently (Strijbos, 2010).

4.4.2 The ‘Soft’ System Thinking (SST)

It was around this time that the approaches of the so-called ‘soft’ systems thinkers first began to be used in an organisational setting. The introduction of techniques such as interpretive structural modelling (Warfield, 1976), interactive planning (Ackoff, 1974) and soft systems methodology (Checkland, 1981) all heralded the kind of gestalt switch from one paradigm to another. The dominant force behind this change in perspective can be summarised in Vickers' aphorism: 'Human systems are different' (Vickers, 1983 cited in Ison, 2005).

The debate which took place during the 1970s between functionalist (‘hard’) and interpretive (‘soft’) systems approaches was played out in the main academic journals of the time. For example, the discussion by Dando & Bennett (1981) of the Kuhnian crisis[2] was published by the O.R. journal, Journal of the Operations Research Society, as were several developments of the systems engineering approach through Checkland's Soft Systems Methodology (SSM).

[2] Kuhnian Crisis refers to discussion around ‘paradigm’ shift as introduced by Thomas Kuhn in his famous book *The structure of scientific revolution.* The discussion of it will be in chapter 5 of this thesis.

Methodologies which had been based on preceding hard systems approaches now began to lay claim to offering a 'learning process' through which organisational problems could be resolved. Checkland was one of many who developed new approaches based on an analysis of inadequacies of the hard perspectives: his SSM drew explicitly on the earlier Systems Engineering (SE) methodology of Jenkins (1969). It was developed in light of the inabilities of SE and other hard systems methods to deal with the problematic, human activity systems which resist an optimisation approach. SST puts human beings and ethical questions at the heart of the systems approach (Jackson, 1982). Checkland's (1999) classic work distinguishes 'soft' from hard approaches by assuming that problems are interpretations by its perceivers rather than being independent of observers. It finds its philosophical basis in phenomenology.

These new, soft methodologies shared a number of features. They took as their subject matter the values, opinions, and conflicting viewpoints of the human actors in any problem situation. Their view of these actors was one that understood them as behaving in a voluntaristic manner. It was held that the elements of importance in any problem situation were human, or human-related, and that quantitative approaches were wholly inappropriate for these situations. Attitudes, understanding and appreciation became the currency of the soft systems approaches.

Jackson (1982), however, argues that the emphasis was still on regulation of the status quo, rather than on bringing about radical change. Despite this recognition of the inherently conservative nature of the soft approaches, it was the climate of debate and "irresolvable" difference between the two early systems paradigms (hard and soft) that provided the setting for the emergence of the third systems perspective, that of the "critical" systems thinkers.

4.4.3 The ‘Critical’ System Thinking (CST)

Discussions between soft systems thinkers and those advocating a critical approach were initially centred on an argument about whether or not social systems are basically conflictual and thus require radical change. While SST accepts interpretations as given, Jackson (1982) criticised it for not questioning existing power relationships or assumptions. Critical system thinking seeks to handle power structures in social situations, especially conflict, and to question assumptions (Strijbos, 2000). CST has taken a normative stance. It finds its philosophical basis primarily in the social theorist, Jürgen Habermas.

This can be seen in the discussion which took place in the Journal of Applied Systems Analysis during 1982. Checkland, Ackoff and Churchman all responded, individually and somewhat predictably, to the criticism from Jackson (1982) that the soft approaches were unable to deal with the fundamentally conflictual nature of social systems. From the experience of countless case studies they were unable to support the view that situations of irresolvable conflict are the norm (Ackoff, 1980).

This way of conceptualising the social world as fundamentally coercive or repressive has a significant role to play in critical thinking. All critical theories (whether from the social science or systems domains) adopt some view of situations as basically repressive or coercive. In order for their approaches to be capable of emancipation, critical thinkers have to posit a view of the evolution of society which explains the mechanisms or processes of alienation that prevent individuals or groups from satisfying their genuine interests.

4.4.4 Overview

Each of the Hard, Soft and Critical system thinking can help in developing the ability to see the 'bigger picture' within an organization and understand how changes in one area affect the

whole system. They are types of thinking about systems helping to understand what are meant by system in practice (For example: IS Use).

They also help with identification of problems and seeking a solution to the problem situation. Though they are helpful with the problem situation, in IS Development (ISD) field it has been discussed that one view cannot help accommodation of diversity of methodologies, and a multi-view framework is required. For example Avison & Wood-Harper (1991) see soft system thinking as being combined with other approaches to shape a multi-view framework because Soft system thinking on its own is less likely to address the diversity of ISD methodologies. It is not clear how each of system thinking on their own would help diversity of IS Use discourses shown in chapter 3.

Similar to ISD field, IS Use field is complex. Multi-view framework developed for the diversity of ISD methodologies is confined to organisational context, whereas IS Use has gone beyond organisational life and reflect everyday life of people, For example, discourses on life domains.

HST, SST and CST might be enabling to help a researcher to see why a promised Information Systems is not utilised and how changes can be introduced to overcome such a problem. They primary give us different conceptualisation about IS. but how IS Use discourse could be fit into them? Take the example of TAM; it does not fit well into HST, SST or CST because on the one hand the stipulation of a model might be seen as hard, but allowing many external variables might be seen as soft. It seems these three types of system thinking are probably not enough to make sense of the IS Use field.

4.5 Technology Determinism, Social Construction of Technology and Social Shaping of Technology (T-S-S)

In the literature on the history and philosophy of technology, there are two standard answers to the technology question – determinism and constructivism – and a middle ground (Herrera,2003). These are three main "paradigms" concerned with the relationship between technology and the social sphere, which form a chain or reaction; Technological determinism (TD), Social Construction of Technology (SCOT) and Social Shaping of Technology (SST).

These needs to be considered here, because they are seen as a philosophical basis intended to shape our understanding of the interaction between Human and Technology.

4.5.1 Technological Determinism (TD)

Technological determinist logic argues that technology is a variable exogenous to political and social analysis but that nonetheless has some substantial, and definable, influence on Human and society. For determinists, technology is the (or a) key independent variable in explaining social change.

Robert Heilbroner in his influential 1967 essay argued that the broad forms technology takes in a given society will determine the overall pattern of social and economic relations in that society. After noting that technological advance tends to happen in several places at once (simultaneous invention), that technological advance is not rapid and disjointed but rather steady and incremental, and that technological development has a definite trajectory and is therefore predictable, he concludes as: "I think we can indeed state that the technology of a society imposes a determinate pattern of social relations on that society". Heilbroner's position is a determinist one: technology is exogenous to the social system, it enters the system, and generates a certain social outcome. So technology can alter the distribution of

power in the system (the central variable in the theory), but it operates in an exogenous role – no effort is made to explain where new technology comes from.

Technological determinism is represented by either one of two beliefs (Bijker, 1995). The first is the belief that technological development follows a trajectory that is intrinsic to the technology itself. Technology "advances", with newer artifacts replacing the old, on a progressive course. The second is the belief that technologies act upon the social world in predictable, inevitable ways. Both hold that a technology's intrinsic properties and functionalities determine socio-cultural changes (Leonardi & Jackson, 2004).

4.5.2 The Social Construction of Technology (SCOT)

The alternative pole to technological determinism is social constructionism, or what we might call more appropriately social determinism. It is the philosophical opposite of technological determinism and the dominant approach in sociological and historical studies of science and technology. The social constructionist approach argues that technology is 'social through and through' (Herrera, 2003). Rather than entering the social world as an exogenous agent of change, technology and its 'effects' are instead created and shaped by human interest and creativity, and by political and economic power.

New technologies are developed by human beings. They are not, or at least not very often, discovered like a seashell on a beach. Technologists make choices about how and what to innovate. They pursue particular interests and particular curiosities. They have adequate resources to pursue their interests and curiosities (or they don't). They have adequate institutional support (or they don't). The result of this framework of interest and choice is that what technologies get developed – and which don't – is not (just) a function of the technically feasible, not the product of some inevitable technological trajectory. It is instead a function of human choice, interest, ideas, institutions, power and resources.

The sociologist Donald MacKenzie's study gives us the example of nuclear weapons. Nuclear weapons are themselves the product of a complex social and political process. It means that, for the social constructionist, nuclear weapons are not some natural artefact that, once introduced to the human social environment, will have an unambiguous and singular effect on that environment. In another word, social construction of technology emphasises the 'interpretive flexibility' of an artifact. Different social groups associate different meanings with artifacts leading to interpretive flexibility appearing over the artifact. The same artifact can mean different things to different social groups of users'. The technologies we have (and don't have) are not inevitable. They are not separate from social, economic, or political forces.

Unlike TD, SCOT (Bijker & Pinch ,1986) sees social groups as the source of technological development, determining how a technology functions or "works" (MacKenzie & Wajcman, 1985). This implies an "interpretative flexibility", in which varying social groups can have different understandings and readings of technology.

4.5.3 The Social Shaping of Technology (SST)

Since the 1990s, scholars have found that the relationship between society and technology is not a simple, linear, cause-and-effect relationship. The social shaping of technology (SST, hereafter) approach basically rejects technological determinism, which assumes that technology is an autonomous body that can have intrinsic logic power to influence society (Russell & Williams, 2002). Also, SST opposes social determinism with the belief that technology and society (or culture) are mutually constitutive and interacting each other. SST assumes that technology is not totally controllable but that people can utilize it as a resource for social change. According to this argument, social effects "depend on the way that particular impacts are sought or avoided by the actors involved, while the technology is being designed and negotiated" (Russell & Williams, 2002).

To be brief, SST rejects absolute control of technology by society as well as that of society by technology. The way technology is used is extended by society as a comprehensive concept that encompasses users and those who are directly or indirectly related to the use of technology. SST is concerned with how people, including policy makers, administrators, developers, and users, "shape" technological innovation (Dutton *et al*, 2004; Bijker, 1995).

Unlike TD and SCOT, SST theory avoids direct causality in either direction, SST emerged through the critique of technological determinism but It goes beyond simplistic forms of social determinism (Williams & Edge, 1996; MacKenzie & Wajcman, 1985), resulting in a circular relationship. It also entails critique of the social status quo, believing that this should change.

4.5.4 Overview

Each of the TD, SCOT and SST are ways of understanding about the role of technology in society. They emerged as a response to studies focusing on the social consequences of technology implementation, and in doing so increasingly shift the focus to viewing technology itself as being shaped by social processes.

TD, SCOT and SST might be able to help with conceptualising about the relationship between technology and society. However, they do not seem to be enough to help with making sense of the development and diversity of discourses in the IS Use field. For example, though SCOT is a useful framing for examining the changes that take place within a particular context, Campbell (2007) discusses that it is unable to identify normative behaviour of mobile phone use in some of life domains, and believe SCOT needs a complementary framework to address such a situation.

SST highlights the importance of wider macro-environmental factors in influencing technology and its implementation into organizations. Whereas discourses on IS Use shows

perspectives of IS Use are not constrained by just society, it also involves individual use, for example TAM.

These three ‘paradigms’ are highly concerned with discussion around what construct a technology and use of technology becomes important only as part of their discussion, whereas in Chapter 3 covered discourses in which IS Use is of their primary focus. pioneers in the IS Use field directly have introduced conceptualisations of IS Use. For example, Davis (1986) focus was on prediction of IS Use, or Burton-Jones & Straub (2006) introduce dimensions of IS Use.

4.6 More problems with three sets of three

It would be illusory to see each of these three sets of ‘paradigms’ as perfect Each of them give different view of the world. Even having them as a bundle give us three different world views that are not willing to affirm the insight in one another. The three sets show a way of identifying worldviews by historical reaction that is dialectical in nature.

The three sets of paradigms all follow a similar pattern of dialectical reaction of thesis, anti-thesis and synthesis which is often associated with Hegel (Hirschheim, 1985). Hegelian dialectic, usually presented in a threefold manner, it is stated that Hegelian dialectic comprises three dialectical stages of development: a thesis, giving rise to its reaction, an antithesis, which contradicts or negates the thesis, and the tension between the two being resolved by means of a synthesis (Fox, 2005). Though the purpose of the dialectic method is resolution of disagreement through rational discussion, and, ultimately, the search for truth (Pinto, 2001; Eemeren, 2003), the development of discourses reviewed above in chapter 3 does not seem like a rational discussion. So the Hegelian cycle does not seem appropriate to discussing them. This is seen in all three sets of ‘paradigms’

In each case, the first ‘paradigm’ (i.e Hard System Thinking, Positivism, Technology Determinism) tends to assume a largely deterministic reality that is independent of human interpretation or knowledge. The second ‘paradigm’ (i.e. Soft System Thinking, Interpretivism, and Social Construction of Technology) all react against the first, and assume physical and social reality is subjectively constructed and reconstructed through human action and interaction. The first and second tend to be seen as opposites. The third ‘paradigm’ (i.e. Critical System Thinking, Critical paradigm of research, Social Shaping of Technology) may be seen as trying to span the opposition. However, it is not strictly a Hegelian process because the critical ‘paradigm’ in each case does more than just seek to integrate the opposites, in that it introduces questioning of status quo and assumptions and attendant normative criteria to ground this.

This problem falls into old object-subject relationship. In each case, the first ‘paradigm’ falls into the objective pole and the second ‘paradigm’ into the subjective pole. And then a third ‘paradigm’ appears to bridge between the first and second ‘paradigms’. Yet the tension continues between them. A similar tension has been encountered in the IS Use field.

The kinds of affordances discussed in the discourses about enhanced use of IS, on the one hand, relative to (meaningful to) the user, while on the other hand being located in the environment, i.e. the IS facilities themselves. Over the past few decades the IS Use field has increasingly emphasised the former, the subjectivity of IS Use (Hartson 2003), including the flexibility with which users can resist use, adopt workarounds or use the facilities in innovative ways. Hutchby (2001) charts the dialectical reactions that have characterized perspectives in the IS Use field, between emphasis on objectivity with technological determinism, then on subjectivity with social construction of technology and social shaping of technology, and suggests that affordance might offer a next phase, which he calls “technological shaping of sociality”, and which recognises the objectivity of technology

alongside the subjectivity of the user. However, he looks for reconciliation, which escapes from being self-critical. The debate about subject-object in that field can be useful in IS Use field and must be addressed philosophically.

4.7 Fuzzy ways of using the word 'paradigm'

The word 'paradigm' is used in different scientific disciplines and spread into the IS discipline to draw attention to the benefits that IS researchers receive from having a more fundamental and philosophical view to real world problem. However, the concept remains multiform and is used interchangeably with a range of other terms such as position, stance, approaches, worldview, perspective and assumption. Though it is not the purpose of this study to argue for and against each of these terminologies, it seems that the lexical differences, in fact, result from different understandings of the concept 'paradigm' which could slow its use in research. Such differences could sometimes lead to confusion for the readers in the field and raise debates.

There are examples of the researchers who clarify their use of these terms. For example, Lyytinen (1987) clarifies for what he means by perspective

> *"By perspective we mean a standpoint that selects specific components and their interactions in the IS context for the study. A perspective also incorporates assumptions and conjectures regarding each component's behaviour and how the selected field of study can be investigated"*

In contrast, Burrell & Morgan (1979) define paradigms as *"Meta-theoretical assumptions about the nature of the subject of study"* and use the word perspective to help with defining paradigms:

> *"The four paradigms define fundamentally different perspectives for the analysis of social phenomena" (p.23)*

Here, ‘paradigms’ are perspectives. There are examples where ‘paradigm’ means epistemology. For example, Hirschheim & Klein (1989) clarify that their use of the word ‘paradigm’ differs from Kuhn (1962):

> *“The most fundamental set of assumptions adopted by a professional community that allows its members to share similar perceptions and engage in commonly shared practices is called a “paradigm.” Typically, a paradigm consists of assumptions about knowledge and how to acquire it, and about the physical and social world.” This differs somewhat from Kuhn’s classic conception of paradigms which were defined as “universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners” (Kuhn, 1962) the structure of scientific revolution*

Another example is Hirschheim (1985) in his study of exploring whether there is a need for an IS research paradigm shift or existence of other alternatives to the current orthodoxy of IS research he mentions:

> *"....It is my contention that IS epistemology draws heavily from the social science because Information systems are, fundamentally, social rather than technical systems. Thus, the scientific paradigm adopted by the natural science is appropriate to information systems only insofar as it is appropriate for the social sciences. If one contends the social sciences embrace an epistemology which is different from their natural science counterparts, then so too is the case for IS."*

Using the term ‘paradigm’ as an equivalent for epistemology can be seen in some other studies as well. For example, Guba & Lincoln (1994) and Morgan (2007) refer to Positivist, Interpretive and Critical positions of our knowledge of reality as research ‘paradigms’. Yet,

some others refer to these three as research epistemologies (Orlikowski & Baroudi, 1991; Myers & Avison, 1997). Mingers (2001) cites Orlikowski & Baroudi (1991) and says:

> *"This paper puts forward arguments in favour of a pluralist approach to IS research. Rather than advocating a single paradigm, be it interpretive or positivist, or even a plurality of paradigms within the discipline as a whole, it suggests that research results will be richer and more reliable if different research methods, preferably from different (existing) paradigms, are routinely combined together."*

By paradigm, Mingers (2001) means research epistemology.

In the field of system thinking, Checkland (1988) considers system thinking and 'paradigm' equally:

> *"From the early 1970s the author and his colleagues sought a better approach to tackling the messy ill-structured problems which characterize human affairs. The research strategy was to take systems engineering (the 'hard' systems paradigm) as given and try to use it in unsuitably 'soft' problem situations. Systems engineering failed in such circumstances and had to be reconstructed. The outcome of a decade of the research was 'Soft Systems Methodology' (SSM)."(p.244)*

This is in Zexian and Zuhui (2010) study too:

> *"By comparing SST with HST, it is clear that SST achieves a paradigm shift which makes applied system thinking change from 'hard' approach to 'soft' approach."*

The confusion arises because referring to Kuhn sense of 'paradigm' without deep consideration of his work. One might argue that each of 'paradigms' in the three sets cannot

be ‘paradigm’ in Kuhnian sense, because a general understanding of Kuhn work is that with emergent of new and better paradigm the old one is abandoned or replaced (For example, the Paradigm shift from Newton to Einstein in the natural science). But this is not the case for the three sets of ‘paradigms’ discussed above, and such a view cannot be applied to epistemology. Though interpretive and critical research approaches emerged, positivist research has not been abandoned yet. There will always be researchers applying that philosophy and approach to research. This is also the case for Burrell and Morgan's four ‘paradigms’ and Rudy Hirschheim’s study on IS research ‘paradigm’ shift. They refer to Kuhnian sense of ‘paradigm’ accepted in sociology which has received critiques by Eckberg & Hill (1979).

The purpose of this study is not to clarify others scholars usage of the word ‘paradigm’. For the purpose of this research, discussion related to the notion of ‘paradigm’ will be in chapter 5. And clarification of what the ‘paradigm’ means for the purpose of this thesis is explained in chapter 6.

4.8 Conclusion

A number of words have been used to refer to what is called 'Paradigm'. These include: perspectives (Lyytinen,1987), paradigms (Burrell & Morgan,1979),epistemologies (Orlikowski & Baroudi, 1991) . All these refer to something that is useful to help make sense of the diversity and development of IS Use field as seen in chapter 3. However, as this chapter shows, the idea is ambiguous and therefore needs clarification. In IS, many scholars refer to Kuhn’s notion of ‘paradigm’ as basis for consideration (Farhoomand ,1987;Mingers, 2001,Galliers, 2003;Burek, 2007) therefore a good starting point for such clarification is Thomas Kuhn's well-known idea of ‘paradigms’, but even that contains ambiguities. Chapter 5 examines his idea and the subsequent debate about it

Chapter 5 LITERATURE REVIEW PART 3: DISCUSSION OF "PARADIGM" IN THE PHILOSOPHY OF SCIENCE

5.1 Introduction

In chapter 3, we looked at the different IS Use discourses in the IS Use field. Diversity of IS Use discourses has not been received its place in how Benbasat & Weber (1996) categorised the diversity in the IS field. It was also concluded that diversity of problems as identified by Benbasat & Weber (1996) is vague and they think it could be addressed by referring to Kuhn's work, they invited IS researchers to work on clarification of that. IS Use field shows progress but we are also looking for an approach to explain the development of IS Use discourses.

In chapter 4, we concluded that the major and most dominant works on 'paradigms' in IS research are not enough to address the complex picture of the IS Use Field. Burrell and Morgan's framework and the Three Sets of Three 'Paradigms' suffer from falling into dialectical and dichotomous structure and more importantly Burrell and Morgan's Framework as major work on 'paradigms' have not been faithful to Kuhn's notion of 'paradigms'.

At the end of Chapter 4, it was noted that various words have been used with similar meaning, such as 'perspective', 'paradigm', 'epistemology', etc. We argued that Kuhn's discussion of 'paradigms' is relevant to them all. Others have used the term 'paradigm' in a fuzzy way and mostly referred to Kuhn's 1962 version of 'paradigm'. This led us to seek Kuhn's notion of 'paradigm' in the philosophy of science. This is the reason to dedicate a separate chapter to understand the notion of 'paradigm' in the philosophy of science.

This chapter will start with general introduction of main figures who contributed to discussion of progress of science, then with introducing Thomas Kuhn and his view of science and

'paradigm'. It is followed by Karl Popper, Imre Lakatos, Paul Feyerabend and Margaret Masterman critiques on Kuhn's work. It is concluded that even in the philosophy of science notion of 'paradigm' has suffered from some weaknesses.

5.2 Progress of Science

Five thinkers have contributed most to our understanding of progress in science in the 20th century: Thomas Kuhn, with his principles of paradigm shift, Karl Popper, with his theory of falsification, Imre Lakatos, with the idea of research programme, Paul Feyerabend, with an emphasis on proliferation, and Margaret Masterman's contributions to the notion of 'paradigm' . These five different thinkers served to drive the philosophy of science forward.

Although these four differ greatly in their ideas, they all criticized positivism and logical positivism whose proponents hold the idea that science is superior to any other form of enquiry because it subscribes to strict method that verifies its results. They are seen as thinkers with moderate positions on their view of progress of science compared with proponent of positivism and logical Positivism . I will explain their view to progress in science one by one.

5.2.1 Thomas Kuhn

Thomas Kuhn was an American physicist, historian, and philosopher of science whose controversial 1962 book *The Structure of Scientific Revolutions* was influential in both academic and popular circles, and transformed the philosophy of science, and intellectual life more generally.

Thomas Kuhn's work on the structure of scientific revolutions (Kuhn 1996) is so well known that I will focus only on the concepts that I consider relevant for my argument. One of the main Kuhn's contributions to the philosophy of science was his novel principle of paradigm

shift. Kuhn's thesis is that science progresses not through evolutionary development or a gradual growth, but through a revolutionary displacement of one paradigm for another. Scientific revolution is a paradigm shift.

Now two things are important and relevant to be considered for the purpose of this thesis. First, how Kuhn sees the science? Second, what he means by paradigm which has become a point of reference for many scholars in IS research?

To address the first question, Kuhn distinguished between two kinds of science; normal science and revolutionary science, which tended to be seen as two stages of progress in the field (Watkins, 1970). In fact what seems differentiating Kuhn from others in the post-positivists camp is that unlike Popper and his followers who see the progress of science as integrating abstract theories into other theories through higher levels of abstractions Kuhn showed that scientific knowledge was socially constructed, negotiated and evolving. Kuhn argued that scientists through peer influence, learning research skills, and socialization into values and cognitive frames and institutional power would establish what he called normal science.

Normal science is science pursued by a community of scientists who share a paradigm. A paradigm is a consensus among a community of practising scientists about certain concrete solutions called 'exemplars' to central problems of their field. Their consensus is based on commitment to the paradigm. The commitment is derived from their training and values; it is not the result of critical testing of the paradigm. In addition, Normal science is intellectually isolated from "outside" influences, including the paradigms of other scientific fields and non-scientific events and values. Kuhn believes during the period of normal science scientist live and experience a 'paradigm' until they reach a point of chaos that switch to a new paradigm

which is revolutionary to that community. To Kuhn, old ‘paradigm’ is called the dominant ‘paradigm’.

To address the second question, although the use of the word ‘paradigm’ in philosophy of science can be traced to Georg Christoph Lichtenberg of the late 18th century and Ludwig Wittgenstein of the early 20th century (Cedarbaum, 1983), the present popularity of the term originates in Thomas Kuhn’s (1962) *The Structure of Scientific Revolutions*. Despite the wide use of the term, the ‘paradigm’ concept remains very difficult to define in every field. The reason for this stems from its original usage by Thomas Kuhn. Kuhn usage of the word paradigm was vague (See section 5.2.5)

In the beginning of the book, Kuhn defines paradigm as an exemplar for a research community:

> *I take [paradigms] to be universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners.*
>
> *(p. viii)*
>
> *By choosing [paradigms], I mean to suggest that some accepted examples of scientific practice—examples which include law, theory, application, and instrumentation together—provide models from which spring particular coherent traditions of scientific research.*
>
> *(p. 10)*

Researchers from different fields mostly refer to this definition and invent their own way of applying this concept in their research. We can read the application and the impact of Kuhn's work in such diverse fields as history, philosophy, political science, anthropology, sociology, theology, and even art (Hollinger, 1973) and IS field is no exception.

From the review of the IS Use literature in chapter 3 it seems that from the point of view of discourses on IS Use as multi-dimensional concept, enhanced use of features, beneficial Use, resistance and life domains, TAM is the dominant paradigm. Silva (2007), from post-positivist philosophy view, considers TAM as Normal Science, which has been the dominant paradigm for years in the IS Use field. Silva (2007) believes that cognitive science could constitute the paradigm behind TAM. Given that it provides IS Use researchers with a model and theory (based on TRA) for studying all types of IS Use and Acceptance situations. It also offers ways to formulate research problems, to approach those research problems, and to solve them. Elie-Dit-Cosaque & Straub (2011) affirm that models of IT Acceptance and use literature are employing TAM as a theory base.

Discourses on IS Use as multi-dimensional use, enhanced use of features, and life domains show a sense of frustration with the problems within Discourses on IS Acceptance, IS Success. Elie-Dit-Cosaque & Straub (2011) believe IS Use researchers are more and more concerned about the limitations in the IT Acceptance stream of research. There are now, indeed, influential advocates for shifting in the way we study how users react to IS. Schwarz & Chin (2007) also believe that in the past two decades the Technology Acceptance Model (TAM) has successfully catalysed a large number of studies related to IS Use or intentions toward that usage. They argue that the focus of these studies has been on a narrow aspect of usage (typically, extent or frequency of use). Silva (2007), from Kuhnian point of view questions whether there is any paradigmatic crisis? Yet, the question remained unanswered because the Kuhnian view does not seem to be enough to help in answering the question like this. Silva (2007) explains:

> *"The Kuhnian lens has made us reflect on the fact that most normal science experiences crisis when its anomalies cannot be resolved. The question here is: Is*

TAM and related research experiencing a crisis? This is a question that I cannot categorically answer in an essay like this. The historical approach to the philosophy of science assigns the fate of paradigms to the actions of actors and not to the propositional content of their theories."

Silva (2007) refer to the difference in criterion for paradigm shift from two point of views: Kuhn (the actions of actors) versus and Popper (the propositional content of theories)(section 5.2.2). This indicates that what might be seen as crisis from Popperian point of view might not be seen as crisis from Kuhn point of view. This makes it difficult to give any clear answer from one point of view.

While most take Kuhn's original idea as authoritative, Kuhn himself later modified his views, in response to debate about them. It is important to understand the main elements of this debate. The question must be asked, however, whether Kuhn's ideas, or those that arose in the subsequent debate, are fully appropriate. They put Kuhn's *the structure of scientific revolution* as a basis, but ignore the confusion in the concept of paradigm by Kuhn

The discussion of kuhn's ideas in Criticism and the Growth of Knowledge (Lakatos & Musgrave 1970) is a collection of papers from the Fourth International Colloquium in the Philosophy of Science, in 1965, in which kuhn and a number of major figures gathered to discuss kuhn's ideas, and that it is such a valuable work that it is still in print. The discussions below by Popper, Lakatos, Feyerabend and Masterman, as well as Kuhn's responses, all are found in that book.

5.2.2 Karl Popper

One of the Karl Popper's major contributions to the philosophy of science which is relevant to the purpose of this thesis is his argument of what differentiates science from pseudo-science. In his book, *the logic of Scientific Discovery*, Popper argues that what distinguishes a scientific theory from pseudo-science is that a scientific theory must be falsifiable. A theory is falsifiable if one's argument or observation proves it to be false. In simple words, in Popperian view falsifiability is criteria for demarcation in distinguishing a scientific theory from unscientific. This means that scientific theories cannot be shown to be true, but they can be shown to be false.

Popper's principle of demarcation derives from his opposition to the earlier logical positivist view of science, where observations are seen to be enough to confirm a theory. His argument draws upon Hume's criticism on induction. Hume argues early on that there are no bases to assume that the future is going to resemble the past. Popper offers the following example: a theory "all swans are white," is formed by an observer who repeatedly sees white swans. Popper indicates that no matter how many white swans an observer reports, these observations would not confirm the theory as being always true. Through empirical observation we cannot ever finally prove the statement that 'all swans are white', for example, but through one observation of a black swan, we can prove that statement is wrong; we can falsify it. Falsification, Popper argues, is the essence of the rationality of science and calls his approach to science a process of refutations (Popper, 1972).

The relevance of Popper's argument to this thesis could be seen in his critiques on Kuhn's idea of paradigm shift and development of a scientific field. Though it was not Popper who raised the term, he questioned the very idea that 'normal science' (the period before happening of paradigm shift), so construed, and could count as good science at all. Popper

instead emphasised the importance of striving to overthrow theories that might very well be false or otherwise unfit for purpose. The opposition of the two might be clarified by giving some example of what Popper means with pseudo-science.

Among the examples used by Popper to illustrate pseudo-science are astrology, Marxism, and psycho-analysis, which cannot be subjected to falsification and thus should be demarcated. Popper deems psycho-analysis to be pseudo-science because it can provide an account for every type of observed behaviour, and thus is not amenable to refutation. In fact, Popper observes that the explanation of most types of behaviour is what makes the theory attractive to others; this same characteristic is what makes it pseudo-science in Popper's eyes (Popper 1972:75). In the IS Use literature, in chapter 3 we read that Davis (1989) refers to Theory of Reasoned Action (TRA) that has its roots in social and cognitive psychology, which is very general and designed to explain nearly any human behaviour. Given that TAM is based on a psychological theory, the psycho-analysis example is apt for our purposes. TAM is seen as a dominant theory in the IS Use literature since its introduction and it seems difficult to find a context of IS Use where TAM cannot explain for. Similarly, this is a possibility for the idea of Task, System and User triad introduced by Burton-Jones & Straub (2006).

Giving this example from the IS Use field does not mean that we could be certain from Popperian lens they are not scientific theory, but we could be certain that it helps to clarify that what might be seen as scientific theory from Kuhnian view , could possibly be seen as pseudo-science from Popperian view.

The heat discussion between Kuhn and Popper in Lakatos & Musgrave's (1970) book, however, shows it tends to be seen as a debate which was inconclusive because both sides clearly had a perfectly reasonable points.

5.2.3 Imre Lakatos

Lakatos started working with Popper at the London School of Economics in 1960 where he eventually became Popper's successor, though he died at an early stage of his career and before Popper. Lakatos aimed at correcting the problems of falsification to develop an improved rational model of scientific theory. He argued that a major problem with Popper's ideas is that the history of science is inconsistent with the falsificationist model. Popper argued that if scientific theories are falsified, they should be rejected. But, Lakatos argues that if this was the way in which science worked, many of the most successful theories of science would have been rejected. If falsificationism were really true, we would have rejected Copernican astronomy because it did not match the paths of the planets or their perceived size.

Imre Lakatos, in a way, tried to synthesis the Kuhnian viewpoint with that of Popper and called this endeavour the "Methodology of Scientific Research Programs". In fact, one of his major contributions to the philosophy of science is the principle of progressive research programme by which a science moves forward. Research programme is based on a "hard core" of theoretical assumptions that cannot be abandoned or altered without abandoning the programme altogether. The defense of the core is conducted by the elaboration of auxiliary hypothesis. Lakatos proposed specific terms for the core and auxiliary hypotheses. The latter is called the protective belt while the former is the hard core. These are also referred to as heuristics: positive heuristic and negative heuristic. The negative heuristic rules are tacit rules that scientists within the research program accept, so the hard core is never questioned. The positive ones allow the modification or addition of auxiliary hypotheses to protect the hard core and modify the protective belt.

The relevance of explaining Lakatos argument in this chapter is that Kuhn in his response to Lakatos' critiques of *the structure of scientific revolution* tends to demonstrate the similarities between the two more than opposing Lakatos. In a sense his idea of research programme is similar to Kuhn's paradigm. He tried to replace Kuhn's paradigm with a research programme guided by Popper's logic of scientific development. Both are referred to for meta-theoretical guides to inquiry (Walker, 2010). Kuhn can probably be seen as closer to Lakatos in terms of having similarities in theory arguments than to Popper. Walker (2010) says:

> *"Unlike Kuhn and Lakatos, Popper sought to apply his ideas directly to the social sciences. Yet any cursory view of Ph.D. reading lists or citation indices show that Popper's philosophy of science has become overshadowed by those of Kuhn and Lakatos"*

From Silva's (2007) point of view, if we take Lakatos' lens and consider TAM, the hard core would be TRA (i.e. the theoretical assumption that postulates that all actions are caused by beliefs). The auxiliary hypotheses of TAM, its protective belt, would be constituted by the different additions made by researchers committed to this research program to protect the hard core from anomalies. For example, TAM researchers have added new constructs to the model with the purpose of explaining unexpected results. Some of those added constructs are prior experience (Taylor & Todd 1995), gender (Gefen & Straub 1997; Venkatesh & Morris 2000), and voluntariness (Venkatesh & Davis 2000). The metal-analysis of TAM by Yousafzai *et al.*(2007) shows all these added constructs. Silva (2007) explains as:

> *"In light of Lakatos' methodology of scientific research programs, I argue that the complementary constructs and additional theoretical explanations were added by TAM researchers to protect the hard core. These additions can be considered auxiliary hypotheses that have been incorporated in the protective*

belt. In this sense, it is also worth mentioning that in my reading of the TAM literature, I could not find papers that challenged the hard core."

Yet, Silva argument is published in 2007. As explained in chapter 3, Burton-jones & Straub(2006) challenge the hard core of TAM and introduced a new conceptualisation of IS Use and IS Use researcher are referring to them more and more to study the multi-dimensionality of IS Use. So, in a sense, the triad of Burton-Jones & Straub (2006) has the capability of being a hard core in near future. Also when reading discourse 6 on life domains, we face a distinct set of assumptions which is different from other discourses in chapter 3. So it is also important to consider which viewpoint will remain the gate open for more distinct and alternative views.

In contrast, Paul Feyerabend has argued that the emergence of 'paradigm' mentalities, as depicted by Kuhn and Lakatos, leads to narrow, rigid, highly specialized, and conservative research approaches that suppress alternatives.

5.2.4 Paul Feyerabend

One of the influential supporters of alternatives was the Austrian philosopher Paul Feyerabend who also studied under Popper's supervision, but adopted a very different position to that of Lakatos. Starting with Kuhn's view that 'paradigm shifts' do not occur on the basis of reason alone, Feyerabend went on to develop what is known as an *anarchistic philosophy of science*.

In his book, *the conquest of Abundance*, he critically mentions the term 'paradigm' inspired by Kuhn "...that despite the relativistic tricks inspired by Kuhn's idea of a paradigm, many scientists have lived and are still living with ambiguity and contradiction". Rather, Feyerabend speaks of worldviews. He defines a worldview as "a collection of beliefs,

attitudes, and assumptions that involves the whole person , not only the intellect, has some kind of coherence and universality , and imposes itself with a power far greater than the power of facts and fact-related theories." In *Against Method*, he uses the term ‘paradigm’ only for the purpose of his discussion in defence of Galileo's Ideas. However, in his discussion of ‘paradigm’, Feyerabend does not go as far as Kuhn.

The relevance of Feyerabend’s idea to this thesis is that he has shown more emphasise on the importance of pluralism and diversity compared to Kuhn, Popper and Lakatos. He argues that science and its philosophy provide the greatest threat to diversity. He claims that scientific method, science's dominant role in society, and philosophy, suppress freedom and marginalise diversity. Fourie (2002) explains Feyerabend main arguments in three points:

- Firstly, Feyerabend argues that scientific method interferes with the freedom of scientists and the complexity of scientific practice.
- Secondly, Feyerabend maintains that science's dominance in society stifles non-scientific alternatives and the autonomy of citizens to choose between science and these alternatives.
- Thirdly, Feyerabend argues that philosophy necessarily suppresses difference by associating knowledge with simple abstract theories, instead of the pluralism of the concrete world.

Feyerabend's solution to accommodating diversity is to eradicate science's dominance in society. He aspires to construct a free society that will regard science as equal to all other non-scientific alternatives, and that will increase the autonomy and freedom of both citizens and scientists by eliminating the principles and ideologies imposed on them by scientific and rationalist intellectuals. Feyerabend’s argument draws upon a wealth of material but can be summarised as proceeding along one main line which is the claim that for science to progress

all possibilities needs to be considered: science involves thinking the unthinkable. And progress is most likely to occur in a climate of intellectual anarchism in which ‘anything goes’.

Feyerabend, however, could be considered unsuccessful in providing a way of accommodating diversity. Fourie (2002) argues as: Firstly, that Feyerabend's free society fails to accommodate diversity successfully. Secondly, Feyerabend's condemnation of philosophy is flawed because philosophy can be successfully used to express difference. Thirdly, Feyerabend seems to be suppressing scientific knowledge and elevates non-scientific which could be problematic again.

In relation to IS Use field, chapter 3 shows that IS Use story looks more like an example of proliferation, as understood by Feyerabend (1970). There is a dominant TAM, Davis (1989) who was funded by IBM, which seems overshadowing most alternative conceptualisation of IS Use, if not suppressing them. Yet chapter 3 shows a proliferation of perspectives from which IS Use is discussed, which is much more appropriately discussed in terms of proliferation than in terms of shift from one dominant paradigm to another. It is possible to assume Feyerabend might be supportive of everyday life view of IS Use and rejecting TAM contributions to the field. However, elevating one and suppressing the other would not help accommodating diversity of IS Use discourses.

Overall, Feyerabend's view alone would not seem sufficient to help with diversity and development of IS Use discourses. One reason is that Feyerabend has not specifically focused on the idea of ‘paradigm’ in science as Kuhn did. Second reason is that, though he supports diversity he is not seen successful in providing a way of accommodating it. We still need to rely on Kuhn's contribution to our understanding of how ‘paradigms’ operate in science along with its critiques.

5.2.5 Margaret Masterman

Margaret Masterman (1910 – 1986) was a British linguist and philosopher, most known for her pioneering work in the field of computational linguistics and especially machine translation. She criticised Thomas Kuhn for his use of the concept 'paradigm'.

Masterman describes Thomas Kuhn's effort as 'scientifically perspicuous and philosophically obscure' which inspired her to make an effort towards the clarification of the nature of 'paradigm'. She believed that until the Fourth International Colloquium in the Philosophy of Science, in 1965, no attempt had been made to elucidate the notion of 'paradigm'. According to Masterman, on one hand Kuhn's form of thinking is complex, but not opaque, which makes paradigm elucidation genuinely difficult for the superficial reader, on the other hand those who provided a critique on Kuhn's work have overlooked examination of Kuhn's conception of 'paradigm'. She explains as:

> *"For not only is Kuhn's paradigm, in my view, a fundamental idea and a new one in the philosophy of science, and therefore one which deserves examination , but also, although Kuhn's whole general view of the nature of scientific revolutions depends on it, those who attack him have never taken the trouble to find out what it is. Instead, they assume without question either that a paradigm is a 'basic theory' or that it is a "general metaphysical viewpoint"; whereas I think it is in fact quite easy to show that, in its primary sense, it cannot be either of these."(p.61)*

Masterman (1970) criticises Kuhn for using the term 'paradigm' with not less than twenty-one different senses:

- 1) As a universally recognised scientific achievement
- 2) As a myth

- 3) As a ‘philosophy’, or constellation of questions
- 4) As textbook, or classic work
- 5) As a whole tradition, and in some sense, as a model
- 6) As a scientific achievement
- 7) As an Analogy
- 8) As a successful metaphysical speculation
- 9) As an accepted device in common law
- 10) As a source of tools
- 11) As a standard illustration
- 12) As a device, or type of instrumentation
- 13) As an anomalous pack of cards
- 14) As a machine-tool factory
- 15) As a gestalt figure which can be seen two ways
- 16) As a set of political institutions
- 17) As a ‘standard’ applied to quasi-metaphysics
- 18) As an organising principle which can govern perception itself
- 19) As a general epistemological viewpoint
- 20) As a new way of seeing
- 21) As something which defines a broad sweep of reality

Masterman then, categories the twenty one conceptions of ‘paradigms’ into three categories:

1. Metaphysical paradigms--equalling those uses in which Kuhn “equates ‘paradigm’ with a set of beliefs” as a metaphysical notion or entity, rather than a scientific one.

2. Sociological paradigms--when used in a sociological sense, i.e., as a universally recognized scientific achievement (p. x). However, the only explicit definition of a ‘paradigm’ is a set of

scientific habits which are concrete and observable which Kuhn collects them under the name of a concrete scientific achievement. This is the sociological notion of ‘paradigm’ by Kuhn as opposed to being seen philosophically.

3. Construct ‘paradigms’--when the term is used in a more concrete way, such as an actual textbook or classic work (p. 10). Kuhn's construct of ‘paradigm’, according to Masterman, is less than a theory, since it can be something as little theoretic as a single piece of apparatus: i.e. anything which can cause actual puzzle-solving to occur

What is the relevance and importance of explaining Masterman’s critiques of Kuhn in this chapter?

Masterman provided us with a list of twenty one conceptions of ‘paradigm’ but her point was not that the word is ‘up for grabs’:

> *“It is evident that not all of these senses of “paradigm” are inconsistent with one another: some may even be elucidations of others” (Masterman 1970, p. 65).*

She believes though these conceptions are crude, the crudeness is not the problem. But there is diversity of conceptions and some inconsistency between them, however not all conceptions are inconsistent, some maybe are the elucidations of others. She asks:

> *“Given the diversity of conceptions of paradigm, is there anything in common between all these conceptions?” (Masterman, 1970, p.65)*

Kuhn agrees with Masterman that the way the term ‘paradigm’ is treated in *the Structure of Scientific Revolution* is badly confused, and considers Masterman’s critiques helpful in developing the concept of ‘paradigm’. However, it is not clear whether this specific question of Masterman was answered by Kuhn in Lakatos & Musgrave’s (1970) book. Shortly in

response to Masterman, Kuhn helps the reader to be aware of his decision in changing the term. The first definition is what Kuhn (1970, p.181) has called "the constellation of group commitments". He has therefore chosen to call this notion of 'paradigm' a disciplinary matrix[3].

Unfortunately, this reformation of the concept has not satisfied most of Kuhn's critiques (Shapere, 1984). The original criticism can be reduced to two points: that the concept is ambiguous in that it refers to so many aspects of the scientific process that his thesis is almost nonfalsifiable; and that it is so vague that it is difficult to identify the specific 'paradigm' of a discipline (Vasquez, 1998). The problem of ambiguity is quite severe, at times it seems that the 'paradigm' concept refers to a set of research questions, the publication of seminal work that changes inquiry in the field (exemplar), a particular theory, an epistemological viewpoint or a method of investigation (Masterman 1970, p.61-65)

Clearly, lack of inconsistency among the conceptions of 'paradigm', and focusing on one of these conceptions while ignoring the others will produce a very different description of a field. This ambiguity need to be addressed by providing a platform which enables members of a sub-community such as IS Use community to share and have relative consensus in problem-choice.

5.3 Overview

The debate about 'paradigms' is not yet sufficient to help make sense of the diversity and development of the IS Use field. Each of the scholars has provided an insight that helps

[3] "All of the objects commitment described in my book as paradigms, parts of paradigms, or paradigmatic would find a place in the disciplinary matrix, but they would not be lumped together as paradigms, individually or collectively" (Kuhn, 1970, p.271)

towards understanding, but even when taken together they are not sufficient. It is worth summarising them all in terms of what insight they offer and how they are limited.

Kuhn's idea of ‘paradigm shift’ can help make sense the development of perspectives from discourse one (e.g. Davis (1986) TAM) to discourse two (e.g. Burton-jones & Straub’s (2006) Triad). However, it cannot help make sense of the others. Also Kuhn cannot help make sense of the diversity. The issue of diversity in research centres on the philosophical view that one holds of scientific development.

Applying Popper’s principle of demarcation draws our attention to the falsification criterion. Popper’s falsification automatically encourages the production of the alternative theories to the dominant one. Yet, diversity in the IS Use field draws from other disciplines such as psychology and sociology. While Popper’s view might be useful for supporting diversity in a logical arena, it would not be useful to support the diversity in these areas (i.e. Psychology, Sociology, etc). The external view of diversity is best conveyed by Whitley (2000) who argues that many of the factors that influence the choice of research problems as well as the research methods used to address them, do not stem from the field itself, but originate from outside the field.

Lakatos’ work is seen as a synthesis between Kuhn and Popper. It helps in clarifying that what we are looking for is not the narrow idea of ‘paradigm’ as ‘exemplar’, as in Kuhn 1960s, but the wider idea of a research programme, which includes a set of meaningful assumptions, to which researchers are committed. However, he is not telling us about how the emergence of new research programmes could be accommodated.

Feyerabend, in contrast to Kuhn, helps us to understand the importance of diversity. However, Feyerabend cannot help with the diversity of research problems as his approach mainly suffer from the tension between scientific activity and freedom of the researchers.

Masterman shows that the idea of ‘paradigm’ itself is still in need of clarification. This shows that even when the twenty one conceptions were taken together (as perhaps happened in Kuhn's (1970) new idea), they are not yet sufficient to make sense of the diversity and development of the IS Use field, and hence a new understanding is needed.

The critiques of Kuhn in this chapter are to his landmark book, *The Structure of Scientific Revolutions* (1962), Kuhn (1970) responded to the lack of clarity about the meaning of ‘paradigms’ by discussing this issue at length in a “postscript” that he added to the later editions of his book. In response, Kuhn wished that he had used a different term like *disciplinary matrix* to summarize the various forms of group commitments and consensus that we now associate with ‘paradigms’. He himself never actually adopted the term *disciplinary matrix,* however, and even though his later work (e.g., Kuhn, 2000) tended to avoid references to ‘paradigms’, that word and all its variant meanings is now a central concept in scholarly work (Morgan, 2007). As a result, it is all too easy for IS researchers to talk about ‘paradigms’ and mean entirely different things.

5.4 Conclusion

In this chapter, we have explored notion of ‘paradigm’ from Thomas Kuhn’s point of view. As we have seen, Kuhn’s notion of ‘paradigm’ is seen as the dominant one in the philosophy of science pervades into various disciplines. However, it has received critiques since publishing his book on *the structure of scientific revolutions*. His idea of ‘paradigm’ went through modifications after the critique. IS literature seems not to have taken into account the

whole discussion of ‘paradigm’ between Kuhn and his opponent views. Among the opponents, Feyerabend seems to be the supporter of diversity. Claiming, however, that Feyerabend wants to promote diversity within science is still not a sufficient description of his ideas about science. Feyerabend's primary concern is with diversity within society, not science. Masterman, in contrast, points to the diversity of ‘paradigm’ conceptions in Kuhn’s work and lack of consistency between some of them as an issue that needs to be addressed.

Those discussed the idea of ‘paradigm’, but do not provide a basis by that we can differentiate the IS Use discourses and address their diversity and development. This requires new ways to investigate them. As will be seen in the next chapter, it may be captured by reference to multi-aspectual philosophy.

Chapter 6 LITERAURE REVIEW PART 4: DOOYEWEERD'S PHILOSOPHY

PART A

6.1 Introduction

This chapter explains the proposal for this thesis. It contains two parts: Part A and Part B. Part A explains the proposal based on the belief that philosophy can help us to address the diversity and development of the IS Use field outlined in chapter 1. Philosophy could be employed to give us frameworks for understanding the areas of concern, from which methodology can then be generated to help address the problems themselves. This thesis discusses one particular type of philosophy that questions the presuppositions that have underlain western thinking and produced our perspectives on technology for 2,500 years. Basden (2008) has suggested that an appropriate philosophy for doing this is that of Herman Dooyeweerd (1894 -1977). The aim of this chapter is to present Dooyeweerd's philosophy and discuss how they help us in making sense of the IS Use field.

The part A of this chapter starts with Why Philosophy (section 6.2), then introducing Herman Dooyeweerd and the difference in his philosophy (section 6.3, 6.4), continuing with one of the main Dooyeweerd's theory; the theory of ground motives (GM) (section 6.5), following by Dooyeweerd's theory of modal aspects (section 6.6), next would be why Dooyeweerd's aspects (section 6.7).

Part B explains how Dooyeweerd's philosophy might help to make sense of the IS Use field. It starts with application of Dooyeweerd's philosophy to understand diversity (section 6.8), Dooyeweerdian understanding of the diversity of generic research approaches is next (section 6.9), following by applying Dooyeweerd's philosophy to the conceptions of 'paradigm' (section 6.10), and then it proposes paradigm as meaningfulness (section 6.11), at the end part

B depicts application of Dooyeweerd's philosophy to understand development followed by conclusion (section 6.12, 6.13).

6.2 Why Philosophy?

Each of the IS Use discourses has been centred on the research problem to be addressed. How the diversity and development of them are understood is informed by the conceptual foundation assumed. It would be beneficial to find a conceptual understanding into which both diversity and development of IS Use discourses could be situated and which has the potential to shed a fresh light on the IS Use field.

According to Strauss (2004), philosophy tries to explain and discover the cohesion among different fields of understanding. It can widen the scope of research when an area of study has become too narrow to answer practical questions. This is helpful in examining the nature of IS Use with a broader view. Basden (2008) argues that to consider, discuss, and formulate a framework for understanding for any area of study requires some reference to philosophy.

This study employs Dooyeweerd's philosophy for understanding the IS Use field. This philosophy is used to address the calls for reconceptualising the IS usage, IS development and other issues, and demonstrate that philosophical tools can bring fresh insight to vexing problems.

6.3 Herman Dooyeweerd

Dooyeweerd was professor of jurisprudence at the Free University of Amsterdam, and a contributor to many debates on Dutch government strategy and policy. He sought philosophical roots for his work in the Dutch Calvinian tradition, because he was dissatisfied with western philosophy. He investigated its ground motives in ancient Greek thought, Mediaeval and Scholastic thought, and Humanistic thought of the current era. This was

because he believed that all these diverse kinds of thought were heavily influenced by a presupposition of the self-dependency of theoretical thinking or some other thing or activity in the cosmos, and this, he argued, inevitably led the theoretical thinking of a community into antinomies or reductions (Basden & Burke, 2004).

Dooyeweerd published his main work, *A New Critique of Theoretical Thought*, in 1955, but it is only now that interest in his work is growing. His thought speaks particularly to the postmodern situation and addresses the diversity that characterizes contemporary life, in a way that involves a definite normativity and a respect for coherence (Basden & Wood-Harper 2006).

6.4 The Difference in Dooyeweerd's Philosophy

"All else is a footnote to Plato" (Whitehead, 1929). This means that Plato offered an ideology and a presupposition which has been crucial in shaping most of western thinking such as neo-Kantian thinking. But, Basden (2001) explains that Dooyeweerd's thinking was not a footnote to Plato's idea, because he started from different presupposition (Basden, 2001, 2002; Basden & Wood-Harper, 2006). Likewise, Eriksson (2006) see Dooyeweerd's philosophy, among other things, a reaction against the dominant continental thinking. Some of the differences in Dooyeweerd's philosophy could be explained as follows:

6.4.1 Meaning and Existence

Thinking which is derived from Greek scholars' presupposition is based on 'being' and existence that persist over time. As Clouser (1996) states "on the ancient view a whole is, in Aristotle's words, "prior to" its parts in the sense of being basic to them. A part cannot exist, or function, or be understood apart from the whole of which it is a part". Whereas Dooyeweerd maintained that meaning is the most fundamental and being (existence) is

derived from meaning. To Dooyeweerd things are meaning and do not have meaning as a kind of property (Basden & Wood-Harper, 2006).

This Meaning is what we experience in our everyday life. It is different from the meaning we attribute to other things because of our sovereign egos. It is also different from the meaning which is the content of a sign, as it is studied in the field of semiotic. Basden & Wood-Harper (2006) explain from Dooyeweerdian point of view these types of meaning are based on, and enabled by, a deeper type of Meaning. Meaning is "*a framework within which we live freely, being, doing, knowing and attributing subjective meaning of our own to things" (Basden &Wood-Harper, 2006).*

6.4.2 Law and entity

Another point of difference between Dooyeweerd and others is how law and entity and their relationship are conceived. Basden & Wood-Harper (2006) compare Peirce's (1898) belief with Dooyeweerd's. Peirce gives priority to entity who said "the first germ of law was an entity", whereas Dooyeweerd believed that entity emerges from law. Dooyeweerd's idea on law and entity is explained by Basden & Wood-Harper (2006) as:

> *"Dooyeweerd differentiated sharply between the law side and entity side of the cosmos. The entity side comprises all that exists or occurs in the cosmos, as concrete, observable reality and includes all our experience, past, present, future and potential. The law side comprises the framework within which all can exist or happen and is not directly observable. Universals cannot be found within the entity side nor can they be derived therefrom as various forms of empiricism hoped, but only in the law side."*

6.4.3 The nature of philosophical and theoretical thought

Dooyeweerd made a thorough study of western theoretical thought over the past 2500 years, maybe deeper than Kant. Dooyeweerd believed that theoretical though was not sufficiently critical and self-critical (Basden, 2002). Basden & Wood-Harper (2006) explain this as:

> *"Dooyeweerd refused to presuppose that we can take for granted either the nature of philosophical and theoretical thought or even that they are important. Instead, he undertook a 'new critique of theoretical thought' which made the theoretical attitude itself a critical problem for philosophy."*

According to Clouser (1996), Dooyeweerd offered two transcendental critiques of the conditions for theoretical thought and argued that it is based inescapably on self-dependant presuppositions or as Basden & Wood-Harper (2006) say "an extra-theoretical religious root".

6.4.4 Dignity of everyday life

Dooyeweerd fundamentally distinguished everyday life, pre-theoretical attitude, from disciplines that have arisen from the theoretical thought that is science (Basden, 2002). In fact, Dooyeweerd provided the critique of theoretical thought in the context of everyday life. Basden & Wood-Harper (2006) explain it as:

> *"For most of our history, the everyday, pre-theoretical (or 'naïve') attitude has been deemed inferior to the theoretical or scientific attitude. Husserl and the phenomenologists started to afford some dignity to the everyday 'lifeworld', by using it, and especially its stock of assumptions, to explain inter-subjectivity. But Dooyeweerd afforded the lifeworld even more dignity by making it the*

starting point for his thinking rather than merely an object of study. It is with the lifeworld that his 'new critique' starts."

6.4.5 Non-self-dependence

Most western thinking presupposes that there is a self-dependant explanation of cosmos within the cosmos itself. This is seen in Ancient Greek philosophy with focus on entities as well as hermeneutic tradition with focusing on human life and existence. Whereas Dooyeweerd argued that nothing in cosmos is self-dependant and all depends on a transcendent Divine creator for its meaning, its existence and its ability to act, even though there is immense freedom in these.

Dooyeweerd's presupposition on non-self-dependency of everything in cosmos lies at a different ground motive. In contrast to western thinking which has been driven by three ground motives—the motives of form–matter (Greek), nature–grace (mediaeval) and nature–freedom (modern)—Dooyeweerd adopted the creation–fall–redemption ground motive (Hebrew).

Theory of ground motives is one of five domains of though in Dooyeweerd's work in philosophy. The other four are; the theory of modal aspects, the entity theory, and the social theory, the theory of time. These are five distinct, yet interrelated, domain of thought.

For the purpose of this thesis both the theory of religious ground motives and the modal theory will be applied as tool of investigation. So, next section starts with explaining the theory of ground motives.

6.5 Dooyeweerd's Theory of Religious Ground-Motives

In his study of Western philosophy, Dooyeweerd has identified four religious ground-motives (GM) (Eriksson, 2006). The philosophical activities in western world are identified by these

four GM, which are essentially religious in nature. According to Dooyeweerd, three of them have an inner tension, because they have abandoned religious faith (Dooyeweerd, 1955, vol. I cited in Eriksson, 2003).

6.5.1 The Form-Matter Ground-Motive

The first of the four religious ground-motives is called Form and Matter. It marks all Ancient Greek thinking. The dialectic of these two divine principles can be seen in the Aristotelian philosophy (Clouser, 1996; Eriksson, 2006).

According to Dooyeweerd (1955), Form and Matter are the two principles controlled all Greek thought (Basden, 2008). Eriksson (2003) explains the history behind this GM as:

> *"During the early period of Greek history worship centred essentially on natural powers; thus the Greek religion was a nature religion. It implied a worship of a formless stream of life out of which generations of beings periodically emerged. These beings were all subjected to death, fate and decay. This includes a continuous process of coming into being and passing away. The stream of life can only continue if individuals at the end of their assigned life are absorbed again. Individual man and beings are doomed to die and decay so that the cycle may continue. At a later stage a new type of religion arose. This was a culture religion, as represented in the Homeric gods dwelling on Mount Olympus. These gods had left mother earth with her eternal cycle of life and death, and acquired a personal and immortal form of splendid beauty. They became gods of abiding form, measured harmony."*

The combinations of the culture religion and the nature religion gave rise to the inner dialectic of the Greek Form and Matter ground-motive. They are briefly explained as follows:

- The culture religion contributed with the principle of form, i.e. abiding being, light and heavenly splendour, as well as reason (Eriksson, 2003).
- The nature religion, on the other hand, contributed with the principle of matter, that is, mortality and change, the elements of unpredictable mystery and the formless dark (Eriksson,2003).

6.5.2 The Creation–Fall–Redemption Ground-Motive

The second religious ground-motive is the creation–fall–redemption (CFR). This is the biblical ground-motive, which is shaped by the Scriptures and Hebrew view of things. It constitutes the Archimedean point that determines all Christian activity. Eriksson (2003) explains CFR as:

> *"The creation–fall–redemption relation is set by God as Creator, who gives His law to which creation is subordinated. In the Fall, humans separate themselves from their relation to God. Redemption is thus required to allow a full restoration and reintegration. Thus, this ground-motive is the religious presupposition of any theoretical thought that may claim a biblical foundation."*

As Dooyeweerd argues CFR ground-motive is beyond the reach of a theoretical investigation.

6.5.3 The Nature–Grace Ground-Motive

The third religious ground-motive is named the Nature–Grace. This ground motive emerged as a result of synthesis of CFR and Form-Matter ground motives in the medieval period.

This GM also contains a dualistic dialect. Being a dualism, on one hand we have natural theology which most thinkers would have thought of it as lower level of nature (Nature), one

the other hand we have revealed theology treated as higher level of super-nature (Grace). In another word, Nature representing materialistic view of life, while Grace representing the view of God as transcendent pure form (Eriksson, 2003).

The synthesis philosophy of medieval period is well-explained by Erkisson (2003) as:

> *"Christianity developed a synthesis that culminated in the great scholasticism of the middle Ages. The nature–grace ground-motive came to its most articulate expression in the philosophy of Thomas Aquinas. It stated that human nature is weakened by the Fall and directed by a common natural law and the natural light of reason. Christianity, the Bible, faith, all these are specially added items. The natural man is not the radically fallen but a man endowed with reason that is one and the same in all men, and therefore the basis of all common neutral and autonomous areas of life. In the nature–grace ground-motive there was an implicit possibility of secularism. This so, because if it is true that there is a whole realm of nature and if that nature possesses a certain amount of autonomy, then there is nothing to prevent the area of nature from going alone—there is no reason why whole areas of life may not be secular. Aquinas' position though was that the realm of nature was the primer and necessary step toward the realm of grace. Hence, there was a necessary link and order between the two realms*."

However, Ockham, one of the main figures of medieval philosophy, place these two poles of thinking about reality as far apart as possible, as though these two areas have nothing to do with each other. This means Ockham believed Biblical view is so separated from scientific view.

6.5.4 The Nature–Freedom Ground-Motive

Unlike the philosophy of the middle ages which was based on the nature–grace Ground-motive, the philosophy of the modern era was found on the nature–freedom ground motive.

The philosophy of the Renaissance is characterised by the realm of freedom accompanied the realm of nature. Nature-Freedom emerged from Nature-Grace ground motive as result of replacing God by autonomous man at the centre of the realm of Grace.

This replacement, however, has not solved the tension between the realm of freedom and realm of nature. This is because nature is understood as "a set of scientifically discerned mechanical laws and processes which gives no room for autonomous freedom" (Eriksson, 2003). Therefore, the problem of modern philosophy was to find a way of bridging the gap between the two poles of thinking.

According to Eriksson (2003) Immanuel Kant can be considered as the father of the Nature–Freedom GM. Eriksson (2003) explains the Kant's attempts in resolving the gap in order to resolve the tension between the nature and freedom poles which was constructing a bridge between the two realms with the help of imagination (Eriksson, 2003). However, as Basden (2008) explains Dooyeweerd believed that these attempts would lead to further splits, because the Nature-Freedom GM cannot allow Nature and Freedom to integrate.

It is the Creation–Fall–Redemption (CFR) Ground-Motive which theory of modal aspects is driven from by Herman Dooyeweerd.

6.6 Dooyeweerd's Theory of Modal Aspects

Dooyeweerd's Cosmonomic Philosophy is a philosophical outworking of the CFR ground-motive. CFR makes it easier than do the dualistic ground-motives to philosophically address

the diversity of meaning and normativity encountered pre-theoretically in everyday experience (Basden, 2011).

Dooyeweerd introduced aspects of everyday life as "a way that appeals to our intuition, only later gradually exposing their nature" (Basden, 2008, p.63). To Dooyeweerd, everything functions in all aspects, Table 3. Each aspect has an irreducibly different meaning, and indeed may be understood as a distinct way in which things can be meaningful (a 'sphere of meaning') and good/bad (a 'sphere of law'). This means that aspects are ways of looking at things as well as ways in which things function. Because of this, aspects are not just subjective categories but underlie all human life. All aspects important and none can be ignored. This is because human activities function in varieties of aspects and none can be considered as more important than others.

Aspects have inter-modal cosmic coherence and no single aspect stands by itself; every-one refers within and beyond itself to all the others (Basden & Wood-Harper, 2006). Despite defining an order between aspects, Dooyeweerd believed his suite of aspects cannot be absolute truth and he was careful about representing them in a too systematic list.

To facilitate our discussion, nevertheless, it is useful to assemble a systematic list of Dooyeweerd's aspects. Table 3 shows these aspects with their kernel meanings.

Aspect	(Meaning)	Example Functioning (Good / bad)	Example Repercussions (Benefit / Detriment)
Quantitative	(Discrete amount)	Being-amount	Numeric order
Spatial	(Continuous extension)	Spreading	Simultaneity
Kinematic	(Flowing movement)	Moving	Dynamism

Physical	(Fields, Energy, mass)	Causality	Persistence
Biotic/organic	(Life, organism)	Life functions	Health, Growth
Sensitive/psychic	(Sensing, feeling, emotion)	Sensitivity	Interaction with world
Analytical	(Distinction, concepts, Abstraction, logic)	Distinction / Blurring	Confusion / Clarity
Formative	(Deliberate shaping, Technology, skill, history)	Planning, constructing / Laziness	Achievement, Structure / Failure, Mess
Lingual	(Symbolic signification)	Truth-saying / Deceit	Understanding / Misunderstanding
Social	(Relationships, roles)	Respect, Friendship / Hostility	Organisations / Enmity
Economic	(Frugality, resources; Management)	Frugality / Profligacy	Prosperity / destitution
Aesthetic	(Harmony, delight)	Orchestration / Frenzy	Beauty, Fun, Interest / Grotesqueness, Boredom
Juridical	('Due', appropriateness; Rights, responsibilities)	Responsibility, appropriateness / Oppression, inappropriateness	Justice / Injustice
Ethical	(Attitude, Self-giving	Generosity, humility /	Goodwill /

	love)	Selfishness, Greed	Defensiveness, More greed
Pistic/Faith	(Faith, commitment, belief; Vision of who we are)	Belief, Loyalty / Disloyalty, Idolatry	Trust, Dignity / Distrust, Decline

Table 3 Dooyeweerd's aspects

The apparent simplicity that the kernel meaning of each aspect in such a list implies is misleading. Within the sphere of meaning of each aspect is a whole constellation of meaningful concepts that are objects, relationships, properties, events, processes, perspectives, goals, constraints, freedoms, motivations, norms and the like. Meaningfulness is what often motivates us and in any research field meaningfulness is what governs the perspectives that researchers take. This will be argued later.

Numbers of authors have mainly referred to this part of Dooyeweerd's philosophy, his notion of irreducible aspects, and that is the part most used in this study. They were designed primarily with everyday life, pre-theoretical attitudes and experience in mind, but can be used as tools for theoretical analysis since theoretical analysis itself is part of the everyday reality that is governed by the aspects. For a given time and purpose (such as to address characteristics of IS Use field; Diversity and Development), with having critical distance, this research make temporary commitment to the Dooyeweerd's suite of aspect.

6.6.1 Use of Dooyeweerd's aspects as a tool for investigation

Dooyeweerd's philosophy has been applied to the field of IS by several authors.

- De Raadt (1995) presents a framework that integrates information systems design with an overall system design approach and which makes machines the servant of

humanity. The design approach is based on a combination of Dooyeweerd's theory of modal aspects and general systems theory.

- Winfield(2000), Winfield's 'Multi-aspectual Knowledge Elicitation' method used Dooyeweerd's aspects on their own to surface many meaningful concepts. Multi-Aspectual Knowledge Elicitation (MAKE)
- Eriksson (2001) take a situation where an implementation of a new business process, supported by a new computerized information system, has taken place causing some unpredicted and unwanted consequences and analyses this with the help of the theory of modal aspects. This leads to an identification of system design shortcomings.
- Basden (2002), through Dooyeweerd's theory of modal aspects gives a theory-like foundation for the information systems development (ISD). Aspects enable us to take a multi-aspectual view of IS that can address even tricky problems of multiple stakeholders and unintended and indirect impact.
- Mirijamdotter & Bergvall-Kareborn (2006), apply Dooyeweerd's theory of modal aspects into the process of gathering Rich Pictures and then into valuing models of Human Activity Systems.
- Basden & Wood-Harper (2006) review of some problems in CATWOE in Checkland's soft systems methodology and use Dooyeweerd's theory of modal aspects to enrich it
- Basden (2010) uses Dooyeweerd's theory of modal aspects and suggests a new approach, which views disciplines in terms of what is meaningful to those who work within them. With the help of aspects IS discipline could be given dignity, destiny and responsibility than just identity.

- Breems & Basden (2014) introduce a philosophical framework and apply Dooyeweerd's theory of modal aspects to a case study to demonstrate its potential in understanding the richness of computer procrastination.

Such diversity cannot be seen other than healthy when a new scientific school is establishing itself, as was the case with the early Frankfurt School and its critical theory (Burill, 1987, p. 8 cited in Erkisson, 2001)

6.7 Why Dooyeweerd's Aspects?

The significance of choosing Dooyeweerd's aspects in this study is that it considers 'Meaning' as a different presupposition from that of the conventional streams of thinking and allows us to seek for the implicitly held as important to IS Use Researchers, which in turn is enabling us to address the issue of diversity and development of IS Use discourses.

There are reasons to prefer Dooyeweerd's suite to those of others for several reasons:

Firstly, Dooyeweerd has wider coverage, and because of the scrutiny it has been subjected to, it is more likely to be applicable across cultures. Choi (2000) has applied Dooyeweerd's critique to Korean culture and thought. Also most aspects identified in the literature are a subset of the Dooyeweerd's aspects, so Dooyeweerd helps to look for issues that have been overlooked. For example, the hierarchy of needs by Maslow (1943) comprises only biotic, sensory, analytic, lingual, social, aesthetic and pistic (Basden, 2008, p. 66). Another example is Bunge's (1979) ontology of levels consists of the physical, biotic, psychic, formative and social aspects only.

Secondly, the Dooyeweerd's suite of aspects has been subjected to philosophical and historical scrutiny, by means of in-depth discussions of what has been written about each aspect by thinkers over the past 2,500 years (Dooyeweerd, 1955, vol. II, cited in Basden,

2008). Dooyeweerd's suite has discussed philosophically to a greater degree in terms of their characteristics and their philosophical roles. For example, Basden & Wood-Harper (2006) believe Hartmann (1963) discussed some characteristics and roles of his aspect-like 'strata' but Dooyeweerd's treatment is more comprehensive, and is necessary for the purpose of this study to address the complexity in the IS Use field.

Thirdly, Dooyeweerd made a clear statement (Dooyeweerd, 1955, vol. II, p. 556; cited in Basden, 2008) that any set of aspects, including his own, cannot be considered a final truth because separating them out depends on theoretical analysis; his set has a philosophical underpinning, but is only his best guess at the diversity of meaning., and this gives us explicit ways of testing and refining it.

Fourthly, Dooyeweerd suggested individuals can grasp the kernel meaning of each aspect through intuition rather than by exact definition. Aspect is beyond definition and there will be no perfect definition of any of the Dooyeweerd's aspects. Though the kernel meanings of the aspects can never be fully comprehended by means of theoretical (analytical) thought, Dooyeweerd claimed they can be 'grasped' by intuition. Both Winfield (2000) and Lombardi (2001) support this: lay clients could understand and work with the aspects after a short period of learning

So far, I proposed Dooyeweerd's philosophy and argued why it could be used for the purposes of this study. Part two of Chapter 6 explains How Dooyeweerd might help us in this study.

PART B

The second part of Chapter 6 intends to address the following question:

'How Dooyeweerd might help Make sense of the diversity and development of IS Use?

6.8 Applying Dooyeweerd's Philosophy to Understand Diversity

This section shows application of Dooyeweerd's aspects on Diversity of Reference disciplines, and Diversity of Research Methods as identified by Vessey et al (2002). Vessey et al (2002) expansion of Benbasat & Weber (1996) categories could be used here. This is because Vessey et al (2002) attempt is in itself a contribution to dealing with the ambiguity of the three categories. As mentioned in Chapter 3 they tried to break down the third type of diversity which is Diversity of research methods into Diversity in Generic approach and Diversity in Method. Yet, they have not addressed the vagueness in the Diversity of Problem. Diversity in generic approaches will be discussed in section 6.8.

Dooyeweerd promise is to deal with Diversity; what makes Dooyeweerd's proposal a foundation for diversity is that the aspects are irreducible, so that none can be derived from the others; he called this 'sphere sovereignty'. But sphere sovereignty on its own can lead us to fragmentation, because no aspect is complete on its own. Dooyeweerd also stressed 'sphere universality': that the aspects are closely intertwined with one another, leading to a coherence and harmony among them. Each aspect contains 'echoes' of all the others, and each is involved in a mutual inter-dependency with others. This is one foundation for coherence.

To show how Dooyeweerd's theory of modal aspects can be used as tool for analysis, Its application on the Diversity of Reference Discipline and Diversity of Research Methods in the IS Use Field is shown in Table 4.

Aspect	Diversity of Reference Disciplines	Diversity of Research Methods
Quantitative		Survey (D2, D3, D4, D5, D6[4])
Spatial		
Kinematic		
Physical		
Biotic/Organic	Health and Medical Science (D4)	
Sensitive/Psychic	Psychology (D1, D3, D5, D6)	
Analytical	Computer Science(D1)	Lab (D1, D2) Data Analysis (D1) Survey (D2, D3, D4, D5, D6)
Formative	Management Science (D4, D5) Computer Science (D1)	Survey (D2, D3, D4, D5, D6) Instrument Development (D6) Field Experiment (D1) Concept Implementation (D3)
Lingual	Computer Science	Literature Review (D1,

[4] D 1 stands for Discourses on IS Acceptance, D 2 stands for Discourses on multi-dimensionality of IS Use, D3 stands for Discourses on enhanced use of IS, D4 stands for beneficial use of IS, D5 stands for resistance to IS Use, and D6 stands for Discourses on everyday life domains.

	(D1)	D2, D4, D5)
Social	Sociology (D1, D3, D6)	
Economic	Economic (D4) Management Science (D4, D5)	
Aesthetic	Environment, Ecology (D6)	
Juridical		
Ethical		
Pistic/Faith	Organisational politics (D5)	

Table 4 Aspects of divers reference discipline and research methods in the IS Use Discourses

Table 4 shows three columns. Column one are Dooyeweerd's aspects. Column two shows the Diversity of Reference disciplines in each of the six discourses and their central aspect. In each discourse one might be able to find more Reference disciplines depending on how explicitly writers reveal the root of the theory, or their own background. For example when we one reads Davis paper on TAM understands the root of it is in social-psychology. Third column shows the Diversity of Research Methods within the discourses with aspects assigned to them.

The aspectual analysis of RDs and RMs shows that Dooyeweerd can account for diversity in these two. This fulfils Dooyeweerd's promise regarding each reference discipline and research method is centred on one main aspect. So it is reasonable to think that it might also

be able to account for diversity of discourses centred on the Research Problems in the IS Use field. Six different discourses of IS Use were identified intuitively at the end of Chapter 3, however that is not empirical based analysis. Chapter 8 is the empirical study of this thesis.

6.9 Dooyeweerdian Understanding of Diversity of Generic approaches

This section applies Dooyeweerd's philosophy to understand how it helps account for why dualistic or reaction approaches like P-I-C, H-S-C and TD-SCOT-SST are not helpful from Dooyeweerdian point of view. In chapter 4 it was argued these three sets of "paradigms" cannot help with the diversity and development of IS Use discourses. One of the reasons was that they fall into Hegelian dialectic approach as they have been reactional to each other throughout history. In this section the theory of GMs (explained in Part a. of Chapter 6) is used to support the argument in chapter 4.

The three sets of "paradigms" suffer from reductionism. Each of the "paradigms" tends to make phenomena intelligible by analysis, hence transducing phenomena of certain complexity to one of a lower complexity. This leads to lose insight hidden in the attempts made by another "paradigm". These could be seen in each of the sets.

Eriksson (2006) using Dooyeweerd's ideas of ground-motives, explains why H-S-C is problematic. According to Eriksson (2006) the communities of information systems including system thinking community have operated in a kind of internal intellectual conflict, having two seemingly opposing meta-theoretical positions. One is the positivistic foundation, as inherited from the natural science, while the second is the hermeneutic foundation as inherited from social sciences. To solve the tension between the two and offer a new and alternative theoretical and meta-theoretical foundation, Critical research approach was introduced by the proponents of the so-called Frankfurt School. This has been represented in the work of

Habermas (1984, 1987), the younger representative of Frankfurt School, on Critical theory (Eriksson, 2006).

Eriksson (2006) explains that Critical theory, among other things, offers a broader notion neither of rationality, not limiting itself to the goal-oriented or technical rationality, as the positivistic foundation tends to do, nor to the communicative rationality as the hermeneutic foundation tends to. Because of its Kantian foundation, Habermasian thought account for three kinds of rationality:

- Empirical analytic sciences, which focus on instrumental-reason and provide nomological causal knowledge that aims at prediction and control of nature
- Historic-hermeneutic sciences, which provide the practical understanding of other human beings
- Critically-oriented sciences, such as psychoanalysis and critical theory which provide emancipatory interest in freedom and overcoming unconscious compulsion.

The critical foundation offers a complementary notion of rationality that tries to bridge the gulf between the positivistic and the hermeneutic positions.

However, the Kantian and thus also approaches founded on Habermas have an inherent and unresolved theoretical conflict that makes its normative guidance blind and reduced to intellectual reasoning and argumentation (Eriksson, 1998, 2006). Eriksson (2006) criticises the critical position for accepting and promoting the intellectual supremacy of rationality.

We need to know that ground motives are not worldviews. Rather, they are generators of worldviews, and explainers of worldviews. The dualistic ground motives lead us to presuppose two ‘poles’, which are mutually exclusive at a fundamental level. Much of the history of Western thought can be seen as a dialectic between two poles of the prevailing ground motive. The difference between the positivist or ‘hard’ approaches and the ‘soft’ or

interpretive approaches can be explained through Nature-Freedom GM which is the main ground motive today. Interpretivism will always tend to be antithetical to positivism because freedom of interpretation is Freedom pole while laws that transcend us are Nature pole (Basden, 2011).

Nature-Freedom GM fuel debates that centre around determinism versus free will, science and rationality versus personality, brain versus consciousness, control versus freedom, etc. Dooyeweerd contends that poles of a ground motive can never be reconciled by means of theoretical thought such as Critical approach.

If we are to circumvent the problem of the Cartesian subject-object relationship, we need to understand what makes it problematic. Dooyeweerd (1955) located its root problem in pre-theoretical commitment to a dualism between nature and freedom, and this influenced the thought of both Descartes and Heidegger. Descartes' subject is presupposed to be free in its perceiving, thinking and acting, while his object is presupposed to be largely passive and unfree – of the nature pole. Heidegger could only remove the tension between subject and object by ignoring one of them, but this ultimately fails to fit everyday experience, in which subject and object both occur and neither can be ignored (Basden, 2014).

By similar argument, PIC and TD-SCOT-SST are also problematic. Root of problem is in dualistic ground-motive. Dualistic ground-motive also lies at heart of Burrell and Morgan framework.

Looking at Vessey et al (2002) study revealed what they mean by generic research approaches (explained in Chapter 3) are research "paradigms" such as positivist, interpretive and critical. These research "paradigms" similarly reveal themselves from the dualistic poles which end up with a kind of inconsistency and tension. Basden (2011) argue that the so-called generic

approaches (dialectical) are not enough for IS Use field and Dooyeweerd's philosophy could help as underlying framework for understanding this inconsistency.

Dooyeweerd could overcome the tension while retaining both subject and object by recognising that, to be a subject (agent) is constituted in being subject to law (thus re-integrating the two English words 'subject'). Law does not refer to subjectively or socially constructed laws, rules or norms, whether spoken or unspoken, but to the deep law that enables reality to Be and Occur, and by which Time itself is generated. Law often takes the form of promise, and is different for each aspect; for example, a law of the lingual aspect might be expressed as "If we make sense in terms of what the reader already assumes or believes, then the reader will understand better". What Dooyeweerd called the law side of reality includes the deep laws of all aspects together.

A similar tension has been encountered between Technology Determinism, Social Construction of the Technology and Social Shaping of Technology. This set cannot succeed in helping with diversity and development of IS Use discourses. From Dooyeweerdian point of view their root is in dualistic Ground Motives. Similar pattern may be detected that is similar to that seen in system thinking approaches by Eriksson (2006):

- TD, like hard system thinking, adheres to the Nature Pole.
- SCOT adhere to the freedom pole, like soft systems thinking (Checkland, 1989)
- Social Shaping of Technology, like critical systems thinking tries to integrate the two poles.

Dooyeweerd argued that the Nature and Freedom poles cannot be integrated under that ground-motive. So, to acknowledge insights in all these views, in a way that does not contain inner antinomy, requires shifting to a different ground motive.

Basden (2011) and Baden (1999) are two examples of how shifting to CFR can help. Dooyeweerd offers a non-dualistic ground-motive. This frees us to take a pluralistic aspectual view.

6.10 Applying Dooyeweerd's Aspects to Understand the Inconsistency of twenty one Conceptions of Paradigms

This section applies Dooyeweerd's philosophy as a tool on different conceptions of the idea of 'paradigm' as extracted by Masterman from Kuhn's text.

Aspectual explanation for Kuhn's 'paradigm':

- "Recognised scientific achievement"(p.x): This is Analytic aspect because it is distinguished and well-known to scientific community. Kuhn emphasis has been on distinctiveness of a scientific achievement. However, there are passages in which Kuhn only repeats "scientific achievement" as his understanding of paradigm which would be seen as formative aspect.
- "Myth" (p.2): "Myth" as out-of-date beliefs is Pistic aspect. "Myth" as a form of legend story that comes through one generation to another as established as a commencing belief is Pistic aspect.
- "Constellation of questions" (p.4): This seems lingual aspectual because of questions. The idea of 'constellation' might indicate harmony (aesthetic aspect), but the important thing about this usage is the questions that arise, and that this aesthetic harmony is important in almost all ideas of paradigm in the background. It could be thought as analytic aspect, because the questions would presumably be scientific ones about 'whether' and 'why', but perhaps the important thing is that it is indeed the communication of questions in the community; hence lingual aspect.

- "textbook"(p.10): This is certainly of Lingual aspect.
- “model” (p.10): This is primary of Analytic aspect
- “Scientific achievement” (p.11): "scientific achievement” is of primary importance to Kuhn and it is Formative aspect.
- 7)"Analogy"(p.14): This could be Analytic aspect, but analytic might be secondary. Analogy is of the aesthetic aspect. It is about metaphor, which is built on harmony. For example the analogy or metaphor in the arts such as poetry, hence Aesthetic aspect.
- “Successful metaphysical speculation” (p.18): If 'success' is about distinguishing itself competitively, then the 'success' is analytic, but success is often formative, because it is about achieving something. However, here the most important part of the phrase is 'Metaphysical speculation'. ‘Metaphysical speculation’ is about beliefs, hence Pistic aspect.
- "Accepted device in common law"(p.23): acceptance is social aspect. But it seems that Kuhn here means "pattern" such as what we have in grammar which is Formative aspect.
- "Source of tools" (p.37): 'tools' is Formative aspect. Source of tools is functioning in Economic aspect, “…..the conceptual and instrumental tools the paradigm supplies …”.
- “Standard illustration” (p.43): Illustration is Lingual aspect. Standard can be Social aspect when it is an agreed pattern; For example, the standard behaviour of pedestrians at traffic light is to help old ladies across the road safely. However, the 'standard' here might not be social but rather refer to 'typical', and hence reinforce the lingual.
- “Device” (p.59): This is mainly of formative aspect.

- “Anomalous pack of cards” (p.62): This is mainly of Analytic aspect. Anomalous is Analytic aspect.
- “Machine-tool factory” (p.76): If Kuhn means a source of tools, then it is Economic aspect.
- "Gestalt figure" (p.85): This is Pistic aspect. “…the marks on paper that were first seen as a bird are now seen as an antelope, or vice versa….” This is about the way of seeing. This is Pistic. Pistic is about our broad 'vision' of things.
- “Set of political institutions” (p.92): political is usually Juridical aspect, when used properly, in the sense of maintaining justice and what is appropriate. When It used to mean underhand dealing in an organisation, then it is Pistic dysfunction, but here it seems Kuhn means it in the proper sense. Institutions is Social aspect. However, It could be Juridical aspect because the emphasis here is about setting rules for what is appropriate
- “Standard’ applied to quasi-metaphysics” (p.102): This is Social aspect, in a sense of getting the community to agree about something. While metaphysics might be Pistic aspect, 'quasi' seems to me to indicate that Kuhn is downplaying the metaphysics part here.
- "Organising principle which can govern perception itself" (p.112) organising principle is Formative aspect. ‘Governing' means setting and reinforcing laws, which is Juridical aspect. However, Governing can also be Formative aspect if it really means 'controlling, shaping'.
- “General epistemological view point"(p.120): Viewpoint is Pistic aspect.
- "New way of seeing" (p.121): Kuhn refers to "lightning flash" that scientist speak of it, as something which enables a puzzle to be seen in a new way. This is Pistic aspect. Certainly if seeing means observing, it is psychic aspect, but Kuhn

is talking about a way of seeing which means a way of grasping. This is Pistic aspect.

- "Something which defines a broad sweep of reality" (p.128): Kuhn explains that 'paradigms determine large areas of experience at the same time'. Experience is formative aspect, yet it seems Kuhn means more than that, as if he does not want to be confined to just scientific achievement, maybe with saying '...Large areas of experience. .' he sees the multiple important things within the experience. If that is the case, then this is pistic aspect.

Aspects	Kuhn's various conceptions of Paradigm (Masterman , 1970)
Quantitative	
Spatial	
Kinematic	
Physical	
Biotic	
Psychic	
Analytical	"Model", "Anomalous pack of cards",
Formative	"Recognised scientific achievement", "scientific achievement", "Accepted device in common law", "device", "organising principle which can govern perception itself"
Lingual	"textbook", "Constellation of questions", "Standard illustration"
Social	"Standard' applied to quasi-metaphysics"
Economic	"Source of tools" "machine-tool factory",
Aesthetic	"Analogy",
Juridical	"Set of political institutions"

Ethical	
Pistic	“Myth”, "New way of seeing", "something which defines a broad sweep of reality”, "Gestalt figure" “General epistemological view point”, “Successful metaphysical speculation”,

Table 5Aspects of 21 conceptions of "paradigm"

Table 5 accounts for meaningfulness of twenty one different conceptions of paradigms as extracted by Masterman from Kuhn's text. It demonstrates six out of twenty one of these conceptions are centred on pistic aspect. Five out of twenty one are functioning in formative aspect. Three conceptions are functioning in lingual aspect. Two conceptions are economic aspect. Similar to economic aspect, analytic aspect is assigned to two conceptions. Each of the social, aesthetic and juridical aspect was assigned to only one conception.

Having six conceptions centred on pistic aspects affirms Kuhn’s argument on the importance of commitment of researchers to their perspective during Normal Science stage. The Five conceptions being centred on formative aspects affirm the process of progress in science. Having textbook, standard illustration and constellation of questions as lingual aspect highlights another scientific activity which is when researchers inform their professional colleagues of their achievements. Having two conceptions centred on analytic aspect seems to be in line with Kuhn’s agreement with Popper on the importance of logical activity of a researcher. Having two conceptions centred on economic aspect shed lights on mutability of paradigms. However, despite Kuhn’s emphasis on sociology of progress in science only one conception out of twenty one is functioning in social aspect. Role of harmony on everyday activity of research has received less attention with only one conception functioning in aesthetic aspect. Having one conception in juridical aspect in Kuhn’s view of paradigm would

not, perhaps, surprise Feyerabend who believed the science is not free from politics and injustice.

The above aspectual analysis reveals the multi-aspectual nature of paradigms. It suggests that the 21 meanings of 'paradigm', need not be seen as an inconsistency as Masterman suggests, but as aspects of one complex thing, the paradigm. This puts us in a position to discuss how Dooyeweerd might give further insight into the nature of paradigms in a way that can help us make sense of the diversity and development of the IS Use field.

6.11 Paradigm as Meaningfulness

Revealing the multi-aspectual nature of paradigms suggests paradigms may be understood as multi-aspectual human functioning. Both doing normal science within an existing paradigm and shifting to a new paradigm may be seen as multi-aspectual functioning.

As the table 5 shows, the pistic aspect of paradigm functioning involves several things related to ways of seeing, to perspectives. The pistic aspect is concerned with meaningfulness of the world, and meaningfulness is the most important component of research because it motivates individuals to make sense of their research and empowers them to cope with it successfully.

It was suggested above that in 'normal science' the pistic aspect refers to commitment of researchers to the paradigm's perspective on the field. If individuals have no sense of meaning they have no motivation to understand their field. During paradigm shift, the pistic aspect can refer to the belief in, and commitment to, a new perspective, a new way of seeing the field.

To Dooyeweerd, the later aspects provide wider meaning for functioning in the earlier aspects. The pistic is the latest aspect and hence provides wider meaning for all other aspects and influences those aspects of our activity. So, it is in the case of paradigms. The pistic perspective on the field influences such elements as the model that is used (analytical aspect),

what is recognised as a scientific achievement (formative aspect), which constellation of questions are posed (lingual aspect) and so on. When a new paradigm emerges, its pistic aspect influences the development of new models, provides new ideas of what it is meaningful to achieve, generates a new constellation of questions, and so on.

A perspective or way of seeing things implies adopting one way in which the reality that is being researched is meaningful, from out of the diversity of ways in which reality can meaningful. (The 'older' paradigm saw the field as meaningful in one way, and the new paradigm sees the field as meaningful in a different way.) This adopted way of seeing things then influences all other aspects of the activity of research within the paradigm. That may be summed up in the statement: Paradigms may be understood as meaningfulness.

A given kind of research problem, such as is found in chapter 3, is also linked to meaningfulness. A research problem is what is meaningful to a researcher as they do their research. When we pose a question in a research field it is because there is something meaningful to us about which a question is raised, a problem is detected, something is missing. A research problem is a question mark in the researcher's mind, determined by the way in which they find the field meaningful, but it has not come to the point of being answered.

A research problem is meaningful not just to the researcher but to the research community and so to other researchers. This gives rise to discourse, which revolves around what the community finds meaningful.

If we understand paradigms as meaningfulness, then this links paradigms with both discourses and kinds of research problem. Thus the three things that are important in this thesis are bound together by meaningfulness. This provides a sound basis for employing the idea of

paradigms as meaningfulness as a device that helps makes sense of the discourses and research problems.

Since each aspect is an irreducibly distinct sphere of meaning, this suggests that a paradigm (or a kind of research problem or a research discourse) will usually be centred on an aspect.

If Dooyeweerd's suite of aspects is suitable for investigating meaningfulness in everyday life as a whole, it should also be suitable for analysing the diversity of the Information Systems Use discourses and paradigms. The question is, how this may be achieved? The pistic nature of meaningfulness gives us a clue: look for what motivates those who work in, or generate, the paradigm. During 'normal science', the motivation is seldom stated because it is taken for granted, but during paradigm shift, the motivation for taking the new perspective is often clearly argued. Looking for motivations expressed in seminal papers of a given paradigm or discourse can therefore reveal what is deemed particularly meaningful in that paradigm. So the aspectual analysis of the motivations of the seminal papers can reveal the aspects that are at the core of each paradigm.

The idea that each paradigm is centred on an aspect can also help understand development of discourses in a field, which is discussed next.

6.12 Applying Dooyeweerd's Philosophy to understand Development

This section shows application of Dooyeweerd's philosophy on Development of IS Use discourses in the IS Use field. As argued in Chapter 4 three sets of 'paradigms' fall into Hegelian dialectical thinking which explains for development of theoretical thoughts. Whether Hegelian dialectical thinking is sufficient is discussed.

There are similarities between Dooyeweerd and Hegel as discussed in Basden (1999). Dooyeweerd mentions dialectic in a number of places in his *New Critique of Theoretical*

Thought (1955). But, in the main, this is merely explaining what others have said about dialectic, with the purpose of discussing other issues. Dooyeweerd understands Hegel quite well, though he uses the terms thesis, antithesis and synthesis more than Hegel did. He mentions several times the dialectic between individual and universal. Hegel's idea of a thing always containing its own contradiction means that the thing always refers beyond itself Negation is therefore firstly discovery of the gap and secondly an attempt to fill it. This idea that everything is radically incomplete, referring beyond itself, is central to Dooyeweerdian thought too. All things require and link to other things; all things are dependent.

However, there are critiques of Hegelian dialectical thinking in understanding of development. Hegel's view has been criticized as being rather mechanistic, with each thesis (e.g. Positivist, Hard System thinking and Technology Determinism) already containing in a deterministic way, its own contradiction, and there is little scope for human autonomy and the unpredictable (Basden, 1999) . This determinism has been interpreted as supporting the status quo, on the grounds that it is just the current state of the inexorable flow of ideas and history. Basden (1999) argue that while Hegelian Dialectical thinking is excellent as a tool that might help us structure our experience, it cannot predict, it cannot help us manage, and it cannot evaluate. To predict, manage and evaluate, we must be able to say something of the nature of the contradiction. Basden (1999) argues that Dooyeweerd's philosophy can help.

However, Dooyeweerd's philosophy goes beyond Hegelian dialectical thinking. The main contribution about dialectic from Dooyeweerd's own thought is the difference between two dialectics: religious and theoretical. Theoretical dialectic is the intentional opposing of the analytical aspect of theoretical thought to other aspects. It is relative in nature, and thus valid. In contrast, Religious dialectic is an implacable opposition of two poles, resulting from the absolutizing or deifying of an aspect and a corresponding reaction which claims absolute

opposition to the initially deified aspect. This religious dialectic or antithesis comes from idolatrous ground motives and "drives human action and thought continually in opposite directions, from one pole to the other." (Dooyeweerd, 1955, p.64,vol 1).

In this way Dooyeweerd reveals what he believes to be the engine of (religious) dialectic process: human communities of thought and action swing between the two opposing poles of dualistic ground motives. This engine, which we will call the ground motive engine, has a significant advantage over Hegel's one of being less deterministic, since its activity is the (absolutizing) actions of human beings.

Using Dooyeweerd's philosophy Basden (1999) develops the eight stage aspectual engine compares it with the three stage Hegelian engine. The three stage Hegelian engines are as follows:

1. 'Thesis', 'Understanding': Certain concepts are taken as well defined and sharply distinguished from one another. The inner contradiction is not yet visible.
2. By 'Negative Reason', 'First Negation', when we reflect on those concepts or categories, we find a number of contradictions occurring, and form an 'Antithesis'.
3. By 'Speculation', 'Positive Reason', 'Second Negation', a 'Synthesis' or 'Result' emerges that is a higher set of concepts that embraces the two earlier ones in a way that resolves the inner contradiction.

The eight stages aspectual engine is explained by Basden (1999) as follows:

1. Prevailing Neglect: In the prevailing view of people in a community, one aspect happens to be fashionable and is elevated, while another aspect is suppressed, or neglected.
2. Widespread Transgression: in the functioning of a significant proportion of the people in the community, the laws of N will tend to be transgressed, whether unwittingly or knowingly.

3. Harm Starts: These transgressed laws still pertain, however, and their transgression will yield harmful effects

4. Harm not recognised: The harmful results often have a time delay, and are slow in becoming manifest, so people tend not to notice them at first, and, when they do appear, ignore them.

5. Harm Felt and Noticed: As time passes, the harmful effects accumulate and become more common. Eventually they cannot be ignored altogether, and they are first felt, then noticed

6. Investigation and Discovery: Some, who are more adventurous or perhaps less satisfied, investigate and ponder these effects and discover the laws behind them.

7. Growing Popularity: Neglected aspect grows in popularity, as the key to understanding the harm that has befallen the community.

8. Repetition: Neglected aspect gradually assumes dominance, becoming elevated as the new fashionable aspect, and, after a while, different aspect (or aspects) becomes neglected, becoming the new neglect.

A major difference between the engines is in the core on which the engine is shaped. Hegel's engine centres on negation, whereas the Dooyeweerdian engine centres on the human actor and thinker (amplified by the prevailing view). In Hegel's engine, each thesis holds within it its own contradiction, its antithesis, and the dialectical process is, ultimately, merely the self-realization of the Absolute Idea. This gives Hegel's engine a more deterministic flavour: given a certain thesis, its antithesis is also given, and thus the historical process is determined. Little or no place was left for real human freedom; as Dooyeweerd (1955) said, "the 'creative freedom' of man in the historical process was reduced to the role of a puppet of the World-Reason." The Dooyeweerdian engines, by contrast, are centred on the human person in community as responsive and responsible actor. This accounts for human autonomy (Tarnas, 1991 cited in Basden,1999). Therefore the dialectical process, while it may occur, is not

determined in the direction it takes, and we can expect some surprises which Hegel's engine finds it hard to explain.

6.13 Conclusion

This chapter has introduced Dooyeweerd's philosophy and explained that part of it which is relevant to this research. It discussed reasons for using Dooyeweerd's aspects and religious ground motives and how they can help to deal with characteristics of IS use field. So the central proposal of this research is that Dooyeweerd's aspects and religious ground motives can provide a way of addressing complexity of IS Use field. However, this proposal needs testing. The next chapter discuss research methods for testing it, and chapter 8 show use of it as tool for investigation.

Chapter 7 RESEARCH METHODOLOGY

7.1 Introduction

This chapter is concerned with the approach to the empirical study in this thesis. The empirical research in this thesis aims to find out what is centrally meaningful in each of the discourses? This is achieved by analysis of excerpts from seminal papers that introduce each discourse. Seminal papers tend to explain what motivates the discourse, and thus what is particularly meaningful to them.

The chapter starts with the chosen research paradigm suitable to the research (section 7.2), this followed by set of principles for conducting the interpretive research (section 7.3), the choice of research method is justified (section 7.4) and then qualitative analysis of texts of seminal papers and research procedure are discussed (section 7.5, 7.6).

7.2 Chosen Research Paradigm

This section is concerned with the choice of research paradigm to use as the analytical framework for the empirical research. Choosing the appropriate paradigm must be approached with an open mind, since there is no one paradigm that is superior, and there are also options for multi-paradigm research projects (Mingers 2001: 240). The decision on the paradigm selection is usually based on the given research questions, the research context, the tradition of the discipline and the researcher's willingness to take a risk and challenge traditional beliefs both of the discipline and the researcher (Oates 2006: 304).

Positivism presupposes that the world operates by invariant, causal, largely mechanical laws. This is the origin of meaning that inspires it. Positivism tries to minimize expressions of freedom in both researcher and research world, it seeks quantified ‘facts’ obtained by empirical means (Basden, 2011). Of researcher, it demands detachment and suppression of

opinion, belief, ethics and pure reflection, and reduction to logical-statistical rationality in order to minimise free variability. Positivistic approaches are often used in the natural sciences.

In contrast to positivism, the interpretive position considers the methods of natural science to be inappropriate where human beings are concerned, mainly because different people will interpret the same situation differently (Braa & Vidgen, 1999). Research of an interpretive nature adopts the position that our knowledge of human action is a social construction by human actors (Walsham, 2006).

The interpretive epistemological position is appropriate for this research, because firstly, this study is trying to find out what is meaningful, and multiple explanations are to be expected. For example:

- Freedom of the researcher in the understanding and deciding what is the meaning hidden in each discourse of IS Use,
- The identifying the IS Use discourses and distinguishing them from each other ,
- And suggesting a way of improvement in understanding.

So a positivist approach is not suitable.

Secondly, it is not an attempt against the status quo in the IS Use field, nor it is trying to change it, so a critical approach (explained in Chapter 4 section 4.3.3) is not being adopted in the empirical work. .

7.3 The Methodology

7.3.1 A Set of Principles for Interpretive Field Research

Using the philosophical perspective of hermeneutics, Klein & Myers (1999) propose a set of principles which are mostly applied to the conduct and evaluation of interpretive research of a hermeneutic nature. However, they acknowledge there are many other forms of interpretivism that are not necessarily hermeneutic. For the purpose of this study, these principles are being applied for conducting the empirical interpretive research in Chapter 8 as follows:

1. The fundamental principle of the hermeneutic circle

This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form. This principle of human understanding is fundamental to all the other principles. Identifying the parts and the whole in a circular relationship and the fact that a whole could be treated as a part for a larger whole could be a primary step toward human understanding.

In this study I seek to understand what is meaningful to IS Use researchers by taking into account both the text excerpts but also I take notice of what is said in the whole paper.

2. The principle of contextualisation

This principle requires critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged.

The knowledge and understanding of each author, the context in which they conducted the study and the individuals who were studied are all changing. For the case of this research this refers to the academic context in which the authors wrote their papers. The motivation that comes from the academic context for conducting a research on IS Use and what the authors

were trying to criticise in other studies, to a large extent has shaped the current status of IS Use research. Therefore understanding these motivations are critical for this research.

To interpret the meaning, I take account of the context in the IS Use field in which the paper was written. For example, in chapter 3 we noticed that for Burton-Jones & Straub (2006) and others; the context is that TAM has become dominant. Burton-Jones & Straub (2006) were trying to attain the acceptance of TAM followers on the Triad of IS Use (i.e. Task, User and System). For this purpose they introduced an alternative to measuring IS Use. This means that their suggestion of quantitative measurement is secondary to their primary suggestion of a new framework, and is not to be taken as part of their motivation.

Following Principle 2, I examined texts for their historical context by taking account of text that appeared in the decade before each was written, the text they reacted to as being problematic- i.e. ignoring one or more aspects. I also look in the text for evidence of motivation, especially in the Introduction and Conclusion of each paper, taking note of value-laden wording.

3. The principle of interaction between the researchers and the subjects:

This principle requires critical reflection on how the research materials (or data) were socially constructed through the interaction between the researchers and participants. This is about bias arising in the researcher. It is especially directed to interviews etc., where the researcher might (knowingly or not) ask leading questions or might miss things out, and these affect the answers that are given. Researcher might also inadvertently 'bully' the interviewee into saying certain things. So, a good interpretive researcher will be aware of this, try to minimise bias, and discuss it at end.

This study is not using interviews etc. but rather gathering data from what other authors have written thoughtfully and which has undergone a peer review process that has forced them to express clearly what they meant. This means that this principle is less relevant for this research, since this will not affect what other authors say. However, biases can still arise from the way their text is interpreted, especially from the researcher pre-existing knowledge of, and like for, Dooyeweerd.

This study intends to take account of my possible biases in interpreting. However, having been attuned to multi-aspectual philosophy, this will be sensitive to many aspects beyond the conventional.

4. The principle of abstraction and generalization

This principle requires relating the idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action.

The emphasis on attempting to link what is particular in each study to a more general concept helps to build on the principle one and two. Both the results of the iteration between the parts and the whole, and understanding the motivation of authors in IS Use studies are the building blocks of the next stage in this research.

This principle guides this research to focus on a complete and in-depth understanding of what is meaningful to the authors in each seminal paper and then trying to specify which of the Dooyeweerd's aspects describe them better. It means I take the individual meaningful pieces from the excerpts, but generalise using aspects. For example, in the Health IT discourse catching up with IS Acceptance and improvement in health care, etc are all specific issues that

motivate the authors, and are thus meaningful to them, and these are generalised with assigning Economic and Ethical aspects to them.

5. The principle of dialogical reasoning

This principle requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings (i.e. the story which the data tell) with subsequent cycles of revision.

This refers to the need for the researcher to be willing to change their own theories or beliefs if the data goes against them. This study holds the prejudice that IS Use field is complex by nature and the diversity and development of IS Use discourses needs to be addressed. Literature review part 1, 2, 3 examine whether approaches in the IS discipline and the philosophy of science are enough. Literature review part 4 suggests that Dooyeweerd philosophy could provide a better framework to help with the diversity and development of IS Use discourses. For example, before starting the empirical work in Chapter 8 I expected that each discourse has a different aspect, but that I found that many discourses had two aspects, and that a few aspects were common to several discourses when examining the chosen seminal papers. So this led to thinking that discourses are not as distinct as Dooyeweerd aspects and possibly more overlaps could be found.

6. The principle of multiple interpretations

This principle requires sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same sequence of events under study. Similar to multiple witness accounts even if all tell it as they saw it.

The principle of multiple interpretations requires the researcher to seek out and document multiple viewpoints and the reasons for them. This includes seeking to understand conflicts related to power, economics and values. In addition to that the researcher should bring

together the contradictions inherent in the multiple viewpoints with each other, and revise his or her understanding accordingly.

For the purpose of this study, for each discourse I looked at only one seminal paper. Except for conventional IS Use streams of research, where I had more than one. Therefore, in putting those seminal papers together into one 'meaningfulness' aspect, perhaps I took account of multiple interpretations.

7. The principle of suspicion

This principle requires sensitivity to possible 'biases' and systematic 'distortions' in the narratives collected from the participants.

This refers to likelihood of bias in the sources (interviewees etc.) rather than researcher. Even if researcher is unbiased, the sources can still be biased, by not mentioning things that seem obvious to them, by finding some things embarrassing, by finding some things too trivial to mention, etc. In this study, this principle is applied to the possible 'biases' in the accounts collected from the IS Use literature.

By analysing the text excerpts I took the words being used by authors in the seminal papers on their own and not at face value. I made the selected text bold and assigned an aspect to a word. I was suspicious of the authors' use of any word as meaning something different from what it normally means. Rather I tried to ensure understanding of the word as it is.

7.4 Choice of Research Method

It is usually possible and certainly popular to characterize a research study's methodology as qualitative; as quantitative; or as involving both qualitative and quantitative methods, in which case it is typically referred to as mixed methods. The terms quantitative and qualitative are used widely in IS discipline as well as other fields to differentiate both data collection

techniques and data analysis procedures. One way of distinguishing between the two is the focus on numeric (numbers) or non-numeric (words) data (Saunders *et al.*2011).

Quantitative is predominately used as a synonym for any data collection techniques such as questionnaire or data analysis procedure such graphs and statistics, which generates or uses numerical data. In contrast, qualitative is used predominately as a synonym for any data collection technique such as interview or data analysis procedure such as categorising data that generate or use non-numerical data. Qualitative therefore can refer to data other than text, such as pictures and video clips (Saunders et al.2011). Many qualitative researchers prefer the term 'empirical materials' to the word 'data' since most qualitative data is non-numeric (Myers and Avison, 1997).

For this research, quantitative research method is rejected because no counting procedure has happened. Qualitative research method is chosen for the purpose of the empirical study in chapter 8, because the aim of empirical study is to understand what is centrally meaningful to IS Use researchers through text analysis and generate new idea and insight. This is because qualitative research methods focus on discovering and understanding the experiences, perspectives, and thoughts of participants—that is, qualitative research explores meaning, purpose, or reality.

7.5 Qualitative analysis of texts of seminal papers

The empirical study of this thesis is an analysis of wider discourses among researchers as it generates new discourses. This suggests that discourse analysis is a method of text analysis which might be appropriate. However, as Morgan (2010) suggests discourse analysis can be ambiguous depending on the epistemological stance of the theorist. Generally speaking, discourses analysis is an approach for exploring power relations from a critical standpoint in

an attempt to make sense of the social world by providing new critical insights (Morgan, 2010).

Discourse analysis, however, is an umbrella term that covers many methods and none of them seem appropriate for analysing motivations in the seminal papers. Moreover, the aim of empirical study is not exploring the power relations in the IS Use discourses, but what is centrally meaningful to the authors of the seminal papers.

Conversational Analysis is another method of text analysis which is primarily an objectivist, realist position, in which inductive, data driven activity is achieved whose goal is to find patterns within language (the text) and solely but absolutely describe what is there (Morgan, 2010). It is not appropriate to see the motivations sought in this research as patterns. Moreover, this method suits interview-based studies where the data is generated as a result of conversation with participants in the research. Therefore, it is less likely this method serves the purpose of this thesis.

Another well-known method for text analysis is Content Analysis which is a widely used qualitative research technique. But, it describes a family of analytic approaches ranging from impressionistic, intuitive, interpretive analyses to systematic, strict textual analyses (Rosengren, 1981 cited in Hsieh & Shannon, 2005). Hsieh & Shannon (2005) define qualitative content analysis as a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns. Again, this makes it unlikely to be appropriate for this research. However, they believe the specific type of content analysis approach chosen by a researcher varies with the theoretical and substantive interests of the researcher and the problem being studied. Although this flexibility has made content analysis useful for a variety of researchers, the lack

of a firm definition and procedures (Tesch, 1990) means that it can provide very little specific guidance for this research on how to disclose motivations.

Thematic Analysis is a type of content analysis that draws inferences from data by systematically identifying characteristics within the data (Keng *et al*.2007). It shares many principles and procedures of content analysis (Joffe & Yardley,2004). It emphasizes pinpointing, examining, and recording patterns (or "themes") within data. Themes are patterns across data sets that are important to the description of a phenomenon and are associated to a specific research question, so yet again this approach is not likely to be appropriate. However, boundary between the qualitative content analysis and thematic analysis has not clearly specified. In other words, they are being used interchangeably and it seems difficult for the researcher to choose between them. Content analysis, and thematic analysis is suitable for researchers who wish to employ a relatively low level of interpretation, in contrast to grounded theory or hermeneutic phenomenology, in which a higher level of interpretive complexity is required (Vaismoradi *et al*.2013). In this research hermeneutic interpretation is very important.

Because, it is difficult to see how any of the above are useful for detecting motivations, a new method has been devised. Since motivations are what is meaningful to people, this study is using Dooyeweerd aspects to understand the motivation of the authors of the seminal papers in the IS Use field.

Next section describes the research method, i.e. how I selected the seminal papers (Data Collection), extracted the relevant text and analysed the texts (Data Analysis).

7.6 Research Procedure

Primary research method for this study is rejected, because I am neither aiming to do a social survey (Questionnaire, Interviews) nor to do an observation. Secondary research method is chosen because I resort to Literature (published texts) such as theoretical works, research papers of IS Use researchers and data that other authors have previously collected. Secondary research is where we use information that is derived from other people's primary research.

Next sub-section explains how I selected seminal papers to find out what is meaningful to the initiators of paradigms.

7.6.1 How the seminal papers were selected

Unlike the strategy chosen for the literature review part 1, the searching strategy chosen for this stage was narrowed down to the available literature in chapter 3. The following was taken into consideration for selecting seminal papers:

First, I started with the question as: Has the specific paper been cited sufficiently and often enough to be regarded as a guiding influence? While this is likely to be the case for papers published in 1980s, 1990s and early 2000s, recent discourses might not have had chance of being available for long time. For example, by January 2015 Davis (1989) was cited more than 23000 times, whereas most discourses in IS Use in health sector was cited for less than 100 times. To be cited sufficiently, though important, is also a matter of time and could not be the only criterion for selecting seminal papers. This led us to the next criterion.

Second, does the paper make a substantial scholarly contribution? If the answer to this question was yes, then the third step is to ask, how explicitly the motivation for research (what is important) is expressed in specific paper.

7.6.2 How the text excerpts were selected

First, I reviewed the abstract, introduction and conclusion of each seminal paper, and then selected the relevant passages indicating what is important and normative to the authors.

Second, the body of each paper is also reviewed again to ensure whether reading through abstract, introduction and conclusion is sufficient.

Third, I started aspectual analysis on the motivational and normative texts to reveal what is important to the authors.

7.6.3 How what is meaningful was detected

The kernel meanings of aspects are understood intuitively rather than by abstract thought so should be relatively easy to employ in both practical analysis and in the empirical stages of academic research. Since aspects transcend humanity, both researcher and researched are likely to have a shared background understanding of them, even if one or other researcher do not know their names. Using aspects should be able to reveal taken-for-granted perspective of both the researcher (analyst) and the researched; this was found to be so by both Winfield (2000) and Kane (2005).

First, I looked for the motivation of the researcher. Motivation may not always be explicit as such for example "I am motivated to…" or "I am inspired by…", but the motivation here is what is important to the authors which made them to conduct the specific research on IS Use. The important thing could be manifested through emphasizing on a word or a sentence or more, for example Techatassanasoontorn and Tanvisuth (2010) emphasise on "social inclusion" and "participation" or Grgecic & Rosenkranz (2010) emphasise on "functional affordance" and "lingual expression". Sometimes things are important to authors that they are held as implicit to them; tacit importance. The tacit things come through better in the Introduction and Conclusion, when the authors are not trying to keep word count down. For

example Davis (1989) does not explicitly state the importance of profit-making for IBM. He uses device to tell the reader what is important, for example "research priority".

Second, I looked for normative sentences, yet that is not found in all seminal papers. An example of normative sentence could be seen in Selwyn's (2003) seminal paper. He says "*Above all, commentators on technology and society should avoid the temptation to assume that technology is always (a) available and (b) a 'good' thing."*

Third, the analysis presented here is not meant to be an exhaustive interpretation of the complexities of IS Use Literature; there is no doubt other studies would reveal different things. However, the data are sufficient to demonstrate the existing diversity and overlaps of IS Use perspectives in the literature and provide a basis for a way of addressing them.

7.7 Conclusion

This chapter has described the approach to the empirical research process. Despite the fact that positivism is the dominant research paradigm in most IS Use studies, this chapter notes that interpretivism is suitable for the purpose of this research to generate insight in the IS Use field. In order that the insight is allowed to emerge, Klein and Myers (1999) principles for interpretive research helped analysis process to reveal what is centrally meaningful to the authors of the seminal papers. The chapter has covered the whole research process of this study including the techniques for selecting the seminal papers.

In the next chapter, the outcome of the aspectual analysis of the data is explained.

Chapter 8 INVESTIGATION OF MEANINGFULNESS

8.1 Introduction

This chapter presents the analysis of the seminal papers in the IS Use discourses. The aim of the analysis is twofold. First, it demonstrate what is most meaningful to the authors of seminal papers representing different IS Use perspectives. Second, by doing this, it is possible to gain insights that offer a useful basis for understanding paradigm as meaningfulness. In order to do this, the Dooyeweerd's aspects presented in the chapter 6 are used to structure the analysis.

The chapter contains two main sections. It starts with applying Dooyeweerd's aspects on the IS Use field (section 8.2) and then the discussion of the table which shows the result of the analysis (section 8.3).

8.2 Applying Dooyeweerd's Aspects on The IS Use Field

The present investigation uses the modal theory of aspects as a tool of investigation. It starts from Life domains because Dooyeweerd's aspects are representing naïve experience of everyday life.

8.2.1 A seminal paper on everyday life domains

The first paper to analyse here is written by Techatassanasoontorn & Tanvisuth (2010) and it has been cited 2 times until March 2015. Their self-understanding of the research they are undertaking is addressing the gap on how IS Use improves quality of life which leads to

strong contribution to the theory. Their explicit motivation for the research was found in the abstract and introduction of their paper as follows.

In their study, Techatassanasoontorn & Tanvisuth (2010) criticise Silva & Figueroa (2002) that they have taken a rather broader perspective with having an institutional approach for the use of IS at national level. Silva & Figueroa (2002) explain their main motivation as follows:

> *"...since both governments and international agencies spend huge amounts of money in projects aimed at inducing the widespread use of ICTs in developing countries ....these investments follow economic discourse that indicate the positive relation between the adoption of technologies and economic growth....unfortunately, many of these efforts have not resulted in an expected outcome – development."*

What drive the main motivation of Silva & Figueroa (2002) is that the return on investment is not as expected. To them, IS Use is supposed to serve economic growth which is mainly of Economic aspect. Techatassanasoontorn & Tanvisuth (2010) are critical of the broad perspective of IS Use which is narrowed down to just Economic dimension of people's life (Dooyeweerd would see that as reductionist perspective than broad), and seek for other important life dimensions in which IS Use play role:

> *"...ICT use should enhance a process of social inclusion by enabling individuals to fully participate in society across a variety of domains related to health, education, recreation, and culture, among others..."*

There are two things important in the above passage. First, "social inclusion" is important. This is mainly of Social aspect. It could be Juridical aspect as well, in that inclusion might

imply the ‘right’ to be included, but Social aspect is treated as primary. The importance of Social aspect is supported by “..to fully participate..”. Second, “..across a variety of domains.." is important to Techatassanasoontorn & Tanvisuth (2010). It might be Aesthetic aspect of harmony. But, it may not be what is primarily important in that passage, so it is secondary.

> *".....the goal of using ICT should shift from the old concept of overcoming a digital divide to the new concept of enhancing a process of social inclusion, thus fulfilling the goal of improving people’s lives.”*

The “old” is often attached to what the authors believe, perhaps assume, that readers will probably know that was important for a period of time. The “new” is attached to what authors want the readers to shift towards. Social inclusion could be mainly either Social or Juridical aspect (see above), but, again it would seem that this is primarily Social aspect in that they are talking about togetherness, and participation etc. much more than what is ‘right’ or ‘due’ to people.

> *“Social inclusion refers to "the extent that individuals, families, and communities are able to fully participate in society and control their own destinies, taking into account a variety of factors related to economic resources, employment, health, education, housing, recreation, culture, and civic engagement.""*

The above passage nicely helps to assign social aspect to social inclusion. It emphasises on the fully participation. Participate could be Social aspect and Formative aspect on its own, but here it is Social. The above passage helps not to think of Juridical aspect as primary one.

The above passage shows authors are taking into account a variety of factors. This suggests Aesthetic harmony of the whole which seems important to the authors. This is supported by authors' interest in the life domain variety.

> *"This new conceptualization suggests that a more holistic understanding of the impact of ICT use on various life domain satisfaction (e.g., community, social, work, leisure, etc.) and quality of life as a whole is essential to make progress in this important research area..."*

In the above passage, authors' emphasis on "holistic" and "whole" would show that harmony is important to them. Harmony is primarily aesthetic aspect. So, it seems that two things are mainly motivational or normative to the authors: social inclusion (Social aspect) and taking all domains into account (Aesthetic aspect).

8.2.2 A seminal paper on resistance to IS Use

The second paper to analyse is written by Selwyn (2003) and it has been cited 250 times until March 2015. Selwyn (2003) propose an alternative framework of why people may not use IS in their day-to-day lives which is their contribution to the theory. The explicit motivation for the research was found in the abstract and introduction and conclusion of the paper as follows.

In his study, Selwyn (2003) criticise Rogers (1983) as the pioneer of widely held assumptions that IS Use is inherently desirable and beneficial activity for all individuals and society:

> *"According to diffusion theory, societal use of an innovation is hastened by its relative advantage—i.e. "the degree to which an innovation is perceived as providing greater benefits than the previous idea that it replaces". From this perspective, new ICTs such as the Internet are seen to have a high degree of*

relative advantage, as Rogers continues: Compared to postal mail, email via the internet is faster, cheaper and quicker. Compared to books or other sources of information, the World Wide Web is a more convenient means of searching for information"

In the passage above passage, Selwyn (2003) consider time and cost as two factors important to Rogers (1983), because these bring relative advantage for new innovation compared to the old one. Time and cost are primary of Economic aspect. Selwyn (2003) would think of Rogers's view as perhaps 'unfair' view, because if someone does not want to use new innovation (IS) he or she has to choose not to be part of the information society which is an irrational and ultimately disadvantageous position. So, Selwyn (2003) view seems to be the one which would avoid Rogers's view of Economic aspect as the only lens for understanding information society.

".....Despite the high-profile nature of the current 'digital divide' debate, academic understanding of who is making little or no use of information and communication technologies (ICTs) remains weak....."

".....to develop a deeper conceptual understanding of people's non-use of new technologies...."

In the above passage, Selwyn (2003) uses the word "Despite" as a device to separate what has been paid more attention to ('digital divide') from what is also important to be considered (who is making little or no use of information and communication technologies) which remained weak. This is how the author prepare the reader for something 'good' which is "understanding of people's non-use of new technologies". Emphasising on "who" and "people" are mainly of Social aspect, It seem the author is going to pay attention to a

particular social group in order to find out more about them. He emphasise on considering the process of non-use and low-use of IS and that requires understanding of a particular social group who choose not to use.

> *"…the ability to use information and communications technology (ICT) is now assumed by most commentators to be a prerequisite to living and working in the 'information society'."*

In the above passage from the introduction of this seminal paper, with the word "assumed" as a device Selwyn (2003) is going to question an assumption or something important: "The ability to use….." is assumed "to be a prerequisite to..". The ability to use is Formative aspect, but it seems the author would say the ability to use is not the one and only important thing. So, Formative aspect cannot be seen as the primary one here, it could be a secondary aspect.

> *"….there has been a burgeoning body of academic research over the past 10 years pointing towards the growing emergence of an 'information apartheid' and a 'digital divide' ; popularly seen as occurring between technological 'haves' and 'have-nots' or the 'information rich' and 'information poor'"*

In the passage above, the author of this seminal paper is using "academic research over the past 10 years pointing towards" as a device, and trying to tell the reader about main thing that makes the research to come through. The author is trying to open up more about what has been seen discussed and received attention more as it is explained above. Selwyn (2003) is giving more information to the reader by bringing in 'information apartheid' along with

‘digital divide’ and then uses “haves” and “have-nots” or “information rich” and “information poor” as terminologies to explicitly express the divide in his paper. The “haves” and “have-nots” is emphasising on two groups of people or community which is primarily Social aspect. With “apartheid” the author makes the reader to think whether there is something else important hidden in the text. It seems Selwyn is drawing our attention to human “right”, a kind of ‘segregation’ or ‘discrimination’ maybe. This would be Juridical aspect which is primary aspect here. The next passages might help us to ensure Juridical aspect.

> *“to distinguish between the ‘information rich’ and ‘information poor’ both avoids precise delineation of who they are and fails to consider the range of different positions ... In short the model lacks sufficient sociological sophistication”.*

In the passage above, “..both avoids”, “..fails to consider”, and “..the model lacks sufficient..”, are devices telling us there is a ‘good’ thing in authors perspective to be considered. The “..who they are” as well as “sociological sophistication” would help our intuition on seeing Social aspect as important. Also, it would seem the author is supportive in giving justice to “..who they are” by pointing to it, because it is motivational or normative in the author’s attitude which is Juridical aspect.

> *“This paper therefore starts from an emerging consensus within the sociology of technology that conceptualising non-users of technology as purely those who ‘have not’ any access to any technology is too crude an analysis.”*

Author uses “…starts from an emerging consensus…” as a device to tell the reader about the starting point which is conceptualising those who ‘have-not’ any access. That means, apart

from Social aspect, there is more aspects import to Selwyn. Author directly mentions "access" which is mainly Juridical aspect. This is convincing that both social and Juridical aspects are primary to the Author.

> *"It is therefore important to acknowledge the importance of an individual's 'perceived' (or effective) access in practice over the theoretical (or formal) access to ICT."*

Author of this seminal paper uses "…important to acknowledge…" and "..over…" as a device to distinguish between individual's 'perceived' access which is Psychic aspect and theoretical access which is Analytical aspect. This shows the higher value of people's perception to IS in Selwyn's understanding which is certainly Psychic aspect. However, it seems secondary to Social and Juridical aspects.

> *"There are distinct types of access to technology; whether people have access at all and the hierarchy of access amongst those that do. We should identify both 'peripheral' and totally 'excluded' users as being 'apart from technology' and therefore worthy of further consideration."*

This passage is giving justice to "peripheral" and totally "excluded" users which is a functioning in Juridical aspect. This is a normative thinking expressed in part of Selwyn's paper.

In the conclusion of the paper we read as follows:

> "*Above all, commentators on technology and society should avoid the temptation to assume that technology is always (a) available and (b) a 'good' thing. For many authors, the imperative is towards giving people the*

information tools they need to participate in the decision-making structures which affect their daily lives. It means helping people use these resources to deal with their everyday problems. But for some people dealing with everyday problems does not and will not involve personal use of ICT".

"Focussing on the social and technological non-placement of technologies into people's everyday life should now form a central tenet of research into technology and society."

The passage above is normative. The "*commentators on technology and society should avoid"* indicating author's normative thinking about the assumption which is not giving justice to society. The "for many authors" is a device Selwyn is using to tell the reader what is mostly seen as important by other authors. However, "but" is another device to tell the reader what is most important to Selwyn. The "*for some people dealing with everyday problems does not and will not involve personal use of ICT"* refer to the belief that some people would not find ICT useful for their everyday life problem. This is mainly Pistic aspect because it shows Selwyn's belief in the belief of a particular social group.

So in this seminal paper, Social, Juridical and Pistic aspects are mainly important to the author.

8.2.3 A seminal paper on beneficial use

The third paper to analyse is written by Classen & Bates (2011) and it has been cited 41 times until March 2015. Classen & Bates (2011) provide us with three practical implications on how meaningful use of EHRs will lead to meaningful benefits. The explicit motivation for the research was found in the introduction of the paper as follows.

In their paper, Classen & Bates (2011) believe that Health care has long lagged behind all other major industries in use of IS, but it is beginning to catch up. They would be expected to draw on dominant understandings and theories on IS Use as explained in Chapter 3. However, we cannot ensure what is important to researchers on discourses on beneficial use is exactly the same as researchers in the dominant understandings of IS Use. Reading through the text of this seminal paper would help us to see whether there is any difference between the two discourses.

> *"Health care has long lagged behind all other major industries in the adoption of information technology, but it is beginning to catch up. Because of the belief that electronic health records (EHRs) will be a key foundational tool for improving safety and quality of care and for reducing costs, the federal government has implemented substantial incentives for providers to adopt EHRs through the Health Information Technology for Economic and Clinical Health (HITECH) Act."*

In this passage, authors are mentioning "health care has long lagged behind…." as something "bad" for the health sector and then telling the reader that "it is beginning to catch up.." as something "good". These are devices authors use to prepare the reader for important issue which is the belief that EHRs are useful system. That is expressed by the "will be a key foundational tool …" for improvement.

The "improving safety and quality of care and for reducing costs" is mainly Formative aspect, yet we see safety, quality of care and reducing cost as other important things. Safety would be seen as Juridical aspect, Quality of care as Ethical aspect and reducing cost as Economic aspect. However, authors' motivation is not clearly stated in the paragraph above, so it would

not enable us to identify the primary aspects and those which are most important to authors' understanding. Now we can analyse another paragraph.

> *".....Data from several studies have suggested that simple adoption of EHRs does not necessarily improve the quality of care and that quality does not appear to improve even over a number of years among EHR users. This challenge was recognized in the HITECH Act, which included the new concept of "meaningful use" of EHRs. The intent of meaningful use was to provide incentives to providers not only to adopt EHRs but also to use them in ways that would improve quality, safety, and efficiency...However, even though the concept of meaningful use is extremely attractive, it remains to be shown that the standards that are being established will result in improvement in care."*

The "Simple adoption of EHRs does not necessarily improve the quality of care" is a device to tell the reader that adoption is not enough, and there must be something else! Authors of this seminal paper have something more important to tell us, the one which is needed in order to achieve "improve the quality of care". From here we can see that improvement which is Formative aspect perhaps is not the main one. Also, we can see that "quality of care" was emphasised more than safety and reducing cost. This tells us that so far Ethical aspect is seen more important compared with Economic and Juridical.

The "challenge was recognised" was used as device by Classen & Bates (2011) to prepare us for telling what is the solution to the challenge. The "meaningful use" is the "good" news! Use of EHRs must be 'meaningful'. "Meaningful use" is the one that supports both adoption and use in order to improve some other important issues. In another words, "meaningful use" refers to the idea that Use of EHRs is "good" and is beneficial.

Being beneficial would be seen as an underlying motivation for Classen & Bates (2011) which is Economic aspect. So Economic and Ethical aspect are the main aspects compared to Formative and Juridical. Hence, two important things are mostly motivational for Classen & Bates (2011): First, "meaningful use" which is Economic aspect as it is understood from Classen & Bates (2011) text. Second, quality of care that should be the purpose of 'meaningful use', this is Ethical aspect.

8.2.4 A seminal paper on enhanced use of features

The fourth paper to analyse is written by Ggrecic & Rosenkranz (2010) and it has been cited 5 times until March 2015. Ggrecic & Rosenkranz (2010) propose a way of rethinking the concept of IS Use. Their self-understanding is that their new conceptualization has the advantage that IS use is not only considered as the amount or extent a user spent using IS. The explicit motivation for the research was found in the abstract, introduction and conclusion of this paper as follows.

In their study, Ggrecic & Rosenkranz (2010) see weaknesses in IS Acceptance and criticise Davis' TAM:

> *"...they often stop short of addressing how the use of IT leads to an increase in productivity..."*

They believe IS Acceptance theories were not able to address how IS Use leads to productivity so much as predicting IS Use. Then in the introduction of the paper they add:

> *"In past studies, the definition of IT use has been too simple and one-dimensional; we suggest that until now it is still unclear how IT use does de facto contribute to the overall success of an IS."*

In that, Ggrecic & Rosenkranz (2010) seek to conceptualise IS Use in ways that help in better investigation of IS Success, a conceptualisation that address "how". In this passage, *"in past*

studies" is a device to distinguish between what has been seen important by most and what is the missing link. The *"IT use has been too simple and one-dimensional"* is referring to the "amount view" of use in IS Acceptance studies which is mainly Quantitative aspect.

> *"…Consequently, while a rich body of knowledge has emerged, with prominent models such as the Technology Acceptance Model or the IS Success Model, the complexity of defining a suitable multi-dimensional construct for IT use has largely been neglected…"*

In this passage, Ggrecic & Rosenkranz (2010) use *"while a rich body of knowledge has emerged"* as a device to tell us something which has been important but it is not satisfactory any more. Their emphasis is on IS Use as multi-dimensional construct, which is a "good" thing in their understanding of IS Use. Yet, we need more information to investigate what is meaningful to them.

> *"...IT use is a complex construct that cannot be restricted to one or two components, for example, to the amount of time spent with the IT artifact. Instead we argue that the nature of use has to be considered in more detail..."*

In here, Ggrecic & Rosenkranz (2010) are critical of the "amount of time" as the only way of understanding IS Use. They believe nature of IS Use goes beyond "amount" view which is of Quantitative aspect.

> *"……we directly consider the relation between an IT system and IT use through the concepts of functional affordance and symbolic expression and therefore contribute to the understanding why and how certain IT aspects affect the use of IT…"*

In this passage, with *"the relation between an IT system and IT use"* they refer to technology-human interaction, but it seems they seek the multi-dimensionality more on the system side. *"the concepts of functional affordance and symbolic expressions"* refers to the two important things which goes beyond past studies and are distinguished from "amount" view in their understanding of IS Use. Functional affordance is about the potential use of IT object. Markus et al. (2008) define this as "the possibility for goal-oriented action afforded by technical objects", which is mainly Formative aspect. A symbolic expression, the other component of Use is defined as "the communicative possibilities of technical objects" which is mainly Lingual aspect. Functional affordance and lingual expression are the dimensions of IS Use in Ggrecic & Rosenkranz (2010) research.

Formative and lingual aspects are assigned as the main aspects.

8.2.5 A seminal paper on multi-dimensionality of Use

The fifth paper to analyse is written by Burton-Jones & Straub (2006) and it has been cited 542 times until March 2015. Burton-Jones & Straub (2006) suggest new directions for research into the nature of system usage, its antecedents, and its consequences. They have strong contribution to the theory by proposing a way of reconceptualising IS Use because there was a lack of explicit conceptualizations of system usage in past research. The explicit motivation for the research was found in the conclusion of this paper as follows.

In their research, Burton-Jones & Straub (2006) provide a critique of past discourses on IS Use such as IS Acceptance (Davis, 1989) and IS Success (Delone & McLean, 1992). They believe the IS Use construct itself escapes scrutiny in such studies of antecedents and consequences.

> *"..To overcome the lack of explicit conceptualizations of system usage in past research, the present study advances a staged approach for reconceptualising*

> *it. The first stage, definition, recommends that researchers explicitly define system usage and its assumptions. The second stage, selection, recommends that researchers select usage measures by a two-step method that involves identifying the relevant elements of usage for a research context"*

In the passage, Burton-Jones & Straub (2006) try to use *"To overcome the lack of explicit conceptualisations…"* as a device in order to say something which was problematic in the past. IS Use has been central, but was not explicitly known to the community; it was a construct in TAM and IS Success, but had not been studied separately on its own. Burton-Jones & Straub (2006) dedicate their attention to IS Use.

They recommend every IS Use researchers to define and select the elements of IS Use, which is primarily Formative aspect. They distinguish Task, System and User as a suggestion of multi-dimensionality to IS Use field. This contrasts with that of Davis (1989) that IS Use is seen as frequency of use. The staged approach understanding of IS Use as it appears in Burton-Jones & Straub (2006) text is Formative aspect.

> *"..Given contradictory results in past studies of system usage and performance, and the centrality of the usage construct in past research, our focused reconceptualization of the construct should enable more informed research into the pathways by which IT impacts individuals at work.."*

This passage, "given" is the device to prepare the reader for the motivation of their research. "..focused reconceptualization of the construct..." was their main motivation and it refers to the reconceptualising IS Use into a construct with three dimensions which is Analytic aspect. Two aspect, Analytic and Formative are assigned to what is centrally meaningful to the authors of this seminal paper in the IS Use field.

8.2.6 Two seminal papers on IS Acceptance

The sixth paper to analyse is written by Venkatesh et al (2003) and it has been cited 11431 times until March 2015. Venkatesh et al (2003) propose the most intensive model elaboration of TAM. Their proposed model was found to account for 69% of the variance in usage intention which is seen as strong contribution to IS Acceptance research domain. The explicit motivation for the research was found in the introduction of this paper as follows.

In their study, Venkatesh et al (2003), developed UTAUT and it is one of the highly influential model in IS Use research. They reveal the motivation for their study as follows:

> *"....The presence of computer and information technologies in today's organizations has expanded dramatically. Some estimates indicate that, since the 1980s, about 50 percent of all new capital investment in organizations has been in information technology....."*
>
> *"Yet, for technologies to improve productivity they must be accepted and used by employees in organizations. Explaining user acceptance of new technology is often described as one of the most mature research areas in the contemporary information systems (IS) literature...."*

This paragraph indicates the motivation of Venkatesh et al (2003) for their research and introducing UTAUT (explained in chapter 3). They aim to advance research in explaining user acceptance; however through that aim they serve what is of motivation to them which is addressing the productivity gap in organisations. This is evident in the introductory text of their paper. As indicated in the text, three things are important to them:

"...50% of all new capital investment" is mainly Quantitative aspect. Though capital investment is mainly of Economic aspect, here it is the amount of investment which is more important and it is Quantitative aspect.

"..improving productivity..." is both of Formative aspect (improving) and Economic aspect (productivity), but productivity is seen as central and important which is Economic aspect.

The seventh paper to analyse is from IS Acceptance domain and is written by Davis (1989) and it has been cited 24510 times until March 2015. Davis (1989) contribute to the theory in IS by developing and validating new measurement scales for perceived usefulness and perceived ease of use, two distinct variables hypothesized to be determinants of IS Use. The explicit motivation for the research was found in the abstract and introduction of this paper as follows.

In his study, Davis (1989) developed TAM and it is treated as an influential exemplar for most IS Use studies. Davis (1989) reveals his motivation as follows:

> *"...Valid measurement scales for predicting user acceptance of computers are in short supply..."*

"Short supply" of "valid measurement scales" is something "negative" and motivates Davis (1989) to overcome this problem.

> *"...Most subjective measures used in practice are unvalidated, and their relationship to system usage is unknown. The present research develops and validates new scales for two specific variables, perceived usefulness and perceived ease of use...."*

In this passage, "…most subjective measures..." are not valid, which is another "negative" point that inspires Davis to develop "new scales". Davis (1989) reacts to weak measurement of system use and refer to previous studies affirming this weakness in IS implementation, for

example one of the studies Davis (1989) refers to is Ginzberg (1981) study on diagnosis of MIS implementation failure.

> *"Past research indicates that many measures do not correlate highly with system use (Ginzberg, 1981 cited in Davis, 1989)"*

For Ginzberg (1981) IS has to be useful to managers. Davis (1989) then explains that this is important to his study. He states:

> *"…The development of improved measures for key theoretical constructs is a research priority for the Information Systems field…."*

Davis emphasises on the central role of measures here and uses "research priority" as device.

> *"....aside from their theoretical value, better measures for predicting and explaining system use would have great practical value, both for vendors who would like to assess user demand for new design ideas, and for information systems managers within user organizations who would like to evaluate these vendor offerings…"*

Here, *"....better measures for predicting and explaining system use would have great practical value"* shows Davis' emphasise on measure view of IS Use, which is mainly Quantitative aspect.

> *"…The purpose of this research is to pursue better measures for predicting and explaining use..."*

In the line above, Davis affirm the importance of improving measures.

> *"Unvalidated measures are routinely used in practice…… For example: designers within vendor organizations such as IBM (Gould, et al., 1983),*

Xerox (Brewley, et al., 1983), and Digital Equipment Corporation(Good, et al., 1986) measure user perceptions to guide the development of new information technologies and products; industry publications often report user surveys (e.g., Greenberg, 1984; Rushinek and Rushinek, 1986)"

This passage in the introductory part of Davis paper shows his study is business-driven. "*…measure user perceptions to guide the development of new information technologies and products...*" refers to importance of such a study for business organisations such as IBM. Practical value for vendor and managers is the motivation for Davis (1989) study which is Economic aspect.

8.3 Discussion of the Table 6

The main aspects of what is primarily meaningful in the seminal papers are shown in Table 6.

The rows are the aspects and the columns are the authors of the seminal papers.

Aspect	Tachatassanasoontorn and Tanvisuth (2010)	Selwyn (2003)	Classen & Bates (2011)	Grgecis & Rosenkrantz (2010)	Burton-Jones and Straub(2006)	Davis (1989)	Venkatesh et al (2003)
Quantitative						✓	✓
Spatial							
Kinematic							
Physical							
Biotic							
Sensitive							
Analytical					✓		
Formative				✓	✓		
Lingual				✓			
Social	✓	✓					
Economic			✓			✓	✓
Aesthetic	✓						
Juridical		✓					
Ethical			✓				
Pistic/Faith		✓					

Table 6 Main aspects representing what is most meaningful in the IS Use Discourses

Here a number of significant things about the table are pointed out, the implications of which for this research will be discussed in the next chapter.

8.3.1 Variety of Meaningful Aspects

The Table 6 shows a number of different aspects as meaningful in different discourses. There are many aspects that are covered by only one discourse. That means that only that discourse sees that aspect as meaningful as its main concern. No other discourses make that aspect its main concern. In each IS Use discourses, IS Use is conceived in a different way. Individual researchers might work within several. Though they have appeared approximately in the order set out, they overlap.

Table 6 shows with aspectual analysis we would be able to look at overlapping aspects to provide an account for the overlaps between different understandings of IS Use. These are overlaps on the Social, Economic and Formative aspects.

8.3.2 Overlaps on Social aspect

The Table 6 shows both Selwyn (2003) and Tachatassanasoontorn & Tanvisuth (2010) share Social aspect as one their main motivating aspects. However, two authors from different discourses might share the same aspect and yet their focus is two different important things. This is because, as mentioned in chapter 6, each aspect is a constellation of things having an aspect as their kernel meaning.

Selwyn (2003) considers the "have-nots" as the motivation to study non-use of IS. He believes we still know little about non-users. It is important to know the people that resist a particular IS and how they differ from other social groups. This motivation for addressing the "have-nots" and their social group in the IS Use field is one of the main drivers of shaping Selwyn (2003) research, which is a functioning in Social aspect.

Tachatassanasoontorn & Tanvisuth (2010) share Social aspect with Selwyn (2003). To Tachatassanasoontorn & Tanvisuth (2010), full participation of individuals in using IS across all domains of life is important. They call it social inclusion as the process in which individuals or entire communities of people systematically have full access to IS rights, opportunities and resources that are normally available to members of a different group, and which are fundamental to social integration. To them IS Use is meaningful once individuals have access to it in areas of their life, which is not unexpectedly functioning in Social aspect. Considering the two studies shows both social inclusion and "have-nots" are mainly of Social aspects.

8.3.3 Overlaps on Economic aspect

Davis (1989) and Venkatesh et al (2003) as two seminal papers pioneering majority of IS Use studies were motivated by productivity issue. Productivity is an average measure of the efficiency of production. It can be expressed as the ratio of output to inputs used in the production process, i.e. output per unit of input. Which is one of the main concepts in the field of economic and it is represented through measures. Hence, seeing IS Use as frequency of use, extent of use and duration would not be surprising if treated as the only input. As shown in the Table 6 both Quantitative and Economic aspects are the primary aspects of these two influential IS Use research.

The Table 6 shows Economic aspect as the common one between these two seminal papers and that of Classen & Bates (2011) study. This commonality is because of Classen & Bates (2011) seeing "meaningful use" of IS as an advantage such as medical insurance, life insurance, and sick pay, that employees receive from their employer in addition to money. In another word benefits that could be brought to both doctors, patient and hospital staff is mainly Economic aspect due to its scarcity.

To Davis (1989) and Venkatesh et al.(2003) IS Use is meaningful as long as it is productive, to Classen & Bates (2011) IS Use is meaningful as long as it is bringing benefit to the people on the ground (i.e. patients , doctors, nurses). These are both functioning in Economic aspect.

8.3.4 Overlap on Formative Aspect

To Burton-Jones & Straub (2006) lack of attention to the IS Use construct was the missing link in the IS Use field. They suggest elements of use must be selected and defined. This is a thinking process of defining IS Use and is Formative aspect. They share Formative aspect with Ggrecic & Rosenkranz (2010).

To Ggrecic & Rosenkranz (2010), it is important to go beyond the simplistic understanding of IS Use select elements of a multi-dimensional use. Functional affordance is about the capability of technical feature is performing goal-oriented task. This element of use highlights the Formative aspect of IS Use.

To Burton-Jones & Straub (2006), one of motivations is the act of researcher in defining the elements of IS Use, while functional affordance is actually one of the defined elements of IS Use in Ggrecic & Rosenkranz (2010) understanding. These are both function in Formative aspect.

8.4 Conclusion

In this chapter Dooyeweerd's aspects were used as a tool to analyse the seminal papers from different IS Use discourses. In the next chapter, the value of the Dooyeweerd's approach is discussed, based on these results.

Chapter 9 DISCUSSION OF FINDINGS

9.1 Introduction

In view of what has been argued and found in the previous chapters, how (in what ways) can Dooyeweerd help us make sense of the diversity and development of discourses in the IS use field?

As explained in Chapter 1, the main purpose of this thesis is to make sense of IS Use academic field. In Chapter 3 IS Use discourses were reviewed by showing major changes in understandings of IS Use and at the end of the chapter two characteristics of IS Use field were outlined: Diversity and Development of IS Use discourses. This had to be addressed at philosophical level. In chapter 4, it was argued that the 'standard paradigms' cannot help with making sense on in the IS Use field. In Chapter 5, the ideologies of the main figures of the philosophy of science in the 20 century were discussed and we concluded they are not enough to address the diversity and development of IS Use discourses. In Chapter 6, Dooyeweerd's philosophy proposed paradigm as meaningfulness as a way of making sense of diversity and development of IS Use discourses. Chapter 8 applied Dooyeweerd's aspect for analysis of seminal papers from each discourse.

This chapter will discuss ways of overcoming these problems, using the results of the aspectual analysis from Chapter 8. It contains three main sections: First, Paradigm as Meaningfulness (section 9.2), second making sense of the diversity (section 9.3), and third understanding the development of paradigms (section 9.4).

9.2 Paradigms as Meaningfulness

As discussed in Chapter 5, Kuhn is far from clear in what he really means by paradigm, often using ambiguous formulations. To address this problem the idea of paradigm as meaningfulness has been proposed in chapter 6 of this thesis.

Affirming IS Use paradigms as meaningfulness is in accordance with Dooyeweerdian view as it was promised in Chapter 6 and argued by Basden (2008). Each aspect is a constellation of meaning around its kernel containing 'echoes' of that of other aspects, and hence can be meaningful in different ways. So understanding the aspectual profile provides a way to understand the presupposition (what it is meaningful) that drives research in each of the IS Use discourses.

In Chapter 8, investigation of meaningfulness based on what is important to authors of seminal papers yielded the following important aspects in each:

- Paradigm 1, IS Use as measurable amount and productivity (Quantitative and Economic aspects)
- Paradigm 2, IS Use as a multidimensional construct (Analytic and Formative aspects)
- Paradigm 3, IS Use as enhanced use of features (Formative and Lingual aspects)
- Paradigm 4, IS Use as beneficial (Economic and Ethical aspects)
- Paradigm 5, IS Use as resistance to use of IS (Social, Juridical and Pistic aspects)
- Paradigm 6, IS Use as everyday life domains (Social and Aesthetic aspects)

9.2.1 So what?

This shows that, using Dooyeweerd, we can identify something meaningful in each discourse that differentiates it from others. If paradigms are centred on meaningfulness, then this gives a philosophical basis for considering each of the discourses to be a distinct paradigm in the

field of IS Use. These paradigms are neither chronological nor fully distinct, but they are different with some overlaps. By looking at non-overlapping aspects, we can identify distinct areas of interest and hence different paradigms.

9.2.2 Benefits of This

Though this has demonstrated a way of identifying paradigms for IS Use research that did not fit standard paradigms, several questions arise. What is the foundation of the paradigms; on what basis can such paradigms be criticised? What do we do about overlaps? Might there be other paradigms? Does it have any benefit? These can be answered by reference to Dooyeweerd's aspects treated as spheres of meaning.

1. Several aspects are important in more than one paradigm. In these aspects, the paradigms overlap, in that they are interested in similar things. However, the way the aspect is meaningful might vary between paradigms. For example, the formative aspect is important in P2, as task accomplishment, adaptation, in P3 because features are technical artefacts, and in both as skilling. This illustrates a useful point about Dooyeweerd's aspects, that they are not rigid categories, but rather areas of meaning, reference to which focuses and stimulates further consideration and discussion.

2. Dooyeweerdian understanding injects new insight into the IS Use field. Though other IS Use researchers may have recognised these discourses they have not been able to place them in relationship to each other. Venkatesh et al. (2003) integrate eight theories and find similarities between them, but they are from the IS Acceptance discourse. Burton-Jones & Straub (2006) show awareness of conventional research on IS Use but differentiate themselves from them by introducing new conceptualisation for IS Use construct. Recent study by Lauterbach & Mueller (2014) recognised proliferation of IS Use concepts and attempt to clarify terminological bafflement - Adopt, Adapt, Enact or Use-, but they reduce

them into the positivist and interpretivist camp and try to reconcile these two camps by suggesting a way of how to resolve their conceptual tension the context of IT adoption and use.in addition, their study is limited to IS Use in the organisational context.

3. However, what distinguish this thesis from their attempt is that they do not even provide a basis by which IS Use discourse could be separated, but Dooyeweerdian aspectual approach found the basis. Lauterbach & Mueller (2014) only separate the issues out by categorising them into two research approaches camps and look for a framework to combine the two poles. Whereas Dooyeweerd enabled us to give all discourses of IS Use their due within an integrative framework. Also, Lauterbach & Mueller (2014) propose a synthesis of IS Use conceptualisations which is useful for the IS Use field but they have not provided a rigorous philosophical basis on which it can be critiqued or discussed. The Dooyeweerdian approach in this thesis provided a useful philosophical underpinning which allows for critiques and discussion within the IS Use community.

4. Because of Dooyeweerd's respect for everyday life, not just as something to be explained theoretically but as the very foundation for all theoretical activity, and in his reinforcement of the importance of the pre-theoretical attitude of thought (Basden, 2011), this approach is able to 'listen' to the actual, everyday experience of those who work within their various paradigms, both researchers and reflective practitioners, to discern what is meaningful. Dooyeweerd's approach has been found to be able to surface assumptions and reveal tacit knowledge (Winfield & Basden 2006; Ahmad and Basden, 2013).

5. Another benefit is a breadth and inclusiveness that existing paradigms lack. Whilst it is true that many researchers actually cross boundaries of existing paradigms, in their pure form they are largely mutually exclusive. Because, to Dooyeweerd, all human activity involves every aspect, and all aspects are of equal importance, meaning-based paradigms, even in their

pure forms, recognise their own limitation and can integrate with others without losing their identity. Since multi-aspectuality applies to all things, researcher could conceptualise IS Use as functioning in all aspects. The IS Use field will, in general, be more successful when the IS Use researchers hold more aspects important to them.

9.3 Making sense of diversity

To understand the diversity of discourses found in Chapter 3, this section uses the results of empirical work demonstrated in the Table 6 in chapter 8 and the intuitive understanding of discourses in bullets in chapter 3.

9.3.1 The Irreducible Diversity of Discourses

The analysis of seminal papers by using Dooyeweerd's philosophy reveals diversity of aspects among the discourses, which shows what is meaningful to them about IS Use. They are shown in Table 7 below. Column 2 expresses the kernel meaning of each aspect. Column 3 identifies in which of the IS Use discourses each aspect might be important. Note: This meaningfulness is for the community, not just the individual.

Dooyeweerd's Aspects, and IS Use Discourses		
Aspect	Its meaning	Discourses
Quantitative	Discrete amount	D1 (measurable amount)
Spatial		
Kinematic	Flowing movement	
Physical	Forces, energy, mass	
Biotic/organic	Life, organism	
Sensitive/psychic	Sensing, feeling, emotion	

Analytical	Distinction, concepts; Abstraction, logic	D2 (multi-dimensionality)
Formative	Deliberate shaping, Technology, skill, history	D3 (features)
Lingual	Symbolic signification	D3 (features)
Social	Relationships, roles	D5 (non-use) D6 (life domains)
Economic	Frugality, resources; Management	D1 (productivity); D4 (benefits)
Aesthetic	Harmony, delight	D6 (life domains)
Juridical	'Due', appropriateness; Rights, responsibilities	D5 (non-use)
Ethical	Attitude, self-giving love v. selfishness	D4 (benefits)
Pistic/Faith	Faith, commitment, belief; Vision of who we are	D5 (non-use)

Table 7 Dooyeweerd's aspects and IS Use paradigms that find them meaningful

Considerable diversity of meaning is evident. The 15 aspects that Dooyeweerd found helped to systematize the diversity of discourses in the IS Use field.

That they are diverse is obvious from reading through IS Use literature, but an aspectual analysis reveals how rich the diversity is. Given that each discourse finds a different aspect important, even while other aspects overlap, they discourse around different things that cannot be reduced to each other (Basden, 2008). Therefore, the discourses are all different and none can substitute for the others. Ten of Dooyeweerd's fifteen aspects are represented in Table 7.

The wide range of aspects represented in the table means that it offers a usefully wide range of what is important to IS Use authors. Each IS Use study is multi-aspectual, yet investigating what is important to the authors of these studies revealed in most of the seminal papers only two aspects predominates.

9.3.2 A Philosophical Underpinning for the Statements in Chapter 3

There are a number of similarities and differences between the Table 6 that is indexed by aspects, created from data from chapter 8 by analysing motivation statements in seminal papers, and the bullet list that is indexed by discourses, created from chapter 3 by analysis of IS Use literature followed by intuitive summary.

It was not the primary purpose of this paper to address issues that are currently being debated within the field of IS Use such as improving the measurement scale or exploring multi-dimensionality of IS Use, but it is was to make sense of the IS Use field because there are a number of discourses currently in progress that relate to what is discussed here. It might be expected that our discussion would take the conventional route of identifying a problem and showing how Dooyeweerd's philosophy could solve it, but such an incremental approach is inappropriate when considering a new paradigmatic framework such as Dooyeweerd offers. Instead, we identified a number of discourses and suggest how fresh light can be thrown on them.

Each starts with the 'intuitive' statement of the discourse, compiled after the literature review of Chapter 3, and then each is discussed in the light of the aspects found in Chapter 8.

- "Discourses on IS Acceptance believe IS Use has not met the expectations of managers and vendors, "let us" predict the Use before IS implementation."

- The intuitive understanding of this discourse is similar to those of aspects assigned to it. Davis' (1989) TAM and Venkatesh *et al.'* (2003) UTAUT are quantitative models. TAM links perceived usefulness and ease of use to degree of Use. Similarly, UTAUT links performance expectancy, effort expectancy, social influence and facilitating condition to IS Use. These two and similar models have been widely researched, interested in quantitative factors like frequency, duration and extent of use. Researchers in this discourse see IS as productivity tools. The original motivation for TAM this was that IBM wanted more accurate predictions of levels of use of their systems (Davis, 1986). UTAUT is concerned with return on investment. If IS is not utilised after large sum of money invested it is not meeting managers and vendors expectations.
- The empirical work on two influential seminal papers from this discourse also highlights two aspects. Economic aspect affirms IS Use is treated as an intellectual capital to human subject-functioning (to the researchers).To the researchers of this discourse IS Use must be managed as a resource for profit making, Therefore they rely on prediction tools. Quantitative aspect affirms the "amount view" (i.e. frequency of use, duration) of Use.

- "Discourses on IS Use as multi-dimensionality believe IS Use is more than one dimension, let us think of it as multi-dimensional Use."
    - One criticism of work under paradigm 1 is that mere measurement of degree of usage is one dimensional (Burton-Jones & Straub 2006), and that it is necessary to research users' behaviour with the system in fulfilment of their tasks. Trice and Treacey (1988) originally advocated seeing IS Use as behaviour, and Buffo & Barki (2003) have developed a sophisticated framework for understanding this. Complexity is to be faced, not hidden in quantitative measurements, and should go

beyond productivity. The main kinds of 'behaviour' seem meaningful under this paradigm are such things as task accomplishment, adaptation, learning and communication (Buffo & Barki, 2003).

- The aspects found to be meaningful and motivating Burton-Jones & Straub (2006) were the Analytic and Formative. The distinction of dimensions is an analytical activity, matching the intuitive statement. But it would seem that the Formative aspect does not match anything in the intuitive statement.

- "Discourses on feature-based use of IS Use believe IS Use as multi-dimensional use is not enough, let us explore how people use features."
  - There is increasing interest in (under-)utilisation of IS features, and the deeper, imaginative use of features that leads to enhanced or 'infused' use (Bagayogo et al. 2010; Tennant et al. 2011; Aal-Natour & Benbasat 2009; Fadel 2006). The features of interest are those which process information. Grgecis & Rosenkrantz (2010) theorise this using affordance, symbolic expression and structuration theory.
  - As a result of empirical study, the Formative and Lingual aspects found to be meaningful to Grgecis & Rosenkrantz (2010). Exploring features of a system is a process which is of Formative aspect, matching intuitive statement. However, it would seem that the Lingual aspect does not match anything in the intuitive statement.
- "Discourses on IS Use in health believe, IS Use only makes sense when it is beneficial to us"
  - In 2009 the USA Health Information Technology for Economic and Clinical Health act (Vest & Jasperson, 2010) directed researchers to what they called

"meaningful use". This directs attention to the good that IS use brings, or "fruitfulness" (Selwyn, 2003, 12), rather than mere behaviour or skills in use.

  - The aspects found to be meaningful and motivating to Classen & Bates (2011) were Economic and Ethical. Being beneficial is Economic aspect, matching the intuitive statement. But, it would seem that the Ethical aspect does not match anything in the intuitive statement.

- "Discourses on IS resistance and non-use believe IS Use is not necessarily beneficial. Let us see it in terms of resistance and non-use"
  - Previous paradigms assume IS Use is beneficial, but this has been questioned. Selwyn (2003) warns that understanding of who is making little or no use of IS remains weak. A major branch of this paradigm focuses on resistance to use. Kurt Lewin's classic 1947 work on resistance to change has been reconceptualised in terms of psychology, power, attitudes and ideology (Laumer, 2011). Lapointe & Rivard (2005) believe this is still under-researched.
  - Social, Juridical, and Pistic found to be meaningful and motivating to Selwyn (2003). IS resistance and non-use are both Social and Pistic aspect, matching the intuitive statement. Yet, it would seem that the Juridical aspect does not match anything in the intuitive statement.
- "Discourse on IS Use as everyday activity believe IS Use is not limited to only organisational settings, let us see it in all life domains."
  - Everywhere we turn, we see information technology, used in all areas of life, as part of everyday experience (Yoo, 2010). Research under this paradigm emphasise IS Use without professional, organisational contexts (e.g. Hong & Tam 2006; Venkatesh & Brown 2001). IS Use should be integrated or harmonized with other forms of human activity (Orlikowski & Jacono, 2001).

- The harmony of IS in all domains of life is an issue that is meaningful because of the Aesthetic aspect; this is the aspect the was identified in chapter 8 as the one that motivated Techatassanasoontorn & Tanvisuth (2010) in their seminal paper. What they reacted against, in Silva & Figueroa (2002), was an over-emphasis on the Economic aspect. This partly agrees with the statement made in Chapter 3, about "organisational settings", in that, though 'organisational' would normally be of the Social aspect, in the IS and IS Use fields, it often has a management flavour, which is of the Economic aspect.

Most of the intuitive statements made in Chapter 3 about the discourses have here been affirmed with aspectual analysis of what was meaningful in the seminal papers carried out in Chapter 8. In a few places, there are differences, but overall their match is good. This agreement provides a degree of triangulation; to affirm the importance of these discourses as paradigms of the field of IS Use.

9.4 Understanding the Development of paradigms

The foundation of each paradigm is few aspects. Most paradigms have several aspects that are important to them. It is possible that there is a 'pure' kind of paradigm, which emphasises only one aspect, and that this would provide a set without overlap, but such paradigms are likely to be less rich and less useful. Each paradigm seems to arise by exploring aspects that were previously ignored by others. Many, for example, distance themselves from Paradigm one (Discourse on IS Acceptance) on the basis of what it ignores or is unable to do.

Dooyeweerd's philosophy provided a way for understanding the emergence of new paradigms. As shown in the Table 7, that some aspects are empty, and yet that those aspects are still meaningful in human life, implies that it is possible that there are paradigms in which those aspects are meaningful. This indicates the possibility of new paradigms yet to emerge.

Aspects can also be used to examine candidate paradigms, to find out what is distinctive about them. Basden (1999) argued that Dooyeweerd's philosophy helps explaining the development in an academic field. Aspectual engine as explained in chapter 6 help understanding the emergence of new paradigms.

Applicability of aspectual engine on the IS Use field could be explained here to show how it helps understanding the development of paradigms.

Stage 1 Prevailing Neglect

In dominant view of authors in the IS use community, the problematic area revealed after investment and implementation of Information Systems as good and beneficial for business organisations (Barkin & Dickson, 1977; Lucas, 1978; Ginzberg, 1981). IS was not utilised as expected by managers, implementers, investors. It was expected to increase productivity , but the reports showed that the return on investment (i.e. Quantitative and Economic aspect appeared as neglected aspects (N)) is not satisfactory. This was seen as important and motivating problem for a period.

Stage 2 Widespread Transgression

Therefore, the law of neglected aspects tended to transgress. The neglected Quantitative and Economic aspects transgressed. Investment on IS increased in every organisations. But there were also attempts to overcome the problem. Fred Davis study was one of the main pioneers. Davis in reaction to IS implementation failure (Ginzberg, 1981) introduced TAM in which IS Use is understood as frequency and duration of use. This paradigm as 'Measure' or 'Amount' (Quantitative aspect) happened to be fashionable and highly acceptable. Information Systems Use research elevated this aspect together with their aspiration of dealing with the gap in return of investment (Economic aspect) and held them as their major paradigm. The productivity problem became so significant that was seen as another major neglected aspect.

Every other researcher has tried to give justice to this aspect. However, Davis declared that TAM is not complete, and future research should try to improve it.

Stage 3 Harm Starts

There was a persistence of transgressed laws. Majority of IS Use research in 1990s and after introduction of TAM to IS Use community were still eager to publish in response to neglected Quantitative and Economic aspect (Productivity problem). This tendency might have been unwittingly or knowingly. This is evident by proliferation of studies that tapped into TAM to improve it. It is seen in the period when a lot of studies tried to add various antecedents (variables) to the two dominant constructs of TAM; Perceived usefulness and Perceived ease of use. These variables were the manifestation that current view of IS Use is not enough, therefore there is a need for something more. But overcoming it within the framework of TAM was yielded 'harmful' effects, even if these were not immediately obvious. This was the period when TAM was affirmed, maybe criticized and enriched by other variables related to IS Use, each functioning in one or two aspects.

- Importance of Gender (Biotic aspect) was neglected (Gefen and Straub,1997; Venkatesh et al.2003)
- Importance of computer anxiety (Psychic aspect) was neglected (Brosnan,1999; Roberts and Henderson, 2000)
- Importance of task characteristics (Analytic aspect) was neglected (Dishaw and Strong ,1999)
- Importance of experience (Formative aspect) were neglected (Venkatesh and Morris, 2000)

- Importance of argument for change (Lingual aspect) was neglected (Jackson et al.1997)
- Importance of role with technology (Social aspect) was neglected (Agarwal and Prasad, 1999)
- Importance of access cost (Economic aspect) was neglected (Shih, 2004)
- Importance of response time (Economic aspect) was neglected(Lin and Lu,2000)
- Importance of enjoyment (Aesthetic aspect) was neglected (Davis et al.1992)
- Importance of compatibility (Aesthetic aspect) was neglected (Moore and Benbasat, 1991. Agrawal and Prasad, 1997. Chau and Hu, 2001)
- Importance of Subjective Norm (Juridical Aspect) was neglected (Hardgrave et al.2003; Venkatesh et al. 2003; Venkatesh and Davis,2000)
- Importance of self-efficacy (Pistic aspect) was neglected (Davis and Venkatesh, 1996; Yi and Hwang, 2003)
- Importance of Trust (Pistic aspect) was neglected (Suh and Han ,2002;2003)

All these are different aspects which seem secondary to Quantitative and Economic aspects of TAM and its variants.

Stage 4 Harm not Recognized

The harmful results often have a time delay, and are slow in becoming manifest, so perhaps researchers tend not to notice them at first, and, when they do appear, ignore them. Given that it is the majority of the community who take part in elevating the fashionable (F) aspect(s) (i.e. Quantitative and Economic) and neglecting the other aspect(s) as alternative to the

dominant, the majority of authors will maintain that what they are doing is right and refuse to acknowledge the wrong. Peer pressure will ensure that those who might wonder whether something is wrong keep their doubts to themselves.

A lot of IS Use researcher who applied TAM to different systems (i.e. IT artifact) and context of use were showing some kind of awareness of TAM not being enough, but they seemed to be persuaded to think of the Quantitative and Economic aspects as the main ones. So they were not attempting on reconceptualization of IS Use. Instead it seemed, for other reasons, they had been happy to continue with that dominant view of IS Use. It seemed they had ignored the need for reconceptualization of IS Use. But the transgression of laws continued and even increased. Moreover, the more the original elevation was religious in nature, the greater the incentive to refuse to recognise harm and the reluctance of researchers to admit wrong. Therefore transgression and harm increase the more.

Stage 5 Harm Felt and Noticed

As time passes, the harmful effects accumulate and become more common. Eventually they cannot be ignored altogether, and they are first felt, and then noticed. This is seen through the publications during 2000s. At some point some authors felt after two decades of research we reached to a point that we needed to revise and monitor what we had done, what results we arrived to, and is there any need to take action? The bullet points below are examples of the studies noticed the harm.

- Legris *et al.* (2003) state that Davis proposed a new version of his model: TAM2. They believe TAM2 includes subjective norms, and was tested with longitudinal research designs. Overall the two explain about 40% of system's use. Analysis of empirical research using TAM shows that results are not totally consistent or clear. This suggests that significant factors are not included in the models.

- King & He (2006) in a meta-analysis considered four major categories of modifications on TAM.

- Yousefzai et al (2007) collects about 70 constructs added to PU and PEoU and categorise them into four categories.

- Benbasat & Barki (2007) believed we reached to a status of confusion that we do not what version of TAM will be helpful and both PU and PEoU were treated as black box. Benbasat & Barki (2007) state that the intense focus on TAM has caused researchers heedlessly step toward different directions and this has created a false belief that there is progress in knowledge. They continue that researchers have not paying enough attention to important issues such as artifact design.

- Goodhue(2007), one of the contributor to TAM over last 2 decades, states that TAM is like any good theory, in that it is a lens that lets us focus on one view of reality and see important relationships. But like any lens, it brings some things into focus and blurs others. Persisting in his critical view, he argues that this has bothered the IS field and TAM has left us with some significant blind spots, largely because it only asks a limited question of "what causes users to utilize a technology?"

Stage 6 Investigation and Discovery

Some, who are more adventurous or perhaps less satisfied, investigate and ponder these effects and discover the laws behind them. Research and discussion ensue. Some look back to earlier ages or to other cultures in which the N aspect(s) was not neglected, and eventually this aspect is identified as significant, no longer to be reduced to another but to be given the emphasis it rightly deserves. In most cases it is a minority view that starts this process, acting as spark to the fuel of harm, because they have different presuppositions and may value the

neglected N aspect. Burton-Jones & Straub (2006) were the first who responded to call for new approach and offered a new conceptualization of IS Use.

As we see gradually some other authors started to notice and recognise the reductionist view of IS Use. They suffered the effects disproportionately, which often compounds injustice and leads to division within the community. These other authors try to broaden the view of IS Use. They draw our attention to other important aspects.

6.1 Emergence of paradigm 3: different authors in the IS Use field felt the neglecting aspects differently. There are those who believe there are prevailing neglected aspects. Number of authors' understanding shows that IS Use is of different nature than what is explicitly demonstrated in TAM studies. They introduced the notion of IS Infusion into IS Use literature. These authors were motivated, as an example, by lack of attention to the technological configuration (Formative aspect) and documentation (Lingual aspect) (Cooper and Zmud, 1990; Zmud and Apple, 1992;Saga, 1994; Moore ,2002) We analysed Grgecis & Rozenkranz (2010) functional affordance and lingual expressions as a seminal paper for the authors sharing paradigm 3.

6.2 Emergence of paradigm 4: In 2009 the USA Health Information Technology for Economic and Clinical Health act (Vest & Jasperson, 2010) directed researchers to what they called "meaningful use" as explained in Chapter 3. Most authors studying "meaningful use" in Health Care are experiencing the early stages of predicting IS Use. Similar to authors of Paradigm 1, the major motivation is the return on investment (Economic aspect) and IS Use is highly encouraged. This directs attention to the good that IS Use brings to patient care (Ethical aspect). There might go through the stages of frustration and feel the neglected aspects such as importance of multi-dimensional Use (Analytic aspect) or skills (Formative aspect) in use. Though authors

sharing this paradigm are similar to author in paradigm 1 in terms of Economic aspect, they are distinguished by the importance of Ethical aspect. I analysed Classen & Bates (2011) as seminal paper for this paradigm.

6.3 Emergence of paradigm 5: Eckhardt *et al.* (2009) is motivated by understanding the influence from different social groups in IS Use which highlights the lack of Social aspect by which they were motivated, yet they aim to understand the non-use as a respond to the domination of TAM, so they are categorised similar to Selwyn (2003). We analysed Selwyn (2003) as a seminal paper for this paradigm.

6.4 Emergence of paradigm 6: Others authors believe the main thing which is neglected is looking at pervasive IS Use various life domains. The neglected aspect is enjoyment (Aesthetic aspect) of using IS in various life domains outside professional work environment. We need to recall that enjoyment was recognised as neglected aspect during 1990s. But it was secondary to Quantitative and Economic aspects and some researchers added it as an external variable to TAM. Yet, others such as Tachatassanasoontorn & Tanvisuth (2010) and Yoo (2010) give Aesthetic aspect a primary position in paradigm 6.

Stage 7 Growing Popularity

Neglected aspect grows in popularity, as the key to understanding the harm that has befallen the community. Burton-Jones & Straub (2006) and Buffo & Barki (2003) for example invite the community to view IS Use as a complex multi-dimensional behaviour. This perspective drew on Analytical aspect but they believed other dimensions of IS Use needs to be discovered by the IS Use community. Exploring new dimensions of IS Use seems to be the growing popularity now.

Stage 8 Repetition

Each of the paradigms 3 , 4 , 5 and 6 (aspects presented in the stage 6) have the potential of gradually being assumed as dominance, becoming elevated as the new fashionable aspect (F), and, after a while, different (set of) aspect becomes neglected, becoming the new neglected aspect. This is mostly expected from IS Use studies referring to Burton-Jones & Straub (2006) seminal paper. For example, Grgecis & Rosenkrantz (2010) believed Formative and Lingual aspects were neglected in community perspectives of IS Use. These studies are recent and might become so dominant at the expense of other alternative understanding.

9.5 Conclusion

This chapter has shown the value of Dooyeweerd's philosophy, which go beyond what has been discussed in the IS Use field. It showed paradigm as meaningfulness is a way of identifying paradigms for IS Use research. This helps to make IS Use researchers aware of the importance of the diversity of aspects, as compared to those in the IS Use literature. Dooyeweerdian aspectual engine helped to provide an account of the development of the discourses in the IS Use field.

Chapter 10 CONCLUSION

10.1 Introduction

In the final chapter of this thesis, the conclusions will be drawn. Particularly this will include revisiting the original aim and objectives of this research. This is followed by limitation of this research. And then, the recommendations for further related research will be summarised. Finally the contributions of the research will be discussed.

10.2 Summary of research

In drawing the conclusions to this research it is important to reflect on its aim and objectives which were described in chapter one. The objectives of the research were designed to support the aim, which in turn was designed to fulfill the purpose. Therefore they will be considered in this order.

- The first objective was to find out what are the different ways of understanding of IS Use in the IS literature. This objective was achieved through literature review (Chapter 3) which led to organizing the IS Use field into different discourses to set the stage for searching a way of addressing their diversity and development in the IS Use field.

  Six discourses were investigated each of which focused on a distinct issue that was meaningful to each researcher. The diversity among the discourses was one of research problem rather than research methods or theoretical foundations. Whereas Benbasat & Weber (1996) discuss the latter two, they are ambiguous about research problem.

- The second objective was to examine the utility the standard IS 'paradigms' for understanding the IS Use field. Chapter 4 argued that the conventional IS 'paradigms' (i.e. Burrell & Morgan Framework, P-I-C, H-S-C, and TD-SCOT-SST) are not sufficient to address the diversity and development of IS Use discourses, because they

are based on dichotomous and dialectical reactions. Moreover, they are based on weak understanding of Kuhn's notion of 'paradigm'.

- The third objective was to investigate what 'paradigms' means and the discussions associated with it. To meet this objective, chapter 5 looked at the available literature in the philosophy of science and the discussions associated with how science is developed. The notion of 'paradigm' shift is at the center of these discussions and there is vagueness about what 'paradigm' is. Moreover, the discussion of 'paradigm' shift lacks a way of accommodating diversity, as highlighted by Feyerabend. Furthermore, Masterman highlighted the inconsistency in Kuhn's notion of 'paradigm'. Therefore there was a need for an underlying philosophy to help with addressing what 'paradigms' are and their diversity and development.
- The fourth objective was to find a sound basis for investigating the IS Use researchers' understanding of their field. Dooyeweerd's philosophy suggested a way for explaining both diversity and development of perspectives in the IS Use field. It also generated new insight into the nature of paradigms as meaningfulness.
- The fifth objective was to use the sound basis found by objective four to address the complexity associated with IS Use discourses. In chapter 8 the Dooyeweerdian notion of paradigm as meaningfulness was applied to seminal papers of IS Use discourses. Chapter 9 discussed how this was able to make sense of the diversity and development of the discourses in the IS Use field.

The main research question (MRQ) of this research was to examine how we can make sense of the Information Systems Use field. The research question that was actually answered by this research is how to make sense of the diversity and development of IS Use discourses?

The answer is to use Dooyeweerd's idea of aspects as spheres of meaning to analyse the seminal papers. In the thesis, diversity of the field maybe explained by the irreducible distinctness of aspects, and development maybe explained by the aspectual engine of Basden (1999).

This research, however, has some limitations.

10.3 Limitations

Though care has been taken in the design and conduct of this research in Chapter 2 and 7, every piece of research has its limitations and it is important to consider these as the limitations have the potential to impact on the future research and the conclusions that can be drawn.

10.3.1 IS Use Discourses

This research has not included each and every published paper centred on, or related to, IS Use. The selected papers in Chapter 3 formed an evaluative report of studies found in IS Use literature which provided a context to serve the aim of the research. The selected papers outline the wider picture of IS Use literature and illustrate how the IS Use has been studied previously, but there are yet other discourse of IS Use that were not included, such dysfunctional use, IS Use continuance, IS Use in implementation process, IS Use in decision making process or in each and every other discipline.

Taking all the discourses would have given even a wider picture of the field, but whether any of these is a separate discourse is not clear because some might be incorporated in existing ones or be combinations of them. For example dysfunctional use of IS use might extend the discourse on meaningful use, albeit in a negative direction.

This thesis has concentrated on those which give alternative understandings of IS Use as such.

Some of the omitted discourses, although addressing important issues, might be sub-discourses around specific issues within the discourses identified in Chapter 3. They might be centred on one particular theory, being silos within the main discourse. This thesis seeks a wider view, of the breadth of discourses rather than their detail. To consider the effect of the sub-discourses must be left to future research.

10.3.2 Focus on Diversity and Development

This thesis has focused on the diversity and development of IS Use discourses. Diversity and development were treated as characteristics of the complexity in the IS Use field. This research could have examined the available complexity theories, but if this had been done, the style of the thesis would have very different, with numerical and mathematical calculation and less focus on everyday experience of the IS Use researchers. Philosophically, the focus on diversity and development is sufficient for this study in that it expresses both the structure and the dynamics (changes) of the topic under study (the discourses of the IS Use field).

10.3.3 Discussion of "standard" IS "paradigms"

In chapter 4, this thesis examined the capability of four sets of standard IS paradigms (P-I-C, H-S-C and TD-SCOT-SST and Burrell and Morgan's framework) in helping with both diversity and development of various IS Use discourses. The description of each set of paradigms, and of each paradigm in each set, was relatively brief. The explanation of these sets could have been in more detail but much of the discourse about them is about strengths and weaknesses of them within their own set and is not relevant to this thesis. The focus of this thesis is on IS Use discourse that centred on how researchers understand IS Use research problems, whereas none of four sets tries to distinguish kinds of research problem. The P-I-C set, for example, distinguishes research epistemologies and much of the discourse within that set is about that.

Within each set there are other paradigms that might have been taken into account, which lie in between the existing ones, extend them or overlap among them, for example Avison and Wood-Harper's (1990) 'Multivew' or De Raadt's (1989) 'Multi-Modal System Thinking'. Consideration could have been taken of these, but they were seen as not concerning themselves with distinguishing research problems. Even though De Raadt employs the same philosophical foundation as this thesis, Dooyeweerd, his multimodaity is directed at simply taking a further step in systems thinking. No other distinct sets of paradigms were found.

10.3.4 Discussion of "Paradigm" Shift in the Philosophy of Science

Chapter 5 discussed Thomas Kuhn and his view of science and paradigm and then the other main figures in the philosophy of science that provided critiques on Kuhns work. The Lakatos and Musgrave (1970) book was read as the main source for understanding the critiques on Kuhn work because that is the best version known which includes point of views of the other influential philosophers of the time, and it is still current today.

Even within this collection, the critiques of some of the philosophers were omitted such as those of Watkins. Watkins' contribution seemed more general than that of the others, intent more on simply comparing Kuhn with Popper than on deepening the debate with a critique of the idea of paradigm. Watkins' discussion might be useful in taking the research in this thesis further with more detailed attention to incommensurability.

10.3.5 Appropriateness of using Kuhn in discussing IS Use discourses

IS epistemology draws heavily from social science because information systems are fundamentally social rather than technical systems. Thus, the scientific paradigm adopted by the natural science is appropriate to information systems only insofar as it is appropriate for the social science. If one contends that the social science embrace an epistemology which is

different from their natural science counterparts, the so too is the case for IS. (Hirschheim, 1985).

There are two questions here. First, can we really claim information systems are social science? Second, Thomas Kuhn's notion of paradigm is influenced by his background in natural science, so what is the relevance of Kuhn-based approach in discussing IS Use discourses in the thesis?

It is not easy to give a straight answer to each of the two questions. There are two issues here for consideration:

First, whether drawing to other reference disciplines could help the IS community, as a loosely connected group of individuals trying to advance the state for IS knowledge, to find their identity among other fields. Benbasat and Zmud (2003) argue that there is an identity crisis within the Information Systems discipline and, as a solution to the crisis, propose a focus on IS as a technical system. However, DeSanctis (2003) argue that a more positive progress toward legitimacy of the IS field is possible via boundary enhancement, by drawing on other reference disciplines, rather than constraint. So there is still ongoing discussion about this issue.

Second, there is this confusion that Kuhn's idea of paradigm shift suits only natural science! However, in *the structure of scientific revolution*, Kuhn shows that he did not intend to limit the idea of paradigm and paradigm shift to logic. He considers the scientific activity as everyday enterprise which go beyond logic. This is shown in his argument with Popper and the emphasis on the psychology and sociology of research activity. So, Is Kuhn-based approach still relevant to the discussion of IS Use discourses in the IS Use field where we have diversity of reference disciplines?

From Dooyeweerdian point of view we can address both issues:

The discussion about the identity of IS as discipline shows the IS community is swinging between social science and perhaps one or two other reference disciplines. Basden (2010) through Dooyeweerd's philosophy argues that IS as a discipline cannot be reduced to neither Analytic (logic) nor social aspect. But the core of Information systems is a functioning in lingual aspects. Basden (2010) argues that what the IS discipline seems to lack, however, is dignity which has little to do with self-identity and it has more to do with 'intrinsic worth'. 'Intrinsic worth' is not to be understood in financial terms, neither social nor psychological terms, but it has to do with meaningfulness. Because through meaningfulness we no longer need to refer to other reference disciplines in order to establish our own importance. However, this is a complex issue and this thesis is not called upon to resolve the issue.

In chapter 6, we proposed paradigm as meaningfulness and that helped us in aspectual analysis of twenty one conceptions of paradigm. It shows Kuhn has gone beyond seeing the paradigm shift as logic. There are conceptions functioning in pistic aspects which reflect ccommitment of researchers to what is important to them. Similarly, IS Use discourses are centred on research questions which is important to the IS Use researcher. Though there are ambiguity in Kuhn's notion of paradigm and in the identity of IS as a discipline. Having a Kuhn-based approach has been relevant to the discussion of IS Use discourse.

10.3.6 Dooyeweerd's Philosophy

Dooyeweerd's aspects, though it is a promising philosophy for understanding IS as suggested by Basden (2008), has not been widely applied in research into IS Use discourses. Recently, Ahmad & Basden (2013) applied Dooyeweerd's aspects to understanding of IS Use by looking at everyday down-to-earth issues. This research differs, and could be seen as among the first to apply Dooyeweerd's aspects to understand IS Use discourses.

One limitation of this work, in relation to its use of Dooyeweerd's philosophy, is that, instead of investigating IS Use discourses as found in the literature, this research could have applied Dooyeweerd's philosophy to analyse what Use means to a group of users of a particular system. Empirical work of that nature was considered, but it would not have provided such a wide view, nor such an articulation of what motivated the paradigms as was found in Chapter 8.

Another obvious limitation of this research is to employ a philosophy that is less known than some others in the IS Use field. In fact, however, as Chapter 6 shows, it has been used quite widely, and shows considerable promise (De Raadt 1995; Winfield 2000; Eriksson 2001; Basden 2002; Mirijamdotter & Bergvall-Kåreeborn 2006; Basden & Wood-Harper 2006; Basden 2010; Breems & Basden 2014). Dooyeweerd's emphasis on diversity of meaning and on everyday life are important in this thesis.

However as remarked by Dooyeweerd: "it is a matter of life and death for this young philosophy that Christian scholars in all fields of science seek to put it to work in their own specialty" (Dooyeweerd, 1955, Vol I,vii cited in Strauss, 2004). Therefore, it may be that the application of Dooyeweerd's aspects to IS Use research can feedback and contribute to the development of his philosophy. This can be valuable because much of the application is to the everyday experience of IS users and developers, not just in IS Use research.

10.3.7 Empirical Study

In chapter 2, it was explained that this thesis would have unusual structure comparing with most PhD thesis. This has been demonstrated with having more theoretical study in Chapter 3, 4, 5 and 6 and less empirical study in chapter 8.

The empirical study is based on the analysis of the texts in the seminal papers. It is possible that if more papers had been selected the results would have been different. For instance, might examination of Delone & McLean (1992) and Goodhue & thompsonn (1995) have yielded a different aspectual profile in Discourse 1? Both offer models that are seen as different from Davis' (1989) Technology Acceptance Model. However, examination of them shows them giving central importance to the same aspects as the rest of Discourse 1: the Quantitative and Economic aspects. It is true that Delone & McLean also recognise some other aspects of IS Success, but these are still within the context of management, in which the economic aspect is important.

A second limitation lies in using seminal papers. Instead, it might have been possible to contact one or two of the authors in each paper and arranging an interview on skype or on phone with them, or meet them in person depending on where they are based. Indeed, this was considered. Though this might have given an opportunity to the authors to express their motivation and what was important to them, much would depend on their time for the interview, their interest in this thesis, how fresh their memory is and whether there has been any change in their motivation. This possibility might be considered in future research; my initial survey of seminal papers might stimulate such research.

10.4 Future Research

A number of further research paths are suggested by the work in this thesis. These include research into:

This thesis has applied Dooyeweerd's philosophy to six discourses in the IS Use field. Future research can take more discourses of IS Use into account. Dooyeweerd's aspects and aspectual engine can be applied to more discourses in the IS Use field. For example, IS continuance. Further research might include researching overlaps and sub discourses.

This thesis has narrowed down the aspectual analysis to the seminal papers. However aspectual analysis could go cover more papers in a specific journal, this will lead to more detailed findings. Further research can be done by periodic review of all research associated to IS Use in specific journals.

Future research can take into account other critiques relevant to Kuhn's idea of 'paradigm' shift. For example, the discussion of incommensurability of paradigms not only helps to discuss the diversity and development of IS Use discourses, but also the overlaps between them. This study suggested a way of identifying overlaps between IS Use discourses. Aspects as distinct spheres of meaning can help to find more areas of overlap in the IS Use field. This would give them another professional way of affirming other scholars working in the same community.

Future research can give a thorough analysis of development of discourses from the Kuhn and Feyerabend perspective and compare it with the Dooyeweerdian perspective.

This thesis applied Dooyeweerd's philosophy to the diversity and development of IS Use discourses. Future research can apply Dooyeweerd's philosophy in the other areas of IS research. Aspects as distinct areas of meaning can be applied to IS development field to understand diversity of discourses in information systems development. This will enable us to, at least, categorise the diversity of IS development discourses based on aspects rather than topic or frequency of citation. Eight stages of aspectual engine can help to understand how

development discourses progressed IS. This idea can be also applied to the infant area of IS and sustainability, and suggest a way of consistency in the field.

This thesis applied Dooyeweerd's philosophy on the IS Use discourses which were distinguished intuitively based on the research problem intended to be addressed in the IS Use field. Future research can apply Dooyeweerd's philosophy on the diversity of the reference disciplines in the IS Use field. This will suggest another view to the field which is different from 'internal' and 'external' views of diversity as explained by Westin et al (1994) and Whitley (2000). It might also provide a way to situate the research "paradigms" (Diversity of generic approaches), if aspects important in each are identified (as Basden (2011) does with the positivist-interpretivist-critical stream).

10.5 Contributions

The intention of this study was to contribute to the body of knowledge on making sense of the IS Use field. There is now abundance of literature on IS Use, majority of them rely on TAM and its variants. Others responded to the weaknesses of this dominant view and now we have gone through proliferation of different discourses developed over time. This has added to the complexity of the IS Use field. It is this problem that this thesis was designed to address; Diversity and Development of IS Use discourses.

Dooyeweerd's philosophy helps to suggest a way of analysing and understanding both diversity and development of IS Use discourses, but it also show its fruitfulness indirectly to IS research and Philosophy of Science. Thus this research might make several contributions.

10.5.1 Contributions to Theory

Most of the contributions of this research are to theory, of which there are four sub-contributions.

- Sub-contribution to the theory of paradigms in the philosophy of Science

The contribution of this research to the philosophy of Science is three:

First, this research proposed paradigm as meaningfulness as the contribution of Dooyeweerd to the philosophy of science. In Chapter 6, section 6.11 an alternative way of identifying paradigm has been proposed. It is based on meaning, and may be operationalized by asking "What do researchers treat as most meaningful in carrying out and discussing their research?" Dooyeweerd's aspects, as spheres of meaning, helped in asking this question, and provided a basis for seeing what is meaningful to each of the IS Use discourses.

Second, this research provided aspectual account of twenty one conceptions of what is "paradigm", and a way of consistency between them. Compared with Masterman who suggested that Kuhn's manifold uses of the term 'paradigm' in *The Structure of Scientific Revolutions* may be reduced to three, this research, organise twenty one conceptions into eight distinct categories which suggests a way of reducing inconsistency for those researchers who seek clarity and consistency in Kuhn's twenty one conceptions before grounding their research on Kuhn. This shows the gap that had not been addressed by Masterman. The Dooyeweerdian approach grounded the scientist practices on meaningfulness. It helped the twenty one conceptions of paradigms find their consistency in Analytical, Formative, Lingual, Social, Economic, Aesthetic, Juridical and Pistic aspects, all are spheres of meaning. The scientist practices are human activities functioning in aspects. This leads to the next sub-contribution to the philosophy of science.

Third, this research provided a way of reducing tension between personal vs community use of paradigm. Masterman (1970) concludes that though the concept of paradigm is crude, it is not without boundaries. However, the vagueness of the boundaries raised tension between personal versus community conception of paradigm. Proponents of community concept tend to think of paradigm as a specific practice (activity) which lies outside of the individual's

thinking (perspective) and argue against the personal paradigm. This tension falls into Nature-Freedom GM. This research suggested a way of addressing this tension by using Dooyeweerd's aspects grounded in CFR. Aspects helped to see both perspectives and activities of researchers are meaningful in aspect. Instead of seeing a gap between perspective and activity, Dooyeweerd's aspects could be a common ground for both perspective and activity of scientists (researcher).

- Sub-contribution to the development (Related to chapter 4: Development)

This research suggested a way of accounting for the development of discourses which is neither Hegelian dialect nor dualistic ground motives account. In a sense it provided a way of judging standard IS "paradigms". The standard IS "paradigms" have been reviewed in chapter 4 of the thesis, and there seems to have been two main foundations for identifying paradigms: the interaction of predefined dichotomous dimensions, and historical reaction. Problems have been found with paradigms emerging from these, not least being that much IS Use research cannot comfortably be fitted into the "paradigms" thus identified. A root of the problem was seen to be presupposition of an absolute antithesis is inherent in the nature-freedom ground-motive.

The nature-freedom ground-motive would not enable account for the development of the IS Use field, due to inherent dualist view. Compared with Hegelian engine of dialect and ground-motives engine of dialect, a new approach called Aspectual engine of dialect was developed by Basden (1999) from Dooyeweerd's philosophy that presupposes the non-dualistic ground-motive of creation, fall and redemption (CFR). This approach grounds the development of discourses in dialect of meaning. Instead of giving a matrix of "paradigms" or three stages of thesis-antithesis-synthesis approach, aspectual engine of dialect gives a cycle of eight stages which is less deterministic and more precise.

Application of aspectual engine in the IS Use field, though it is at its initial stage, is a proposal to IS Use field. If development of thoughts is an indicator for a field be seen as distinct and progressing field of study, this research provides a way of analysis to examine the progress of the IS Use field.

- Sub-contribution to the IS Use Field (related to Diversity)

In chapter 6, paradigm as meaningfulness was proposed. In chapter 8, It was identified what primarily meaningful to each seminal paper. In chapter 9 it was discussed we can identify something meaningful in each discourse that differentiates it from others. Application of paradigm as meaningfulness contributes to the IS Use field.

First, Dooyeweerd's philosophy helped to identify six paradigms of IS Use that could guide IS Use research. This helps to separate out distinct paradigms, by reference to what researchers and others actually try to express when writing, rather than by reference to predefined dichotomous dimensions or theorized historical reactions (i.e. standard IS "paradigms").

Second, this research showed another way of affirming the diversity in the IS Use field. There might be other researchers who see the field of IS Use proliferated with various understanding, methods, etc. This could be the issue that current researcher have also faced. Some have affirmed this diversity by Meta–analysis, for example King & He (2006) and Yousefzai *et al.* (2007). Yet, Dooyeweerd's philosophy helped to affirm the diversity in the IS Use field in a unique way. Compared with common way of affirming the diversity in the IS Use field, this study looked at the motivation of IS Use researchers which had not been looked at before and used philosophical framework. Previous studies affirmation were up to

the point of collection and categorising data, whereas this research, instead of merely collection, has focused on affirming though aspectual analysis.

Third, this study suggested a way of coping with overlaps and for seeing where paradigms might be missing. Not only IS Use researchers would be able to understand what is meaningful to their colleagues' paradigm, but also they would be able to see some of the main meaningful paradigm in the field. Current researcher in the field of IS Use can see their stance of their understanding of IS Use. New researchers who are interested in IS Use research can see whether they have any similarity in terms of paradigm to the seminal papers or they are different. Also there is a chance for current and future IS Use researchers to see the gaps in aspects. They can see what aspects received less or no attention and be innovative in their paradigm and their research idea. Another way of being innovative is by combining two or more aspects. IS Use researcher could be motivated by multiple aspects and shape their research.

Fourth, this study suggests a way integrating IS Use paradigms into a wider picture. Venkatesh *et al.* (2003) integrates eight divers theories associated with IS Use into one and gives a wider picture to the IS Use researchers, but that is only confined to discourses in IS Acceptance. Whereas this study integrates the seminal papers as representative of six different discourses of IS Use without combining them together into one. The way it does is based on pre-theoretical attitude. Aspects are distinct and coherent and this helps to integrate discourses together while giving them their own distinct place in the field.

Fifth, this research found meaningfulness as a basis to identify diversity in the IS Use field. Whether diversity will have benefit or cost for IS as discipline has been controversial. There

are IS scholars for and against diversity. Some invites for unification and some others inspire proliferation. Yet, there are IS scholars who also attempted a way organising and characterizing the diversity in IS Research. This thesis contributes to their work.

Benbasat and Weber (1996) is an invaluable and pioneering attempt, yet they have not introduced any classification scheme on how to identify diversity in IS research. Vessey *et al.'* (2002) research is the first attempt in analysing empirically the diversity in IS field. They addressed the diversity in IS field as a whole and clarified their approach in identifying the diversity. Compared with Vessey *et al.* (2002) who identified diversity in IS research based on topic and research method by perusing text or the key words, this research identified diversity based on meaningfulness by analysing texts in the seminal papers from different IS Use discourses. Meaningfulness has been used to identify the diversity of reference discipline and research methods in the IS Use field.

Meaningfulness specifically stands out as a different way of identifying the diversity of paradigms. While most ways of identifying paradigms to date have been dialectical, this study has introduced a non-dialectical yet pluralist basis for giving equal dignity to all discourses in the IS Use field. Dooyeweerdian approach grounds all research in diversity of meaning, and makes everyday experience foundational for theoretical thought. Applicability of this approach in the IS Use field can contribute to other areas in IS research. This could be applied in IS design, IS development, IS operation, and IS ecology. Now meaningfulness of the current discourses in each of these areas could be examined.

- Sub-contributions to the Theory of Dooyeweerd

As it was stated in chapter 6 Dooyeweerd's (1894-1977) philosophy lacks a wide experience of application. Therefore this study is adding value to the applicability of Dooyeweerd's

philosophy by using it in a new context. As a result, there are four ways in which this research adds contribution to Dooyeweerd's philosophy.

First, Basden's (2008*) Philosophical Frameworks for Understanding Information Systems* illuminates the application of Dooyeweerd's philosophy in information system field. Using Dooyeweerd's theory of modal aspects he introduces a framework for understanding the nature of computers and information, a framework for understanding information systems Development , a Framework for understanding information technology resources, a framework for understanding information technology as ecology and a framework for understanding human use of computers in which we read a reinterpretation of human use of computers which is not limited to just one kind of subject -object interaction such as Human computer Interaction, but it goes beyond that and involves Human living with computers (HLC) and Engaging with represented content (ERC) . For human use of computers it has been noticed that early research only recognized Human Computer Interaction HCI.

Basden (2008), however, applies Dooyeweerd's philosophy and then proposes frameworks for our understanding. And although in each chapter he compares and looks at existing literature in relation to each framework, he does not really evaluate the literature, whereas this study has reviewed the existing literature and applied Dooyeweerd's philosophy for the evaluation of it. The evaluation had a form of affirming the IS Use discourses assembled in the IS literature.

Second, Ahmad & Basden (2013) *Down-To-Earth Issues in Information Systems Use* applies Dooyeweerd's philosophy and proposes a new understanding of IS Use that gives attention to the everyday 'Down-To-Earth' (DTE) issues that actually affect the success or quality of IS Use. These differ from the kinds of issues discussed in the extant literature on IS Use, in at

least five main ways. The DTE approach takes the user's everyday perspective rather than that of management, IT suppliers or researchers. However, compared with Ahmad & Basden (2013) who investigate what IS Use means to people on the ground, this research applies Dooyeweerd's philosophy to investigate IS Use researchers' paradigms. In a way Dooyeweerd helps in two different ways in making sense of the IS Use Field.

Third, Basden (1999) *Engines of Dialectic focus* focuses on understanding Hegel's deepest ideas. He first find points of agreement between Hegel's idea and those of Dooyeweerd, second, he applies Dooyeweerd's ideas to criticize and enrich Hegel's. Third, he proposes an engine of dialect based on Dooyeweerd's concept of irreducible aspects that has advantages over other proposals and applies that on the development of environmental perspectives. Whereas, this research, rather than focusing of Hegel's idea, focus on making sense of the complexity in the IS Use field, and applies engine of dialect as a tool on the development of IS Use discourses.

Fourth, Skillen (1979), in *Herman Dooyeweerd's Contribution to the Philosophy of the Social Sciences* looks for points of agreement between Kuhn and Dooyeweerd especially when the former digs into the character of pre-theoretical "paradigms". There are similarity and difference between Skillen (1979) research and this research. Both studies take a field through which to show how Dooyeweerd's philosophy could contribute to the philosophy of science as discussed by Kuhn. While Skillen (1979) take social science as an example, this research takes Information Systems. However, comparing with Skillen (1979) who show the potential contribution of Dooyeweerd's philosophy to the philosophy of social sciences this research show the contribution of Dooyeweerd's philosophy directly to the philosophy of science by

applying Dooyeweerd's aspects to one of the crucial discussion in the philosophy of science – crudeness of the notion of paradigm.

10.5.2 Contributions to Methodology

First, this research has used aspectual text-analysis as a different method for analysing texts. Text analysis is used by those who are interested in seeking meaning in the literature. Therefore, qualitative researchers interested in text analysis could gain benefit from the Dooyeweerdian approach suggested in this study. Enriching qualitative analysis with Dooyeweerd's aspects could benefit them by enabling them to find what is meaningful to the authors in their field of study. Aspects cover most human everyday activities and are grasped intuitively, which makes them useful when trying to understand researcher's activities including their paradigm. This approach has two benefits:

- First, it explains more clearly what it is about IS Use that is meaningful to the authors.
- Second, the reference to an initial aspect can help raise questions that can deepen further exploration. Thus aspects can deepen our understanding of them.

A possible second contribution to research methodology is that, since each aspect expects a different research method (Basden, 2008), identifying the central aspect of the discourse or paradigm can indicate which methods would be most fruitful in research. For example, from Table 4, to research resistance to IS Use, methods suited to research of attitude and beliefs are more likely to provide insight than research geared to logic or measurement.

10.5.3 Contributions to Practice

This research was concerned with making sense of the diversity and development of IS a Use discourse and it is a theoretical topic. For this reason, it is unlikely to be much contribution to practice.

However, this research suggests an initial framework by which practitioners could understand what is happening in the IS Use academic community. For example, Table in chapter 8 can be used by practitioners to see what is meaningful, because practitioners can understand the aspects. Aspects could be seen as a common language between theory and practice.

10.6 Conclusion

This research has proposed a new approach to understanding the nature of paradigms which can help to make sense of the diversity and development of discourses. One way of doing this is to use Dooyeweerd's aspects to analyse the seminal papers. This can give IS researchers and analysts a richer and wider picture of the IS Use field which can accommodates emergent as well as existing discourses. It is hoped that this Dooyeweerdian approach to the diversity and development of the IS Use discourses can be taken further both to improve the overall understanding of Information Systems Use field, and to make sense of other fields.

REFERENCES

Abdualrazak, B., Malik, Y., & Yang, H. I. (2010). A taxonomy driven approach towards evaluating pervasive computing system. In Aging Friendly Technology for Health and Independence (pp. 32-42). Springer Berlin Heidelberg.

Ackoff, R. L. (1974). Redesigning the Future: A Systems Approach to Societal Problems, WileyInterscience, New York.

Ackoff, R. L. (1979). The future of operational research is past. Journal of the operational research society, pp. 93-104.

Ackoff, R. L. (1980). 'The systems revolution' in Lockett, M. and Spear, R. (eds) (1980). Organizations as Systems, The Open University Press, Milton Keynes. (Ackoff's article originally published in 1974).

Agarwal, R. and Prasad, J. (1997). "The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies", Decision Sciences, 28(3), pp. 557-581.

Agarwal, R., E. Karahanna. (2000). Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. MIS Quarterly, 24(4), pp. 665-694.

Agarwal,R. and Prasad,J. (1999). "Are individual differences germane to the acceptance of new information technologies?", Decision Sciences, 30(2), pp. 361-391.

Ahmad, H. (2013). Down-to-earth issues in Mandatory Information Systems Use. PhD Thesis, University of Salford, Salford, U.K.

Ahmad, H., & Basden, A. (2013). Down-to-Earth Issues in Information System Use. In PACIS (pp. 191).

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Huamn Decision Processes, 50, pp. 179-211.

Al-Natour, S., and Benbasat, I. (2009). "The Adoption and Use of IT Artifacts: A New Interaction-Centric Model for the Study of User Artifact Relationships," Journal of the Association of Information Systems, 10(9), pp. 661-685.

Alvesson, M., and Deetz, S. (2000). Doing Critical Management Research, London: Sage Publications.

Alvesson,M . and H. Willmott (1992). "On the idea of Emancipation in Management a and OrganisationS studies", Academy of Management Review, 17(3), pp. 432-464.

Avison, D. E., & Wood-Harper, A. T. (1986). Multiview—an exploration in information systems development. Australian Computer Journal, 18(4), pp. 174-179.

Avison, D. E., & Wood-Harper, A. T. (1991). Information systems development research: An exploration of ideas in practice. The Computer Journal, 34(2), pp. 98-112.

Avison, D. E., Wood-Harper, A. T., & Antill, L. (1990). Multiview: An exploration in information systems development. Oxford: Blackwell Scientific.

Bagayogo, F., Lapointe, L., Bassellier, G. (2010). Enhanced use in the post-adoption phase: A conceptualisation.ASAC.

Banker RD and Kauffman RJ (2004). 50th anniversary article: the evolution of research on information systems: a fiftieth-year survey of the literature in management science. Management Science, 50(3), pp. 281-298

Barki, H., Rivard, S., & Talbot, J. (1993). A keyword classifi cation scheme for IS research literature: An update. MISQuarterly, 17(2), pp. 209-226.

Barkin, S. R., & Dickson, G. W. (1977). An investigation of information system utilization. Information & Management, 1(1), pp. 35-45.

Barkin, S. R., G. W. Dickson. (1977). An investigation of information system utilization. Inform. Management, 1(1), pp. 35-45.

Basden, A. (1999). Engines of dialectic. Philosophia reformata, 64(1), pp. 15-36.

Basden, A. (2001). Christian philosophy and information systems. Toronto Institute for Christian Studies, Oct.

Basden, A. (2002). The critical theory of Herman Dooyeweerd?. Journal of Information Technology, 17(4), pp. 257-269.

Basden, A. (2008). Philosophical Frameworks for Understanding Information Systems. Herschey, PA, USA: IGI Global.

Basden, A. (2010). On using spheres of meaning to define and dignify the IS discipline. International Journal of Information Management, 30(1), pp. 13-20.

Basden, A. (2011). Enabling a Kleinian integration of interpretivist and socio-critical IS research: The contribution of Dooyeweerd's philosophy. European Journal of Information Systems, 20(4), pp. 477- 489.

Basden, A. (2014). A Dooyeweerdian Understanding Of Affordance In Information Systems And Ecological Psychology. Available: http://rozenbergquarterly.com/iide-proceedings-2014-a-dooyeweerdian-understanding-of-affordance-in-information-systems-and-ecological-psychology/. Last accessed 20th Feb 2015.

Basden, A., & Burke, M. E. (2004). Towards a philosophical understanding of documentation: a Dooyeweerdian framework. Journal of Documentation, 60(4), pp. 352-370.

Basden, A., & Wood-Harper, A. T. (2006). A philosophical discussion of the root definition in soft systems thinking: an enrichment of CATWOE. Systems Research and Behavioral Science, 23(1), pp. 61-87.

Baskerville, R. L., & Myers, M. D. (2002). Information systems as a reference discipline. Mis Quarterly, pp. 1-14.

Benbasat, I. and Barki, H. (2007). "Quo Vadis, TAM?", Journal of the Association for Information Systems, 8(3), pp. 211-218.

Benbasat, I., & Weber, R. (1996). Research commentary: Rethinking "diversity" in information systems research. Information systems research, 7(4), pp. 389-399.

Benbasat, I., & Zmud, R. W. (2003). The identity crisis within the IS discipline: Defining and communicating the discipline's core properties. MIS quarterly, pp. 183-194.

Benbasat, I., & Zmud, R. W. (2003). The identity crisis within the IS discipline: Defining and communicating the discipline's core properties. MIS quarterly, pp. 183-194.

Bergman, E. (2000). Information Appliances and Beyond. Morgan Kauffman, San Francisco, CA.

Bhattacherjee, A. (2001). An empirical analysis of the antecedents of electronic commerce service continuance. Decision support systems, 32(2), pp. 201-214.

Bijker, W., (1995). Sociohistorical technology studies, in: Jasanoff et al. (Editors), Handbook of Science and Technology Studies (Sage Publications, London), pp. 229-256.

Braa, K., & Vidgen, R.T., (1999). Interpretation, intervention and reduction in the organizational laboratory: a framework for in-context information systems research. Information and Organization, 9(1), pp. 25-47.

Breems, N., & Basden, A. (2014). Understanding of computers and procrastination: A philosophical approach. Computers in Human Behavior, 31, pp. 211-223.

Brosnan, M. J. (1999). Modeling technophobia: A case for word processing. Computers in Human Behavior, 15(2), pp. 105-121.

Brynjolfsson,E. (1993).The productivity paradox of information technology.Communications of the ACM, 36(12), pp. 66-77.

Buffo, C., & Barki, H. (2003). Conceptualising Information System use: A behavioural and Perceptual framework, Cahier du GReSI no 03-05:HEC Montreal.

Bunge M. (1979). Treatise on Basic Philosophy, Volume 4. Ontology II A World of Systems. Dordrecht, Netherlands: D. Reidel.

Burke, M. E. (2007). Making choices: research paradigms and information management: Practical applications of philosophy in IM research. Library review, 56(6), 476-484.

Burrell G, & Morgan G. (1979). Sociological Paradigms and Organizational Analysis. London: Heinemann Books.

Burton-Jones, A., and Straub, D. W. (2006). Reconceptualizing System Usage: An Approach and Empirical Test, Information Systems Research, 17(3), pp. 228-246.

Campbell, S. W. (2007). Perceptions of mobile phone use in public settings: A cross-cultural comparison. International Journal of Communication, 1(1), pp. 20.

Carroll, J., & Fidock, J. (2011). Beyond resistance to technology appropriation. In System Sciences (HICSS), 2011 44th Hawaii International Conference on (pp. 1-9). IEEE.

Cedarbaum, D. G. (1983). Paradigms. Studies in History and Philosophy of Science, 14 (3), pp. 173-213.

Cenfetelli, R. T. (2004). Inhibitors and enablers as dual factor concepts in technology usage. Journal of the Association for Information Systems, 5(11), pp. 16.

Chapman, R. (1999). Redefining Equity: Meaningful Uses of Technology in Learning Environments. Position Paper on Equity and Educational Technologies. MIT Media Laboratory, Cambridge, MA 02139.

Chau, P.K. and Hu, P.J. (2001).”Information Technology acceptance by individual professionals”, Decision Sciences, 32(4), pp. 699-710.

Checkland, P. (1981). Systems thinking, systems practice.

Checkland, P. B. (1988). Information systems and systems thinking: time to unite?. International Journal of Information Management, 8(4), pp. 239-248.

Checkland, P.B. (1999). Systems thinking. In: W.L. Currie and B. Galliers (eds) Rethinking management information systems, pp. 45–56. Oxford: Oxford University Press.

Choi, H., Lee, M., Im, K. S., Kim, J. (2007). Contribution to Quality of Life: A New Outcome Variable for Mobile Data Services, Journal of the Association for Information Systems, 8, pp. 598-618.

Chua, W. (1986). Radical Developments in Accounting Thought. The Accounting Review, 61, pp. 601-632.

Chua, W. F. (1986). Radical developments in accounting thought. Accounting review, pp. 601-632.

Classen DC, Bates DW. (2011). Finding the meaning in meaningful use. N Engl J Med, 365(9), pp. 855-8.

Clements, J. A. & Bush, A. A. (2011). Habitual is use and continuance. Proceedings of the Southern Association for Information Systems Conference, Atlanta, GA, US.

Clouser, R. (1997). A critique of historicism. Crítica: Revista Hispanoamericana de Filosofía, pp. 41-64.

Clouser, R. A. (1996). A Sketch of Dooyeweerd's Philosophy of Science'.Facets of Faith and Science, 2, pp. 81-97.

Cohen, L. Manion, L. and Morrison, K. (2007). Research methods in education 6th edition. London: Routledge.

Coleman, E. (2013). Reawakening the Qualitative/Quantitative Debate. Proceedings of the Nineteenth Americas Conference on Information Systems, Chicago, Illinois, August, pp. 15-17.

Connelly, K. (2007, September). On developing a technology acceptance model for pervasive computing. In 9th International Conference on Ubiquitous Computing (UBICOMP)-Workshop of Ubiquitous System Evaluation (USE), Springer, Innsbruck, Austria (pp. 520).

Cooper, R. B., & Zmud, R. W. (1990). Information technology implementation research: a technological diffusion approach. Management Science, 36 (2), pp. 123-139.

Dando, M. R., & Bennett, P. G. (1981). A Kuhnian crisis in management science ?. Journal of the Operational Research Society, pp. 91-103.

Davis, F. (1986). "A technology acceptance model for empirically testing new end-user information systems: theory and results", Doctoral Dissertation, MIT Sloan School of Management, Cambridge, MA.

Davis, F. (1989). Perceived usefulness, perceived ease of use, and end user acceptance of information technology. MIS Quart, 13(3), pp. 318–339.

Davis, F. D., and Venkatesh, V. (1996). "A Critical Assessment of Potential Measurement Biases in the Technology Acceptance Model: Three Experiments," International Journal of Human Computer Studies (45), pp. 19-45.

Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models, Management Science, 35(8), pp. 982-1002.

Davis, F., Bagozzi, R.P. and Warshaw, P.R. (1992). "Extrinsic and Intrinsic motivation to use computers in the workplace", Journal of Applied Social Psychology, 22(14), pp. 1111-1132.

De Raadt, J. D. R. (1989). Multi-modal systems design: A concern for the issues that matter. Systems Research, 6(1), pp. 17-25.

De Raadt, J. D. R. (1995). Expanding the Horizon of Information Systems Design. Systems Research, 12, pp. 185-199.

De Raadt, J. D. R. (1995). Expanding the horizon of information systems design. Systems Research, 12(3), pp. 185-199.

Deetz, S. (2006). Describing Differences in Approaches to Organization Science: Rethinking Burrell and Morgan and Their Legacy Stanley Deetz Source: Organization Science 7 (2)(1996): 191-207. Organizational Communication: History and theoretical perspectives, 1(2), pp. 231.

DeLone, W.H., and McLean, E.R. (1992). Information systems success: The quest for the dependent variable. Information Systems Research, 3(1), pp. 60-95.

DeLone, W.H., and McLean, E.R. (2003). The DeLone and McLean model of information systems success: a ten-year update, Journal of Management Information Systems, 19(4), pp. 9–30.

DeSanctis, G. and Poole, M. S. (1994). Capturing the complexity in Advanced Technology Use: Adaptive Structuration Theory. Organization Science, 5 (2), pp. 121-147.

Dishaw, M.T. and Strong, D.M. (1999)."Extending the technology acceptance model with task- technology fit constructs", Information and Management, 36(1), pp. 9-21.

Ditsa, G. (2002). Executive Information Systems Use in Organisational Contexts: Understanding the User Behaviour. In L. Cornwell (Eds.), Issues in Information Systems: Emerging Technologies...The Challenges and Opportunities of Change Stillwater, OK, USA:IACIS.

Doll, W.J., & Torkzadeh, G. (1998). Developing a multidimensional measure of systems use in an organizational context. Information & Management, 33(4), pp. 171-185.

Dooyeweerd H. (1955). A New Critique of Theoretical Thought, Vol. I-IV, Paideia Press (1975 edition), Jordan Station, Ontario.

Dooyeweerd, H. (1955). A New Critique of Theoretical Thought, (Vol. I-IV). Jordan.

Dutton, W. H., Cheong, P. H., & Park, N. (2004). The social shaping of a virtual learning environment: The case of a university-wide course management system. Electronic Journal of e-learning, 2(1), pp. 69-80.

Eckberg, D. L., & Hill Jr, L. (1979). The paradigm concept and sociology: A critical review. American Sociological Review, pp. 925-937.

Eckhardt, A., Maier, C., Hsieh, J. J., Chuk, T., Chan, A., Hsiao, J., & Buettner, R. (2013). Objective measures of IS usage behavior under conditions of experience and pressure using eye fixation data.

Eckhardt, A., S. Laumer and T. Weitzel (2009). "Who Influences Whom? Analyzing Workplace Referents' Social Influence on It Adoption and Non-Adoption." Journal of Information Technology, 24(1), pp. 11-24.

Eemeren, F. H. v. (2003). Anyone who has a view: theoretical contributions to the study of argumentation. Argumentation library, vol. 8. Dordrecht:Kluwer Academic. p. 92.

Eisenberg, M. B., & Johnson, D. (2002). Learning and teaching information technology. Syracuse, NY: ERIC Clearinghouse on Information & Technology (No. ED465377). Retrieved July 7, 2003, from http://ericit.org/digests/EDO-IR-2002-04.pdf.

Elie-Dit-Cosaque, C. M., & Straub, D. W. (2011). Opening the black box of system usage: user adaptation to disruptive IT. European Journal of Information Systems, 20(5), pp. 589-607.

El-Khatib, R., & Barki, H. (2009). The Influence Of Habit On Different Behavior Types: Implications For Is Research. In ASAC (30(4)).

Erikson, D. (2001). “Multi-Modal Investigation of a Business Process and Information System Redesign: A Post-Implementation Case Study”, Systems Research and Behavioural Science, 18(2), pp. 181-196.

Eriksson DM. (1998). Managing Problems of Postmodernity: Some Heuristics for Evaluation of Systems Approaches. Interim Report, IR-98-060/August, International Institute for Applied Systems Analysis, Laxenburg, Austria.

Eriksson, D. M. (2001). Multi-modal investigation of a business process and information system redesign: a post-implementation case study. Systems Research and Behavioral Science, 18(2), pp. 181-196.

Eriksson, D. M. (2003). Identification of normative sources for systems thinking: an inquiry into religious ground-motives for systems thinking paradigms.Systems Research and Behavioral Science, 20(6), pp. 475-487.

Eriksson, D. M. (2006). Multimodal Investigation of Technology-Aided Human Practice in Business Operations. In In Search of an Integrative Vision for Technology (pp. 165-184). Springer US.

Ernest, P. (1994). An introduction to research methodology and paradigms. Exeter, Devon: RSU, University of Exeter.

Ernest, P., & Exeter Univ.(United Kingdom). School of Education;. (1994). An Introduction to Research Methodology and Paradigms: Educational Research, Its Philosophy and Purpose. University of Exeter, School of Education.

Ernst, S. (2009). Using Qualitative Content Analysis of Popular Literature for Uncovering Long-Term Social Processes: The Case of Gender Relations in Germany. Historical Social Research/Historische Sozialforschung, 252-269.

Fadel, K. (2006). Individual Infusion of Information Systems: The Role of Adaptation and Individual Cognitions, Proceedings of the Twelfth Americas Conference on Information Systems, Acapulco, Mexico August 04th-06th.

Farhoomand, A. F. (1987). Scientific progress of management information systems. ACM SIGMIS Database, 18(4), 48-56.

Ferneley, E. H., & Sobreperez, P. (2006). Resist, comply or workaround? An examination of different facets of user engagement with information systems.European Journal of Information Systems, 15(4), pp. 345-356.

Feyerabend, P. K., Consolidations for the Specialist, in Lakatos, I. and Musgrave, A. (eds) Criticism and the Growth of Knowledge (Cambridge: Cambridge University Press, 1970).

Fishbein, M. and Ajzen, I. (1975). “Belief, Attitude, intention and behaviour: An introduction to theory and research, Addison-Wesley, Reading, MA.

Fleming, V., Gaidys, U., & Robb, Y. (2003). Hermeneutic research in nursing: developing a Gadamerian-based research method. Nursing Inquiry, 10(2), pp. 113-120.

Ford, J. D., L. W. Ford and A. D'amelio (2008). "Resistance to Change: The Rest of the Story." Academy of Management Review, 33(2), pp. 362-377.

Fourie, C. (2002). Accommodating diversity: Feyerabend, science and philosophy (Doctoral dissertation, Rand Afrikaans University).

Fox, M. A. (2005). The accessible hegel. Humanity Books.

Frissen, V. A. (2000). ICTs in the rush hour of life. The Information Society, 16(1), pp. 65-75.

Galliers, R. D. (2003). Change as crisis or growth? Toward a trans-disciplinary view of information systems as a field of study: A response to Benbasat and Zmud's call for returning to the IT artifact. Journal of the Association for Information Systems, 4(1), 13.

Galliers, R. D., & Whitley, E. A. (2007). Vive les differences? Developing a profile of European information systems research as a basis for international comparisons. European Journal of Information Systems, 16(1), pp. 20-35.

Gattoni, A., & Tenzek, K. E. (2010). The practice: An analysis of the factors influencing the training of health care participants through innovative technology. Communication Education, 59(3), pp. 263-273.

Gefen, D. and Straub, D.W. (1997).“Gender differences in the perception and use of e-mail: an extension to the TAM“ , MIS Quarterly , 21(4), pp. 389-400.

Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. MIS quarterly, 27(1), pp. 51-90.

Giglio, L. (2009). I Am Not But I Know I Am: Welcome to the Story of God. Multnomah Books.

Ginzberg, M. J. (1981). Early diagnosis of MIS implementation failure. Management Sci, 27(4), pp. 459-478.

Ginzberg, M. J. (1981). Early diagnosis of MIS implementation failure: promising results and unanswered questions. Management Science, 27(4), pp. 459-478.

Glass, G. V. (1976). Primary, secondary, and meta-analysis of research.Educational researcher, pp. 3-8.

Goles, T., & Hirschheim, R. (2000). The paradigm is dead, the paradigm is dead… long live the paradigm: the legacy of Burrell and Morgan. Omega, 28(3), pp. 249-268.

Goodhue, D.L.(2007).”Comment on Benbasat and Barki’s “Quo Vadis TAM” article”, Journal of the Association for Information Systems, 8(4), pp. 219-222.

Goodhue, D.L., & Thompson, R.L. (1995). Task-Technology Fit and Individual Performance, MISQuarterly, 19 (2), pp. 213-236.

Grgecis, D. & Rosenkranz, Ch. (2010). Rethinking the concept of IT use, Proceedings of the Diffusion Interest Group in Information Technology (DIGIT) Workshop, St. Louis, USA, December 2010. Association for Information Systems Electronic Library.

Grimmer, J., & Stewart, B. M. (2013). Text as data: The promise and pitfalls of automatic content analysis methods for political texts. Political Analysis, mps028.

Grint, K. and Woolgar, S. (1997). The Machine at Work: Technology, Work and Organisation. Cambridge : Polity Press.

Guba, E. G. and Lincoln, Y. S., (1998). Competing Paradigms in Qualitative Research, in Denzin, N. K. and Lincoln, Y.S. (eds). (1998). The Landscape of Qualitative Research: Theories and Issues, Sage Publications, London.

Hardgrave B, Davis F and Riemenschneider C. (2003). Investigating determinants of software developers' intentions to follow methodologies. Journal of Management Information Systems, 20(1), pp. 123-151.

Hartson, R. (2003). Cognitive, physical, sensory, and functional affordances in interaction design. Behaviour & Information Technology, 22(5), pp. 315-338.

Harwell, M. R. (2011). Research design in qualitative/quantitative/mixed methods. The Sage handbook for research in education. 2nd ed. Los Angeles, CA: Sage, 147.

Haythornthwaite, C., & Wellman, H. (2002). The Internet in everyday life: An introduction. The Internet in everyday life, pp. 1-41.

Herman, P.L (2002).Case Study of a Professional Development Program: Meaningful Technology Integration in Secondary Education Doctoral Thesis: Drexel University.

Herrera, G. L. (2003). Technology and international systems. Millennium-Journal of International Studies, 32(3), pp. 559-593.

Hirschheim, R. (1985). Information systems epistemology: An historical perspective. Research methods in information systems, pp. 13-35.

Hirschheim, R. and H. K. Klein (1994). "Realizing Emancipatory Principles in Information Systems Development: The case for ETHICS," MIS Quarterly, 18(1), pp. 83-109.

Hirschheim, R., & Klein, H. K. (1989). Four paradigms of information systems development. Communications of the ACM, 32(10), pp. 1199-1216.

Hirschheim, R., and Klein H. K. (2010). A short and glorious history of the information systems field. Journal of the Association of Information Systems.

Hirschheim, R., and Klein, H. (2010). A short and glorious history of the information systems field. Journal of the Association of Information Systems.

Hirschheim, R., Klein, H. K., & Lyytinen, K. (1995). Information systems development and data modeling: conceptual and philosophical foundations (Vol. 9). Cambridge University Press.

Hollinger, D. A. (1973). TS Kuhn's theory of science and its implications for history. The American Historical Review, pp. 370-393.

Hong, S.-J., & Tam, K. Y. (2006). Understanding the adoption of multipurpose information appliances: The case of mobile data services. Information Systems Research, 17(2), pp. 162-179.

Hsieh, J., & Robert, J. (2006). Understanding Post-Adoptive Usage Behaviours: A Two-Dimensional View. In Proceedings of the DIGIT Workshop¸ Milwaukee, Wisconsin, USA.

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. Qualitative health research, 15(9), 1277-1288.

Hsu, M. H., & Chiu, C. M. (2004). Predicting electronic service continuance with a decomposed theory of planned behaviour. Behaviour & Information Technology, 23(5), pp. 359-373.

Hutchby, I. (2001). Technologies, texts and affordances. Sociology, 35(2), pp. 441-456.

Iivari, J. (1991). A paradigmatic analysis of contemporary schools of IS development. European Journal of Information Systems, 1(4), pp. 249-272.

Ison, R. (2005). Geoffrey Vickers 2004: Contemporary applications and changing appreciative settings. Systems Research and Behavioral Science, 22(4), pp. 277-284.

ITU. (2004).The portable Internet, International Telecommunication Union. ITU Internet reports.

Jackson, C.,Chow, S. and Robert, A. (1997). "Towards an understanding of the behavioural intention to use an IS", Decision Science, 28(2), pp. 357-389.

Jackson, M.C. (1982). The nature of 'soft' systems thinking: the work of Churchman, Ackoff and Checkland. Journal of Applied Systems Analysis, 9, pp. 17–29 [followed by a response from Ackoff, Churchman, and Checkland].

Jackson, M.C. (2001). Critical systems thinking and practice. European Journal of Operational Research, 128, pp. 233-44.

Jain, V., Kanung, S. (2005). "Beyond perceptions and usage: Impact of information system use on information system-enabled productivity," International Journal of Human-Computer Interaction, 19(1), pp. 113-136.

Jasperson, J. S., Carter, P. E., and Zmud, R. W. (2005). A Comprehensive Conceptualization of the Post-Adoptive Behaviors Associated with IT-Enabled Work Systems,MIS Quarterly, 29(3), pp. 525-557.

Joffe, H., & Yardley, L. (2004). 4 Content And Thematic Analysis. Research methods for clinical and health psychology, 56.

Joneidy, S & Basden, A. (2011). Exploring Dooyeweerd's aspects for understanding perceived usefulness of information systems; Proceedings of the 17th Annual Working Conference of the IIDE, Maarssen, Netherland.

Joneidy, S & Basden, A. (2012). An Exploration of The Paradigm of Information Systems Use; Proceedings of the 18th Annual Working Conference of the IIDE, Maarssen, Netherland.

Joneidy, S., & Basden, A. (2013). Five paradigms of information system use: Affirmation, critique and enrichment. UKAIS-12, Oxford.

Joshi, K. (1991). "A Model of Users' Perspective on Change: The Case of Information Systems Technology Implementation." MIS Quarterly, 15(2), pp. 229-242.

Kane, S. C. (2005). Multi-aspectual interview technique (MAIT) (Doctoral dissertation, University of Salford).

Karahanna, E., Straub, D. W., & Chervany, N. L. (1999). Information technology adoption across time: a cross-sectional comparison of pre-adoption and post-adoption beliefs. MIS quarterly, pp. 183-213.

Keen, P. G. (1980). MIS research: reference disciplines and a cumulative tradition (pp. 9-18). Center for Information Systems Research, Alfred P. Sloan School of Management.

Keller, S., & Coulthard, D. (2011, January). Charting changes in the discipline: a tri-continental analysis. In ECIS 2011: Proceedings of the 19th European Conference on Information Systems: ICT and Sustainable Service Development (pp. 1-13). Aalto University.

Keng, K. T., Roper, J., & Kearins, K. (2007). Corporate Social Reporting in Malaysia: A Qualitative Approach. International Journal of Economics and Management, 1(3), 453-475.

Kim, H. W., & Kankanhalli, A. (2009). Investigating user resistance to information systems implementation: a status quo bias perspective. Mis Quarterly, pp. 567-582.

King, W. R., & He, J. (2005). Understanding the role and methods of meta-analysis in IS research. Communications of the Association for Information Systems, 16(1), pp. 32.

King, W. R., & He, J. (2006). A meta-analysis of the technology acceptance model. Information & management, 43(6), pp. 740-755.

Klaus, T. and J. E. Blanton (2010). "User Resistance Determinants and the Psychological Contract in Enterprise System Implementations." Eur J Inf Syst, 19(6), pp. 625-636.

Klein, H. K., and Myers, M. (1999). D. "A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems," MIS Quarterly, 23(1), pp. 67-94.

Kuhn, T. (1970). Postscript—1969. In T. Kuhn, The structure of scientific revolutions (2nd ed., pp. 174-210). Chicago: University of Chicago Press.

Kuhn, T. (1974). The essential tension: Selected studies in scientific tradition and change. Chicago: University of Chicago Press.

Kuhn, T. S. (1962). The structure of scientific revolutions. Chicago: University of Chicago Press.

Lai, V. S., & Li, H. (2005). Technology acceptance model for internet banking: an invariance analysis. Information & management, 42(2), pp. 373-386.

Lakatos, I. (1970). Falsification and the methodology of scientific research programmes. In I. Lakatos, & A. Musgrave (Ed%), Criticism and the growth of knowledge (pp. 91-195). Cambridge: Cambridge University Press.

Lakatos, I., & Musgrave, A. (1970). Criticism and the Growth of Knowledge.

Landry, M., & Banville, C. (1992). A disciplined methodological pluralism for MIS research. Accounting, Management and Information Technologies, 2(2), pp. 77-97.

Lapointe, L. and S. Rivard (2005). "A Multilevel Model of Resistance to Information Technology Implementation." MIS Quarterly, 29(3), pp. 461-491.

Laughlin, R. (1995). Empirical research in accounting: alternative approaches and a case for "middle-range" thinking. Accounting, Auditing & Accountability Journal, 8(1), pp. 63-87.

Laumer, S. (2011). "Why do People Reject technologies – A Literature-Based Discussion of the Phenomena of "Resistance to Change" in Information Systems and Managerial

Psychology Research," ECIS 2011 Proceedings. Paper 60. Retrieved 20 June 2012 from http://aisel.aisnet.org/ecis2011/60.

Lauterbach, J., & Mueller, B. (2014). Adopt, Adapt, Enact or Use ?. InInformation Systems and Global Assemblages.(Re) Configuring Actors, Artefacts, Organizations (pp. 8-29). Springer Berlin Heidelberg.

Lee, J-S., Cho, H., Gay, G., Davidson, B. and Ingraffea, A. (2003a). "Technology acceptance and social networking in distance learning", Educational Technology & Society, 6(2), pp. 50-61.

Lee, Y., Kozar , K.A. and Larsen, K.R.T.(2003b)."The Technology acceptance model: past, present, and future", Communications of the AIS, 12(50), pp. 752-780.

Lee, Y., Kozar, K. A., & Larsen, K. R. (2003). The technology acceptance model: Past, present, and future. Communications of the Association for information systems, 12(1), pp. 50.

Lee, Y., Kozar, K.A. and Larsen, K.R.T. (2003b). "The technology acceptance model: past, present, and future", Communications of the AIS, 12(50), pp. 752-80.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. Information & management, 40(3), pp. 191-204.

Leonardi, P. M., & Jackson, M. H. (2004). Technological determinism and discursive closure in Organizational mergers.Journal of Organizational Change Management, 17(6), pp. 615-631.

Liao, C., Palvia, P., & Chen, J. L. (2009). Information technology adoption behavior life cycle: Toward a Technology Continuance Theory (TCT).International Journal of Information Management, 29(4), pp. 309-320.

Liao, C., Palvia, P., & Chen, J. L. (2009). Information technology adoption behavior life cycle: Toward a Technology Continuance Theory (TCT).International Journal of Information Management, 29(4), pp. 309-320.

Lilienfeld, R. (1978). The rise of systems theory: An ideological analysis.

Lin, C.-P., & Bhattacherjee, A. (2010). Extending technology usage models to interactive hedonic technologies:A theoretical model and empirical test. Information Systems Journal.

Lin, J.C. and Lu, H. (2000). "Towards an understanding of the behavioural intention to use a web site", International Journal of Information Management, 20(3), pp. 197-208.

Linder JA, Ma J, Bates DW, Middleton B, Stafford RS.(2007). Electronic health record use and the quality of ambulatory care in the United States. Arch Intern Med;167:1400-5.

Liu, Y., Li, H., & Carlsson, C. (2009). Exploring the factors driving M-learning adoption. AMCIS 2009 Proceedings, pp. 178.

Livari, J., R. Hirschheim, H. Klein. (1998). A paradigmatic analysis contrasting information systems development approaches and methodologies. Inform. Systems Res, 9(2), pp. 164 - 193.

Lombardi, P.L. (2001). "Responsibilities towards the new generations: forming a new creed" Urban Design Studies, 7, pp. 89-102.

Lowe, A. (2004). Methodology choices and the construction of facts: some implications from the sociology of scientific knowledge. Critical Perspectives on Accounting, 15(2), pp. 207-231.

Lucas Jr, H. C. (1978). Empirical evidence for a descriptive model of implementation. MIs Quarterly, pp. 27-42.

Lucas, H. C. (1978). Empirical evidence for a descriptive model of implementation. MIS Quart, 2(2), pp. 27- 41.

Lyytinen, K. (1987). Different perspectives on information systems: problems and solutions. ACM Computing Surveys (CSUR), 19(1), pp. 5-46.

Ma, Q. & Liu, L. (2004). Technology acceptance model: A meta-analysis of empirical findings.Journal of Organizational End User Computing, 16, pp. 59-72.

Mack, L. (2010). The philosophical underpinnings of educational research.Polyglossia, 19, pp. 5-11.

MacKenzie, D., J. Wajcman. (1985). The Social Shaping of Technology. Open University Press, Milton Keynes, UK.

Mackenzie, N. and Knipe, S. (2006). Research dilemmas: Paradigms, methods and methodology. Issues in Educational Research, 16(2), pp. 193-205. Retrieved August 9, 2009, from

Mao, E., & Palvia, P. (2006). Testing an extended model of IT acceptance in the Chinese cultural context. ACM SIGMIS Database, 37(2-3), pp. 20-32.

Marakas, G. M. and S. Hornik (1996). "Passive Resistance Misuse: Overt Support and Covert Recalcitrance in Is Implementation." Eur J Inf Syst, 5(3), pp. 208-219.

Markus, M. L. (1983). "Power, Politics, and Mis Implementation." Commun. ACM, 26(6), pp. 430-444.

Markus, M. L. and Silver, M. S. (2008). A Foundation for the Study of IT Effects: A New Look at DeSanctis and Poole's Concepts of Structural Features and Spirit. Journal of the Association for Information Systems, 9 (10/11), pp. 609-632.

Martinko, M. J., J. W. Henry and R. W. Zmud (1996). "An Attributional Explanation of Individual Resistance to the Introduction of Information Technologies in the Workplace." Behaviour & Information Technology, 15(5), pp. 313-330.

Maslow, A. (1943). A theory of human motivation. Psychological Review, 50, pp. 370-396.

Masterman, M. (1970). The nature of a paradigm. In I. Lakatos & A. Musgrave (Eds.), Criticism and the growth of knowledge. Cambridge: Cambridge University Press.

Mclean, Ephraim R.; Sedera, Darshana; and Tan, Felix Ter Chian, (2011). "Reconceptualizing System Use For Contemporary Information Systems" PACIS 2011 Proceedings

Mingers, J. (2001). "Combining IS Research Methods: Towards a Pluralist Methodology, "Information Systems Research, 12(3), pp. 240 - 259.

Mingers, J. (2001). Combining IS research methods: towards a pluralist methodology. Information systems research, 12(3), 240-259.

Mirijamdotter A and Bergvall-kåreborn B. (2006). An appreciative critique and refinement of Checkland's soft systems methodology. In Search of an Integrative Vision for Technology: Interdisciplinary Studies in Information Systems (STRIJBOS S and BASDEN A, Eds), pp. 79-102, Springer, New York.

Mirijamdotter, A., & Bergvall-Kåreborn, B. (2006). An appreciative critique and refinement of Checkland's soft systems methodology. In In Search of an Integrative Vision for Technology (pp. 79-102). Springer US.

Moore, G.C. and Benbasat, I. (1991). "Development of an Instrument to measure the perceptions of Adopting an information technology Innovation", Information Systems Research, 2(3), pp. 192-222.

Mora-Monge, C. A., Azadegan, A., & Gonzalez, M. E. (2010). Assessing the impact of web-based electronic commerce use on the organizational benefits of a firm: An empirical study. Benchmarking: An International Journal, 17(6), pp. 773-790.

Morgan, D. L. (2007). Paradigms lost and pragmatism regained methodological implications of combining qualitative and quantitative methods. Journal of mixed methods research, 1(1), pp. 48-76.

Morgan, A. (2010). Discourse analysis: An overview for the neophyte researcher. Journal of Health and Social Care Improvement, 1, 1-7.

Myers MD and Klein HK (2011). A set of principles for conducting critical research in information systems. MIS Quarterly, 35(1), pp.17–36.

Myers, M. D., & Avison, D. (1997). Qualitative research in information systems.Management Information Systems Quarterly, 21, p. 241-242.

Oates, B. J. (2006). Researching Information Systems and Computing. London: Sage Publications.

Orlikowski, W. J., & Baroudi, J. J. (1991). Studying information technology in organizations: Research approaches and assumptions. Information systems research, 2(1), pp. 1-28.

Orlikowski, W. J., & Baroudi, J. J. (1991). Studying Information Technology in Organizations: Research Approaches and Assumptions. Information Systems Research, 2(1).

Orlikowski, W. J., & Iacono, C. S. (2001). Research commentary: Desperately seeking the "IT" in IT research—A call to theorizing the IT artifact. Information systems research, 12(2), pp. 121-134.

Palvia, P., Pinjani, P., and Sibley, E.H. ―A Profile of Information Systems Research Published in Information & Management.‖ Information & Management. Vol 44, 2007, pp. 1-11.

Pedersen, P. E., & Ling, R. (2002). Mobile end-user service adoption studies: A selective review. Scandinavian Journal of Information Systems, 14(1), pp. 3-17.

Perotti, V., & Hair, N. (2011, January). User experience in online social networks: a qualitative analysis of key activities and associated features. InSystem Sciences (HICSS), 2011 44th Hawaii International Conference on (pp. 1-10). IEEE.

Pinch, T., & Bijker, W. (1986). Science, relativism and the new sociology of technology: Reply to Russell. Social Studies of Science, pp. 347-360.

Pinto, R. C. (2001). Argument, inference and dialectic: collected papers on informal logic. Argumentation library, vol. 4. Dordrecht:Kluwer Academic. pp. 138–139.

Platzer, E. Otto, P., Rauch, W. and Brunnhofer, M. (2010). Causes and consequences of mobile phone's indispensability for everyday life, Ninth International Conference on Mobile Business Athens, Greece.

Popper, K. (1970). 'Normal science and its dangers' in Lakatos, I (ed) Criticism and the Growth of Knowledge Cambridge University Press, Cambridge.

Popper, K. (1972). Conjectures and Refutations: The Growth of Scientific Knowledge. London: Routledge and Kegan Paul.

Roberts, P., Henderson, R., (2000). Information technology acceptance in a sample of government employees: a test ofthe technology acceptance model. Interacting with Computers, 12, pp. 427–443.

Robertson, K. (2011). Promoting Meaningful Uses of Technology in a Middle School, Phd Thesis ARIZONA STATE UNIVERSITY.

Robey, D. (1996). Diversity in information systems research: Threat, promise, and responsibility. Inform. Systems Res, 7(4), pp. 400-408.

Roca, J. C., & Gagné, M. (2008). Understanding e-learning continuance intention in the workplace: A self-determination theory perspective. Computers in Human Behavior, 24(4), pp. 1585-1604.

Roca, J. C., Chiu, C. M., & Martínez, F. J. (2006). Understanding e-learning continuance intention: An extension of the Technology Acceptance Model.International Journal of human-computer studies, 64(8), pp. 683-696.

Roca, J. C., Chiu, C. M., & Martínez, F. J. (2006). Understanding e-learning continuance intention: An extension of the Technology Acceptance Model.International Journal of human-computer studies, 64(8), pp. 683-696.

Rogers Everett, M. (1995). Diffusion of innovations. New York.

Rogers, E. M. (1983). Diffusion of innovations. New York.

Russell, S., & Williams, R. (2002). Social shaping of technology: frameworks, findings and implications for policy with glossary of social shaping concepts.Shaping technology, guiding policy: Concepts, spaces and tools, pp. 37-132.

Saga, V. L. (1994). The nature and determinants of information technology infusion: An organizational level of analysis. PhD Thesis: Florida State University.

Saga, V. L., & Zmud, R. (1994). The nature and determinants of IT acceptance, routinization, and infusion. Diffusion, transfer and implementation of information technology, pp. 67-86.

Sansone, C., Morf, C. C. and Panter, A. T. (2004). The Research Process: Of Big Pictures, Little Details, and the Social Psychological Road in Between, In The SAGE Handbook of Methods in Social Psychology(Eds, Sansone, C., Morf, C. C. and Panter, A. T.) SAGE.

Saunders, M. N., Saunders, M., Lewis, P., & Thornhill, A. (2011). Research methods for business students, 5/e. Pearson Education India.

Schwarz, A., & Chin, W. (2007). Looking forward: Toward an understanding of the nature and definition of IT acceptance. Journal of the Association for Information Systems, 8(4), pp. 13.

Seddon, P.B. (1997). A respecification and extension of the Delone and McLean model of IS success. IS Research, 8(3), pp. 240-253.

Selwyn, N. (2003). Apart from technology: understanding people's non-use of information and communication technologies in everyday life. Technology in Society, 25, pp. 99-116.

Shapere, D. (1984). The paradigm concept. In Reason and the Search for Knowledge (pp. 49-57). Springer Netherlands.

Shih, H. P. (2004). Extended technology acceptance model of Internet utilization behavior. Information & Management, 41(6), pp. 719-729.

Shih, H.P. (2004). "An empirical study on predicting user acceptance of e-shopping on the web", Information and Management, 41(3), pp. 351-369.

Sidorova A, Evangelopoulos N, Valacich JS, Ramakrishnan T. (2008). Uncovering the intellectual core of the information systems discipline. MIS Quarterly, 32(3), pp. 467-482.

Silva, L. (2007). "Post-Positivist review of Technology Acceptance Model", Journal of the Association for Information Systems, 8(8), pp. 255-266.

Silva, L., and Figueroa, E. (2002). "Institutional Intervention and the Expansion of ICTs in Latin America: The Case of Chile," Information Technology and People, 15(1), pp. 8-25.

Sirgy, M.J. (2002). The Psychology of Quality of Life. Boston, MA: Kluwer Academic Publishers.

Skillen, J. W. (1979). Herman Dooyeweerd's Contribution to the Philosophy of the Social Sciences. Journal of the American Scientific Affiliation.

Station, Ontario.: Paideia Press (1975 edition). (Cited in Basden, 2008).

Stauss, D. (2009). Philosophy: Discipline of the Disciplines. Paideia Press, Jordan Station, Ontario, Canada.

Straub, D., & Burton-Jones, A. (2007). Veni, vidi, vici: Breaking the TAM logjam. Journal of the Association for Information Systems, 8(4), pp. 5.

Straub, D., Limayem, M., and Karahanna, E. (1995). Measuring System Usage: Implications for IS Theory Testing, Management Science, 41(8), pp. 1328-1342.

Strauss, D. F. M. (2004). The context and after-effects of the organicistic orientation of early 19th century romanticism. Journal for Christian Scholarship= Tydskrif vir Christelike Wetenskap, 40(3 & 4), p. 57.

Strijbos, S. (2000). Systems methodologies for managing our technological society: towards a'disclosive systems thinking'. Journal of Applied Systems Studies 1(2), pp. 159-81.

Strijbos, S. (2010). System Thinking. In: Börner, Katy and Kevin W. Boyack.(2010). Mapping Interdisciplinary Research. In Robert Frodeman, Julie Thompson Klein and Carl Mitcham, Eds. Oxford Handbook of Interdisciplinarity, Ch. 31, pp. 457-460. New York: Oxford University Press.

Strijbos, S. (2010). System Thinking. In: Börner, Katy and Kevin W. Boyack. (2010). Mapping Interdisciplinary Research. In Robert Frodeman, Julie Thompson Klein and Carl Mitcham, Eds. Oxford Handbook of Interdisciplinarity, Ch. 31, pp. 457-460. New York: Oxford University Press.

Suh, B. and Han, I. (2002). "Effect of trust on customer acceptance of internet Banking", Electronic Commerce Research and Applications, 1(3), pp. 247-263.

Suh, B. and Han, I. (2003)."The impact of customer trust and perception of security control on the acceptance of electronic commerce", International Journal of electronic Commerce, 7(3), pp. 135-161.

Sun, H. and P. Zhang.(2006a). "Adaptive IT Use: Conceptualization and Measurement," Proceedings of the the 5th Pre-ICIS MIS/HCI Workshop, Milwaukee, Wisconsin, 2006.

Tachatassanasoontorn, A. A., and A. Tanvisuth (2010). IS Use and Quality of Life: A Conceptualization and Empirical Investigation, AIS Transactions on Human-Computer Interaction, (2) 2, pp. 26-54

Taylor, S. & Todd, P. A. (1995). Understanding Information Technology Usage: A Test of Competing Models. Information Systems Research, 6, pp. 144-176.

Tennant, V. M. (2014). Understanding Changes in Post-Adoption Use of Information Systems (IS): A Generalized Darwinism Perspective.

Tennant, V., Mills, A. and Chin, W., (2011). Investigating Information System Infusion at the Individual Level : Re-conceptualisation and operationalisation, Pacific Asia Conference on Information Systems (PACIS) proceedings, Published by AIS Electronic Library (AISeL).

Tesch, R. (2013). Qualitative research: Analysis types and software. Routledge.

Thompson, RL., Higgins, c.A., and Howell, lM. (1991). Personal Computing: Torward a Conceptual Model ofUtilisation. MIS Quarterly, 15(1), p. 125-143.

Triandis, H.C. (1980). Values, Attitudes, and Interpersonal Behavior, in 1979 Nebraska Symposium on Motivation: Beliefs, Attitudes, and Values, Uni ofNebraska Press, pp. 195-259.

Trice, A.W. and Treacy, M.E. (1988). Utilization As a Dependent Variable in MIS Research, Database, Fall-Winter, pp. 33-41.

Turner, J.H. (1991). Structuration Theory. In The Structure of Sociological Theory, Giddens, A., Wadsworth.

Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study.Nursing & health sciences, 15(3), 398-405.

Van der Heijden, H. (2004). User acceptance of hedonic information systems. MIS Quarterly, 28, pp. 695-704.

Vasquez, J. A. (1998). The power of power politics: from classical realism to neotraditionalism (No. 63). Cambridge University Press.

Venkatesh, V. (2000). "Determinants of Perceived Ease of Use: Integrating Perceived Behavioral Control, Computer Anxiety and Enjoyment into the Technology Acceptance Model," Information Systems Research, 11(4), pp. 342-365.

Venkatesh, V. and Davis, F. (2000). "A theoretical extension of the technology acceptance model: four longitudinal field studies", Management Science, 46(2), pp. 186-204.

Venkatesh, V. and Davis, F. (2000). "A theoretical extension of the technology acceptance model: four longitudinal field studies", Management Science, 46(2), pp. 186-204.

Venkatesh, V. and Morris, M.G. (2000). "why don't men ever stop to ask for directions? Gender, Social Influence, and their role in technology acceptance and usage behaviour", MIS Quarterly, 24(1), pp. 115-139.

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. Decision sciences, 39(2), pp. 273-315.

Venkatesh, V., & Brown, S. A. (2001). A longitudinal investigation of personal computers in homes: adoption determinants and emerging challenges. MIS quarterly, pp. 71-102.

Venkatesh, V., & Davis, F. D. (2000). "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies," Management Science, 46(2), pp. 186-204.

Venkatesh, V., & Morris, M. G. (2000). "Why Don't Men Ever Stop to Ask For Directions? Gender, Social Influence, and Their Role in Technology Acceptance and Usage Behavior," MIS Quarterly, 24(1), pp. 115-139.

Venkatesh, V., Maruping, L. M., and Brown, S. A. (2006). "Role of Time in Self-prediction of Behavior," Organizational Behavior and Human Decision Processes, 100(2), pp. 160-176.

Venkatesh, V., Morris, M. G., and Ackerman, P. L. (2000). "A Longitudinal Field Investigation of Gender Differences in Individual Technology Adoption Decision Making Processes," Organizational Behavior and Human Decision Processes, 83(1), pp. 33-60.

Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly, 27(3), pp. 425-478.

Venkatesh, V., Speier, C., and Morris, M. G. (2002). "User Acceptance Enablers in Individual Decision-Making about Technology: Toward an Integrated Model," Decision Sciences, 33(2), pp. 297-316.

Vessey, I., Ramesh, V., & Glass, R. L. (2002). Research in information systems: An empirical study of diversity in the discipline and its journals.Journal of Management Information Systems, 19(2), pp. 129-174.

Vest J, & Jasperson J. (2010). How are health professionals using health information exchange systems? Measuring usage for evaluation and system improvement. Journal of the American Medical Informatics Association, 17, pp. 302-307.

Vijayasarathy, L. R. (2004). Predicting consumer intentions to use on-line shopping: the case for an augmented technology acceptance model.Information & Management, 41(6), pp. 747-762.

Wahba, M. & Bridwell, L. (1975). Maslow reconsidered: A review of the need hierarchy theory. Organizational Behavior and Human Petformance, 15(2), pp. 212-240.

Walker, T. C. (2010). The perils of paradigm mentalities: Revisiting Kuhn, Lakatos, and Popper. Perspectives on Politics, 8(02), pp. 433-451.

Walsham, G. (2006). Doing interpretive research. European journal of information systems, 15(3), pp. 320-330.

Warfield, J.N. (1976). Societal Systems, Planning, Policy and Complexity, NY: Wiley.

Watkins, J. W. (1970). Against'normal science'. Criticism and the Growth of Knowledge, 4, pp. 25-38.

Weiser, M. (1991). The computer for the 21st century. Scientific American,, 265(3), pp. 94-104.

Westin, S., Roy, M., & Kim, C. K. (1994). Cross-fertilization of knowledge: the case of MIS and its reference disciplines. Information Resources Management Journal (IRMJ), 7(2), pp. 24-34.

Whitehead AN. (1929). Process and Reality. Free Press: New York.

Whitley, R. (2000). The intellectual and social organization of the sciences.

Williams, R., & Edge, D. (1996). The social shaping of technology.Research Policy, 25, pp. 865-899.

Williams, R., & Edge, D. (1996). The social shaping of technology.Research Policy, 25, pp. 865-899.

Willmott, H. (1993). Breaking the Paradigm Mentality. Organization Studies, 14(5), pp. 681-719.

Wills, M. J., El-Gayar, O. F. and Sarnikar, S. (2011). Beyond Meaningful Use: A Model for Evaluating Electronic Health Record Success, Proceedings of the 44th Hawaii International Conference on System sciences, pp. 1-10.

Winfield M, Basden A. (2006). "Elicitation of highly interdisciplinary knowledge", pp. 63-78 in Strijbos S, Basden A (eds.) In Search of an Integrative Vision of Technology: Interdisciplinary Studies in Information Systems. Kluwer/Springer.

Winfield M. (2000). Multi-aspectual knowledge elicitation. PhD thesis, University of Salford, UK.

Winfield, M., & Basden, A. (2006). Elicitation of highly interdisciplinary knowledge. In In search of an integrative vision for technology (pp. 63-78). Springer US.

Wixom, B. H., & Todd, P. A. (2005). A theoretical integration of user satisfaction and technology acceptance. Information systems research, 16(1), pp. 85-102.

Yi, M.Y. and Hwang, Y. (2003). "Predicting the use of web-based information systems: self-efficacy enjoyment, learning goal orientation, and the technology acceptance model ", International Journal of H-C Studies, 59(4), pp. 431-449.

Yoo, Y. (2010). Computing in everyday life: A call for research on experiential computing. MIS Quart, 34(2), pp. 213-231.

Yousafzai, S. Y., Foxall, G. R., & Pallister, J. G. (2007). Technology acceptance: a meta-analysis of the TAM: Part 2. Journal of Modelling in Management, 2(3), pp. 281-304.

Yousafzai, S. Y., Foxall, G. R., &Pallister, J. G. (2007). Technology Acceptance: A Meta-analysis of the TAM: Part 1. Journal of Modelling in Management, 2 (3), pp. 281-304.

Yousafzai, Sh Y., Foxall, G R. and Pallister, J G. (2007). "Technology acceptance: a meta-analysis of the TAM: Part 1", Journal of Modelling in Management, 2(3), pp. 251-280.

Zamani, E., Kourouthanassis, P. E., & Giaglis, G. M. (2010, June). The Mediating Role of Emotional State Toward Pervasive Information System Acceptance. In Mobile Business and 2010 Ninth Global Mobility Roundtable (ICMB-GMR), 2010 Ninth International Conference on (pp. 100-106). IEEE.

Zexian, Y., & Xuhui, Y. (2010). A revolution in the field of systems thinking—a review of Checkland's system thinking. Systems Research and Behavioral Science, 27(2), pp. 140-155.