From Promise to Practice: Information Systems Implementation Why the Gap?

A Study of Organisational Learning at the University of Natal, Durban Campus, Durban, KwaZulu-Natal, South Africa

by

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This document is dedicated to my late mother, Dr Mary Garvey (Phd.) and to my father, Dr Terry Garvey (Phd.). For always believing in me.

This whole thesis, unless specifically indicted to the contrary in the text, is the original work of the author.

Ric Garvey

ABSTRACT

The following study has taken a systems approach to investigate organisational learning within the University of Natal, Durban (UND). The research used the Banner system implementation project as the case study for the investigation.

In 1993, the University of Natal made a decision to purchase the Banner Student Information System. The system was implemented over an eighteen-month period resulting in the Banner system going "live" for registration of students in 1995. A decision was taken in 1997/8 to discontinue implementing upgrade packages for the Banner system, indicating a move away from the system within two to three years of implementation.

This document begins with a review of current literature with regard to systems thinking, organisational learning and change management. This review serves to underpin the research methodology implemented within the research process.

The research methodology, known as learning histories, is explained, and a description of the research process is provided. The core of the research process involved open-ended reflective interviews aimed at incorporating the different perspectives of the majority of stakeholders involved in the system implementation. In addition to this, an analysis was conducted on a selection of Banner-related documents. The scope of the research was limited and would best be described as a pilot study.

Those interviewed included members of the university executive committee, Banner office personnel, faculty officers, deans, administrative personnel, management information personnel and the project manager for the implementation.

The major findings of the research process were:

1. The decision to purchase the Banner student information system was problematic.
2. The wider system that was created to maintain Banner was complex and generated a large degree of dependency on the Banner office.
3. The Banner office was a powerful gatekeeper of information within the system whose identity was wrapped up in a product and not a function.
4. The training system implemented was flawed and did not equip key users with a global understanding of the functionality of the system.
5. The university was unclear about what information it wanted out of the system and who was to have access to this information.
6. The university used Banner almost entirely as a student administration system and management information was not well developed within the Banner system.

The following areas were highlighted as important for the university with regards to organisational learning and the case study:

1. Decision support systems.
2. The role of technology within the university.
3. A systems approach to understanding the context of the university.
4. The learning systems operating within the university.
5. Managing change.

The limited scope of the research presents its own problems for drawing any firm conclusions. The research process has rather highlighted new areas for research. These include:

1. The relationship between workplace procedures and new technology.
2. The role of information technology and information systems in decision support and management support.
3. Change management processes within larger project-based implementations.
4. Decision making within higher education institutions.

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BEC	Banner Executive Committee.
BIS	Business Information Systems.
BIT	Banner Implementation Team.
CEO	Chief Executive Officer.
CSD	Computer Services Division.
DVC	Deputy Vice Chancellor.
FAS	Financial Accounting System.
GUI	Graphic User Interface.
HR	Human Relations.
IT	Information Technology.
ITD	Information Technology Division.
ITS	Integrated Tertiary Systems.
MIBS	Management Information on Banner System.
PAS	Personnel Accounting System.
PIL	Primary Inhibiting Loop.
PR	Public Relations.
RAU	The Rand Afrikaans University.
SAPSE	South African Post-Secondary Education.
SCT	Systems and Computer Technology Corporation.
SIL	Secondary Inhibiting Loop.
SIMS	Student Information Management System.
SQL	Structured Query Language.
UND	University of Natal, Durban Campus.
WITS	The University of Witwatersrand.
Y2K	Year 2000.

PREFACE

In order to present to the reader a more contextual understanding of this document, I have decided to include a preface. In doing so, I will be presenting some of the more personal reasons for why this research was chosen and provide the reader with a better understanding of the process that lead to those choices.

Why a Systems Approach?

Systems thinking has become an increasingly important aspect of my life over the past two years. I am currently involved in the field of Adult Basic Education and my first taste of systems thinking came about due to the increasing interest in the concept of Organisational Learning in the organisation that employees me. The work of Senge (1990) led to the discovery of Argyris and Schon (1978) and from there to the wider systems thinking field and literature.

Systems thinking has formed the basis of the course of study within which this project has been undertaken and, much more personally, I could say, has invaded my whole being and thought processes. At first I experienced great resistance to thinking in this manner but as I read further into the philosophy of systems thinking, I came to realise the inherent usefulness of viewing the world as a set of interrelated systems.

One of the consequences of my personal evolvement in systems thinking was that it freed me from the intensely reductionist thinking that I had been schooled in up until this point. Not to say that this type of thinking is not necessary, but rather that my worldview has expanded to allow this other, more holistic framework to be developed.

I understand systems thinking as a useful way of viewing the world and the problem situations we so often find ourselves in. It has helped me to develop a more inclusive, rather than my previously held exclusive, framework of

investigation. Although just a theory and a way of viewing the world, systems thinking has helped me to investigate problems on a deeper level. A systems approach looks to interrelationships, systems within systems, tacit assumptions, trends and patterns, and emergence to understanding a problem.

With this being the case, a systems approach is a very useful tool for the investigation into the area of systems implementation. I believe that a systems approach lends itself very well to dealing with complexity and interrelationships. The university case study certainly presented itself, at the onset, as a system of complexity and diversity with a great deal of interconnectedness.

The research process utilises a specific systems approach called A Learning History. This methodology will be further explained in a separate chapter later in the document.

Why Information Systems?

The major reason for choosing the area of information systems was a personal, career-related desire to enter into the IT field and specifically into systems implementation. I have not worked in the field and thus saw this as an opportunity to gain some exposure into the field and discover some of the complexities and problematic areas that exist within this area.

In addition to this information systems are becoming a centrally important aspect of modern day, computerised organisations. They have the potential to play an extremely important role in the organisation. On the other hand, if the system does not satisfy the requirements of the organisation and the users, it has the potential to become an extremely costly and frustrating investment in technology that serves little purpose.

CHAPTER ONE: AN INTRODUCTION TO THE PROBLEM AND PROBLEM CONTEXT

1.1 Introduction

I want to begin by making explicit the overarching emphasis that guided the research process. My intention was to investigate the problem context with a particular emphasis on organisational learning. Although the case study used in the research was an information systems implementation, it simply provided a context within which to investigate organisational learning.

Organisational Learning is a concept that has been discussed and analysed to a large degree within the fairly recent past. Peter Senge (1990,1994) has often been attributed to popularising the concept. Within his book, The Fifth Disciple (1990), Senge argues that Organisational Learning is grounded in five principles or as he states, 'disciplines'.

Other noted authors include: Argyris (1993, 1994), Garratt (1987), de Geus (1997), Kleiner (1996), Donald Schon (1987), Van Der Heijden (1996) and Pierre Wack (HBR Sept-Oct 1985). Some further reading lead me to believe that the writings of Bohm (1996), Kolb (1984), Piaget (1969) and Churchman (1968, 1971, 1979) are foundational to the writings mentioned above. This list is by no means complete, but simply gives reference to some of the noted authors within this area.

From the reading completed, what begins to emerge is that organisational learning, as a field or area of study, is extremely diverse. Different authors have presented their views and begun to develop theories from different perspectives, which seems to have evolved more out of their experiences than anywhere else. This is not to say that this is a good or bad thing, but simply an observation made. This observation could, and should be, an area of research in its own right, but it is not one that I have chosen to focus on here.

1.2 Information Systems

Information Technology (IT) and more specifically Information Systems (IS) has become a critically important aspect of most organisations within the computerised world. Within the last eight years, this field has had to deal with rapid development and expansion.

Marais' (2000) recent article is useful at this point to highlight this expansion and the impact it is having. The article gives reference to Castells' trilogy, "The Information Age: Economy, Society and Culture". Castells (in Marais 2000) mentions that the new networked economy has three basic features. For our purposes, the first feature is of most importance, "Productivity and competitiveness depend on information technologies and the building of knowledge" (p. 62).

In a world of growing interconnectedness and hence increasing complexity, decisions need to be taken on the basis of valid, authentic and useful information. In theory, this is what an information system is meant to provide. One of the underlying principles, possibly the central principle, with regard to the design and development of information systems is that they must satisfy the needs and requirements of the organisation (Burch & Grudnitski, 1989; Eason, 1988; Lucas, 1986; Senn, 1982).

Although the focus is on organisational learning and not, per say, information systems implementation, I think it would be useful to give a brief overview of some general criteria for a systems implementation of this nature. This is by no means a detailed review of the literature, but rather a presentation of the "basics" to enable greater insight into the problem context.

One of the clearer reviews of this process was found in Eason (1988), where he lists a six-stage process for systems specification:

" 1. *Analysis of Organisational Needs and Opportunities*. In this stage the objective is to undertake a form of analysis which will identify the directions

the organisation should be taking in a way which will facilitate the identification of valuable roles for information technology to play.

2. *The Specification of Options.* If the overall direction has been established, technological and other options can be matched to the organisational requirements in order to produce broad conceptual proposals for potential socio-technical systems.

3. *Assess Consequences of Options.* This is the analysis by role playing techniques of the direct and indirect consequences of proposed socio-technical systems and their evaluation from the viewpoints of different groups of staff.

4. *The Analysis of User / Task Requirements for the Proposed Socio-technical System.* Within the broad conceptual specification that has been agreed upon it is necessary to detail the requirements of the users and their tasks for the social and technical systems to be designed.

5. *The Specification of a Prototype System.* The creation of a version of the proposed system(including both its technical and social elements) for the purpose of evaluation and refinement of the specification.

6. *The Evaluation of the Prototype System.* The systematic analysis, perhaps through trial usage, of the prototype system in order that users can have realistic experience upon which to base their assessments and to revise their requirement specification." (p.85).

Although the above description is a clear and concise account of the process, it does not contain anything vastly different from the rest of the literature reviewed. Most of the literature starts with identifying organisational goals and objectives and seeing how information systems could be utilised to facilitate the meeting of these goals. From here the process moves to identifying user requirements and then begins to enter into the detailed stage of the systems development lifecycle.

Burch and Grudnitski (1989) talk about strategic information systems planning (SIPS). This contains basically three stages: Establishing information systems goals, eliciting and prioritizing information system project requests and finally assessing information systems resources and capacity.

Finally, Lucas (1986) presents a number of practical suggestions, "...which are intended to produce high levels of systems use and successful implementation.

1. Urge the formation of a steering committee of users and information services department staff members to determine priorities for the development of new applications.
2. Encourage training sessions for the information services department staff to help its members adopt a role as catalyst in the development process.
3. Insist that a user be placed in charge of the design team for a new system.
4. Provide sufficient resources so that staff can spend time on systems design.
5. Work personally (senior management) with a design team to show interest and commitment.
6. See that decisions and not just data flows are considered in systems design.
7. Ask probing questions to see if designers have considered the multiple roles of information for the organisation and different decision makers.
8. Review all proposed output from a new system, be selective, and avoid information overload.
9. Examine the user interface with the system; see that users have experimented with the input and output and find it acceptable.
10. Plan for implementation for subordinates and colleagues, consider different personal and situational factors, and prepare for changes.
11. Ensure that adequate resources have been devoted to training and user documentation "(p.77-78).

It should also be noted that implementation, as used here, should be understood in its broadest sense. This would encompass the whole process from the initial decisions to purchase a new system, right through all aspects of installation, training, maintenance and support.

Due to the recognition that systems implementation is an area of complexity and, in many cases difficult, this study explores the process. This has been

possible through the use of a case study and research process at the University of Natal, Durban Campus, Durban, South Africa.

The research, which uses a systems approach and more specifically a learning history approach, was conducted in order to investigate and hopefully shed some light on the following question:

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This overarching question includes a number of research themes that have been taken up through the process. These themes are:

- **Organisational Learning**
- **Decision Making**
- **Project Management**
- **Actual Use of the System compared to full Capability**
- **Change Management**

I would argue that each of these research themes played an important role within the system under investigation and the particular case study used. As this dissertation is focusing on organisational learning, the first theme is a given.

As the research will show, decision making played a key role in the case study under investigation. The research will show that some of the decisions taken within the Banner System had wide ranging implications for the information system and it's use. As such an investigation into decision making and the decision making context is worthwhile with regard to what the organisation can learn.

The last three themes are related and as such I will mention then together. The Banner system implementation was a project-based implementation that utilised an external project manager model. With this being the case, an

investigation into the manner in which the project was managed, the priorities for the project and the generally running of the project will hopefully shed some light on the whole Banner System Implementation.

In addition to the implementation being project-based, it also is a massive change program. The implementation of a new system, which was to have a sizable effect on the workplace operating systems, on a campus-wide basis, involves a large amount of people changing. The issues of change management play an important role (Kotter, 1996) when undertaking a change initiative of this size and nature.

Linked to the change management issues is that of the actual verses potential use of the Banner system. How well a system is implemented and how well the change aspects are managed is going to have some affect on the extent to which the system is accepted and used to its fullest capability. With this is mind, I wanted to investigate just how well the Banner system implementation and changeover was managed and to what extent the system was used in relation to its full potential.

1.3 The Case Study

In March 1993 the University of Natal signed contracts to purchase the Banner Student and Financial Aid Systems. The Banner system was purchased to replace the existing Student Information Management System (SIMS).

On the basis of an initial presentation on campus in late 1992 by Systems and Computer Technology Corp. (SCT), the American developer of Banner, a more detailed investigation of the system was commissioned. Following on from this, in February 1993, John Lambert from SCT visited the university and made a number of demonstrations. As part of the investigation process, a team of three people was sent to the United States to visit other higher education institutions that were using Banner. At the same time the university

was in contact with Flinders University in Australia who were the pioneers of Banner in Australia.

In late March 1993, the university executive, on the recommendation of the SIMS action group, took a decision to purchase Banner. The promise, with regards to the Banner system, was that it was a fully automated, fully integrated tertiary student information system. Banner was capable of handling the universities full management information requirements, with regard to students and student affairs, in addition to being a fully administrative student information system.

The Banner system was planned to be implemented over a 16-month period and be 'on-line' for registration in 1995. An external project manager was employed to supervise the process.

About 1997/1998, a decision was taken to stop upgrading Banner. In essence, it seems that this decision to stop upgrading Banner was really a decision to move away from Banner.

From this brief overview, one can see that Banner was really only utilised fully for two or three years before the decision was taken to move away from Banner. This posed a very real case scenario that something had not worked as well as expected. A student information system of this size, covering all campuses of the University of Natal, and cost would have had a expected lifetime of more than two to three years.

As a result of this initial investigation of the research context, I decided that the university would be a suitable case study for the purpose of the research emphasis described above.

1.4 Scope of the Study

The scope of the study is a vital aspect of the research. It must be stated at this stage that the research undertaken can only be classified as a pilot study.

The size, cost and time involved in a full-scale learning history were beyond the limits of this study and of one researcher. This issue will be discussed further in the learning history chapter.

The scale of the research was limited to what was feasible in the time allowed and the limited resources available. As a result although the University of Natal is comprised of a number of campuses, the other main one being at Pietermaritzburg, the scope of the study has been limited to the Durban campus. I have attempted to include a full range of perspectives and role players that, in my understanding of the implementation process, covers the key stakeholders.

As mentioned above, I saw the study as a pilot. It is intended to shed some light on the implementation process and for the university organisation to learn from the lessons that emerge. I do not claim that this is the total picture. I acknowledge that, depending on whom one interviewed, the possibility exists for a completely different learning history to be developed. But, in saying this, what I present within this document is the understanding and the perspectives of the people I interviewed as well as my own understanding of the situation and more importantly, what can be learnt from this process.

In conclusion, I am saying that different stories of the past exist. This is a central premise of the learning history approach, in that it tries to tie all these perspectives together and present the richest picture of the process. In saying that, the one that I present here should be acknowledged as valid. It is an accurate reflection of the people I interviewed who were involved in this process. The crux of the matter is that it is just one of many possible stories of the process.

CHAPTER TWO: SYSTEMS THINKING

2.1 Introduction

As an introduction, I believe that it is necessary to lay a foundation that will form the theoretical framework that will underpin the rest of the document. It will also have the dual purpose of informing the reader of the perspective and understanding that I use as a point of departure. I have chosen to highlight three areas. These are Systems Thinking, Organisational Learning and Change.

The reason for highlighting is relatively simple. All three areas are, in my opinion, aspects that have had a major influence on the development of the methodology used in my research. With this being the case, there is a need to look at, and understand, the development of thinking within these distinct, but interrelated, domains

A 'Learning History' has been described as an effective method of uncovering and presenting to the wider organisational audience the learning that has taken place through, and as a result of, a change initiative (Kleiner & Roth, 1996). With this in mind, the concept of organisational learning is of central importance to any such investigation.

2.2 Systems Thinking

Ackoff (1997) presents some useful foundational concepts with regard to the development of systems thinking. One of the first points made is that our worldview or "Weltanschauung" is developed by what he terms "osmosis" (p.1). We acquire it via the very processes of growing up in the family, the environment and the culture of which we are a part. As such, most people are unaware that this framework for interpreting the world actually exists.

Ackoff (1997) would argue, and personal experience would testify to this, that most people do not realise that they interpret the world through a set of

assumptions. In fact most people believe that the way they interpret the world is the 'truth' and that the world before them is made of the simple facts that stand before them as they would stand before anyone. With this understanding, we can begin to see why there is so much conflict in our time. When people come into conflict, if there is no realisation of these assumptions then the idea of 'I'm right and therefore you have to be wrong' is an easy trap to fall into. It is also a very easy and comfortable trap to fall into.

When I am right and you are wrong, there is only black and white, no difficult grey areas of intense complexity exist. This thinking, which underpins the reductionist / scientific paradigm, has a number of beliefs attached to it. Ackoff (1997) highlights three of them:

"

1. The universe is completely understandable.
2. Analysis is inquiry.
3. Everything can be explained by cause and effect " (p.3).

These three concepts really hold the heart of what Ackoff calls the "machine age" (1997). He states that if you believe that the universe is completely understandable, then you should be able to analyse (explained as breaking the whole into its component parts) it and whatever you find in your analysis should have a cause and effect explanation. Ackoff (1997) then quotes the following:

> "In physics, for example, scientists decided that all physical objects could be broken down into indivisible particles of matter called atoms. The atomic theory is thus a reductionist theory of nature. In chemistry, the indivisible units were the elements, listed on the Periodic Table. In biology, the indivisible unit was the cell. Reductionist theory stretched even into linguistics, one of the most modern fields of scientific study, where it is believed that all languages can be reduced to an element of sound called a phoneme.

> In a sense, then, science became a crusade in search of the simplest element in every discipline of study, for post-Renaissance thinkers believed that human beings could understand the universe only by first comprehending the elements of which it was composed" (p.3).

The above quote shows the extent that the scientific paradigm has so engulfed our thinking and endeavours to discover meaning. What it also shows is that this type of analysis has brought about some important discoveries and added a great deal to the advancement of human kind to the place where it is today.

Another interesting point that Ackoff (1997) raises with regard to cause and effect thinking and for our discussion on the development of systems thinking, is that "Environmental factors are excluded as causal explanations for anything" (p.4). This point highlights and underpins the, "I am right you are wrong" standpoint. This statement implies that everything has been reduced to its component parts, the only two things that exist is you and me (no environmental impact) and if we analyse this enough we can find the answer. As we shall see shortly, the idea of environmental impact and 'nested systems' is of great importance to the concept of systems thinking.

One of the problems that emerged and, as Khun (1970) would argue, brings about the "scientific revolution" is that a single paradigm, by its very nature of being limited, is unable to answer all questions posed to it. In most cases, when the paradigm has taken full hold of people's thinking, these unanswerable questions or irreconcilable results and data are simply dismissed. The paradigm acts as a filter and simply filters out that which does not fit within the current framework.

The challenge comes when, generally, new people who are not fully indoctrinated in the paradigm, begin to work on the fringes with data that doesn't fit and ask those unanswerable questions. It is at this point that a new paradigm may begin to emerge.

It is at this point that people began to recognise that reductionism may not answer all the questions. Scientists today have even gone further with the breaking up of the atom, that which we thought was the smallest element of matter, but does this provide the answer to some of the sticky, complex and inherently problematic situations that are so prevalent in today's society?

With the help of Ackoff (1997), I have just presented a brief history of the context that helped to bring about a challenge to the reductionist paradigm. This challenge allowed a new paradigm called the systems approach to emerge.

One of the first issues that became apparent upon investigation of systems thinking and systems in general is the crucial component of perception. Reference is made to this concept via Ackoff (1997) in our discussion above. A system seems to be never more than the observer's perception of the situation being observed. Hence two people can be observing the same situation but see two different situations. Obviously the situations are not different. What is different is the way they are viewed or perceived. The one overwhelming factor that influences the perception of an observer is his or her worldview. The German word, "Weltanschauung", seems to reoccur throughout the literature (Ackoff, 1997, Checkland 1981, Waring 1996) with regard to the concept of worldview.

What is also clear is that the term 'system' used today is very different from the term system used by systems thinkers who agreed that a broadly agreed upon set of components make up a system.

With this in mind, and with reference to Ackoff's (1997) concept of osmosis with regard to the acquisition of our worldviews, I would like to shift focus briefly to look at the relationship between worldview and thought. Bohm (1996) is an interesting source of insight for this discussion. If, as Ackoff (1997) argues, our worldview is developed over time almost as a process of

socialisation, then where does thought fit into this process? I would argue that thought is constrained to those areas which the worldview allows thought on.

Bohm (1996) states, "Thought defends its basic assumptions against evidence that they may be wrong ... Most of our basic assumptions come from our society, including all our assumptions about how society works, about what sort of person we are supposed to be, and about relationships, institutions and so on" (p.11). This shows some alignment in the thinking of Ackoff and Bohm. Both say that our worldview, which basically comprises our assumptions about how the world works, is invested into us through our society. What Bohm (1996) adds is that it is thought that defends these basic assumptions.

What is interesting is that according to the ideas of Ackoff (1997) and Bohm (1996), people could be locked in a double bind. Ackoff (1997) states that people are generally not aware of the assumptions that are held. These assumptions could be said to be tacit knowledge. In addition, Bohm (1996) argues that, "Our thought, too, is a process, and it requires attention, otherwise it's going to go wrong" (p.9). Taking this point further Bohm (1996) states that, ".... but there is a deeper root, which is that thought is very active, but the process of thought thinks that it is doing nothing - that it is just telling you the way things are...The point is: thought produces results, but thought says it didn't do it. And this is a problem" (p.10).

So we can deduce that the average person is ploughing through life probably not knowing about the tacitly held assumptions that make it possible for him/her to interpret the world. On top of that is the process of thought, which will defend these assumptions as if they are the core of "truth" but, at the very same time, tell you that this is just the way things are.

This begins to link very closely with Argyris and Schon's (1978) concept of limited learning systems. One of the core concepts of this is the "cover-up". People tend to cover-up any aspects of conflict and then cover-up the cover-up. In a sense, thought is covering up our basic assumptions by calling them

the truth and then covering up the cover-up by telling us that this is just the way the world is, plain and simple. Within this learning system, it is very difficult, so Argyris and Schon (1978) argue, to uncover these assumptions as they are hidden behind the many walls of cover-up.

So, going back to our original question of the relationship between thought and worldview, I think that it is reasonable to confirm that thought is limited to our worldview, but, to add on my new personal discovery, thought can limit the expanding of our worldview. This happens via thought's cover-up process, as discussed above. To be able to begin to change our worldviews, we have to firstly realise that they are our basic assumptions, but thought is preventing us from doing this by telling us that it is not defending anything but that this is simply "the way it is". So, I would therefore argue that people might have difficulty recognising that thought is active and in addition to this, the double cover-up, that it is defending a set of basic assumptions.

To conclude, Churchman (1979) states, "We ought to ask ourselves at the very outset how to think about a large system, and our manner of thinking will dictate how we will describe the system ...The systems approach will have to disturb typical mental processes and suggest some radical approaches to thinking. It may in fact already be radical for somebody to think first of all about the overall objective and then to begin to describe the system in terms of this overall objective" (p.12). This can be seen graphically in the diagram below.

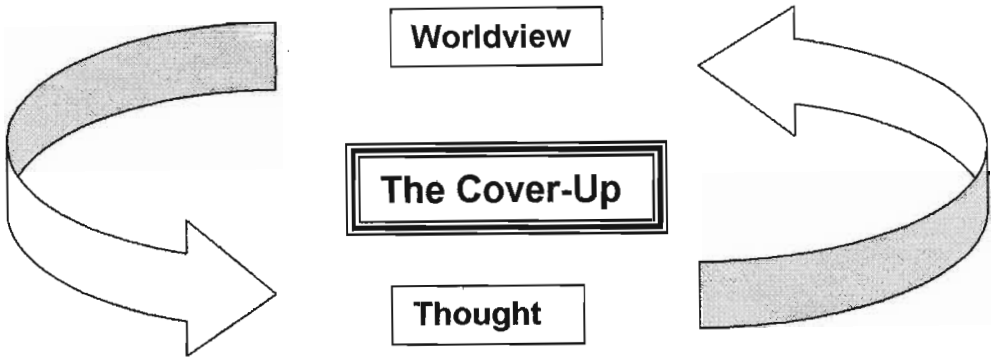


Figure 1: The Relationship between Thought and Worldview

2.2.1 What is a System?

While there seems to be some general consensus around the concept of a system, there are still a variety of so-called definitions. For example, Wilson (1984) states, "a system is a structured set of objectives and/or attributes together with the relationships between them" (p.20) or Flood and Carson (1988), "an assembly of elements related in an organised whole" (p.7). Again Checkland (1981), " the idea of a set of elements connected together which form a whole, this showing properties which are properties of the whole, rather than properties of its component parts" (p.3). In a slightly more general definition, Flood and Jackson (1998) claim, "a system is used not to refer to things in the world but to a particular way of organising our thoughts about the world" (p. 2).

What emerges is an interest in the whole, rather than its parts and not just the whole but the relationships between the parts that make up the whole. Bertalanffy (1968) in his General Systems Theory first suggested this concept of the whole rather than the parts.

Whereas the above ensemble of definitions can help to bring about a general understanding of the concept of a 'system', a more detailed elaboration is required if it is to be of any use in practical terms. With this in mind, I borrow from Waring (1996) in helping to bring about this needed clarity:

- A component is affected by its inclusion in the system.
- Components are perceived to be related in hierarchical structures.
- There are means for control and communication, which promote system survival.
- The system has emergent properties, some of which are difficult to predict.
- The system has a boundary.
- Outside the boundary is a system environment, which affects the system

Although the above components are helpful in making some practical use out of the concept 'system', they are not complete. Some additions are needed to bring together some other key aspects that are in the systems literature.

2.2.2 Events, Patterns and Structure

Events, patterns and structure can be seen as differing levels of perception within a system. An analogy may help in explaining this concept. If one looks at the life of a tree, we can begin to visualise the concepts of events, patterns and structure. If we take events to be the growth of leaves on the branches, patterns, the 'life and death' cycle that a tree goes through each year, and structure, as the internal make up of the tree.

By viewing the tree only from the perspective of the leaves (events) of the tree, we can only discover and understand a limited amount about the tree. By looking at the 'life and death' cycle (patterns) of each year of the tree's life we can understand a little more. But by understanding the internal make up of the tree, we begin to see the factors and relationships that are driving the patterns and events. Just as we cannot see the internal makeup of the tree (this is stretching the analogy) we often cannot see the structures that are driving the patterns and events of the systems we observe. The reason being that the

structure is to be found in the interrelationships of the components and not the components themselves, and as such are often 'invisible'.

2.2.3 'Emergence and Hierarchy' and 'Communication and Control'

Although the terms above are embedded in the list of components taken from Waring (1996), some writers express them as critical pairs of ideas. For example Checkland (1981) states that, "...systems thinking is founded upon two pairs of ideas, those of emergence and hierarchy and communication and control." (p.75) For this reason, I felt it important to mention them in a category of their own.

Systems thinking has attempted over the years to deal with the problematic issues of complexity and organisation of complexity. In its investigations into complexity, as well as the influence of the shift away from reductionist thinking, the concepts of emergence and hierarchy have appeared. In the most basic of terms, emergence is a concept that recognises the fact that there are properties that 'emerge' at a system level that do not exist or cannot be attributed to the isolated components. This links closely to the idea that the whole is greater than the sum of its parts. It states that complexity, at certain levels and in certain situations, cannot be reduced into smaller and smaller parts, because in doing so, the system loses some of these emergent properties from higher levels.

This notion of 'higher levels' brings us to that of hierarchy. Hierarchy refers to the concept of organisation at different levels of a system. Bertalanffy's (1968) General Systems Theory postulates that there are systems everywhere and that all systems are a part of a bigger system. Although Bertalanffy's (1968) generalised view can be left wanting due to its lack of specific content, it presupposes an idea of hierarchy.

The way Checkland (1981) describes hierarchy and emergence is very useful at this point:

> "It is the concept of organized complexity which became the subject matter of the new discipline 'systems'; and the general model of organised complexity is that there exists a hierarchy of level of organisation, each more complex than the one below, a level being characterised by emergent properties which do not exist at the lower level. Indeed, more than the fact that they 'do not exist' at the lower level, emergent properties are meaningless in the language appropriate to the lower level" (p.78).

Hierarchy focuses on the differences between the levels of complexity and the relationships that exist between these levels.

The other pair of ideas is that of communication and control. In a system that has different levels of complexity and can be impacted upon by its environment, there seems to be a certain amount of information that is communicated for the purposes of control. Control can be understood in terms of regulation.

These terms bring into play the field known as cybernetics. Cybernetics, which began to develop in the form we currently know it, emerged in the 1940's. One of the central features of cybernetics is 'feedback'. It is within this concept that control and 'self-regulation' come into play. Fritjof Capra (1996) captures the essence of what is meant by the concept of communication and control:

> "The crucial difference is embodied in Norbet Wiener's concept of feedback and is expressed in the very meaning of 'cybernetics'. A feedback loop is a circular arrangement of causally connected elements, in which an initial cause propagates around the link of the loop, so that each element has an effect on the next, until the last 'feedback' the effect into the first element of the cycle. The consequence of this arrangement is that the first link ('input') is affected by the last ('output'), which results in self-regulation of the entire system, as the initial effect is modified each time it travels around the cycle" (p.56).

Cannon (in Capra, 1996) investigated the above concept of information flow (communication) and control (regulation) during the 1920's, which resulted in his concept of homeostasis. Again Capra (1996) presents Cannon's (1932) clear understanding of this concept: "the self-regulatory mechanism that allows organisms to maintain themselves in a state of dynamic balance with their variables fluctuating between tolerance limits" (p.42).

Interestingly, there are considerable similarities between Capra's (1996) 'Points of Instability', where dramatic and unpredictable events took place; Kuhn's (1970) Paradigm Shifts; and the current concept of emergence in systems thinking. Capra (1996) suggests that as the elements of systems interact, resulting in communication and feedback, 'points of instability' arise, at which time a new 'order' emerges. He makes this classification for 'open systems far from equilibrium', which means a system that operates in a dynamic state that does not reach equilibrium. Kuhn (1970) suggests that the scientific world operates within a currently agreed paradigm that 'constrains' scientists to a certain viewpoint. As this current paradigm begins to 'not' answer some of the questions of science, a stage arises (which could be paralleled to Capra's 'point of instability') at which the 'scientific revolution' occurs and a new state of 'order' emerges in the form of a newly accepted paradigm.

In the same fashion, the concept of emergence and hierarchy come into play. As the elements interact, the information and control begins to flow and properties of this level of the system begin to emerge. Although this could be seen as stretching the point, it was useful in drawing together a fuller understanding of these concepts.

2.2.4 The Influence of Metaphors and Models of Organisation on Systems Thinking

From the works of Flood and Jackson (1998) and Morgan (1986), the concepts of Metaphor and Models of organisation have been shown as key

components in looking at problem situations and attempted resolution. Flood and Jackson (1998) outline metaphors in the following passage:

> "We have our general conception of 'system' in place, broadly in terms of complex networks. To this must be added content in the form of different 'flavourings'. This will provide the systemic metaphors which we shall employ as filters for looking at problem situations" (p.7).

The use of metaphor is thus concealed in the 'viewing' of a certain situation, or an organisation from a certain standpoint. Morgan (1986) brings some clarity to this concept:

> "... our theories about explanations of organisational life are based on metaphors that lead us to see and understand organizations in distinctive yet partial ways. ... for the use of metaphor implies a way of thinking and a way of seeing that pervade how we understand our world generally" (p.12).

The above quote seems to liken metaphor and the concept of 'Weltanschauung' in some respect. The 'world view' that we have would inform which metaphor we use to 'see' a situation. The way Morgan speaks seems to suggest that the use of metaphor is at a level below our conscious thoughts, that is, unless we have been alerted to the concept of metaphor. The usefulness of metaphor comes into play when we are able to suspend an 'ingrained' way of 'seeing' things and begin to use a new 'lens' that brings to light new aspects, not formerly highlighted by the ingrained metaphor. This can then help to bring about a more informed understanding of the problem situation and hence progression towards a viable resolution.

Although Morgan (1986) goes into more detail, Flood and Jackson (1998) propose five metaphors for viewing organisations. They are:

"

- Machine metaphor, or 'closed system' view

- Organic metaphor, or 'open system' view
- Neurocybernetic metaphor, or 'viable system' view
- Cultural metaphor
- Political metaphor" (p.7).

It is important to include this section within the systems thinking component as the concept of organisational metaphor, I would argue, is going to play a key role in the understanding presented by the research participants of the problem situation. As we have been reading over the past few pages, the way a person views a system has a great deal to do with the way they conceptualise the problem situation.

CHAPTER THREE: ORGANISATIONAL LEARNING

For the purpose of this paper, I will be using Argyris and Schon's (1978) theory of organisational learning as a basis. This is not to say that I have not consulted widely within the current literature, but rather that I believe it to be one of the more robust models, which has the potential to be applied within a wide range of contexts. Argyris (1993), in particular, has done an extensive amount of work within the different facets of organisational learning, including organisational defensive routines, skilled incompetence and investigating how to overcome organisational defensiveness.

Argyris and Schon (1978, 1996) are two of the better known writers that have influenced the field of organisational learning. Their seminal text, "Organizational Learning: A Theory of Action Perspective" (1978) has formed, I believe, the basis of much of their later work. It lays down the foundational issues, according to the two writers, of what makes up a learning organisation and places a heavy emphasis on the barriers to becoming a learning organisation.

The authors mention that one of their major concerns when doing research for the book was, "especially directed to learning about interpersonal interaction" (Argyris & Schon, 1978, p.10). From what I understand, the two authors have been heavily influenced by psychology and, in fact, Argyris is a psychologist, albeit an organisational psychologist. It is not difficult to see then that their focus for investigation is around personal interaction. This is carried through in most of their work, and forms the basis of their arguments around becoming a learning organisation.

3.1 Start with a Question

Argyris and Schon (1978) begin their inquiry into organisational learning by posing a question, "What is an Organisation that it may learn?" (p.8). Being

such a useful question, it seemed to make sense to start our inquiry with this question also.

The question seemed to arise out of a concern that some clarity needed to be brought about in terms of what organisational learning is meant to be. This concern, from my understanding, emerged out of a context where learning is often assigned to a group within an organisation. This group becomes a specialist, elite group that is tasked with 'learning' for everyone else. A number of questions arise from this model. One of the most obvious ones is: Does the fact that this group or department learns mean that the organisation learns? Following on from that is the crucial question: What are the components that make up organisational learning? and finally, What distinguishes organisational learning from individual learning?. Argyris and Schon (1978) put it this way:

> "There is something paradoxical here. Organizations are not merely collections of individuals, yet there is no organization without such collections. Similarly, organizational learning is not merely individual learning, yet organizations learn only through the experience and actions of individuals" (p.9).

3.2 Types of Organisations

Argyris and Schon (1978) put forward a number of perspectives of organisations. Although, probably not a complete list, it is useful to discuss them here, as they form a foundation for understanding their concept of organisational learning. Argyris and Schon (1978) state the following:

> "An organisation is:
>
> - a government, or *polis*,
> - an agency,
> - a task system.
>
> Each of these perspectives will illuminate the sense in which an organisation may be said to act. Further, an organization is:
>
> - a theory of action,

- a cognitive enterprise undertaken by individual members,
- a cognitive artifact made up of individual images and public maps.

Each of these descriptions will reveal the sense in which an organization may be said to know something, and to learn" (p.12).

Before we move into a discussion on the above perspectives of an organisation, it will be useful to present a number of foundational concepts with regards to Argyris and Schon's (1978) theory of organisational learning. These are:

1. **Espoused Theory:** What we say that we do in situations. It is what we believe we would do in a situation or to solve a problem. The view that we tell the world what we would do.

2. **Theory-in-Use:** What we actually do in the situation. The fact that the espoused theory and theory-in-use are not congruent is generally not evident to the person. The theory-in-use is often at a tacit level and generally takes some deep reflection to recognise it. It can often be quickly observed by someone else but difficult to point out to the person in question.

(Argyris & Schon, 1978).

To illustrate these concepts further, we can refer to the following:

"When someone is asked how he would behave under certain circumstances, the answer he usually gives is his espoused theory of action for that situation. This is the theory of action to which he gives allegiance and which, upon request, he communicates to others. However, the theory that actually governs his actions is his theory-in-use, which may or may not be compatible with his espoused theory; furthermore, the individual may or may not be aware of the incompatibility of the two theories" (Argyris & Schon 1974, p.7 in Argyris & Schon 1978, p.11).

With this in mind, we return to our discussion on organisations. Argyris and Schon (1978) distinguish between a collectivity and an organisation in the following ways. A collectivity will begin to evolve into an organisation when it has established rule-governed ways of deciding, delegating and setting the boundaries of membership. When this happens, it is said that this newly formed entity is capable of acting. Moving on from the concept of 'acting' on behalf of others for a common goal, it is argued that the new entity has become political, or, as Argyris and Schon (1978) call it, "a polis" (p.13). The authors argue that it is true that individuals decide and act for the members, but they do so in accordance with the rule-based governing values for decision making, delegation and membership (Argyris & Schon, 1978).

If the entity described above continues on an ongoing basis, Argyris and Schon (1978) call it an "Agency" which is "an instrument for continuing collective action" (p.14). The authors argue that once an agency is established, it is possible to develop a "theory-in-use" for the agency from the observable action that is taking place within the agency. An agency is said to continually perform a set of complex tasks, to fulfill the function or goal of the overall organisation.

In order to do this, the organisation has to develop a "task system" (Argyris & Schon, 1978, p.14). This comprises the way different organisational components interact and "is at once a design for work and a division of labor" (Argyris & Schon, 1978, p.14).

Argyris and Schon (1978) talk about an instrumental theory of action. This is bound up in the norms, strategies and assumptions that guide the organisation on its path towards its overall objective. This is where Argyris and Schon's argument begins to really take shape. The idea is that there are generally two theories of action in place within an organisation. The first one is to be found within formal organisational documentation, including organograms, policy and procedure documents and job descriptions. This theory of action, referring back to our earlier definitions, is the espoused

theory of the organisation. It is what it tells the world what it does (Argyris & Schon, 1978).

The crux of Argyris and Schon's argument is that the espoused theory and theory-in-use, the second theory of action, are generally not congruent. Not only are they incongruent but as a result of the tacit nature of the theory-in-use, the incongruency is undiscussable. Not only is it not discussable, it usually is not even seen. Another interesting aspect of Argyris and Schon's (1978) argument is that it is the theory-in-use that is the major force in constructing organisational identity.

To begin to discover this theory-in-use, we must observe what really happens inside the organisation and not what the official documents tell us about what happens. Argyris and Schon (1978) make a distinction here between an outside view, just described as an observation of what happens, and an internal view, described as "When members carry out the practices appropriate to their organisation, they are also manifesting a kind of knowledge. And this knowledge represents the organisation's theory-in-use as seen from the inside" (p.16).

3.3 Images and Maps

Argyris and Schon (1978) make an interesting point with regards to organisational learning and the construction of personal images of the organisation. Basically what is said to take place is that each individual in the organisation is continually constructing a representation of the organisation as a whole. A little later in our discussion, I will reflect on this aspect with regard to mental models and organisational learning.

Due to the fact that our interpretations and representations will be influenced by our worldviews, the representation that each individual constructs is argued to be incomplete. Argyris and Schon (1978) state that as individuals continue to investigate the organisation and themselves in relation to the organisation,

these images of organisation change. They argue that each individual is doing this kind of inquiry all the time. These inquiries, which become embodied in the way people do things in the organisation, form the basis of the organisations theory-in-use. It is also argued that, dependent on how well these individual images are integrated into a organisational image on a continual basis, forms what Argyris and Schon (1978) have termed, "an organisation's knowledge of its theory-in-use" (p.16).

What appears next in this text is a very interesting analogy of an organisation, which is another way of saying 'Metaphor'. Argyris and Schon (1978) describe an organisation as an "organism" (1978, p.16). They go even further than this with the following statement, "Organization is an artifact of individual ways of representing organization" (Argyris & Schon p.16). These statements capture the underlying assumptions of the authors' views towards organisations. It becomes understandable then, that if an organisation is viewed through an 'organic' metaphor and seen as the integration, to put it simply, of each individual's image of the organisation, that Argyris and Schon (1978) come to the following conclusion:

> "Hence, our inquiry into organizational learning must concern itself not with static entities called organizations, but with an active process of organizing which is, at root, a cognitive enterprise. Individual members are continually engaged in attempting to know the organization, and to know themselves in the context of the organization. At the same time, their continuing efforts to know and to test their knowledge represent the object of their inquiry. Organizing is reflexive inquiry" (pp.16-17).

The authors go further and say that individual inquiry is necessary but not sufficient for the type of learning we are talking about. In order for individuals to compare, contrast and debate personal images, some form of external, public images must be developed. Argyris and Schon (1978) call these public images, "Organizational Maps" (p.17). These maps describe the actual way things are done in the organisation and can include diagrams of workflow, compensation charts, statements of procedure etc "Whatever their form,

maps have a dual function. They describe actual patterns of activity, and they are guides to future action ... Organizational theory-in-use, continually constructed through individual inquiry, is encoded in private images and in public maps. These are the media of organizational learning" (Argyris & Schon, 1978, p.17).

3.4 Organisational Learning - Argyris and Schon

A number of consistent themes or focus areas emerge out of the works of Argyris and Schon (1978). The most prominent of these are the two concepts, single-loop learning and double-loop learning. To strengthen the foundation, let us examine the understanding that Argyris (1994) puts forward with regard to learning. Although we have discussed an overview of what the authors understand to be organisational learning, what follows are the details of that overview.

3.5 Single Loop, Double Loop and Deutro-Learning

Argyris (1994) has defined learning as happening under two conditions. "First, learning occurs when an organization achieves what it intended; that is, there is a match between its design for action and the actuality or outcome. Second, learning occurs when a mismatch between intentions and outcomes is identified and it is corrected; that is, a mismatch is turned into a match" (p.8). The important distinction between the two types of learning is discovered in how the mismatches are turned into matches.

Single-loop learning can be expressed as when a mismatch is detected and then corrected within the current framework or value system operating within the organisation. It takes as valid the current assumptions and values and tries to operate, possibly, in a different way but still within the same framework. The commonly used analogy is that of the thermostat. The thermostat only knows when it is too hot or too cold. It has a set framework of temperatures that it has to operate within and then addresses each 'mismatch'

to bring them into the range of current practice. The thermostat never asks itself whether the current range is a good range in the first place.

This brings us to double-loop learning. This can be understood in light of the previous analogy of the thermostat. In double-loop learning, the mismatches are corrected by first examining and questioning the governing variables and then deciding what to do. It begins with the question: Is this temperature range a good and valid range to have in this context? Argyris (1994) states that these governing variables are "not the underlying beliefs or values people espouse. They are the variables that can be inferred, by observing the actions of individuals acting as agents for the organisation, to drive and guide their actions" (p.9).

The following diagram shows single-loop and double-loop learning.

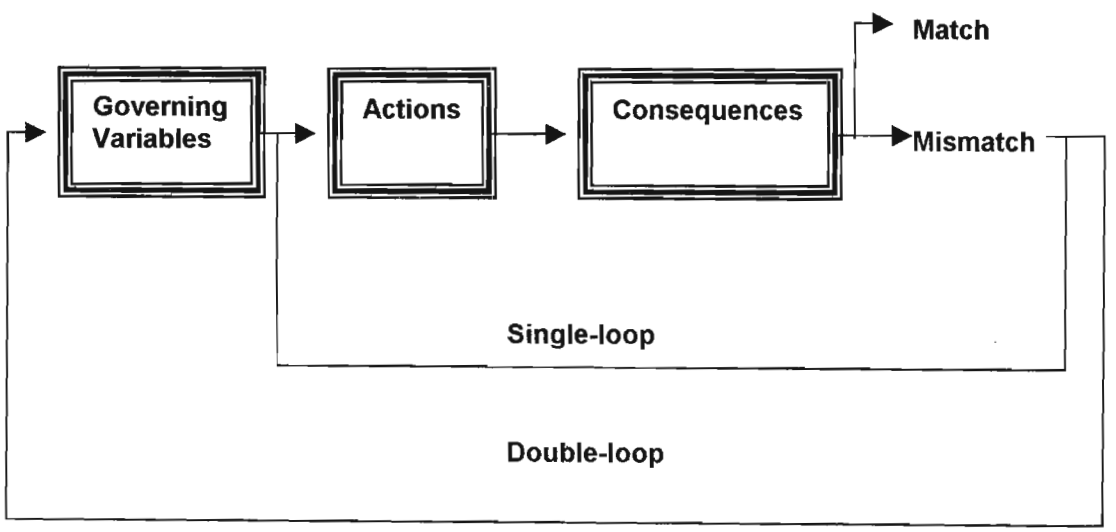


Figure 2: Single and Double-Loop Learning (Argyris, 1994, p.8)

An interesting point that Argyris (1994) makes is that learning, as can be seen in the diagram above, does not really occur until either a match or a mismatch emerges out of the system. Further to this, he adds:

> "From our perspective, therefore, learning may not be said to occur if someone (acting for the organization) discovers a new problem or

> invents a solution to a problem. Learning occurs when the invented solution is actually produced. This distinction is important because it implies that discovering problems and inventing solutions are necessary, but not sufficient conditions for organizational learning. Organizations exist in order to act out and to accomplish their intended consequences" (Argyris, 1994, p.9).

Argyris (1994) states that both types of learning are necessary and needed within an organisation and that they fulfill different functions. "Single-loop learning is appropriate for the routine, repetitive issues - it helps get the everyday job done. Double-loop learning is more relevant for the complex, non-programmable issues - it assures that there will be another day in the future of the organization" (Argyris, 1994, p.9).

The third type of learning mentioned is called Deutro-Learning: Learning about organisational learning. The organisation needs to learn how to engage in single and double loop learning. " When an organisation engages in deutro-learning, its members learn, too, about previous contexts for learning" (Argyris & Schon, 1978, p.27). It is a process whereby the organisation learns from previous learning efforts, how it facilitated or inhibited organisational learning. It is vital for this type of learning that the outcomes/results of this learning be encoded into the organisational maps and images of the people within the organisation.

I mentioned above that one of the crucial aspects to the argument put forward by Argyris and Schon (1978) was the way in which mismatches were turned into matches. At this point of the discussion, I will introduce another critical point in their argument, the importance of double-loop learning and the seeming inability of people to engage in such learning. This links back to our earlier discussion about worldview and thought.

Argyris (1994) argues that when people try and double-loop learn, the processes that they put in motion are actually counterproductive to their intended purpose. Not only that, but at the same time people are unaware of

the counterproductive measures they are implementing to try and double-loop learn. It is argued, however, that people can often see these counterproductive measures in other people. This could be likened to the biblical principle of "Take the log out of your own eye before you try to take the speck out of another persons eye". Argyris (1994) says that this, " ... may be due to a program in people's heads of which they must necessarily be unaware" (p.9). This aligns very closely to the theory that Bohm (1996) presents with regards to thought.

3.6 Model I Theory-in-Use

The concept of a theory-in-use has been discussed at length but what can be added at this point is the interesting concept that Argyris (1994) puts forward when he suggests that any unawareness or cover-up that takes place is actually designed purposefully. "It suggests that the unawareness is designed. It suggests that the incongruence is designed. It suggests, in other words, that human beings must have a theory of action that they use to produce all these difficulties" (Argyris, 1994, p.25).

This adds another dimension to our earlier discussion around thought and worldview. From what I understand Argyris is saying, the cover up is happening but it is 'designed', as opposed to simply happening by chance. On this point he argues against the 'attribution theorists', who claim that people behave in certain ways simply because they have to as a result of it being "human nature". Argyris (1994) adds to this argument and claims that his research shows that, once people learn different theories-in-use, they are able to behave in a manner different to that which is predicted by the attribution theorists. Argyris concludes by claiming that human nature is not a static entity but rather a changeable, dynamic process.

The most prolific theory-in-use that has emerged from the research of Argyris and Schon (1978, 1996) is what has been termed Model I theory-in-use. From reading this research, it is clear that the characteristics of Model I have been

drawn from observable behaviour in a number of different contexts and within a range of cultures.

The characteristics of Model I are as follows (Argyris, 1994):

> "A Model I theory-in-use has four governing variables, or values, for the actor to "satisfice:" (1) strive for unilateral control, (2) minimize losing and maximize winning, (3) minimize the expression of negative feelings, and (4) be rational. Along with the governing variables is a set of behavioral strategies such as (1) advocate your views without encouraging inquiry (hence, remain in unilateral control and hopefully win), and (2) unilaterally save face - your own and other people's (hence, minimize upsetting others and making them defensive)" (p.26).

Argyris (1994) argues that these governing variables form a master program that influences the behavioural strategies that human beings produce. In addition to this, Argyris claims that people can act in accordance with Model I, the opposite of Model I, or swinging between the two. For example, let us imagine the situation where I try to unilaterally control you, then at different times, you unilaterally control me and then the long-term oscillation between the two behavioral patterns occurs. Argyris (1994) adds that all the people he has studied so far hold a model I theory-in-use and that once learned, the strategies that people display in their behaviour, although complex, are performed with ease and so quickly that they present themselves as automatic. It is also argued that people develop the Model I theory-in-use through a process of socialisation (Argyris, 1994).

Argyris (1994) then begins to expand on the ideas that we discussed earlier concerning the process of thought. Speaking about a group of people asked to give suggestions for a course of action within a conflict situation, he made the following comment, "They were unaware of the many inferences that were embedded in their reasoning processes because, according to their Model I theory-in-use, everything they thought and said was not only true, it was

obvious and concrete" (Argyris, 1994, p.27). So to refer back to the work of Bohm (1996), one can see a very close parallel here.

To conclude this section, the following quotation will be useful to reinforce the suggested parallel between Argyris and Bohm:

> "What is also predictable from, and congruent with, Model I is that such thoughts and actions will lead to unrecognized inconsistencies, self-fulfilling prophecies, self-sealing processes, and hence, escalating error. This, is turn, will lead to a world that may be said to be unjust ... Injustice is a double-loop problem, precisely the learning domain in which human beings are programmed to be less than effective" (Argyris, 1994, p.27).

3.7 Model II Theory-in-Use

As an introduction to Model II it will be useful to state that Argyris and Schon (1978) claim that the strategies needed to operate in Model II are not the opposite of Model I. The governing values for Model II are: "valid information, free and informed choice, and internal commitment. The behavior required to fulfill these values also is not the opposite of Model I" (Argyris & Schon, 1978, p.136).

What I understand to be an underlying principle in Model II is the need to confront and test the basic assumptions of 'current practice' within an organisation. Model II uses some strategies that operate within Model I, advocacy, for example, but it uses this strategy within a Model II framework. Hence the Model I aspect of advocacy, which is that you maximise winning, is not used. Rather Model II combines the skills of advocacy and inquiry to bring about a situation where people's assumptions are openly discussed and confronted. This is similar to what has been called the "Ladder of Inference" (Senge et al, 1994), where people are encouraged to use both advocacy and enquiry to begin to discover, among other things, the mental models in operation.

One of the strategies that is not evident in Model I is power sharing among relevant stakeholders, which requires joint task definition and control. The issues of protecting yourself or others is rejected as it is viewed as a defensive routine that creates a barrier to learning. There is a shift from competition to competency. People are chosen to do tasks, make decisions and carry out implementation on their competency and not as a result of trying to out-shine other people. People operating within a Model II frame tend to try and sweep in a wide variety of perceptions about a problem situation so that the richest picture of the problem situation is created and decisions are based on the availability of this valid and useful information (Argyris & Schon, 1978). Argyris and Schon (1978) put it like this, "Every significant Model II action is evaluated in terms of the degree to which it helps the individuals involved generate valid and useful information (including relevant feelings), solve the problem in such a way that it remains solved, and do so without reducing the present levels of problem-solving effectiveness" (p.138).

Although Argyris and Schon (1978) state that both learning is necessary and needed, an emphasis on double-loop learning should exist within an organisation. Their basic argument is that a move from Model I to Model II theories-in-use will decrease the defensive patterns associated with Model I and lead to an increase in the ability to double-loop learn. An overview of Model II is presented in Table 1 on the next page.

Table 1: Characteristics of Model II Theory-in-Use

Governing Variable	Action Strategies	Consequences for the behavioral world	Consequences for learning	Consequences for quality of life	Effectiveness
Valid Information	Design situations or environments where participants can be origins and can experience high personal causation	Actor experienced as minimally defensive (facilitator, collaborator, choice creator)	Disconfirmable processes	Quality of life will be more positive than negative (high authenticity and high freedom of choice)	
Free and informed choice	Tasks are jointly controlled	Minimally defensive interpersonal relations and group dynamics	Double-loop learning	Effectiveness of problem solving and decision making will be great, especially for difficult problems	Increased long-run effectiveness
Internal commitment to the choice and constant monitoring of its implementation	Protection of self is a joint enterprise and oriented toward growth. Bilateral protection of others.	Learning-oriented norms (trust, individuality, open confrontation on difficult issues)	Public testing of theories		

Adapted from Argyris (1994, pp.154-155)

3.8 Learning Systems

As mentioned earlier, Argyris (1994) argues that Model I is learnt through a process of socialisation. As such, one would need to investigate the greater social system or what we could call the 'learning system' to identify if this argument remains valid. Argyris (1994) himself admits that this is not yet fully proven, but has done the type of investigation we are discussing and has come up with a number of learning systems. The first one that we shall discuss is what Argyris and Schon (1978) have called a "Model 0 - I Learning System".

3.9 Model O - I Learning Systems

Argyris and Schon (1978) have developed a learning system which they claim predisposes an organisation to a certain kind of learning, in this case, what they call limited learning. "... a model of organizations which are unlikely either to correct first-order error by double-loop learning or to inquire into their own learning system" (Argyris & Schon, 1978, p.109).

Figure 3: Model O - I: Limited Learning Systems

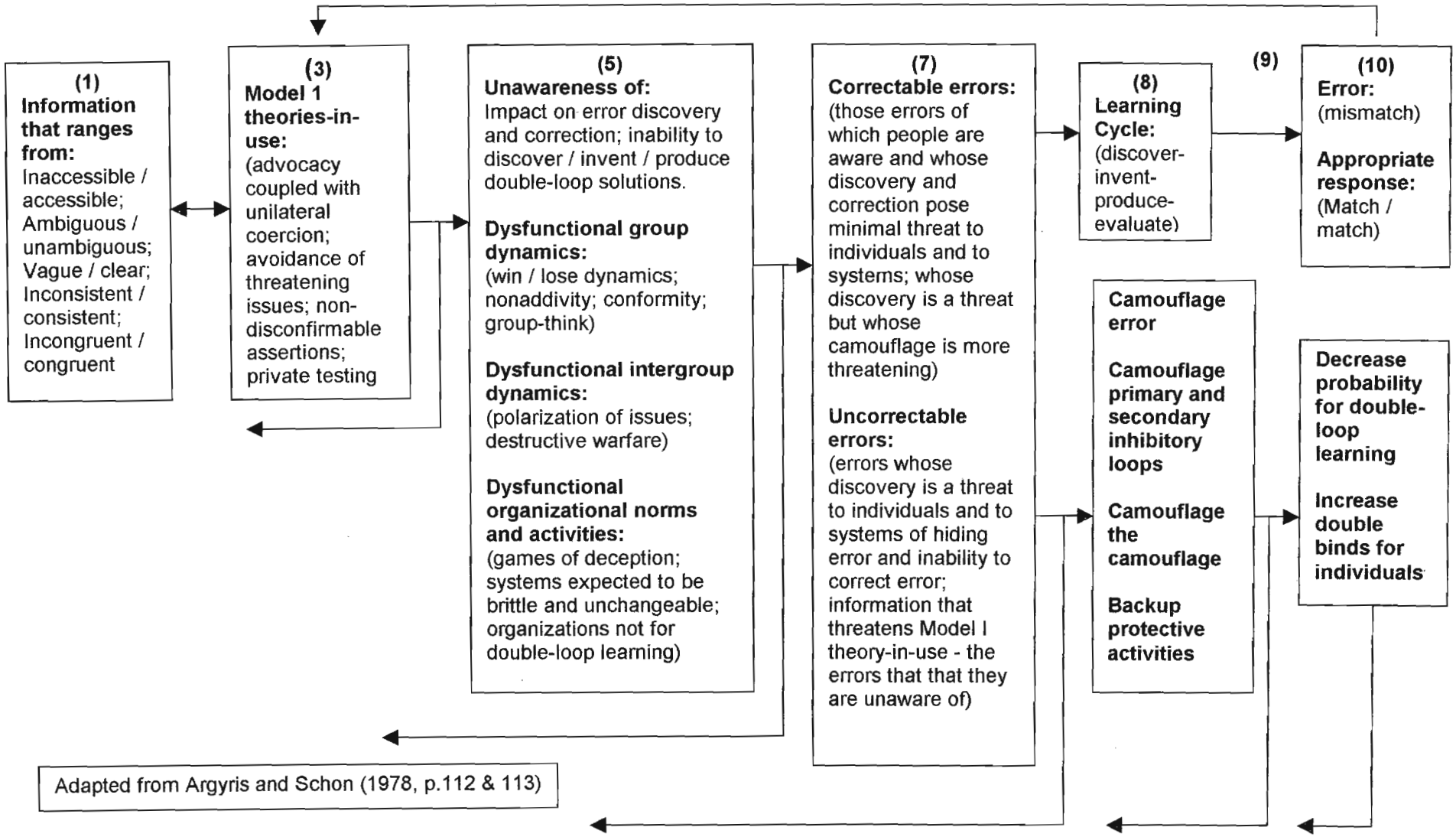


Figure 3 needs a certain amount of unpacking if we are going to utilise the meaning captured within the diagram to the full in our present discussion. Argyris and Schon (1978) state that, "... it is more likely that a limited-learning organisation, at any period of its evolution, displays at least embryonically the full configuration of the system" (p.111). To add further clarity, Primary inhibiting loops are described as, "...'primary' not in the sense of temporal order, but in the sense of their primary importance among the processes which make up the system" (Argyris & Schon, 1978, p.111). From what I understand, primary inhibiting loops (PIL) are also generally on the interpersonal level whereas secondary inhibiting loops (SIL) are more likely to occur on the intra- and intergroup levels, while at the same time sustaining the primary loops.

Column (1) contains elements of, as has been described earlier, an organisation's instrumental theory of action. It is the way things happen within the organisation. The characteristics listed are not particularly useful or positive for an organisation but seem to flourish in most. The instrumental theory of action of the organisation, within a Model I world, seems to be the instigator of Model I interactions which create primary inhibiting loops. The interaction between columns (1) and (2) creates a situation where the "conditions for error become uncorrectable and trigger the very responses which make them so" (Argyris & Schon, 1978, p.112). So basically what happens is that the column (1) characteristics interact with people who operate in Model I worlds and hence trigger appropriate Model I responses which in turn covers up the existence of the column (1) characteristics. When this happens, as stated above, the conditions for error are unnoticed and the feedback loop continues to operate and reinforce itself. One of the most crucial aspects of primary inhibiting loops is that they, "... reinforce the unawareness of their effects on organizational learning" (Argyris & Schon, 1978, p.112).

Moving from here, we see that column (5) deals mainly with the group dynamics level. It is argued that the interactions and behaviour patterns of columns (1) - (4) begin to create a mirror image of interactions at the group

level. Not only do the same interactions begin to take place, causing the formation of secondary inhibiting loops, but also these SIL's in turn reinforce the primary inhibiting loops. This type of reinforced Model I interactions at the interpersonal and intra / intergroup level seems to bring about a mindset which declares that the organisation is brittle and unchangeable. At this point Argyris and Schon (1978) argue that, "... members learn to despair of double-loop learning, the stage is set for games of deception" (p.114).

Games of deception, investigated in detail by Argyris (1993), become the burning issues at the forefront of the organisational consciousness. What seems to happen is that the games become of paramount importance and concern to members of the organisation and, as we can agree in theory and have experienced in practice, leads to a further unawareness of the real errors. These types of games usually have the result of people thinking that the organisation will never change and is on the brink of collapse. Intense blame shifting begins to occur and is reinforced and very little public testing of assumptions is implemented as this in itself has become an undiscussable issue.

What is interesting in the system mapped by Argyris and Schon (1978) is that even in the midst of all the interactions and feedback loops described above, correction of error at a certain level does occur. It is at the level where correction and detection of the errors is not threatening to the Model I behavioural world in operation. These types of errors would seem to align themselves with single-loop learning and ways of doing things better within the current framework. From personal experience of this type of learning system, one of the consequences of this type of error detection and correction is that "progress" is being made and the organisation is really getting better, but in actual fact, reflecting on this discussion, it only adds to the overall unawareness. This is not to say that single-loop learning experiences organisations go through are useless or totally negative. This would be wrong, but what I think could be a result of this type of learning is a further reinforcement of the larger system, that being a limited learning system.

This leads us on to the issues of camouflage. When an organisation is operating within a Model I world, anything that can cause personal or organisation embarrassment or threat is fiercely and automatically avoided. This is camouflage. Argyris and Schon (1978) state that camouflage can take a number of forms, including hiding the issue, disguising the issue or even denying that it exists. In addition to this, the organisation can present its espoused theory while operating with an "open secret" (p.116) about the incongruity of the espoused theory and the theory-in-use. Common features of camouflage also include blame shifting to external factors and going through the motions of problem confrontation while privately conceding that nothing will happen. One of the most interesting features is when an organisation anticipates the consequences of uncorrectable error and builds these into performance indicators (Argyris & Schon, 1978).

In order to be able to engage in camouflage an organisation needs to create an amazingly complex system. This refers back to the point Argyris and Schon make about the fact that theories-in-use are actually designed, albeit in a manner that becomes so ingrained and automatic that it presents itself as the natural thing to do. What would seem to happen is that the organisation builds performance indicators that demonstrate the error exists, makes margins for performance for its staff as a result of the error but at the same time never recognising the error. The system is so strong that it is able to accommodate the error, produce new levels of acceptable performance rather than confronting the actual conditions of error.

Following on from here is the secondary level of camouflage that begins to emerge. As the organisation hides, disguises or denies the existence of error, it is confronted with the situation of needing to camouflage and camouflage the camouflage. As much as the error needs to be hidden, it is just as important that the hiding needs to be hidden. Argyris and Schon (1978) put it this way, "In effect, we must tacitly agree not to discuss our denials and disguises if they are to do their job. This, then, represents a further impediment to deutro-learning" (p.117).

When an organisation, operating within a Model I world, begins to inquire into its learning system or the way it operates, Argyris and Schon (1978) argue that another kind of primary inhibiting loop emerges. This is happens within column (9) on figure 3. It is called a second-order loop, which functions in a primary inhibiting loop fashion. This type of loop is caused by many of the same factors involved in causing first-order primary inhibiting loops but it is being reinforced by a lot of the consequences of the secondary inhibiting loops, such as camouflage and the second order camouflage. In turn this type of primary inhibiting loop, which blocks attempts to investigate the learning system, reinforces and protects that learning system.

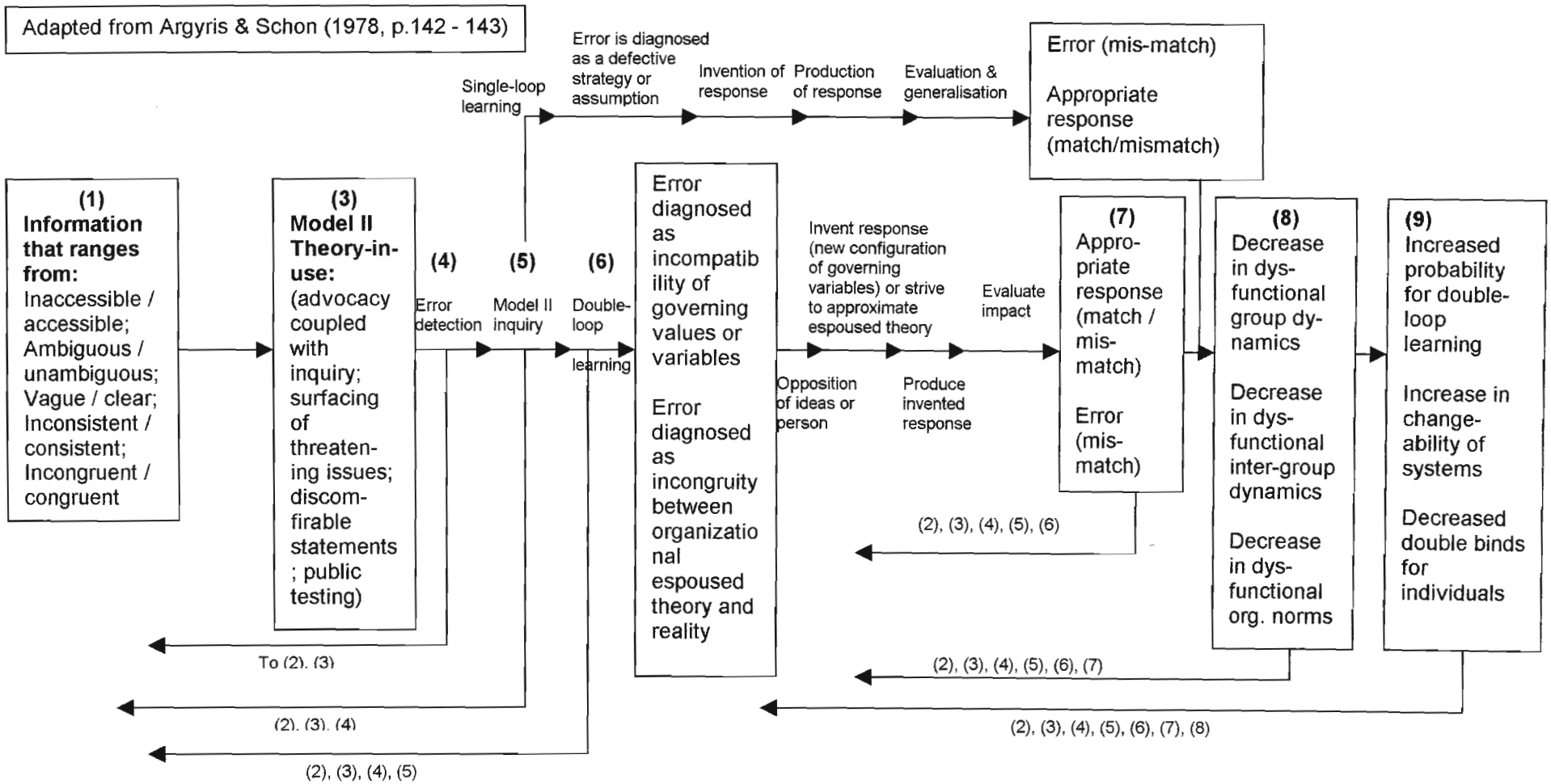
Finally, as a result of the complex interaction of first-order primary and secondary inhibiting loops as well as the second-order inhibiting loops, it is argued that there is a general decrease in the probability of double-loop and deutro-learning as well as an increase in double-binds for individuals working within this system. Argyris and Schon (1978) argue that double loop learning, which they view as crucial to organisational learning, is dependent upon the awareness of error within a learning system. As the present discussion has shown us, the Model O - I learning system has been designed to prevent any such detection. Not only this, but it disallows deutro-learning. If the organisation cannot double-loop learn as a result of the learning system in place, then it is not possible for them to even begin to learn how to double-loop learn.

Argyris and Schon (1978) then argue that this creates what is termed a "double bind" (Bateson, 1972) for individuals within the system. They are said to continually feel a sense of frustration and confinement. It is often described as a 'lose/lose' situation. Argyris and Schon (1978) describe it as follows, "... namely, one is caught in a no-win game and the rules of the game are undiscussable" (p. 118).

3.10 Model O - II Learning Systems

In an attempt to bring us out of the despair of the Model O - I learning system and behavioural world, let me begin to introduce what Argyris and Schon (1978) have developed as an alternative. They have called it the Model O - II learning system, one that is not limiting but rather open and encourages the types of learning that Argyris and Schon argue is necessary for organisational learning to take place. This system is shown as Figure 4 on the next page.

Figure 4: Model O - II Learning Systems



Again, this diagram needs to be explained in a little more detail. As per the Model O - I map, column (1) and (3) interact. The difference being that column (3) represents a Model II theory-in-use and hence the interaction produces some very different results. Instead of producing a primary inhibiting loop, the interaction produces three significant results. Firstly, error is detected. Secondly, a Model II inquiry can begin once the error is detected and, as a result of the Model II inquiry, double-loop and single-loop learning is possible. What this results in is a negative feedback loop to the columns before. It is negative in the sense that it begins to reduce the conditions for error, whereas, the primary inhibiting loops of the O - I learning system were positive or reinforcing loops and continued to increase the scope for error by reinforcing the conditions for error.

It is suggested that single-loop learning occurs relatively easily in the Model O - II system. This type of learning is also associated with techniques, actions, or ways of operating. I would call this the more technical aspect of how the organisation works. The error is detected, and the 'event - produce - evaluate' section of the diagram is entered into without too much difficulty. Another loop that emerges at this point which is not to clear from the diagram is that if, in single-loop learning, the solution produced corrects the error, then the learning stops there. If, on the other hand, the produced solution does not correct the error, then the agent for organisational learning is taken back to diagnosing the problem.

Coming to the next type of learning, double-loop learning, we begin to examine the underlying governing values of the organisation. It isn't simply a tweak of the existing goalposts, but rather seeing that the way we are operating is pointing away from what we intended and want to happen. Argyris and Schon (1978) argue that this type of learning requires that good dialectic be operating in the organisation. It is also stated that this begins with a map to bring about different perspectives of the problem. From here, a similar route is taken as to that described with regard to single-loop learning. The 'invent - produce - evaluate' cycle begins.

Argyris and Schon (1978) then seem, from my perspective, to take a bit of a leap of faith and say that once this happens, the results should be a bed of roses. Most of the dysfunctional elements of intra- and inter-group dynamics will disappear. Not only will they disappear, they will be replaced with very functional group dynamics that will get the results intended by such groups. Following on from such good wins up until this point, the groups will then begin to believe that double-loop learning is possible and useful for themselves and the organisation.

Finally column (8) and (9) begin to create a useful positive or reinforcing loop with the learning system as a whole. The feedback that goes back into the system strengthens the Model II theory-in-use, encourages the Model O - II inquiry and so the story goes through to the end of the system. Argyris and Schon (1978) add to this discussion with the following, "... and hence we have a learning system that is simultaneously stable and subject to continual change" (p.144).

It was argued that unless organisational learning is embedded within the wider organisational system, the benefits of such learning would be very limited. What I understand them to be saying is that a learning system, as per Model O - II, will give rise to new problems. The difference will be that the system will be robust and open enough to engage with the new problems in a way that couples advocacy and inquiry, based firmly within a Model II theory-in-use. The result being an, "...open-ended process in which cycles of organizational learning create new conditions for error to which members of the organisation respond by transforming them so as to set in motion the next phase of inquiry" (Argyris & Schon, 1978, p.144).

3.11 Dialectic

In the past few pages the term dialectic has been introduced. I think it would be useful to clarify what is meant by this term. Argyris and Schon (1978) make some level of distinction between single-loop, double-learning and deutro-loop

learning when talking about organisational dialectic. In fact there is only really one distinction made, that being whether the organisational norms and governing variables are taken as given or if they are the cause of the inquiry.

For single-loop and deutro-learning, the organisational norms are taken as given, although used in a slightly different manner. With single-loop learning, the organisational norms are taken as given and the area of focus is on effectiveness. The issue is whether we can do things better and did we learn to do so. When deutro-learning is spoken of, there are two scenarios presented. Firstly, when the organisational norms are shared by those involved in the learning cycle. Secondly, a case is presented where the organisation learns that the norms are no longer effective.

On the other side is double-loop learning. The difficulty with this type of learning is that the norms and governing values are the very things that are in transition. With this being the case, it is not plausible to use them as criteria for whether learning is taking pace. This is where Argyris and Schon (1978) say that the dialectic approach is so useful. They have therefore come up with a number of questions that can be used to see if good organisational dialectic is taking place. These questions are:

" Do members of the organization treat organizational assumptions as testable? And do they search for disconfirmable data?

Are the members of the organization able to integrate, for example, the images of organizational theory-in-use held by employees at different levels and locations with those of management so as to make a single organizational map capable of revealing the interconnections of assumptions and values?

Do the members of the organization share memories of the organization's past which provide them with a context for the interpretation of present error?

Has the organization found that its expectations to achieve specified objectives are continually disappointed? Are the members then able to respond to uncertainty by reflection and by efforts to restructuring their perception of the problem?

Do the members test for congruence of organizational espoused theory and theory-in-use?

Do the individual members oppose one another without the awareness that their opposition represents a conflict of organizational values?

Or do the members couple advocacy of their own positions with inquiry into the position of others? Do they keep open the possibility that conflicting values could be internalised by the several members rather than distributed among them by polarization?" (Argyris & Schon, 1978, pp.145 - 146).

Argyris and Schon (1978) argue that these questions give the organisation some practical tools to begin an inquiry into how well the organisation is engaging in good dialectic. The questions go beyond simply identifying whether an organisation is involved in dialectic, the questions also provide a broad guideline as to how to engage and develop a Model 0 - II learning system that is embedded in Model II theories-in-use. If the features presented in the questions were not happening within the organisation, Argyris and Schon (1978) argue that it would be very difficult for that organisation to allow conditions for error to emerge and be confronted. It would be difficult for that organisation to double-loop learn. Henceforth, good organisational dialectic forms an integral part of an organisation's ability to develop the skills necessary to learn. Not only to learn, but also to learn in the manner described above as organisational learning.

3.12 Reflections on Argyris and Schon's Theory

When we step back and look at Argyris and Schon (1978), one being a psychologist and the other a professor of philosophy, it sheds some light as to why they have formulated the problem in the manner they have, a cognitive problem. I would argue that since they have studied and become experts in areas such as interaction patterns, behavior and cognition, this must have had some, if not a considerable amount, of influence on the way that they have formulated the problem. Further, we can see that these two authors "create" the organisation they have worked with as a set of interactions between people and that the problems that block organisational learning are the problems created by the way these interactions occur.

Although agreeing with a lot of what they say, there still seems to be a gap that exists in practice. There is not too much guidance about how the elusive jump from a Model O - I to a Model O - II learning system comes about. And although this is taken up in later publications by, particularly, Argyris (1993, 1994) the words of Argyris and Schon (1978) resound:

> "As mentioned at the outset, we have not been able to find in our experience or to draw from the literature descriptions of Model O - II learning systems with the degree of concreteness that was possible for Model O - I. Nor can we depend on the reader to fill in the gaps with his or her own knowledge because we predict that few, if any, readers have observed organizations that double-loop learn" (p.147).

This statement has certain parallels to that of Bohm (1996) where he emphasises the importance of dialogue, but ends up by basically saying that it is not possible, or at least extremely difficult, to have the dialogue that he is talking about.

What I also found interesting with the work of Argyris and Schon was that they really didn't deal too much with issues of structure. Contrasting this against the work of Garratt (1987), who seems to stress the importance of the role of

the leader in the organisation and the need for a certain structure within the organisation. Garratt's concern seemed to emerge from his extensive work within companies that he called "Brainless" and the inevitable conclusion of failure for these organisations. Garratt also places a big emphasis on the directional role of leaders / managers.

Actually this is where Argyris and Schon and Garratt are similar. Both say that unless organisational change is implemented and lead by the top, it is doomed to fail. Garratt goes as far to say that it is the responsibility of the leader to implement an organisational learning culture. But where they seem to differ rather dramatically is the area of structure or hierarchy (Argyris & Schon, 1978; Garratt, 1987).

When I started reading Garratt, it seemed like I was reading Stafford Beer (1966, 1967, 1981, 1985, 1994). Garratt (1987) states that there are three levels of hierarchy that are essential to the effective performance of an organisation. These are, "external monitoring, integrating and direction-giving and operational planning and actions" (p.12). Garratt (1987) even uses terminology very similar to Beer and calls the "Integrating and Direction-giving levels" the "Business Brain" (p.13). This is the level that Garratt begins to sweep in concepts of organisational learning, stating that it is so important for there to be a "Brain" within the organisation. "If it is not possible for an organism to learn, then it will not survive. That is why having a business brain is such an evolutionary competitive advantage. Without a brain capable of abstractions we would be reduced to sign/stimulus predetermined behaviour insufficient to cope with our environmental changes" (Garratt, 1987, p.18). What is also interesting to note from this quote is the organism metaphor that is again used with regards to an organisation.

Another area where Garratt can be linked to Argyris and Schon is in his call for directors to move from specialists to generalists. Garratt (1987) argues that this will happen when managers begin to use a different set of values. This can be aligned with the concept of Theories-in-use and the need to change from Model I to Model II.

Garratt (1987) puts forward the arguments of Reg Revans who states that, "for an organisation to survive, its rate of learning must be equal to, or greater than, the rate of change in its external environment" (Revans (1982) in Garratt, 1987, p.37). Looking further into the field of change, Garratt introduces the concept of first-order and second-order change. These concepts can be paralleled to single and double-loop learning respectively.

Garratt (1987) states that organisational learning is a useful strategy to cope with change. Again, he places the emphasis on the directors and states the following:

> "What is needed for directors is the ability to ask discriminating questions of those experts so that specialist inputs can be maximized whilst the directorial perspective is kept above all specialisms... The directors must learn to ask good quality questions so as not to be fooled by their experts. Revans plays upon the notion of 'looking after one's Ps and Qs' and describes the formula for organizational learning as L=P+Q" (Garratt, 1987, p.46).

Finally Garratt (1987) states that the minimum conditions for a learning climate to develop within an organisation are:

> "1. People at all levels of the organization are encouraged to learn regularly and rigorously from their work and to feed back such learning to other parts of the organization which could use them.
> 2. Systems are set up to ensure that the learning is moved to those parts of the organization which need it.
> 3. Learning is valued and rewarded in the organization.
> 4. The organization is seen to continuously transform itself through the application of its learning, led by the attitudes and behaviour of its directors" (p.59).

What I do think is useful about Garratt's (1987) work is that it does raise the question of structure and its importance within the development of a learning

organisation. This is an area that Argyris and Schon (1978) seem to disregard for the most.

Another influential writer in this field is Arie de Geus (1997). His book, "The Living Company", introduces some of the ideas he has towards learning within organisations. From what I understand of this text, the crux of learning is centred on the external environment and the future. The book seems to be very much based upon research that he carried out within the Shell organisation in order to find out what it was about organisations that made them last for a long time.

From the research carried out, de Geus (1997) stated that a number of common characteristics emerged within the companies studied. The most important characteristic was the ability to adapt and change to the changing external environment so that the organisation is always relevant to the world it is operating in. Following on from this research was the development of what is now known as scenario planning. Kees Van der Heijden (1996) is also a well known author in this field.

One of the key concepts within scenario planning is the development of different possible futures that an organisation may well have to face in the near future. Once the futures have been developed, the organisation then evaluates its current business idea to see how it would survive within the different futures. The idea being that the organisation must develop a business plan that is robust enough to operate well to highly effectively in one or a number of these different futures.

Relating this type of learning to Argyris and Schon (1978), I see a distinct link between double-loop learning and scenario planning. The idea of different possible futures forces the organisation to ask the question, "How will we, operating as we currently do, survive in this future?" It is such a vitally importance question and allows the organisation to really begin to look at the way it is currently operating and some of the assumptions it is making about the present and the future.

In effect, it helps the organisation to re-look at the theory-in-use within the organisation and confront this through the different futures that have been developed. I believe one of the most confining aspects of a Model I theory-in-use is that it allows only one possible future to emerge. That being the case, learning and change are only ever going to occur within the confines of that one future and that theory-in-use. As a result, an organisation can be preparing itself for a future that only exists within the walls of the organisation. The consequences of such thinking can be disastrous.

Not wanting to create the dichotomous good/bad, single loop/double loop learning situation, but I can see that if there is only one future being accepted as valid, the only type of learning taking place will be single-loop learning. An organisation will not likely challenge the basic assumptions it operates with if those basic assumptions fit the only future possible within the organisation. Following on from this, I can also see that scenario planning would be a very useful way of allowing what Argyris and Schon (1978) call the conditions for error to emerge and hence the opportunity to begin to double-loop learn.

This is the reason that the production and development of the potential futures is vitally important. If the organisation is going to accept them as valid, the research and development must be wide reaching and inclusive of all stakeholders. If this does not happen, Model I theories-in-use can begin to operate and the futures can simply be rejected as not valid and the organisation will more than likely not change.

The opposite of this would be that the organisation is very involved in the development of the futures, accepts them as possible and valid and therefore can be used as the catalyst to change. This process would at least reduce the potential for outright, unquestioned rejection of the futures. I believe that it would also improve the likelihood for the acceptance of new ideas and ways of operating in that the organisation would have to confront current best practices within the light of different, possible and valid futures. As such, I can

see that scenario planning is a very practical tool for the development of good dialectic within the organisation.

As a way of concluding this section on organisational learning, I believe it would be useful to mention the work of Peter Senge (1990, 1994, 1999). I made reference to Senge at the beginning of this document and believe that he has done a great deal in widening the audience and increasing the popularity of systems thinking.

His most popular book, "The Fifth Discipline" (1990) has some very useful insights. When I reflect on the relation between Senge's work and that of Argyris and Schon (1978), there are some similarities. This is in the area of mental models, systems thinking and the use of advocacy coupled with enquiry.

Mental models, paradigms and theories-in-use seem to speak of the same concept. It deals with recognising that people operate from a particular framework. The difference in emphasis that I see between the authors is that Senge (1990) focuses on the fact that people's mental models can be vastly different, being developed through the variety of life experiences people have had. This is in contrast with Argyris and Schon (1978) who state that basically everyone operates within a Model I theory-in-use.

I don't think that the different emphases of the authors are diametrically opposed. I believe Senge (1990) to be saying that people have different worldviews and these need to be considered when working within an organisation. Argyris and Schon (1978), on the other hand, are saying that, this being the case and with different worldviews in operation, there seems to be an over arching theory-in-use that most people ascribe to.

I believe that the major difference between the authors is that Senge's (1990) materials are for the manager. It is written in a very accessible way which provides some practical tools to begin to develop a learning organisation and the use of case studies throughout the texts seems to confirm the intended

audience and use of the book. A problem that I can see with this type of text is that managers can see it simply as a recipe book. All one has to do is follow these few steps and suddenly the organisation is going to learn in a meaningful way.

With this in mind and reflecting upon Argyris and Schon (1978) I believe that it is also easy to fall into the trap of thinking that this is a very straightforward process. The very fact that Argyris and Schon (1978) state that they have not seen many, if any, Model O-II learning systems in operation, bears testament to the fact that this is not an easy thing to do. In fact, I am left with the question, "How does one begin to reduce the gap between theory and practice and how does a manager implement this in their workplace?" I believe that this could have been one of the challenges that Senge (1990) wanted to confront in writing his books in the style chosen.

With the above reflections and comments made, I believe that Argyris and Schon (1978) have developed a very insightful theory of organisational learning. It captures and investigates what I believe to be the very core issues affecting learning within organisations. Although at times difficult to access, the theory presented sets out a well developed understanding of the dynamics within organisations and offers a form of solution. The apparent weakness seems to lie within the area of being able to confirm or disconfirm the truthfulness of their theory in practice.

CHAPTER FOUR: CHANGE

Learning and change are so intricately intertwined that it becomes difficult to imagine one happening in isolation from the other. In the most general sense, it could be argued that if one has learnt something new, then that person has changed. Once learnt, it is difficult, if not impossible, to 'unlearn' something and return to the state prior to learning whatever was learnt. Realising that the relationship between learning and change does exist, it is worthwhile to investigate the current understanding of change and the available approaches so often employed in the management of change.

What seems to emerge from the review of change literature is the strong allegiance to a model of change first presented by Lewin (Lewin, 1952, in Dawson, 1994). The model comprises three stages that an organisation needs to go through in order to be successful in a change process. These stages are 'unfreezing', 'changing' and 'refreezing'. Although a certain amount of criticism has been levelled at this model of change, when you begin to look closely at a number of different models, as we will shortly do, one can see a similar trend occurring. See Table 2 below.

Table 2: Models for the Change Process

MODEL	PROCESS		
Lewin (1974)	Unfreezing	Changing	Refreezing
Beckhard & Harris (1977)	Present State	Transition State	Future State
Beer (1980)	Dissatisfaction	Process	Model
Kanter (1983)	Departures from Tradition and Crises	Strategic Decisions and Prime Movers	Action Vehicles and Institutionalization
Tichy & Devanna (1986)	Act I Awakening	Act II Mobolizing	Act III (Epilogue) Reinforcing
Nadler & Tushman (1989)	Energizing	Envisioning	Enabling

Adapted from (Kanter, Stein, & Jick, 1992, p.376)

4.1 Moss Kanter, Stein and Jick Model of Change

Let us start with one of the better-known writers on change, Rosabeth Moss Kanter. Kanter has written a number of books on the subject, notably "The Change Masters" (1983). The model presented in "The Challenge of Organisational Change" (Kanter, Stein, & Jick, 1992) is called, "The 'Big Three' Model: Three kinds of Motion, Three Forms of Change, Three Roles in the Change Process" (p.14).

The types of motion that are mentioned within the above title are:

1. The motion of the organisation within its environment. This is the 'big picture' change. The type of change that affects all organisations within a sector and possibly more broadly. It could be concerned with aspects such as government policy, consumer trends, competitors etc.

2. The internal motion, how the parts of the organisation are relating to one another. This deals with the type of change often associated with restructuring, downsizing or reengineering. The term "life cycle" (Kanter, Stein & Jick, 1992, p.15) is used with regards to an organisation and the path it takes to maturity.
3. The final type of motion mentioned is classified as political. When groups or individuals begin to engage in power struggles towards establishing the controlling interest in decision making, a number of changes come about.

After presenting the three kinds of motion within an organisation, the following forms of change are proposed:

1. Identity changes: This seems parallel to the first kind of motion in that it involves the relationship between the organisation and its environment. It is best captured by the following, "As environmental movement presents pressures and challenges for change, organizations can subtly change their identities by changing their relationships to their environments: changing the businesses in which they operate, the products they offer to the market, the investors who supply capital, and so forth" (Kanter, Stein & Jick, 1992, p.15).
2. Coordination changes: Again this aligns itself to the second type of motion. It is related to the types of changes that occur as a result of restructuring the organisation. The way departments interrelate and the organisation as a whole is structured.
3. Control changes: Finally, changes that result from the political motion within an organisation. "This leads to *makeover through takeover* or other changes triggered by shifts in ownership or governance" (Kanter, Stein & Jick, 1992, p.15).

Coming to the end of the Big-Three change model, the role players or "action roles" as they are called are differentiated. To a certain extent these action roles tally up with the divisions that have gone before in this model, but not to the extent between the types of motion and the types of change.

1. Change Strategists: These are the people concerned with the relationship between the organisation and the environment. They are called upon to

set direction for the organisation. It is stated (Kanter, Stein & Jick, 1992) that these roles are generally occupied by senior management and occur at the beginning of a change process.

2. Change Implementors: This action role is generally associated with middle management that is given the responsibility of implementing the change strategy developed by the above group. It deals with the internal structuring and internal relationships of the organisation. To clarify this role, "Change implementation, as we are using the concept here, involves project management and execution rather than conception" (Kanter, Stein & Jick, 1992, p.16).
3. Change Recipient: The people at the end. Those that are most likely to be the effected by the change process. This role is often linked to the 'bottom' of the organisation and the people who have very little influence over the effects of the change process. "A good deal of the tension that invariably arises in major organizational change programs is the direct result of the disjunction between those directing and implementing change - both of whom are sufficiently involved and have at least a degree of control over the change - and those who are powerless, the passive recipients, as it were" (Kanter, Stein & Jick, 1992, p.16).

With the above description of the types of motion, types of change and the action roles in place, the focus then moves to what these people in the action roles are meant to do. A number of steps are presented in what has been referred to as, "Charting a course for change" (Kanter, Stein & Jick, 1992, p.386).

Kanter, Stein and Jick (1992) have developed four "rules" of the road for charting the course for change. These include:

"

1. Appreciate the difference inherent in other 'changemakers' viewpoints.
2. Respect - but challenge - the ten commandments and their applicability within your own organisation.
3. Ensure that the dialogue and communication among the various constituencies has meaning and purpose

4. Respond flexibly, even opportunistically, not only to what occurs outside the organisation, but also how the change process is faring within the organisation" (Kanter, Stein & Jick, 1992, p.386).

Let us look a little further into each of these rules of the road. To begin with, let us investigate what is meant by:

Appreciate the difference inherent in other 'changemakers' viewpoints.

As has already been outlined above, this model of change involves three action roles. This 'rule' asks for the different role players, whether strategists, implementors or recipients, to begin to realise and appreciate the differences between these role players.

The core assumption attached to this rule is that all the stakeholders are making the change. In effect, the three levels of action roles make up the entire organisation and therefore it is essential for the organisation to understand that everybody must be involved if the change process is going to be successful.

It is stated (Kanter, Stein & Jick, 1992) that 'Appreciating other Changemakers' Differences' is a "prerequisite to applying the subsequent 'rules of the road' that we recommend...That harmony will not be possible unless the roles themselves are understood" (p.387).

Evaluating the Ten Commandments

Before we begin to evaluate the ten commandments, we need to take a minute and investigate exactly what they are. Table 3 below gives a bullet point description of the Ten Commandments:

Table 3: The Ten Commandments

THE TEN COMMANDMENTS	
Commandment	**Description**
1. Analyse the organisation and its need for change.	This basically requires of management an detailed understanding of the organisation, its environment and the subsequent impact of the suggested change process.
2. Create a shared vision and a common direction.	This stage does not mean the creation of a neat mission and vision statement. It is a deeper process whereby the organisation becomes gripped by a desired and possible future that is different to what currently exists. This process stretches people's imaginations as to what is possible and unites the organisation in a central forward direction.
3. Separate from the past.	At a certain point within a change process, the organisation must begin to 'break ties' with the past. Routines and work functions that are not working or are not in line with the desired future must be removed from the organisations daily activities.
4. Create a sense of urgency	If change is deemed necessary but not obvious to the entire organisation, especially the implementors and the recipients of change, then the change leader needs to create a sense of urgency. Unless this is created, the organisation will not align itself with the change process.
5. Support a strong leader role.	This commandment states that an organisation should not try to implement change without a strong leadership role to guide and drive the process. This person is involved in driving just about all of the ten commandments.

6. Line up political sponsorship.	The change leader alone cannot make change happen. For a change process to be successful, the change leader needs to be supported by both the people who have the 'power' within the organisation and those are going to be most affected by the change (Kanter, 1983).
7. Craft an implementation plan.	This puts the 'meat on the bones' of the vision. The vision is the destination, the guiding light, whereas the implementation plan is more of a road map of how to get there.
8. Develop enabling structures.	This requires the organisation to develop structures and process that support and facilitate the change. It is argued that this can often be a critical precursor to any organisational transformation (Kanter, Stein & Jick, 1992).
9. Communicate, involve people and be honest.	The underlying assumption of this commandment is that the more you involve people in the decisions that will affect them, the greater the trust developed between the different stakeholders and the more likely the change process will be successful.
10. Reinforce and institutionalize the change.	This stage involves the leaders of the change to begin to develop processes and structures that reward alignment to the change process. These processes should move towards the creation of a culture and a "way of doing things" that matches the image of the transformed organisation.

Adapted from (Kanter, Stein, Jick, 1992, p.383).

Turning our attention back to the second rule of the road, 'Evaluating the Ten Commandments', Kanter, Stein and Jick (1992) state that these commandments provide good, common sense advice with regards to the dynamics of change. The warning or precaution put forward in this rule is that

the organisation must evaluate these commandments in terms of the particular context in which they are working.

A number of questions are presented to help an organisation in this particular regard. These include, "Are we addressing the real needs of the company, or following the path of least resistance? How shared is the vision? How do we preserve anchors to the past while moving to the future? Does everyone need to feel the same sense of urgency? Can change recipients, far down in the hierarchy, have an impact? How do we handle those who oppose change? How much change can this organisation absorb?" (Kanter, Stein & Jick, 1992, p.388).

Ensuring Meaningful Communication

This rule of the road seems to overlap with the ninth commandment, but the authors are clear to articulate exactly what they mean by communication in this case. It does not simply mean keeping stakeholders up-to-date about the progress of the mandated change process. It goes much further than that. It attempts to bring about the engagement of all the stakeholders on a continuing basis with regard to the change process.

The authors talk about "dialogue between the different changemakers" (Kanter, Stein & Jick, 1992, p.388). This type of communication involves meetings and forums that allow the different stakeholders to voice their concerns about the process. Not only their concerns, but also their opinions and thoughts about the process. These types of forums are hoped to create a much more informed understanding of what change means to the organisation at all of its different levels. It also allows useful feedback to flow to the change leaders. It is hoped that this type of communication would continually build trust and support for the change process. It is argued that if people are 'heard' and are able to input into the process as opposed to feeling that it is simply being pushed from "on high" and they have no choice but to accept it, the success of the change is more likely (Kanter, Stein & Jick, 1992).

Reacting Flexibly and Opportunistically

This rule of the road presents another very useful challenge to the change process and particularly, the ten commandments. It acknowledges that the ten commandments implicitly assume a degree of control that "simply doesn't exist when large-scale change is being implemented" (Kanter, Stein & Jick, 1992, p.389). The central theme of this rule is that the change process is a very dynamic one. Although a degree of guidance and certainly a destination can be plotted before departure, the change leaders need to be aware of the fact that the exact course should not be set in stone. The organisation needs to be able to "react" to the turbulent seas of change just as well as they charted the original course.

Interestingly enough, there is a focus again on the ten commandments. Kanter, Stein and Jick (1992) argue that the assumptions underpinning the ten commandments need to be contemplated in addition to the already stated evaluation. The major point presented is that some of the actions attached to the ten commandments involve a certain amount of risk and a degree of uncertainty which must be looked at and understood before an organisation sails off into the oceans of change.

To conclude, Kanter, Stein and Jick (1992) present a paradox that emerges out of the ten commandments. The commandments are basically a set of guidelines and action strategies to implement change in a way that maximises change and predictability and, inversely, minimises uncertainty and risk. The problem with this, as presented by Kanter, Stein and Jick (1992), is that change and transformation generally require a certain degree of risk taking and uncertainty.

The proposed answer to this dilemma is an evaluative approach to change. What I mean by this, with regards to understanding the authors' perspective, is that an organisation must learn to cope with change on an ongoing basis. After each stage of change occurs, the organisation must take time to evaluate the change and then move ahead. This move forward could

potentially include adaptations to the original course due to the evaluation of where the change process has reached up until this point. Kanter, Stein, and Jick (1992) describe this process as follows, "As alluded to earlier, change implementors have a common sensation of just 'muddling along' without clear progress. But in fact, properly managed, 'muddling along' can be the most effective way of handling multiple changes and complex situations" (p.390).

In summary, the Big Three model presents three types of motion, three forms of change and three roles within the change process. I have presented a more detailed account of each of these categories with a particular emphasis on the ten commandments and the four rules of the road. From here we turn our attention to one other similar view on change and I will conclude with a presentation of Dawson's Processual Approach to change (Dawson, 1994).

4.2 John Kotter's Model of Change

Moving on to the other similar approach to change, we will take up with John Kotter's (1996) eight-stage process. Kotter, in his book "Leading Change" (1996), presents eight stages to the successful management of a change process. These are:

1. Establishing a Sense of Urgency
2. Creating a Guiding Coalition
3. Developing a Vision and Strategy
4. Communicating the Change Vision
5. Empowering Employees for Broad-Based Action
6. Generating Short-Term Wins
7. Consolidating Gains and Producing More Change
8. Anchoring New Approaches in the Culture

(Kotter, 1996).

Kotter (1996) introduces his eight-stage process with a parallel set of eight mistakes that, in his experience, are the most common reasons why change

fails. These eight mistakes and a brief description of why they are mistakes are presented in Table 4 below.

Table 4: Why Organisations Fail to Transform

Why Organisations Fail to Transform	
Error	**Description**
1. Allowing too much complacency.	Kotter states that the biggest reason for failure of change initiatives is the lack of urgency within an organisation. He argues that if complacency is high, change is extremely difficult and often doomed from the beginning. In addition to this factor, Kotter (1996) states that management often,"... overestimate how much they can force change on an organisation. They underestimate how hard it is to drive people out of their comfort zones. They don't recognise how their own actions can inadvertently reinforce the status quo" (p.5).
2. Failing to create a sufficiently powerful guiding coalition.	This coalition is not just the CEO (Chief Executive Officer) of the organisation, but rather has the real power within the organisation. This, of course, would include the CEO and other senior managers, but also other powerful stakeholders in terms of, "... formal titles, information and expertise, reputations and relationships and the capacity for leadership" (Kotter, 1996, p.6).
3. Underestimating the power of vision	Kotter (1996) places a special emphasis on the power of vision. He states that out of all the elements needed in a successful change process, none is more important than a useful vision. It provides the guiding light that facilitates unity to a purpose or destination that the organisation has set it self (Kotter, 1996).
4. Undercommunicating the vision by a factor	Kotter (1996) argues that unless the vision is communicated effectively and sufficiently, people will generally not see the benefits of change and hence

of 10 (or 100 or even 1000).	will not support the change and will not change their own behavior.
5. Permitting obstacles to block the new vision.	Whether the obstacle is 'real' or perceived, unless it is confronted and removed, change will becoming increasingly more difficult. If the organisation is not aligned to the new vision, and this manifests itself in structures and behaviours (particularly of people in management), the masses will not generally support the change (Kotter, 1996).
6. Failing to create short-term wins.	Kotter (1996) argues that change, especially complex, organisation-wide change, is not an overnight process. The risk involved here deals with the loss of momentum if short-term wins are not identified and acknowledged.
7. Declaring victory too soon.	The title is fairly self-explanatory. If the organisation declares victory in the change initiative too early in the process, all could be lost. Kotter (1996) states, "Until changes sink down deeply into the culture, which for an entire company can take three to ten years, new approaches are fragile and subject to regression" (p.13).
8. Neglecting to anchor changes firmly in the corporate culture.	Until behaviour in the organisation changes so that it is aligned with the new vision, a change has not really taken place. "Until new behaviours are rooted in social norms and shared values, they are always subject to degradation as soon as the pressures associated with a change effort are removed" (Kotter, 1996, p.14).

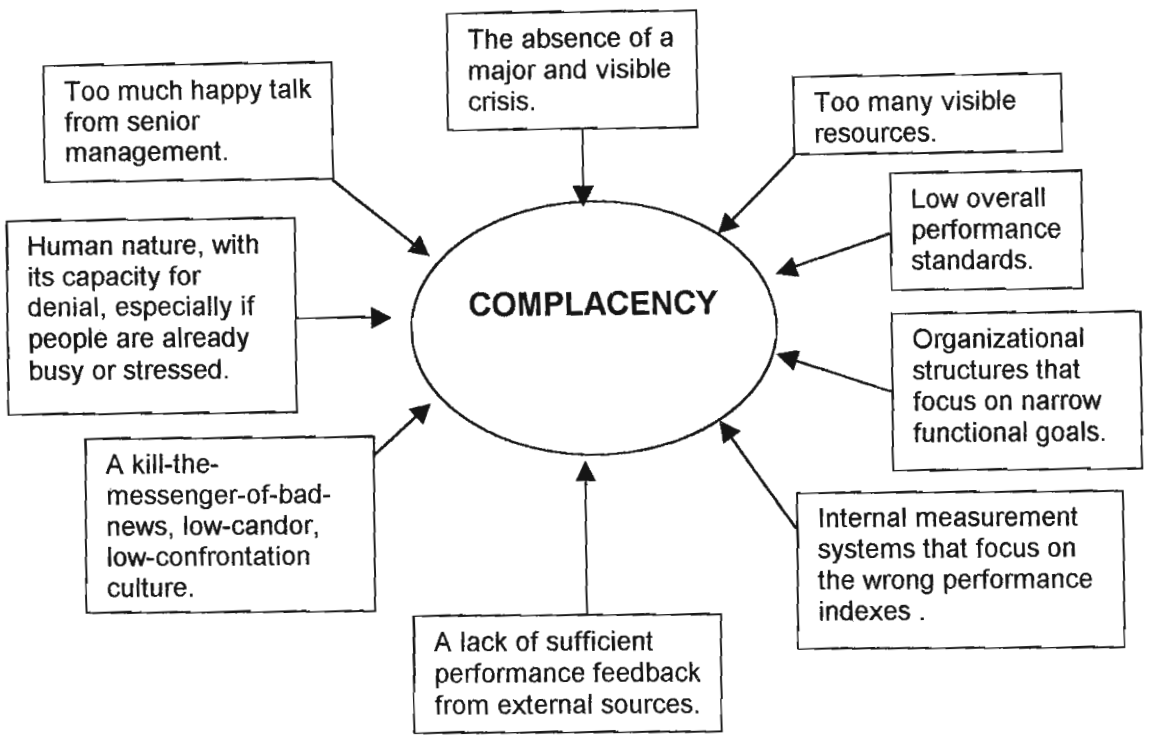
With the eight errors of change in place, let us now move onto Kotter's (1996) eight-stage process as mentioned above, starting with 'Establishing a Sense of Urgency'. Seeing that the titles of the eight-stage process are fairly self-explanatory and that a brief description of the paralleling eight errors have

been given, I will simply present highlights of each stage with reference to the usefulness for this document.

Establishing a Sense of Urgency

As we saw in the description of the error above, complacency is a major threat to the success of organisational change. Kotter (1996) presents a useful range of sources of complacency. This is shown in figure 5 below:

Figure 5: Sources of Complacency



Kotter (1996, p.40).

I will pick up on a few of the sources that need a little more explanation. "Too many visible resources" was cited as a source of complacency. Here Kotter (1996) talks about the exuberant excess that he saw so often in successful firms. The boardrooms, the entrance halls, the offices, all screamed of success and Kotter (1996) assigns an underlying message of "We are rich, we are winners, we must be doing something right. So relax. Have lunch" (p.39). With this kind of obvious excess, it is difficult for people to see the urgency and the potential impending crisis (Kotter, 1996).

Moving clockwise around the figure above, the next four sources, "Low overall performance standards", "Organizational structures that focus employees on narrow functional goals", "Internal measurements systems that focus on the wrong performance indexes" and "A lack of sufficient performance feedback from external sources" all seem to deal with measurement in some way or another and can be addressed together. Kotter (1996) has found that often the complacency was kept high by low performance standards. The standards that were set for the organisation were easily achievable and as such everyone was meeting targets and the perspective of success and progress was built and reinforced. Linked to this point, Kotter states that internal measurement systems are biased towards everyone meeting goals. Looking even further at this aspect, Kotter argues that all the feedback people received came from this biased measurement systems. With the result that all of the feedback was generated internally and nothing external to the organisation was coming through (Kotter, 1996).

On top of that, each department was given narrowly defined goals and targets which then helped to create a fragmented organisation that lacked the overall, global perspective.

Adding to the point of solely internally generated data, Kotter (1996) adds that many organisations have a culture that punishes people who try to integrate some forms of external data that may force a confrontation or challenge to the status quo. In addition to the already complex system being presented here is the peculiar capacity for human beings to deny and discard any information that does not meet their expectations. This particular statement having considerable likeness to the Model O-I Learning System as described by Argyris and Schon (1978) earlier in this paper.

Finally, Kotter (1996) describes a situation where senior management's "Happy Talk" creates a comfort zone that people relax into. It is argued that the source of this is more often than not, past success. Kotter (1996) puts it this way:

> "Much of the problem here is related to historical victories - for the firm as a whole, for departments, and for individuals. Past success provides too many resources, reduces our sense of urgency, and encourages us to turn inward. ... Big egos and arrogant cultures reinforce the nine sources of complacency, which, taken together, can keep the urgency rate low even in an organization faced with major challenges and managed by perfectly intelligent and reasonable people" (p42).

This quote also shows alignment to Argyris and Schon's (1978) Model O-I learning systems that reinforce the status quo. Although Argyris and Schon detail the reasons why in a much more thorough manner, the similarity is obvious.

Kotter (1996) then proceeds to present a number of techniques to increase the Urgency Level and discusses issues such as "The Role of Crises", "The Role of Middle and Lower-Level Managers" and "How Much Urgency is Enough?" (pp 45-49).

To touch briefly on "Creating the Guiding Coalition", Kotter (1996) provides the reader with four key characteristics to an effective coalition. These include:

1. Position Power: Make sure that you have enough people on board so that change can progress. Do the people not in the coalition have the "power" to block progress?
2. Expertise: Make sure that you have the necessary expertise from a variety of areas within the organisation so that decisions taken with regards to change are informed and intelligent.
3. Credibility: Is the make-up of your group credible enough throughout all sectors of the organisation? Will this coalition be respected by the organisation as a whole to the point that the job gets done?
4. Leadership: Have you selected a group of people that have proven leadership, who will be able to lead and drive this change process?

(Adapted from Kotter, 1996, p.57)

Although an important, if not crucial ingredient within this change process, I will not be looking at "Creating a Vision". Kotter (1996) presents a fairly straightforward approach to this and it would be pointless to simply repeat what he has said. What I am particularly interested in is the aspect of communicating this vision.

Kotter (1996) puts forward seven key elements with regards to communicating the vision. These are:

"

1. Simplicity
2. Metaphor, analogy and example
3. Multiple forums
4. Repetition
5. Leadership by example
6. Explanation of seeming inconsistencies
7. Give-and-take " (p.90).

Out of these 7 techniques, numbers 4,6 and 7 are of most interest. The use of repetition is an interesting point. The repetition mentioned here does include talking about the same thing repeatedly, but the examples given show that it is done in a more meaningful way that helps people 'learn' about the vision and see how it really affects their lives. Kotter (1996) explains it this way, "This happens not because the public relations department takes in 'vision distribution' as a "project". This happens because dozens of managers, supervisors, and executives look at all of their daily activities through the lens of the new vision. When people do this, they can easily find many meaningful ways to talk about the direction of change, communications that can always be tailored to the specific person or group with whom they are talking" (p.94).

Kotter (1996) pinpoints addressing inconsistencies within an organisation as in important issue with regards to change. If the organisation is going through a change process, but seemingly only one part is being changed, which often converts into "being reduced, re-engineered or down-sized", then this inconsistency would need to be addressed. Kotter argues that simple, honest

communication is the best strategy. Acknowledge the seeming inconsistency and communicate what is being done about it (Kotter, 1996).

Finally, the people involved in communicating the vision need to be able to listen. The major argument here is that most people would need to grapple with the personal and organisational issues that are coming to the fore through the change process. A forum where people are able to ask questions that help them to deal with the concerns that appear to them most commonly facilitates this. This type of two-way communication also provides the essential element of feedback about the change process (Kotter, 1996).

To conclude, I want to examine some of the aspects of Kotter's approach with regards to Anchoring New Approaches in the Culture. Kotter (1996) puts forward an interesting argument as to why culture is so powerful:

"

1. Because individuals are selected and indoctrinated so well.
2. Because the culture exerts itself through the actions of hundreds or thousands of people.
3. Because all of this happens without much conscious intent and thus is difficult to challenge or even discuss.

" (p.151).

What I find interesting about the above three points is how they reflect the learning model presented by Argyris and Schon (1978). What Kotter (1996) talks about when he uses the term culture is really what Argyris and Schon (1978) talk about when they mention Learning Systems, in this case the Model 0 - I learning system. The system does indoctrinate people, in a very real sense it controls how people behave, although the people themselves collude in reinforcing the system and finally, the system is undiscussable and simply, 'just the way we do things around here'.

In conclusion, Kotter (1996) puts forward the following guidelines for managers about anchoring changing in a culture:

" *Comes last, not first:* Most alterations in norms and shared values come at the end of the transformation process.

Depends on results: New approaches usually sink into a culture only after it's very clear that they work and are superior to old methods.

Requires a lot of talk: Without verbal instruction and support, people are often reluctant to admit the validity of new practices.

May involve turnover: Sometimes the only way to change a culture is to change key people.

Makes decisions on succession crucial: If promotions processes are not changed to be compatible with the new practices, the old culture will reassert itself" (p.157).

4.3 Dawson's Processual Approach to Change

Moving on from Kotter (1996), I will now focus on a 'Processual Approach' to organisational change with particular reference to Dawson (1994). Dawson's point of departure for his development of a processual framework of change is the inadequacies he finds within the contemporary literature on the management of change. Dawson (1994) claims that almost all current management programs adopt Lewin's three-phase approach to change. This model has been mentioned at the beginning of our discussion on change and involves the three phases of unfreezing, changing and refreezing.

When we reflect on the two models just presented, I believe that these models have adopted Lewin's approach as an underlying basis for what they want to achieve. Kanter, Stein and Jick (1992) do mention Lewin's model in their text and acknowledge its influence on the field of change management. In fact, the authors reflect critically on it to some extent. Kanter, Stein and Jick (1992), in the introduction to their book, included the following criticism, "Lewin's model

was a simple one, with organizational change involving three stages; unfreezing, changing, refreezing. This quaintly linear and static conception - the organisation as ice cube - is so wildly inappropriate that it is difficult to see why it has not only survived but prospered, except for one thing. It offers managers a very straightforward way of planning their actions, by simplifying an extraordinarily complex process into a child's formula" (p.10).

A certain amount of confusion arises out of the fact that later in their book, they seem to present a model that, although acknowledging that the change process is more dynamic than is often depicted by the three phase model, is almost entirely based on Lewin's approach and often gives reference to the terminology that he used. For example, let us examine some commentary on the third commandment, "Disengaging with the past - or pattern breaking - is critical to the "unfreezing" process which Kurt Lewin described back in 1947" (Kanter, Stein & Jick, 1992, p.383).

Bringing our discussion back to Dawson's (1994) approach, we find the following commentary on Lewin's model, "Although this theory has proven to be useful in understanding planned change under relatively stable conditions, with the continuing and dynamic nature of change in today's business world, it no longer makes sense to implement a planned process for 'freezing' changed behaviour " (Dawson, 1994, p.3).

Dawson (1994) has attempted to develop a framework that helps to explain the process involved in a major change. Towards this end, he has identified three timeframes that are involved in a change process. These include:

- Conception of a need to change
- Process of organizational transition
- Operation of new work practices and procedures.

Added to this are what he calls the "major determinants of change" (Dawson, 1994, p.41). The three that Dawson has developed are:

1. The substance of change
2. The politics of change
3. The context of change

According to Dawson (1994), the substance of change refers to the type and scale of change. Dawson (1994) poses the following question with regard to the substance of change, "... what are the characteristics of the changes being introduced and how do they enable or constrain the options open to management during the introduction of a major change programme?" (p.42).

The politics of change is referred to as the processes of consultation, conflict and resistance. These pressures can come from both inside and outside the organisation and are wrapped up in the lobbying for power and influence over decision making (Dawson, 1994).

The context of change refers to both the internal and external environments of the organisation. It also refers not only to the current environment but also the past. Dawson lists the five major internal contextual factors as, "human resources; administrative structures; technology; product or service; and history and culture" (Dawson, 1994, p.42).

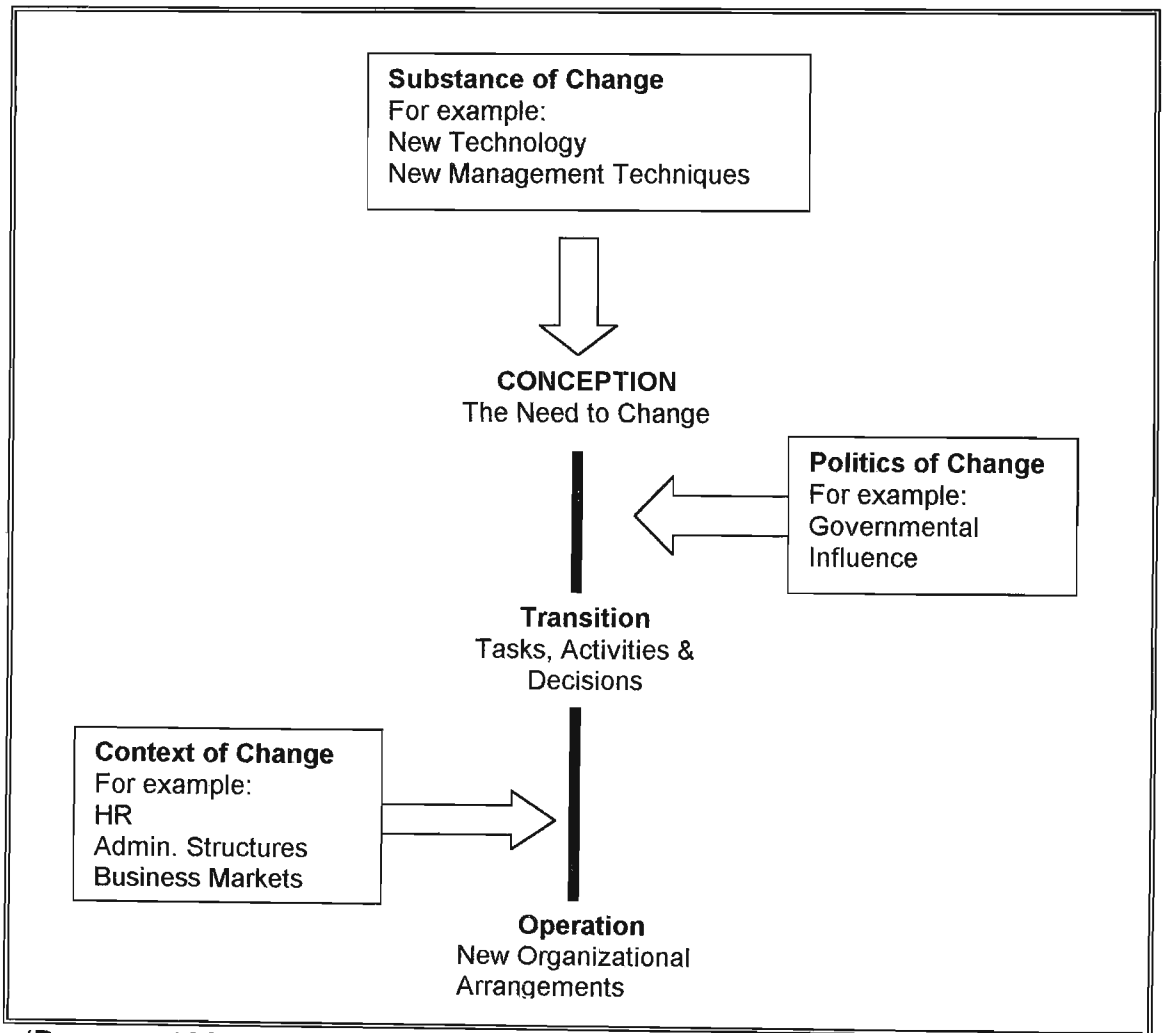
The understanding that emerges from reading this text is that Dawson's (1994) framework is designed as an analytical tool, which helps to explain the processes involved in a major-scale organisational transition. Dawson stresses the notion that change is a very temporal process and, in the bigger picture, one could say the supra-system, the change process that an organisation has just been through is simply part of a wider and on-going process of change. Dawson describes changes as a dynamic and ever changing processes (Dawson, 1994).

In fact, Dawson (1994) adds to the framework described above by saying that the processual approach recognises that change occurs within and alongside

a change program. We read, "Apart from its analytical and explanatory value in particular cases, the processual approach also sensitizes us to the fact that there are no fixed outcomes of change under a given... system, simply outcomes at particular moments in time" (Clark in Dawson, 1994, p.45).

Dawson's framework is presented diagrammatically in figure 6 below:

Figure 6: Dawson's Processual Framework



(Dawson, 1996, p.44)

In summary, Dawson's (1994) framework describes the change process as beginning with a period of time when the idea that change is needed is birthed within an organisation. Following on from here, a decision is usually taken by senior management on whether to invest in a major change program. If the decision is taken and the organisation begins with a change program, then a

time period of implementation occurs. This includes buying equipment, possibly a new technology, hiring external consultants if necessary and moving into the full-scale implementation of whatever change program has been decided upon. The final period is where new operating practices begin to emerge as the norm. It is noteworthy that Dawson makes particular reference to the fact that the operating practices becomes the norm within the wider context of ongoing processes of change (Dawson, 1994).

Interestingly, there is a similarity between Dawson (1994) and Kanter, Stein and Jick (1992) in that Dawson describes the period of actual transition as a muddled and confusing process and not something that is smooth and predictable. Kanter, Stein and Jick (1992) talk about this stage as 'muddling along'.

One really needs to look further into the manner in which Dawson (1994) distinguishes his framework from other change models as one could be forgiven for thinking that there is not really much difference between what Dawson is saying and what the other models present.

I think the difference is found where Dawson (1994) advocates that the processual approach does not prescribe a single structure which is the light on the hill for every transforming organisation. Dawson (1994) puts it this way, "Change is viewed as an ongoing process which is both progressive and regressive, is planned and unplanned, and incorporates intended and unintended innovations from the initial conception of the need to change through to the emergence of new work arrangement" (p.173).

A further distinction that Dawson (1994) makes, as well as a criticism of other models, is that the processual approach does not characterise change as a series of rational and linear decisions or activities. In this light, Dawson has developed two pieces of advice for those involved in change:

1. It is important to be aware and to maintain an overview of the dynamic and long-term process of change.
2. The management of organisational transition is unlikely to be marked by a line of continual improvement from beginning to end. (Dawson, 1994).

In an attempt to give managers a more practical grasp on what Dawson (1994) is talking about, he has developed a list of 15 guidelines which can be drawn from the processual approach to managing change. These include the two piece of advice mentioned above together with the following:

"

1. Be aware of, and understand the context in which change takes place.
2. Ensure that change strategies are culturally sensitive and do not underestimate the strength of existing cultures.
3. Consider the value of having a champion of change.
4. Affirm that the substance of change is fully understood.
5. Train staff in the use of new equipment, techniques and procedures.
6. Ensure senior management commitment and support.
7. Develop a committed and cohesive local management team.
8. Ensure that supervisors are part of major change programmes.
9. Gain trade union support.
10. Spend time developing good employee relations.
11. Clearly communicate the intentions of change to employees.
12. Provide appropriate funding arrangements.
13. Take a total organizational approach to managing transition"

(Dawson, 1994, p.179).

From the above list of rather straightforward guidelines to the management of change, one must ask the question again, "what is the great difference here?" Dawson (1994) argues this issue as follows, "No longer is it appropriate to talk about long-term stability followed by change followed by long-term stability but, rather, organizational transition should be viewed as an ongoing process which may develop from partial incremental commitment as well as by the formulation of corporate strategies for the wholescale introduction of new organizational structures ... caution should be given to studies which present

linear models in an attempt to construct commandments of change or to prescribe the next way to manage organizational change. In short, change needs to be managed as an ongoing and dynamic process and not as a single reaction to adverse contingent circumstance " (Dawson, 1994, p.182).

4.4 Conclusion

In summary, there are a number of models available that prescribe certain methods of dealing with change and the management of change. I have presented two that seemingly align themselves with the Lewin-type model and then a third approach which claims to be addressing the weaknesses of the current change models with a particular reference to the Lewin based models.

CHAPTER FIVE: AN INTRODUCTION TO LEARNING HISTORIES - EXPLAINING THE RESEARCH METHODOLOGY

5.1 Introduction

In this chapter, I will present an overview of the research methodology used for this study. This methodology is called a Learning History. Those that have been involved in the development of this methodology, mainly Art Kleiner and George Roth, have produced a number of documents with regards to learning histories. In these documents, they have placed a heavy emphasis on what is and what is not a learning history (Kleiner & Roth, 1996).

I have taken a 'learning history approach' to my research but concede that, according to Kleiner and Roth (1996), this study would not officially be classified as a learning history. Therefore, I will present the wider process involved in a learning history and then explain how I adapted this methodology to best suit the needs and scope of this particular intervention.

5.2 Learning Histories

Learning histories have developed out of the dilemma that Kleiner and Roth (1996) saw emerging within the field of organisational learning. Although the concept had gained a great deal of currency within management circles, the problem of assessing whether the organisation had actually benefited from the learning effort was repeatedly appearing (Kleiner & Roth, 1996).

The real problem seemed to be related to people's feelings about and perceptions of assessment. It seemed that when people felt they were being assessed, the learning effort was easily compromised. This may come about from the desire to 'look good' if you feel you are being assessed. So, what was lacking from the organisational learning projects Kleiner and Roth (1996) studied, was a suitable form of feedback to the rest of the organisation. It was

as a result of these concerns that learning histories were developed (Kleiner & Roth, 1996).

A learning history document is designed to help organisations become more aware of the learning that is taking place within its borders. "The learning history *presents the experiences and understandings* of participants - people who initiated, implemented and participated in organisational transformation efforts..." (Kleiner & Roth, 1996, p.2).

In essence, a learning history is meant to tell the story through the voices of the people who have been involved in the transformation program. The developers of the learning history claim that the document is structured in such a manner that it helps the organisation move forward and distribute the learnings of one area within the company to the organisation as a whole. "A learning history thus represents the organisation talking to itself, in a safe and carefully structured way, about the things it needs to hear but hasn't yet listened to" (Kleiner & Roth, 1996, p.2).

5.2.1 The Process

A learning history project has been broken into seven distinct stages that one must travel through. These stages are:

1. Planning: Determining the boundaries

This stage consists of planning and reaching some understanding of the scope of the project. An important part of this stage is the identification of "Noticeable Results" - these are important events or processes within the organisation that everyone, no matter who, would recognise as having occurred. It also involves the establishment of the learning history team. This team includes internal and external learning historians.

2. Reflective research: Interviews and data gathering

This is the core of the research within the learning history. The learning historians gather appropriate data and do reflective interviews with

participants of the process being researched. It is important, with regards to the interviews, that a wide enough range of people are interviewed and that a suitable cross-section of perspectives is included. This must include those that did not support the effort.

3. Distillation: Establishing key themes and "plots"

From the large amount of data that is sourced within the research phase (interviews, documents, observations etc) the learning historian has to allow the emergence of a set of core themes. This process of distillation is important as it attempts to present some form of meaningful interaction with the large amount of data produced within the research phase. Kleiner and Roth (1996), with reference to this phase, talk about balancing the three learning historian imperatives:

"

i. The 'research' imperative - keep conclusions rooted in the data
ii. The 'mythic' imperative - to tell an archetypally moving story
iii. The 'pragmatic' imperative - to tell the story in a way that it can be effectively read, heard and discussed in organisations" (p.8).

4. Writing: Production of a transactional object

The learning history is based on the anthropological concept of a 'jointly told tale'. "In this form of writing, the participants and the learning historians tell the story together, incorporating the participants' experience and passion, along with the learning historians' broader perspective and objective training" (Kleiner & Roth, 1996, p.8). This is presented in a 'two-column' format. This will be explained in more detail later.

5. Validation: Reflective feedback

This stage is where the emerging story is checked for validation and authenticity.

6. Dissemination: Application and transferring learning

In an attempt to make the learning history as useful a document as possible, it is not simply handed out to people. The argument is that it would then simply gather dust with the rest of the unhelpful reports prior to the learning history. Rather the learning history is interactively presented to the organisation in a set of carefully designed workshops. These workshops are designed to gain maximum use and 'learning transfer' from the learning history.

7. Publication / Outreach

Once the above process is completed, the learning history is presented to a wider audience, with the organisation's name disguised. This attempts to make the transfer of knowledge as wide as possible and not limited only to the organisation itself (Kleiner & Roth, 1996).

In addition to these seven stages of a learning history, the Kleiner and Roth (1996) have stated that there are a number of generic principles that seem to be emerging with regard to learning history work. These include:

1. Organisations today have a choice - "Slash and burn" or "Learn".

Learning history work is really based on the idea that organisational learning is essential for today's rapidly changing business climate. Kleiner and Roth (1996) state the following, "The alternative to command-and-control is collaborative learning - the ability to expand an organisation's capabilities in response to its own desired future and the state of current reality" (p.11).

2. Learning takes place from experience, but collective learning from experience is inherently problematic.

Learning does take place through experience, but the problem with organisational learning is that it is often difficult to transfer learning from individual or even group experiences to the wider organisational environment. Learning histories are an attempt to overcome this dilemma.

3. **Communication that fosters learning must embody the research, mythic and pragmatic imperatives.**

These imperatives have already been mentioned. What the authors are trying to say here is that communication that is going to foster learning must cycle through the different imperatives.

4. **No one voice provides "the answer" - people accept other's viewpoints in the context of their own.**

The learning history attempts to create validity through the use of as many perspectives as possible. This obviously needs to be limited to what is useful. As mentioned in the beginning of this document, the perspectives of the people interviewed in this study are valid. They might not tell the whole story but they do tell what they experienced. In a full-scale learning history project, the learning historians attempt to create the most accurate picture of the 'whole' story.

5. **"You are not alone" - all particular instances are reflections of universal patterns.**

As Argyris and Schon (1978) reported, most of the organisations that they worked in had a model O-I learning system. It didn't matter what nation, culture or language. Most had the same learning system. Kleiner and Roth (1996), who state that certain patterns emerge that are universal, apply this principle here. Each learning history project and each organisation is unique but often the underlying patterns that emerge are shared.

6. **Organisations "know" what they need to hear but lack the capacity to listen.**

As a whole group, the organisation has an understanding of what the organisation needs to know. The problem is that organisational memory is scattered in the lives and experiences of each individual. The learning history attempts to bring these different experiences together into a combined format so that the organisation can know more than the individuals within it.

7. Organisations need an established infrastructure for reflection.

This principle relates to the effectiveness of a learning history. As a one-off event, it will be limited. Kleiner and Roth (1996) argue that the learning history will begin to maximise its usefulness and effectiveness when it is linked into other organisational structures for reflection.

8. Learning involves change, and change may be difficult.

Any learning involves a certain degree of change. This principle simply states that learning and the change associated with learning can be difficult. The learning history tries to deal with this issue by gathering as many perspectives as possible on difficult issues.

9. Stories convey intangibles.

The beauty of a story is that it is able to communicate some of the intangibles that exist within the organisation. It provides the format and style to tell the story behind the event.

5.3 The Jointly-Told Tale: A note about the two-column format

Kleiner and Roth (1996) have borrowed this concept of presentation from an area of research found within the broader field of ethnographic research. Relying heavily on the work of Van Maanen's (1979, in Kleiner & Roth, 1996) understanding of ethnographic research, Kleiner and Roth picked up on a very experimental type of enthography called the Jointly Told Tale. "In these tales, the subject and the writer interweave the story - either through extensive use of quotes, often from the same person at various times in the story or through a give-and-take between quote and commentary or through a carefully edited narrative in which the writer is barely visible" (Kleiner & Roth, 1996, p.4-1).

Kleiner and Roth (1996) list two types of 'two-column' formats. The first one is called the 'two-column' format. Its name is very descriptive of what the documents appearance. The page is divided into two columns with a section

for "full-text" materials as an introduction to the plot or theme being worked on.

5.3.1 The Right-Hand Column

This section of the text presents the story from the perspective of the participants. The actual quotes of what people said are used in this column. Due to the nature of oral to text-based communication, some of the quotes are edited to make what the person was trying to say clearer.

5.3.2 The Left-Hand Column

This side of the page is dedicated to research-related comments and analysis of what is in the right-hand column. It attempts to present some questions and comments that enable to reader to make more sense of the story in the right-hand column.

5.3.3 The Full-Text Material

This full-width material is used to introduce the start of each segment and provides the necessary scaffolding for the reader to understand the context to such an extent that the story becomes, firstly, accessible and secondly, understandable. It is noted that care must be taken with this material to make sure that the reader understands and is adequately introduced to the story to come, but that evaluative comments on the story are not presented. The learning history format is presented in this manner so that readers are able to make up their own minds about the situation. In essence, the readers are required to make their own assessments about the situation. (Kleiner & Roth, 1996)

5.3.4 The Alternative to two columns: The Staggered Format

Kleiner and Roth (1996) offer another presentation style for use with learning history work. They have called this the staggered format.

The staggered format is somewhat similar to what is seen within current academic writing. The format is also, "more 'linear' - it guides the reader more, while still distinguishing between the various types of material" (Kleiner & Roth, 1996, p.4 -13). As opposed to having two columns, the material and the different perspectives are presented in a staggered approach. Left-aligned comments will be from the researcher and right-aligned comments from the participants. The full-width text is the same as in the two-column format.

5.4 The Distillation Process: The Heart of the Data Analysis

I believe that it would be useful to detail further the process that occurs at this stage. It is where the majority of the data analysis happens and therefore useful to make this process explicit for the reader.

The distillation process outlined by Kleiner and Roth (1996) is based on a "grounded theory" process. "Its rigour is designed to ensure that anyone can organize a mass of material into concepts and theory, *without losing the research validity that emerges from individual's biases"* (Kleiner & Roth, 1996, p.10-3).

The main concepts used for the data analysis are, open, axial, and selective coding. The process that I followed for coding is presented below.

5.4.1 First Research Pass: Coding Concepts

Firstly, the basis of the data is the transcribed interviews. The coding therefore starts with these. This process begins with working through each interview transcript and developing a list of concepts that emerge from the data. This process goes beyond simply identifying common areas of interest but attempts to look further into some of the assumptions and attributions made by the participants interviewed.

Kleiner and Roth (1996) provide a useful model for the phrasing of these concepts. They recommend that each concept consist of two parts. The first is a label that clearly identifies what you are talking about, and the second a

brief description of what that concept is about. It is also recommended when labelling to avoid too much inference but rather give descriptions that are true to the data. This concept labelling process operated at a paragraph level and tried to limit labels to one per paragraph.

5.4.2 Second Research Pass: Joining Concepts Together

Kleiner and Roth (1996) recommend that this stage is done among the learning historian team and individual concepts are presented to the group for discussion and final consensus. Although I can see that this would be a useful process to go through, I was the only one researching and so this was not possible.

The second part of the second research pass is a grouping exercise. From the list of concepts that emerged from the different interviews, I used an "affinity diagram" to group similar ideas or concepts together

From here, I went through a process of Axial analysis. Again, Kleiner and Roth (1996) borrow from grounded theory. This analysis is designed to " bring out the heretofore overlooked aspects of each of these groupings" (Kleiner & Roth, 1996, p.10-11). This happens through interrogating each of the proposed themes with a number of questions. These questions are:

i. What are the correlations of the concepts?
   (a) How many times is it mentioned in the text?
   (b) Is this concept typical?
ii. Why did it happen?
   This stage is underpinned by a technique called "The Five Whys" which Kleiner and Roth outline (1996, p.10-14). It is also used to begin some of the systemic analysis into causal relationships amount the concepts.
iii. What happened next? What did this influence or lead to?
iv. What is the appropriate level of aggregation?
v. What else could it mean?
vi. Where are the taboos?

Kleiner and Roth (1996) stress the importance of words or phrases like, "never", "always" and "everyone knows that". These are key words that flag potential areas that are not "allowed" to be discussed. In other words, they are what Argyris and Schon (1978) would call an "Open Secret" (Kleiner & Roth, 1996, Ch 10).

5.4.3 First Mythic Pass: Writing the Story

At this point we have a number of groupings of concepts which are the raw material for the development of themes. This stage is used for the creation of those themes.

This stage also includes the writing of the "nut-graf". Kleiner and Roth (1996) describe it as, "A single paragraph that describes the theme and tells the story, in a nutshell" (p.10-18).

5.4.4 A Final Pass

"Research

Are we still true to the data?

Does the theme, as described, in fact feel "grounded" in the data?

Mythic

Have we really gotten to the heart of the matter?

Do you feel that the story has a universal element?

Pragmatic

Have we presented this in a way that people will hear and learn from it?" (Kleiner & Roth, 1996, p.10-20).

5.4.5 Sorting

This involved distributing the quotes from each interview into the newly developed themes. I opened one interview at a time and worked through

each one, carefully using the coding developed earlier to identify which quotes fit into the different themes.

5.5 Adaptation of the Research Process

As I mentioned in the beginning chapter, this study is a pilot study and therefore does not encompass the full requirements that Kleiner and Roth (1996) state in terms of a learning history. To clarify this issue, I said earlier that I have taken a learning history approach. In essence, this means that the way I undertook the research is in line with what happens in learning history projects, but adaptations were necessary due to time and resource constraints.

Looking over the seven stages outlined by Kleiner and Roth, I can say that I completed all but two of them. The stages that were not completed, or not fully completed were "Validation" and "Dissemination".

In terms of validation, I was able to have the transcribed interviews checked with one person only. Again, time and resource issues complicated this process and so I could not validate the rest of the interviews with the people concerned.

With regard to dissemination, the very nature of this type of study does not allow for this type of dissemination to happen. I chose the university as a case study for this research, it was not the university who commissioned the research and as such the workshops associated with this stage were not feasible.

Although this is not an adaptation to what Kleiner and Roth (1996) outline for learning histories, it must be noted at this point that due to the limited data collected, roughly 120 pages of transcribed interviews plus other documents, I have decided to present the learning history in the staggered format. I do not believe that I have enough material, or a wide enough range of stakeholders,

to facilitate a meaningful story with the two-column format. As mentioned above, the staggered approach is more guided for the reader and will better suit the amount of data I have collected and the themes that I want to concentrate on within the next chapter.

Furthering this point, there will be stages throughout the next chapter where I will include analysis and commentary that is more suitable to this type of academic document compared to that of a learning history. Although this can be likened to the role of the left-hand column, I will be making more overt analysis of the data as opposed to simply presenting questions that challenge the reader to make his or her own conclusions. I will also, on occasion, include diagrams and systems maps as appropriate.

In addition to this, I will be making some recommendations as a result of this research. Due to the nature of this type of document, it would not be appropriate to simply leave the process open-ended. Therefore, I will attempt to draw out the areas of learning that I believe would be useful for the university to take note of as a result of this implementation. This could also take the form of recommendations for future research.

In making the adaptations or exclusions mentioned above explicit, I acknowledge that the learning history purists would dismiss this as not qualifying for such a title. At the same time, this document does present to the reader a certain perspective of what happened and what can be learnt out of the implementation of Banner. So I would like to make the claim that it is a type of learning history, albeit one that Kleiner and Roth (1996) would not put their label to.

5.6 Overview of Research

As outlined in the general process of a learning history above, the majority of my research has been reflective interviews. Interviews were carried out with 15 participants from a range of stakeholders. These included:

- Deans and Heads of Schools
- Members of the Banner implementation team
- Members of the Banner executive committee
- Members of the SIMS Action Group
- Faculty Officers
- Admission Officers
- Senior Academic staff in various departments
- Staff from the Information Systems department.
- The Project Manager

In addition to the interviews, I gained access to a large number of documents within the Banner Office. These included minutes of meetings, communication between the university and SCT, Banner newsletters, training schedules, various letters of complaint from users to the Banner Office, screen prints of a range of reports available on Banner, and general other documentation regarding the implementation process. The data that has emerged from this interview process and document analysis will be presented in the next chapter.

5.6 Conclusion

This chapter has presented an overview of the research process in a learning history and the adaptation of that process that I have implemented within this study. The chapter also included the generic principles that have come to be associated with learning histories.

CHAPTER SIX: THE BANNER IMPLEMENTATION - A LEARNING HISTORY

6.1 Introduction

On March 31 1993 the University of Natal purchased the Banner Student Information and Financial Aid Systems. The Banner system was implemented over the next eighteen months and went "live" for registration of students in 1995. The project was implemented on time and within budget. About 1997/1998, a decision was taken to stop any further upgrades of the Banner system, indicating a move away from Banner and towards another system. This process was completed with the current (2000) implementation of the Integrated Tertiary Software (ITS) system at the university.

What happened with the Banner project and why? Some have called it a huge success, while others have cried out in angst at the money wasted through this process. Whatever the case may be, this document is not concerned with placing blame, but rather with finding what can be learnt from the implementation.

Sidebar - The Learning History Format

All full width text in this document is commentary from the researcher and will be provided to keep the story flowing. This will also allow for some analysis appropriate to this type of document.

The text that is left-aligned comprises critical questions and commentary from the research, while the text that is right-aligned will be actual quotes from the participants.

6.2 Theme One - Why Banner?

In 1992, the University of Natal was operating with the Student Information Management System (SIMS). The SIMS system was a "homegrown" system

which was reaching the end of its life. The system was, as we will hear shortly, beginning to crumble and needed to be replaced. Most, if not all people were in agreement with this. The challenge for the university was to decide which system was most suitable. Let's look at how this process unfolded.

6.2.1 Some History

The following section will attempt to retell the sequence of events leading up to a decision.

Why was a new system needed?	Uh, the previous system was an in-house system. It had been developed over the years, if I remember rightly, it was largely based on COBOL. It was unable to be maintained, it was crumbling, and a new system was absolutely necessary, the problem was which system. Well, yes, in a post facto, I mean, I explored that. I think the university had a homegrown system prior to that, SIMS, Students Information Management System, I think. That had simply outgrown its usefulness, I mean it was, as were many home-grown systems, just taking too much effort to keep it going. And it was also a mainframe-based machine, the old IBM 360, I think it was, and they were going to scrap that. Um, they were looking for something a little more up to date, offered more functionality
Some people didn't think the change was so necessary.	I can tell you the sequence of events. What happened. Totally wrong sequence of events. What happened was, we were on a system

Is this valid in terms of the technology or a normal human response to change?	called SIMS. SIMS was designed by the university for the university. And it was working fine but it was very limited and as IT grew, we asked for something to be added to make it, you know, to give us facilities, to get more information out of it. So, the university decided to investigate. Um, it was being done in stages, so there was human resources, there was finance, and there would have been student academic affairs. At that time, I was the ... in Durban. The whole student systems came under my responsibility. So, the implementation process was ongoing at the time. The Integrated Tertiary Systems (ITS) program had gone through human resources, the other way round, finance and then human resources. And then, it was sort of our turn. We then said, hang on, is this the best system for the University of Natal? Universities are unique creatures, you know. It's not like a big multi-national something. Every faculty has its own rules and regulations and needs and reports. The idea is to see if the ITS system was appropriate and we did a lot of work, probably about six months. Just going into the system with experts. And you must keep in mind I'm not the expert, I'm just providing some leadership. We found that it was not the best system for the University of Natal because of the way the university was operating but also the system was inflexible. The system came, if I can say this to you, it came from an Afrikaans-speaking

What changes were needed to the Afrikaans-based system that proved so much bigger than the American system? How was this determined?	background, it was introduced in an Afrikaans-speaking institution. But to bring that system into a sort of liberal, English, white university, there wasn't a fit there. The terminology and the changes would have been enormous.

Thus the context begins to develop. Seemingly people having a greater understanding of the technological issues were in agreement that a new system was necessary, if not essential. A question to ponder would be whether this was communicated to all key users? Nel (1996) lists a number of human responses to change. The first two are "Old Contentment" and "Denial". The first is concerned with the fact that most people do not see the need for change and the second response is that people will deny the relevance of information regarding change. So, in response to the above question, a useful follow-on would be, How well were the human responses to change engaged within this process? Possibly an assumption operating at this point was that if you "communicate" the correct information, people will understand and accept it.

The stage is now set. All that remains is to see how the process unfolded. How did the university get to the point of choosing Banner as the most appropriate system for the University of Natal?

	... you could do two things: you could either change the system or change the way we do work. And changing the way we do work is extremely difficult in a university environment. Some of the changes we have achieved over the years, but it was extremely difficult, so the idea was, if we reject ITS, what is it that we need? So we undertook another sort of survey, went to the USA, looked at various systems, and at the end

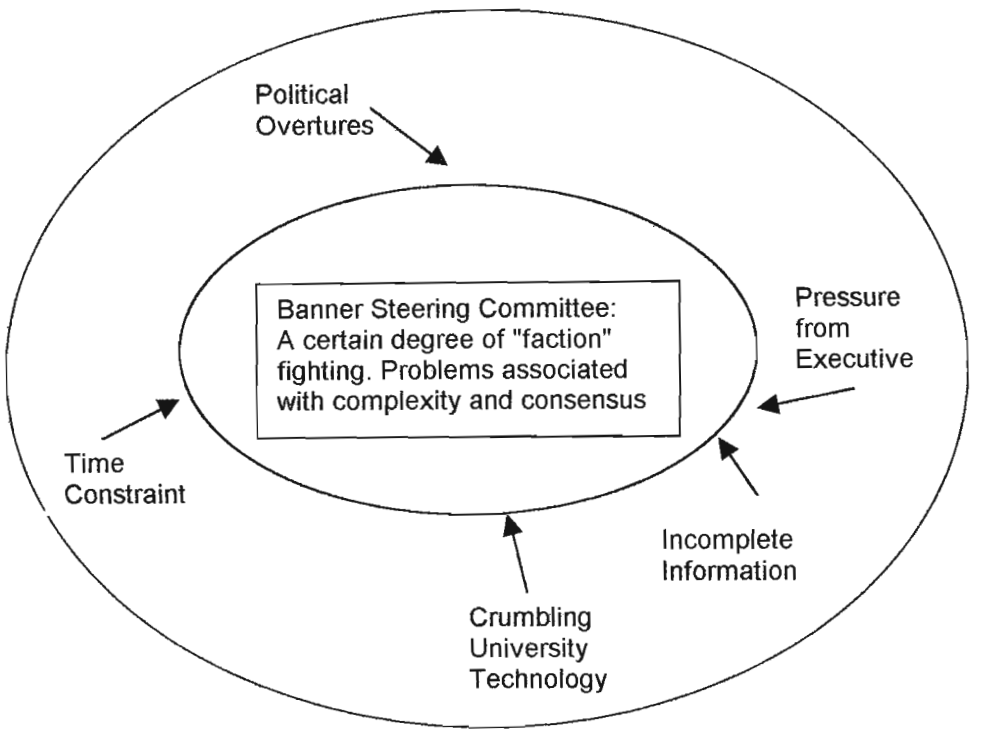
	of the day came up with a recommendation that we should take Banner. So, that's how we got to Banner. So it was a long, very extensive, very detailed process in arriving at that conclusion that we won't go on with ITS, but we will take Banner.
What were the requirements for this new system?	Uh, it had to be a student information system. It would have to be able to...let me put it another way. I don't think the university knew what it wanted at the time except a new system. Uh, part of what we had to do was to try and decide what the actual needs were and I think right early in the beginning, we made the decision that we did not have the capability to write another in-house system. Uh, that was a point that was argued, it was certainly argued, and we should write an in-house system, but, uh, we definitely were of the point of view that we'd have to go for a commercial system. And if we went for a commercial system, then the question is uh, we had our requirements, but we'd have to settle for a level of match to our requirements .... based on what was available.
Some confusion arises here. Was the University aware of the requirements for a new system? *What processes were put in place to find out user specifications?*	It was actually not the perfect process by any means. It was an historic process that developed as time went on. Early on, um, the chief role players at the time had been the

	student affairs section, computer services division (CSD), which is our information technology division (ITD), um, they were, had asked, well everybody agreed that a new system was needed, but to try and specify that system, with the resources available was really a very hard thing to do.
Attempts were made!	
Is there a correlation between a system working somewhere else and being able to work in this context?	A similar process was then doctored in order to see if Banner would meet our needs. And that was also extensive. And we actually went to universities in the States that were using that system. Different types of institutions, we had a whole lot of questions, and we actually wanted to see how the system works. And, subsequent to that, there was sort of a consultant from that end who came down here to demonstrate the system, to show people how it works etc. And did very practical, hands on stuff. We were able to say is this the system you want to go with and
This point was disputed	the answer was yes, that was the system
	No, they weren't (users consulted). They were included but the deal had already been signed and then we were canvassed. And we said we don't want it. We said, if you can just add to SIMS, we don't want Banner. But they'd already signed, but, of course, then when they decided they couldn't keep Banner anymore, they did a survey, but they still didn't ask us, they told us what we're getting.
	Not that I can remember, no. No, no, there

	wasn't. Only the training that they ... but as far as consultation, there was nothing. Well, when we enquired about that, they said to us that they had, they did some time ago, long before Banner was signed and sealed, they asked all the users questions from all the faculties. They asked them questions on what the system does and what they would like it to do etc. And based on that, I think they then looked at Banner and they decided on Banner.
Going back to the requirements issue.	I'd mentioned this, and it got to a certain person's knowledge that I was doing this. That person phoned me and said we're just going overseas to talk to the Banner people, have you got some questions that you could give me to ask them about the student records systems. And during my discussion with that person at that time, I found to my horror that the group of people who were deciding to buy Banner had never done a user requirement specification. And that they were actually going to buy the system without knowing what the users required. Um, I said to this person, cancel your trip now, don't waste the university's money, don't leave the country, don't go. Do the requirements first, then you know what to ask.
The decision making process is always done within the constraints of a wider system. The supra-system begins to exert	Uh, we had a fairly large Banner committee, steering committee, which, well, it became a Banner steering committee, but there was a committee that was in charge of the job and

some pressure. *Lack of users included* *The process was taking time. Not seen in a positive light. We have to do something - anything, but not nothing!*	deciding what system to go for. And that had wide representation, academic representation, it had human resources, it had student affairs, it had computer services, it had finance, and it had management information people on it and we simply fought out what we should go for on that committee. I can say that the situation was fairly desperate by the time I got there. No decision had been made and we more or less had a deadline in the sense of the computers that were running the old system were at the end of their life. They could have collapsed at any minute and we didn't have time to spend going out to the grass roots, go consulting people. But there was this representative team which made the decision to go for Banner. I must say it was made, it was pushed by me and one or two others from above, quite hard, to make, you know, the case that you have got to make a decision. You may be making the wrong decision or the right decision, but you can't procrastinate anymore so we've got to make this decision. This is the information that we've got, that we'd gathered over several years, there were volumes of it, but uh, it had to be made on the basis of some incomplete information, I think is always the case, in that sort of thing.

Figure 7: The Decision-Making Context



As the decision-making context becomes clearer, we are able to see some of the processes and pressures that were on the team to choose a system. Would it have been cheaper and more effective, in the long run, to complete a user requirements specification than to have made a decision without this information? One has to ask, just how did the university come to the point of deciding on Banner? What information formed the basis of that decision? Some thoughts of the participants follow.

Choice of systems is limited and plays a role in deciding.	And really, it was then a case of saying Number One, do we go for um, do we write the in-house system? And we workshopped that extensively. Then it was a case of identifying systems that were offered. That was actually a hard thing to do, 'cause there weren't very many. And we identified Banner, as the one outside the country,

How was this achieved? How would the university know what best suited their needs if the needs were not established?	ITS and other than that, a few in-house systems that had been written by other universities which we might have been able to modify to deal with ourselves. So, when you say, specifying a system, we didn't have many options. Uh, it was a case of seeing what was available and seeing what came closer to, closest to what would serve our purpose.
A member of the Banner Implementation Team (BIT). *People implementing the system divorced from decision making or "shifting the blame"?*	I don't know and I can't really answer that because I wasn't involved in the team who investigated Banner as opposed to ITS as opposed to a home-grown as opposed to at one stage we were thinking about using WITS (The University of the Witwatersrand) or RAU's (The Rand Afrikaans University) type systems. But I don't know what prompted them. They went over to America and they had a look at the system and they came back and said its good. So, I was actually in the stage after that.
A member of the team that went to the USA to investigate Banner.	Well, I don't know. I suppose, I don't know. I wouldn't say that they'd done a proper user needs analysis, and uh, I suppose that they could report, maintain their student records and charge their fees and do reasonable amount of reporting and that you know. That's probably, but I don't think I'm the best person to answer that question, because I wasn't sort of at the level where you know they made all those policy decisions and that. Um, you know I suppose
Characteristics of Model O-I learning systems. Protect self and others	

unilaterally.	they would have been quite happy if they'd served our needs as good as before and ...
The report written on the trip to America does substantiate the position in the last quote in as much as it was written after the decision to take Banner.	"As this report is being written after the decision to acquire Banner systems for the University of Natal, the sub-sections headed "Implications for the University of Natal" indicate matters which should be noted with regard to implementation of the systems" (Bertolotti, 1993, p.1).
The decision for Banner made before report on visit written. Was the visit to America for purposes beyond making the decision?	I have no idea. I just honestly, honestly believe it was a huge expensive mistake. That's my honest assessment. Um, I think they chose Banner because they didn't do the user requirements specification. If they'd gone through the proper systems development lifecycle that we use and teach in our discipline, if they'd done that, they would have realised that they were doing the wrong thing. But they seemed to, from what I understood, they did it, because other people used it, they thought, we could use it. I think it was some decision like that, but I can't answer that.
Is the assumption of "They're using we must be able to" operating within the decision-making process?	
With regards to (South African Post-Secondary Education) SAPSE statutory reporting to the government.	No, I don't think it was ever promised because, I mean, its obviously a unique system, there's no comparable system of reporting. I really have no idea of what went through the minds of those choosing it as far as SAPSE, I think they just

One of the dilemmas with buying a "off the shelf" model is that certain trade-offs will have to be taken. Was this an acceptable one?	traded ease of use and the greater functionality elsewhere. I think they traded off against the fact that they had to develop SAPSE reporting.

The decision to take Banner seems to be surrounded by a lack of foundational information on which to base such a decision. In repeated attempts to locate any user specifications requirements, I found nothing. This is not to say that they do not exist, I just couldn't find them. Some people, quoted above, are of the opinion that it was never done prior to the decision to take Banner.

If this is the case, was there an overall university strategy with regards to the Banner system specifically and the institutions technology more generally? Some insight is given below.

Evidence of a vision with regards to Banner. Resource allocation sited as a reason for failure. *Does this mean it will work in the same manner here? Did the university have the required infrastructure to begin with, to implement such a vision?* *Possible evidence of the*	A system which was never actually achieved because the university never put the resources into it. But we saw the ability to have, first of all, a system which was basically a form based system, to start off with, becoming something that was an automatic student information system and available to students. I mean, I looked at the system, working on campuses in the United States, where in fact, students simply went online and did their registrations themselves. They looked at the rules, they filled in the courses, they were controlled in terms of what they could do, but they filled in the forms. We never got to that stage. But one had a vision

supra-system's ability to accommodate "change" but resist any fundamental change in operating procedures. Mental models and theories in use could be coming into play with regard to the change process. What extent was the change process engaged with?	of moving towards this where there was a fairly automatic process of keeping records where one would not be controlled as one still is by bits of paper moving left, right and centre. And it was certainly not what happened in the end with the hybrid system, where to deal with the departments, they wrote intermediate interfaces to interface with them, I mean ...

From the results that are emerging from this pilot study, it is evident that the decision-making process with regards to choosing Banner was somewhat flawed. It has been established that there was some inconsistency with regards to the information used to decide on Banner. Some stated that the information was there, although I was not able to find it, while others advocated that the user specifications requirements was not done prior to purchase, or even implementation.

6.3 Conclusion

This chapter has provided some insight into the processes leading up to the decision to take Banner. It has been established to some extent that this process was flawed and a certain amount of inconsistency exists with regards to the information used to make this decision.

CHAPTER SEVEN: THEME TWO: WIDER BANNER SYSTEM

7.1 Introduction

I have chosen to call the next theme the "Wider Banner System" as it best describes the contents. This theme includes the technical implementation process and project management of that process. It also includes, and hence the name, the other systems that were set up under the "Wider Banner System". These include the Banner Office and reasons for the new ITS system, or stated differently, why Banner was replaced.

The decision has been taken, Banner is on its way. The only thing left to see is how did it all play out? How was this system that we just learnt about in the last theme actually get implemented at the University of Natal?

7.2 Project Management

A decision was taken by the Banner Executive Committee (BEC) to appoint an external project manager. There was a time limit of eighteen months for the implementation and a team, which was lead by the project manager, was developed called the Banner Implementation Team (BIT).

External Project Manager seen as the most appropriate model for this implementation.	Well, I think the implementation process went exceedingly well. It went to time, we delivered on the due date. It was done professionally in the sense that we said we have to have an external project manager, we appointed Q-Data after looking at a number of proposals. ... was the project manager appointed from a selection process that involved them offering us a number of different project managers and our interviewing them and deciding who would be

Issue of change recognised at early stages. *Assumption that people don't want to change taken as fact.* *"Tell people the facts, train them in new procedures and people will change" Is this valid? How much was the change process taken into account?*	the most appropriate. It was then carried through and as I say delivered on time and I think, of course with all these things, there were problems along the way. There is always a problem with, one of the major problems was bringing the staff on board. People don't want to change and they were going to have to make some changes here. Banner or any other system would not do things precisely the way we'd done them before. And people had to change some of their procedures, and they had to be convinced and this was done by a huge process of visiting them one by one and talking to them, picking up problems, having training courses, uh, trying to bring them on board.
Project Management hampered by lack of earlier processes.	Appalling. The project management process was hampered as a result of the incomplete Banner evaluation. In addition, it didn't adequately address the key areas of risk and change management. Nevertheless, we commended them for achieving project deadlines under very difficult circumstances. Alright. There was no formal user needs analysis and so there were all sorts of unmet expectations because it wasn't ever documented, individual people had different expectations ... we haven't documented that, so we're not sure whether the system's actually going to do that.
Evidence of people's	I think having external Project Manager worked

theories-in-use operating. It could be that these are untested assumptions operating as facts. In a sense, thoughts creating a reality.	very well. But the university is not an easy environment, major systems implementation is not easy anywhere - but within a university it is a particularly difficult environment. I mean, every one is an expert and nobody is going to give an inch. And I think from that point of view - I had no reason to doubt the competence of the Project Manager.
Clear indication of a limited learning system in operation. The internal politics, "should I speak to him" showing how people collude with the system to keep it going.	Definitely. And it was also a very good thing bringing him in as an outside person. Because then he didn't know about the internal politics so he didn't, he just, not rushed in, but um he didn't have to think, should I speak to him about that or ... he just did it.
What was the most important aspect of the project delivery?	Absolutely. 'Cause it was implemented if I'm not mistaken in the period of eighteen months which is what we had targeted. The project implementation was done in terms of what was outlined on the paper. We said this is what we want to achieve and that was done. So, in my view it was a very successful implementation of a project. We had an outside consultant who was an expert at this whole process who went through the stages and actually had workshops in terms of project implementation. He was a very good PR (Public Relations) person and made excellent contact with the academic community with admin people, within users and the community in general. So that was, you know, I think, one of the most successful project implementations in the University of Natal. And
Time and Budget all important.	
Communication was very important.	

Did Banner need to be done "better" or "look better" than other projects?	that's a result of some discussions that we had, looking at some of the other projects in the system - long delays, for different reasons.
What consideration was given to issues emerging within implementation? Things that didn't appear in the work breakdown structure.	No, he was very good, and he kept a tight reign on the project, made sure that if a thing had to be done according to our plan, it was done.
How were the project boundaries defined? Who was responsible for the MIBS project? How was it meant to relate to Banner as a system? Did the BIT take this into consideration?	Well, they got it in on time and they were very happy with it. You know, I wasn't so happy with the way some of the things were done. It was a package and they didn't want to change that much, they would often make you use fields for two things, you know, instead of having a separate field for each set of data, you'd have to combine the two and use the same field. And also I didn't feel that we were being asked what we wanted or you know, from the management information side, so I felt that our requests were not being taken into account. And they were very happy for us do our own thing and do our Management Information on Banner System (MIBS) project. But they got it in on time and they, you know, that seemed to do.
Again, the question of boundaries is highlighted.	There was a tendency to decide who they were going to listen to and what they weren't going to listen to and you know bulldoze something through and just get it in on time and that's it you know. Ja, But that's my personal impression you

	know, nobody else might agree with that.

The project management of the implementation of the Banner system seems to have drawn different responses from different people. From my perspective, I think the project was extremely focused and the main points of focus were time and budget. This has both advantages and disadvantages. Some of these were brought out in the above commentary.

The one area that does seem to be lacking with regard to the project management was the area of change management. From what I have gathered, the major techniques used to cope with change were communication and training. It is not clear that a "sense of urgency" (Kotter, 1996) or a "burning platform" (Nel, 1996) was ever created. Therefore the need for change was never felt. Without this sense of urgency, the normal human responses to change begin to take effect and the change process becomes even more difficult. The change leader is responsible for this. From the documentation, it is evident that the crumbling technology was a suitable "burning platform". It was apparent to those that had access to the information that the technology could collapse "at any moment".

7.3 Banner Office

The Banner Office was established originally as a location on campus where the BIT could be housed. It subsequently became the home of the support staff once the Banner Implementation was completed. It is an interesting part of the Banner system and worth investigating at this point.

What does this say about the structure for the Banner system? What can	It worked too well, because then Banner Office became a crutch to the users, and instead of them trying to find out how to do it themselves, they picked up the phone. Or came down to see

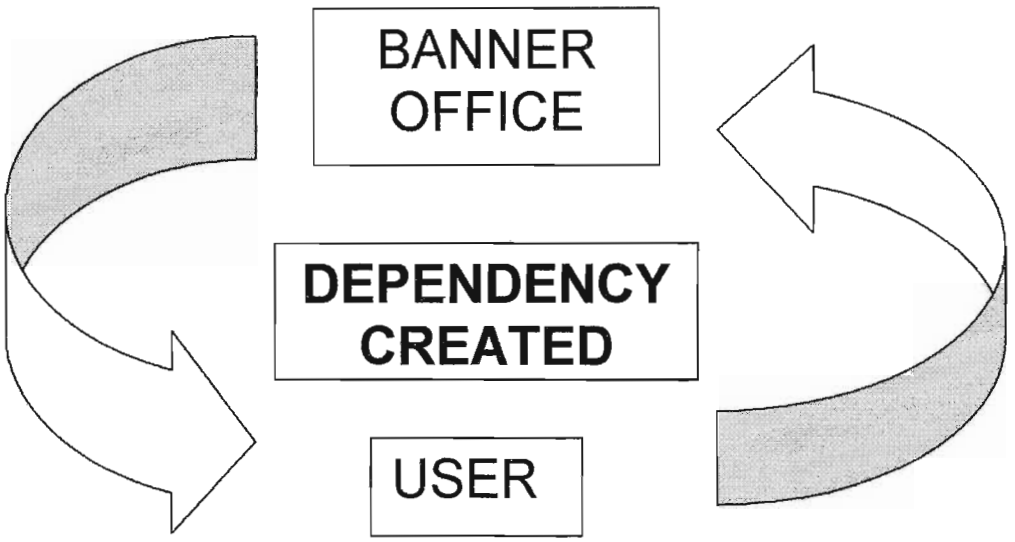
we learn from this?	us ... And we were naughty, we spoiled them, you know, we didn't say look go and try on with this machine or do it yourself, sort of thing, we said okay fine let's show you how to do it. Then the next week they couldn't remember so I'd go up and show them again and eventually I said sorry, I might as well do it for you. That was not the normal run of the mill stuff but the more difficult things.
How did the Banner Office work?	Yeah, no they could because there were reports, local written reports in Banner, which if the dean wanted to know how many students were registered for his courses, they could've done. And then reports that weren't written, if the faculties or the admin staff couldn't run them, they used to send a request to me and I had to write a quick Sequel or we had one which gave them what they wanted.
Issues of Power and Information Gate Keeping could be involved.	
The system that was created for report writing viewed as not efficient. This seemed to birth another system for accessing information, which is then attributed to the users demand for immediate reports.	Because ... and I used to write the quick and dirty reports, because it was too much time to wait, put it in the queue for ITD (Information Technology Division) to write it and put it on the menu. So we just did it one off quickly. Because typical users, they'd come in and say I want this report yesterday and they couldn't wait for it to go through the normal processes.
	Yes, (there were some reports that could have been done on the local level that were pushed to the Banner Office) What we should have done, I

	mean ... and I, we wrote the reports, we should have then maybe sent them up to ITD and asked them to tidy it up a bit and put it on the menu. But instead we didn't, we forgot, or we had other things to do. And users, we didn't mind, they just came and phone and fill in a request sheet and we would run it for them
It's not just technology. "Human" systems interact. Banner, at UND, goes well beyond the computer system. Any inefficiencies, which may have related to the "non-technical" elements of the system, can very easily be blamed on the technical system.	
	It was used as a basic management information tool in terms of providing the standard reports for exams and, things like that, but it was never developed as it should have been. It simply didn't operate that way because if you wanted to get any information out of it, the Banner Office didn't have the capacity to write the reports to get it out. Or there was such a delay that by the time you got it, the information wasn't any use to you.
Raises the issue of resource allocation and capacity.	They'd put you on the waiting list, phone them up in six weeks time, sorry we haven't had time to touch that yet... Then people start losing it because they can't get the information they need.
University didn't staff Banner Office as recommended. Isn't there a deeper issue here?	I would expect a dean or anyone like that would have gone to the Banner office and asked for that, and that's where the problems came because at that stage they were simply not staffed as we'd recommended that they should

What about looking at the system created for Banner? Is this the most efficient system? Technology, in a sense, will always be limited to the context that it operates in.	be staffed. And they didn't have the capacity... So they would usually have to say, you'll go on a waiting list, it might be, you might get it in a year's time. Or you made use of the standard reports that we've got.
What does this say about the university's use of technology?	It's a hell of a pain for the faculty people and still, they still couldn't give me the information about sups. That wasn't in the system, okay. Um, but it just meant an extra link in the chain. The whole concept of technology is that you - you do it in your office where you need it, you don't have to go and ask somebody else to do it for you. It just wasn't using the technology as technology can be used. The whole concept of that, workstations, PC's, databases, is that you can do it, okay, you put in your passwords, you put in your protection, and you can do it, it's your data, , it's your students, it's your exam, it's your marks, why do you have to give your marks to the faculty office for them to put in?
The Banner Office and Faculty Officers were key players in this system. One could say they were the crucial links. Issues of power and ownership emerge.	Just by having that structure, they made themselves powerful, because we couldn't get

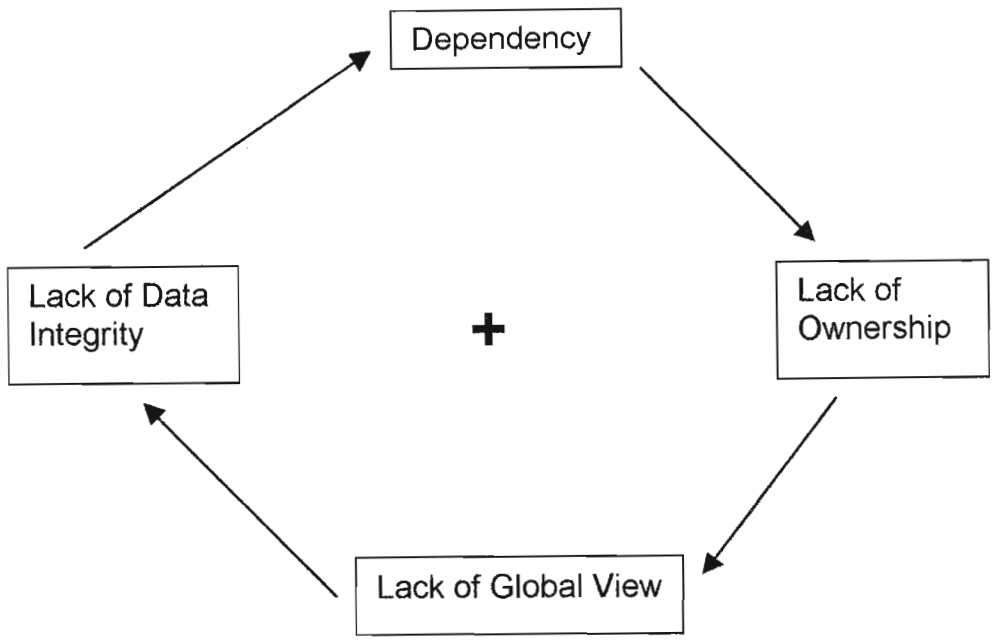
	any information without going through them.
Not just power and ownership but dependency as well.	You know, it was implemented so far, the training didn't go far enough, so we didn't create power users or expert partners whatever you want to call them ... a cohort of people who really knew what was going on. Uh, in the end, a lot of that depended upon two people ... dependence built up between some of the key users, say faculty officers, um, and the small staff in the Banner office.
Dependency created by system, having a negative influence on data and system ownership, which in turn had a negative influence on data integrity.	Ownership invested in a small team, the bottom line is that too few people knew what was really going on. And faculties, the users and owners of the data never took ownership. So you know another flaw was, as we discover now, was integrity and quality of the data. There's not a great deal of emphasis on auditing or taking responsibility for quality of data. Um, and so there was an ongoing tension between the role of information technology division, the Banner Office, and what the user should be doing for themselves.

Figure 8: Diagram of the Dependency Model that Emerged



Both the users and the Banner Office had to collude to keep the system operating. But this also kept the key users and the Banner office very powerful.	Yes, and often by choice, you know they if they got on with the Banner office, that was fine, because they didn't have to bother to learn about it. Ja, so the Banner Office model was not a good one, because the system, nobody really had an overview of the whole system either. Far too few people. They also had no idea what was in those reports, they just took them at face value. And asked ... they'd articulated as best they could a need, and somebody had written something that generated a neat-looking report. They had no idea whether it was actually generating what they were looking for. And they had no idea of how that was updated etc. So that was a serious problem.

Figure 9: Causal Loop Diagram of Dependency System



From what is emerging from the pilot study, the Banner Office Model was problematic. The system that was created through the setting up of the Banner Office had some emergent properties that were unexpected and inefficient, such as dependency and lack of data integrity. This is seen in the causal loop diagram above.

In addition to this, I would argue that the naming of the support office as the "Banner Office" created some unexpected outcomes. This is with particular reference to change. I would argue that the people who were working in the Banner Office would have become very personally affiliated to the Banner system. The naming of the office created a whole sense of identity for those people with Banner.

When critical reflection was needed to see if the Banner system was providing the university with what they desired from a student information system, it would have been natural for the people in this office to become defensive and resist any changes necessary. Obviously, when you work on a project and invest time and effort into its implementation, you do become attached to it in some manner.

On the other hand, I would argue that if the Banner Office was called the student information office, then the focus would have been on providing the best information system, and not having to defend a certain product.

Furthering this point, I believe it would be difficult for the people in the Banner Office to take ownership of the new system when so much of their identity is wrapped up in a particular product. From what I understand the office is still called the Banner Office. I find this quite an amazing statement of allegiance and a very practical display of a human response to change. Is there going to be a separate ITS office to support the new system or will it be supported by the Banner Office?

As a final comment on this issue, I believe that this strong allegiance to Banner would have had a strong influence on perceptions of the capability of the new system. Perceptions that could have far reaching implications in the future.

Although the Banner Office attempted to satisfy the needs and demands of the users and was initially set up to support and expand the Banner system, it seemed to be under-resourced and had the capacity only to maintain the system. It should be noted at this stage that the number of reports that could be generated from Banner did increase and, towards the end of Banner's life at UND, there were a large number of reports available. This does show some expansion on the side of the Banner system. The lack of expansion that I am talking about here has to do more with the initial university vision for Banner and the lack of resources supplied to Banner once the technical implementation was completed.

Other areas included in the Wider Banner System were the Departmental System and the other non-Banner systems operating within the university that Banner had to interface with. I am mentioning them here simply to illustrate how large the Banner system in total really was. My research did not focus on these areas and the participants gave very little comment about them. The major issues mentioned with regard to these other systems included

frustration in not having direct access to Banner, especially in terms of interrogating data within the database and secondly the problems associated with the interface system between Banner and the financial systems.

7.4 Reasons for a New System

I have chosen to include this section here as some of the implications emerging above have influenced the decision to replace Banner. The replacement of Banner is obviously the final stage chronologically speaking, but this information does seem most appropriate presented here.

System not meeting expectations. *Cost is an issue. Dollar-Rand Exchange Rate.* *Blaming the Supra-System of University culture. Blaming the monolithic structure helps protect oneself and others. "It's not really anyone's fault - it's the system! "* *Human responses to change appearing again. Possibly used to vindicate decision for Banner.* *Training blamed.*	It's linked to some of the things I've already mentioned in terms of unhappiness because you're not getting some things out of it. That's one, but there are other sort of outside factors. One of them could possibly be the rand-dollar exchange rate. Because we needed to pay whatever amounts on a yearly basis to SCT as a company and if something major went wrong, then we'd have to get people from the USA. Uh, I think also the culture of the university didn't allow a new system to grow, but the irony of it is that when they were deciding to switch, there were a lot of people saying, hang on, we like Banner, Banner's excellent, the users were saying, those people who sat in front of the screens were very excited about the information they could get, the fact that it was web-based ... It was a highly sophisticated first-world system and maybe that was a problem, you know, sitting in our context where there wasn't sufficient education in terms of its potential and how to use it. So, in my view, uh, you know, one needs to be

Discredit the new system *Banner still the best! - Human responses to change.* *The power of technology - makes you look on the cutting edge. Whether it satisfies your requirements is another question. How important is that question for UND?*	careful how you quote this. In my view, the university went backwards, in taking an ITS system which doesn't compare with what's happening in the outside world. And if we continued with the Banner system, I believe that we would have really rated first in the country. We're the only university in Africa who have the Banner system.
A number of people involved in the process for Banner seem to not be involved in ITS. Did this compromise the potential for learning from the Banner implementation? *Lack of upgrades implicated.* *Cost again.* *The Y2K (Year 2000) issue and Banner. A hotly contested issue.*	Look, I was not involved in that in the least. My own outside opinion was first of all, I think there may have been a number of aspects, um, the university failed to maintain the Banner system properly, in other words, when they had an upgrade, they said to themselves, well, we don't need the upgrade, the current system works, so therefore they lost the maintenance. Therefore it then got to the stage where it, um, needed something more and then we got to the stage where we couldn't upgrade anymore but you would have to buy the system again. Again the rand against the dollar had a big influence in the cost of the thing and I think costs were a major problem. That they had escalated considerably to what they had been at the beginning because of the exchange rate. One of the outcries I heard being mentioned last year which I don't think was

	true was that the version of our Banner, of Banner that we had, was non-Y2K compliant and we couldn't afford to buy the new version 'cause we hadn't upgraded the version before. Now whether that's entirely the truth or not, I don't know. But I think at that stage, they went for a cheaper system.
Is ITS going to be cheaper? What information substantiates this?	
Someone involved in the Banner Y2K discussions at the university. Definitely not Y2K and gives a cost for upgrade.	Ja, I've been involved in discussions on that. One of the critical factors is that Banner is not Y2K compatible and the upgrade was going to cost I think 12 million. Or something like that, a very high price.
The other side of the coin of the Y2K issue. It worked through Y2K and beyond.	That's a load of Crap! 'Cause I proved on my own and that's why we were still using Banner till we went live on ITS. Banner is 100% Y2K compliant. And I got it ready and got it up and its working.
Where did the misinformation come from?	
Reasons given for replacement.	Ya, Banner Y2K. Ya, well, that was not the move away from Banner. It was a top down thing, I mean the executive had decided for a whole host of reasons that Banner was to go. It was tied in with the whole restructuring of the university, costs, perception of Banner, you know, there was a lot of extravagance involved in the whole thing. But Y2K did become an issue because the IBM consultants who looked at all
IBM produces the report and the 14 million rand cost.	

	our systems produced an alarming report that we'd need to spend about 14 million rand to get the Banner system Y2K compliant. Um, as you probably know, what finally happened is that we
University pays for IBM report, which produces some alarming results, which is then ignored. What does this say about learning systems operating within the university?	actually ignored that report altogether and ran with Banner for 9/10 months. I mean we did tests, but not as exhaustive as we should have. So it actually was, to all the tests ... compliant. But uh, there was no guarantees and the vendors wouldn't provide any guarantees, ya, that added urgency to the whole change over.
Politics is sighted as the reason.	Ah, purely political. One of the reasons that they wanted to replace Banner is that Banner is an American system, right, and they wanted to replace it with a local one, which would then
Cost is disputed.	supposedly have been cheaper. But its not, the amount of money that we've spent on this system was grossly underestimated. That's why you've got to be careful what ... Okay, so its not cheaper, it's a - the new system is ten steps
Banner too sophisticated. In essence, blames "Normal African University User" for failure. Assumptions about users creating reality.	backwards from Banner. Banner, alright, I will admit, Banner was too sophisticated for the normal African university user - that was probably its main downfall. And ITS is much simpler, much easier.
Upgrades included within maintenance contract.	No, because we didn't pay for upgrades, that was all part of the normal maintenance contract if you like and we got, there you are, you can see those are all the upgrades I've got which we haven't put in and I'm not going to try and put in

Possible evidence of a non-confrontational learning system or this person's human response to change. Maybe both.	now. But um, I think, yeah, politically there was a bit of misconception spread in the higher circles about the cost of Banner. And because people didn't want to challenge or they didn't know how to challenge, it was believed. But I can't say anymore than that ...
The mysterious "they" begin to appear.	As far as I was concerned it was money. It was an overseas product and the upgrading was expensive. No, first of all, they said it was not Y2K compatible, that was the very first thing they said and that was why they started looking for an alternate system. And they didn't want to carry on upgrading Banner to make it Y2K because of the dollar rand exchange rate. They then found that it was Y2K compatible, you could actually keep on running it and we have the GUI (Graphic User Interface) version but it hasn't been installed. Everything was there for the next level up. But by then, someone had already signed and committed ourselves to ITS.
Untested assumptions and inferences made and accepted as fact. Evidence of a Model O - I learning system.	I don't know who the "they" are. I have a feeling it was someone in ITD. But they misinformed the whole university.
Issues of integration also raised.	Banner is not compatible with our other two systems. The Financial Accounting System (FAS) and Personnel Accounting System (PAS) and ITS in fact are all compatible and Banner

How was this question dealt with prior to purchase? Was it not an issue then?	was the odd one out. So the information for student registrations had to be transferred into the financial system. And we also were falling behind and to catch up in terms of technology was going to be, um, a serious problem. But I think the overarching issue was that we had to move towards an integration of our system. Um, and as there was no intention on the part of our finance division and our HR (Human Resources) to move away from ITS, we had to move away from Banner.
Why are these two departments so powerful? Does the university computing system operate around these departments? Or does this just provide a useful reason to go ITS?	Sorry, the key thing there is the local software. We are a semesterised university but the university was reluctant to change many of its processes to fit in with Banner. Perhaps that's the way it should be but the fact is that a lot of processes which could have be changed or simplified weren't. And part of the major problem with upgrades was not just getting the upgrade from Banner, but you had to upgrade all the local software. So a substantial portion of the money that IBM was talking about was the millions of lines of code that have been added on to Banner. So in some cases, you know, the Banner system was actually largely local software
Is the system telling us what to do? The issue of balancing a generic information system with operating procedures. What kind of a compromise should be made? *The full extent and boundary of the "Banner System" begins to be realised.*	

Another angle emerges. *A post-implementation user specifications exercise is used to determine to move away from Banner.*	Ya, they did it the wrong way around. And then we said use that information to see whether its worth updating Banner, 'cause there was a huge update that was coming that would have cost a lot of money and we said, get the user requirements right and then determine whether it's better to update Banner or whether it's better to get another product. And they used that activity to determine, to actually move to, stop using Banner and to get another product.

The reasons for moving to another system are many, well, I should say, many reasons were given as to why. Nothing really conclusive emerges from this research as to why. Two of the more plausible reasons would be cost and the systems requirements that determined whether upgrading should continue. The issue of integration also plays a role.

When we look at systems within systems, it is understandable, with regards to the cost issue, that this was difficult to foretell. The university operates within the South African system, which operates within the global system. At the time of purchase, the rand-dollar exchange rate was possibly a concern but certainly not of the scale that emerged as the meta-systems, South Africa and the Global economy, began to interact in post 1994 South Africa.

Other issues such as integration and user requirements certainly lend themselves to discovery and discussion prior to implementation. From the results of this research, it seems that a pre-implementation user needs analysis was not conducted. With regard to integration, the issue was certainly in the spotlight at the time of the decision for Banner. The question remains as to how this issue was engaged with and what long-term implications of the Banner purchase were thought through. What future scenarios did the university establish that led them to the point of deciding that integration would not be a problem?

7.5 Conclusion

This chapter has presented a view of the complexity and size of what I have called the Wider Banner System. It has shown some of the difficulties that emerge with regards to a system implementation of this nature. It also shows the intricate link between 'hard' technical systems and 'soft' people systems. The chapter concluded with a discussion around the replacement of Banner. The research from this pilot study shows that there were many potential reasons for deciding to purchase Banner, but could not conclusively establish what reasons were used in making that decision.

CHAPTER EIGHT: THEME THREE - TRAINING

8.1 Introduction

This next chapter introduces the readers to some of the events that surrounded the training of key users for the Banner system.

8.2 Training

The decision has been taken, the implementation completed, the next crucial stage in the process is the training of users.

Shifting the blame. Seems to be a need to justify not being able to use the system fully. *Also highlights some of the difficulties associated with training. What is the most appropriate training model for a system like this?*	It was a general training, but with a system that you don't, that's not your sole function, to work on a system, you don't go into the background of it, you, as you come to do something, you do it and if you get stuck, you pick up the phone, phone somebody else and say I've got here and now where do I go and then they'll tell you what you do. So we had the basic training, so we knew how to put on an application and how to register a student and how to change courses and how to, um, some reports we got out ourselves and others we requested.
Some indication of power and information. Potential for trainers to control how system was used.	I don't think there was time to train us at the beginning. Um, the people who set up the system knew how to do it, so they trained us as and when we needed to, I mean we could have asked for more training, but it's a matter of time. You just don't have the time, and when you do learn, I mean, we've learnt everything for ITS,

Indicates the fear often associated with computers and new programs. Also the issue of saving face. If you are the person being trained and the one who is "supposed" to be able to use it, then the program can become quite a threatening thing.	but I tell you, I don't know how to do everything for ITS. We've gone through the whole system ... But I find with computer things, as you use them, they begin to make more sense and then you learn to query, oh yes, I can do that there, then I should be able to do that there, you know. It's not something that you just know and even when you're trained, and Banner we were trained, I, unless other people maybe have a better memory than I have, but, unless I actually work on it, I don't remember how to do things.
Was the 'need to know basis' model the most appropriate? Does a user understand the full capabilities this way?	It was a step by step process really, as you needed it. And, you know, I found that was better, instead of someone barraging you with a whole lot of information, you know, that I couldn't take in all at one time. So for me, it was, as I needed to know. The first thing that I was taught was how to register a student and from there it progressed to other things. It was like on a need to know basis that I was taught. And it worked well for me.
Indication that training was 'event-driven'. This event is coming up, do a refresher course.	They were very useful because, you know, um, there are certain periods that you use a certain function. And when it comes around, you know, you forget about it, so with these refresher courses, so to speak, I think they were invaluable actually. We work on things on a need to know basis. As we want to do something and it didn't happen,

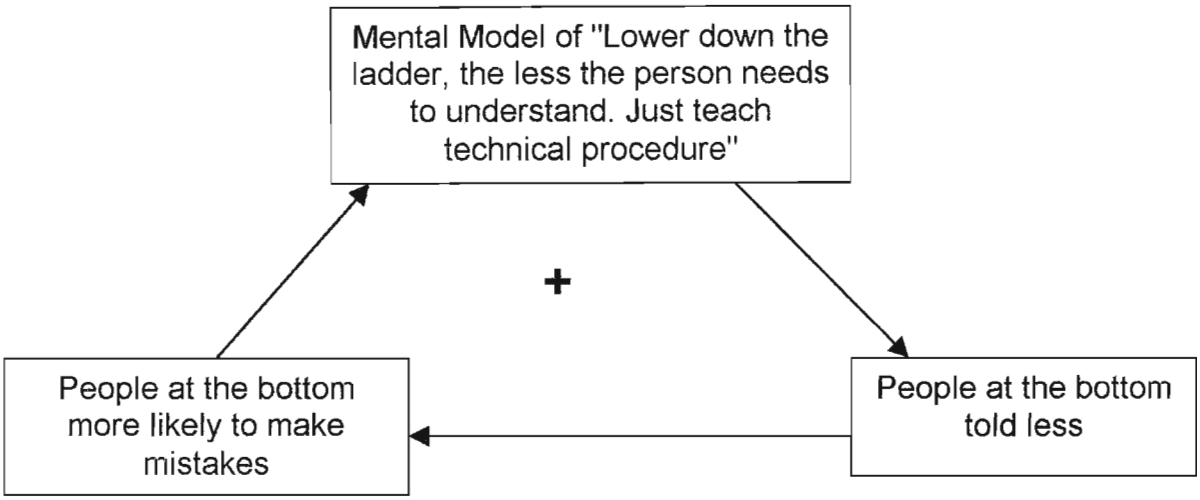
Potential problems resulting from the event-driven training model. *The training system implemented had an emergent property called "dependency ".* *Training not creating a set of "power users". Why?* *No history in training people in how to use systems outside of technical departments. Could this have influenced the training model implemented? Were the trainers for Banner technical people or*	then we phone and say it can't do it and he says it can you've got to do it this way. So I couldn't tell you an overall. As far as I understand, we only had certain sections of Banner. That we didn't have the whole database. Um, so we, I'm not quite sure how to put this, if we needed information, we used to phone the project office and they would provide us with the information. They could tell us whether it was available or not. So that's why I couldn't tell you what it could do and what it couldn't do. I can only tell you what I could get it to do and what I couldn't get it to do. You know, it was implemented so far, the training didn't go far enough, so we didn't create power users or expert partners whatever you want to call them, cohort of people who really knew what was going on. Uh, in the end, a lot of dependence built up between some of the key users, say faculty officers, um, and the small staff in the Banner office. Also the fact that we don't have a long history of training and empowering people outside of ITD or CSD (Computer Services Division) - that was where the locus was - so, yeah, the Banner Office, then you had the IT people and then the users. And very little Structured Query Language (SQL) training given, only one or two people received that training. So there was no depth of training, obviously things have moved along now

professional trainers? Has a definite influence on how training is done.	
The lack of on-going support quoted as a reason. Also highlights problems associated with people leaving the system. How do you create a system that trains and equips people but also retains skills and expertise when people depart? Possibly linked to the issue of depth of training.	There was not enough support and not enough continuity. There was nothing laid on for training new staff, for example, they had to be trained by people who were using the system already. If somebody dropped dead or went off sick or something like that, people are not trained properly and that should have been part of the Banner Office as the program continued on...
Repetition the major training strategy. What implications does this have for "learning"? *Also indicates some fairly strongly held assumptions by training people*	Originally some of our users, they'd not seen a computer before. Right, we're talking five, six seven years ago, don't forget. They'd not seen a computer before, they didn't know how to switch on and then we had to introduce them to this quite sophisticated Oracle-based system, with a keyboard, right it was going to be bad again trying to train them to use a mouse. But, what we did was by repetition. One week I'd give a training course. Next week, same people, same course. The next week, I would then go and give them a course in their office. Because I believed after a couple of weeks in the training room, you know, they either fell asleep or they didn't understand. So I found it easier to go to their office and sit with them like this 'cause then it

regarding users.	was familiar surroundings they didn't feel threatened and I could say come on what's your problem, sort of thing.
Serious implications for learning how the Banner system works!	That worked. Eventually it was just purely by repetition. Do this do this do this. Some of them I didn't even explain why they had to do it, its just one, two, three, four, one, two, three, four. And it got through.
Shows an assumption about users. "Users mess up the system". How much did the training system have an influence on users "messing up"?	Yes and no because then obviously its not an ideal way, because ideally you should show them how it links in when they do something on the student side that they mess up the Student Fees and the Financial Aid. But my logic was that mainly they don't care or they don't think, they just want to say register a student. They're not really even thinking how its going to affect his fees or if they've got the wrong student type he's not going to get a government loan or something like that. So rather just concentrate on what they're interested in. In the next level up I took those steps further and said, look, if this is done in that and that way, then you could have problems. So the lower level I kept very low and then the next level of input staff, if you like, I explained a bit more and then like the faculty managers and the faculty officers I explained a wee bit more still. So I was just hoping that somehow we'd catch all the problems. And when we did get problems, with Fees or Financial Aid, I then went and explained it also at the top level first, saying, right, remember what I
One person having a huge influence on the way the system worked within an entire institution.	
System designed to create dependency. According to Argyris and Schon (1978) this is done "intentionally	

and automatically" but with little critical reflection. *Access to information and understanding of that information is hierarchically based. The lower you are, the less you are told, the less you understand, the more likely it is you will make mistakes resulting in the reinforcement of mental models that the lower you are the less you understand.*	said about this, well this, this and this has happened and this is how you can stop it. And then the next level down. And if the problem was really the lady at the bottom doing step two before she did step four. So maybe swapping the steps round then I said alright there's been a problem because of this, do not one, four, two, three. Do it that way. Yeah, they are not at that intelligence level. And it's not in their job description either. Because there's no ways I'm going to let users write Sequel reports. 'Cause they could've dropped tables, its bad enough them just inputting messing up the data, without doing the reports to mess it up or using Sequel language, 'cause that was the language we used.

Figure 10: Causal Loop Diagram of Training System

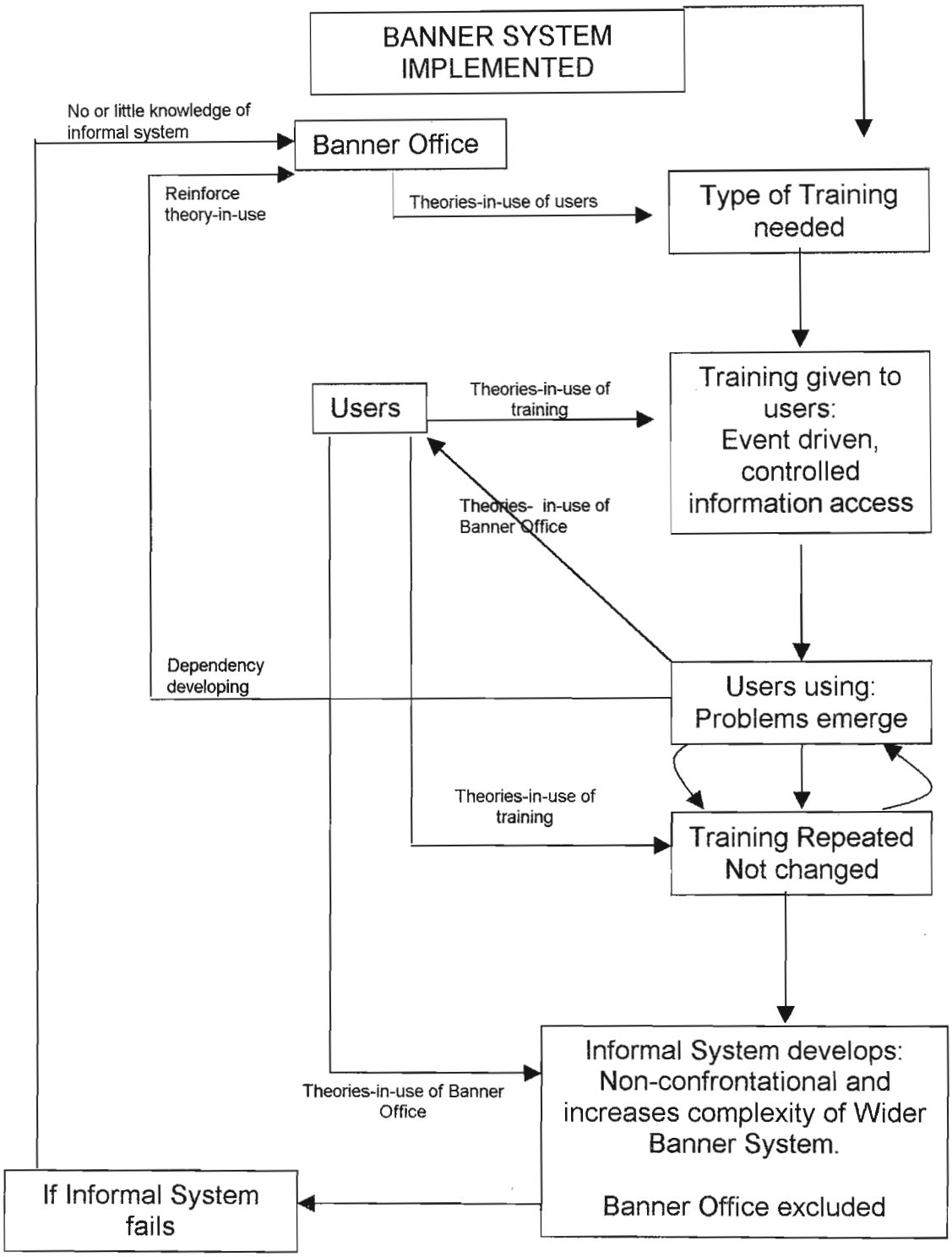


What was the reaction to this system? *The users begin to develop a strong informal network of training and assistance.* *Reluctance to call on the Banner Office.* *Operating in different paradigms. Users and technical support staff. Creating very real communication blocks.*	Absolutely. It was very wide (INFORMAL NETWORK). You would phone your colleague more often then you would phone the Banner Office. Even with running the reports. And if they all say no, then I would go to the Banner Office. That's how it went. Well we're more like familiar with them. And its easier to ask your colleague because sometimes you would find that they (Banner Office) would say that we are busy and just go to your manual and "we had a lesson on that, where were you?" So you would rather just go to someone and just ask you know how do you do this. So sometimes you felt like you were being told off if you went to Banner Office, so its easier to go to a fellow worker.

Non-confrontational learning system. *Perceptions of people affecting the way technology was used within UND. Soft issues, mental models etc, having a great impact on Banner as a system.*	It was so difficult. We're not going to mention names. But later on when it was that guy in 'Maritzburg, he was so sweet. Ja, he was on the ball with everything and it was a pleasure then but I don't know if the person was overworked or what but you avoided going to ... would bite your head off.
The whole informal system begins to develop to deal with confrontational issues that people had with each other. The complexity of these systems is quite dramatic. *Is this how technology is meant to streamline working procedures?* *How much are these crucial elements left out of planning for and implementing a system like this?*	Oh we moaned and groaned ... There was no higher being that we could speak to. The faculty officer and she could take it to the dean and he could then .... But um it was something we had to work around that 's why we'd avoid going to ... and we would rather go to one of our colleagues if they could help. Or someone else.

Who were the users? *Resource allocation problems.* *The last statement shifts the blame and protects self and others.* *Banner Office as a gatekeeper of information. Very powerful structure.* *Should this not be done prior to systems implementation?* *Mental models about users creating the future.*	The administrative faculty administration used it a lot. I think the deans and head of school could have but we didn't have time to show them what they could've done with it. But that's the same with any system. No, you see, because it wasn't actually their job to use it. They (Deans) basically wanted it to get the information out of the system. So then some of them asked the faculty officers, in which case I then went and gave them the reports or showed them the reports. Or some didn't think, you know that's the other thing, you've got to know, I think with ITS we're going to have to do the same. We'll get the data input people educated. Then we going to have to go to the next level up to the deans, heads of school and say alright what do you want out of the system. They will probably say I don't know and then we will probably have to say well you can get this, this and this, do you want it? And then maybe a couple of months later, because they're busy people, they will say can I have this or maybe that.

Figure 11: Learning System Operating at UND with Regards to Banner Training



The learning system mapped above provides some insight into the problems experienced with Banner. The research shows that the training model implemented was problematic. An event-driven, repetition-based model seems to have resulted in people having a limited understanding of the full potential and capability of Banner as a system.

Users were not given a global understanding of Banner. In addition to this, users were not told of the implications of what their actions in a certain part of the system would do in other parts of the system. This relates to the issue discussed in the previous chapter with regards to data integrity.

There seems to have been two major emergent properties from the system that was operating. The first being the dependency on the Banner Office and the second being the informal network. Both added to the complexity of the Banner system.

Both the users and the Banner Office maintained the system of dependency on the Banner Office, which seemed to be a result of the training offered. The users colluded in being "happy" with having a crutch and the Banner Office colluded in supplying that crutch. Not only was the Banner Office supplying the crutch for the users, it created for itself an extremely powerful position within the university. This office had a very strong influence on what information was accessible to the university community. One can assume that this was not their intention and in fact could assume their intention was to "help" the users.

The point that is missed is that the Banner Office was responding to an emergent property of the system created by the training model used. The Banner Office was reacting to the "fire" of user's requests instead of investigating the structures underneath to find out why the fires were starting in the first place.

Without this awareness, the system soon began to reinforce itself and it simply became "the way we work around here". The Banner Office shifted the

blame onto the users. This resulted in the mental models of people in the Banner Office, with regard to users, being reinforced. This further resulted in the same training being offered in the same way, possibly even further simplified or not explained. Some evidence of this was recorded above.

An offshoot of this was the informal network. Informal networks are not uncommon; they are often very positive and play a supporting role in this type of situation. The problem with this one was that it seemed to emerge as a result of a non-confrontational learning system that rather adapts and increases complexity than confront the issue at hand. Users maintained this system and colluded with each other in keeping it an "open-secret". If a user did finally get around to going to the Banner Office, the Banner Office would not have known the journey that this request had taken before it reached them. From comments by users, it is clear that if the informal network didn't work, then sometimes the request were dropped altogether and never reached the Banner Office.

The research shows that perceptions of how well the Banner system worked were very much dependent on the understanding and ability of faculty officers to use the system. As they were the key people within the faculty and the only real users trained, the dean and all other lecturers would need to go through this person to gain access to the data.

If faculty officers had been trained, or at least gone on training, the assumption held by her colleagues would be that this person must be able to use the system. If this was not the case and the person did not know what to do, a request for non-standard information became a threat. Model O-I learning systems have, as a key characteristic, the desire to protect self and others from threat and embarrassment (Argyris and Schon, 1978). I would argue that it is highly probable, under these conditions, to blame the system. That would either be Banner as a system or the Banner Office.

This goes to show how perceptions of Banner could have arisen within the university. I would argue that within the system that was operating in the

university, one of the strongest influencing factors with regard to perceptions of Banner would have been faculty officers.

As a final comment, I would turn our attention to the way technology was actually used within the university. The map presented above of the learning system clearly illustrates the extent of the complexity of the system. The attractive and easy option would be to say that the actual "technology" part of the system is minor and the problem is not technology at all, it is rather some fairly unrelated "people" issues.

I suggest that this is the option that the university chose to take. But where does it lead us? It leads to an unrealistic distinction between the technical and human aspects of an information system. As mentioned before an information system can only operate within the current workplace system. It is not a separate entity. If it is going to work well, it must integrate well with how work is done or the institution must begin to initiate a major change program so that operating procedures are changed to suit the use of new technology.

I propose that neither happened here. It has already been stated that the area of change management was a weakness in the implementation process. At other points within the document it has also been shown that the university was not going to change its operating procedures either. The result was the extremely complex Wider Banner System. I would argue that this was an ineffective use of technology and surely cannot be what the university desired when the decision was taken to purchase Banner.

8.3 Conclusion

This chapter has presented an overview of the area of training and the implications thereof with regard to the Banner system. The research has revealed that there were a number of problematic areas within the training system, which resulted in the complexity of the Banner system increasing.

CHAPTER NINE: THEME FOUR - INFORMATION

9.1 Introduction

This chapter introduces the reader to the information available to the users of Banner. The chapter also investigates how Banner was used on a daily basis.

9.2 Information

Essentially, the most important element of an information system is the information that is retrievable from that system. In other words, the type of information and for whom was that information. We have already looked at issues of implementation, the Wider Banner System and training. All three areas have had an impact on how information was used and what kind of information was accessed from the system. We will now look to the information itself. In an attempt to discover what Banner was used for in regards to daily operations.

Link between reports available and system's usefulness. *Is this valid or an untested assumption?*	And then the challenge, of course, was the generation of the reports that people wanted. 'Cause everybody wants tons of reports and when they didn't get the reports, they were saying, what's happening, the system is not working. Only, in the meantime, you needed to get somebody to actually write those reports. There were a whole lot of reports in the system that you could generate automatically, and a whole lot of other reports that had nothing to do with the system. It required somebody to sit down and write it out and so we can say that this is what that system would generate.

Who didn't realise this? The users or the university? Why didn't it happen? *Would this not be linked to unmet expectations from users? Is it so unreasonable that an information system produce reports needed by the users?*	Yes, yes, because the users linked generation of reports to how good the system was. Not realising that you need someone to sit down to try and get the reports out. The users were saying that the system is not good because we are not getting the reports which is a ridiculous thing. If somebody was there and was paid to generate the reports, then you would have got the reports. So there's a lot of negative things that came out because people didn't get their reports or they didn't get it in the way they were used to. You know, so it's like, it doesn't look like things that I used for the last ten years. So there were a lot of those negative people.
How the system was meant to operate. *Why?*	Uh, we expected to be able to get full reports on almost anything that was, I mean, it had potentially a fairly friendly structured query language for getting, for writing reports, for extracting information. So that one would hope that a lecturer in his office, who had the appropriate authority, would be able to interrogate the database, ask for all the students, uh, in his class doing a particular subject, or, you know, which of the students, you know, asking questions like that. That was certainly there, the potential, it could be done, but we never did it, it never got done.

What value does "potential" have when unrealised? *Who put this system in place? Who controlled the information flow?* *Again, who didn't understand the need for this group of people?* *Are the people generating the reports not part of the system? 'Technology only' focus limits scope of system. Can cause vision to be blinkered.*	The data was all in the database. With the database, there were a number of standard reports that had to be written so that the information could be provided in the way that people expected, exam results, registration forms, and all these kinds of things. The initial project simply had all those reports being generated. With the data in the database, it was, in principle, given the resources, capable of writing any report you wanted. There was a system put in place firstly, to determine if people really needed the report, because you know you automatically generate a whole lot of reports because somebody wanted it five years ago and it continues to be generated. So that system helped tremendously in reducing the number of reports that was required. That was the first step. The second step was to say, let's put some priority on the reports based on the academic year, based on the semester system etc., examinations, period and all that. So that helped tremendously in cutting down the number of reports required. But I don't think that people understood that you still needed a different group of people to sit and generate reports. They looked at the system and said it was not generating the reports.

With no efficient access to the information, is it valid, or useful, to claim that "it was all there"? Again unrealised potential has little value.	Right. The information obviously was all there. It was available at any time.
University, meaning executive, blamed. *Could be evidence of a narrow, technical focus for the project. "Simply implement the physical technology and the job is done."* *Resource allocation problems.*	The gap was simply the university. Once the project was over, despite of the fact that we lectured the executive very hard, presentations to them, we pointed out this was only the beginning, the project had been to deliver a working system and now you had to provide resources. They simply didn't provide the resources. One ended up with essentially a one-person office in Durban and a one-person office in 'Maritzburg and they simply couldn't cope with the workload. So they never did anything more than basically maintain the system ...
How was Banner used? *Banner report free. This was a key principle with the Banner system. Places further emphasis on the "non-technical" aspects of the Banner system. The Wider Banner System.*	There were base reports but obviously with a system like this they were general, because one institution wants a report one way and another wants it different. So the basic reports that we got from Banner were not useless to us but very general. So then we had, especially being an American System, we needed to write matric reports, and we needed financial aid according to our Financial Aid. So we just wrote all our own local reports.

Student administration information.	Yeah, I suppose so, I mean it can give you everything about a student from the enquiries phase right through to graduation phase. You can have financial aid information, student fees and residence.
Separate department for management information from Banner. System gets wider and more complex.	Management used it a lot for their statistics. In fact, our department of management information, especially at registration/application time, they used to churn out statistics
Banner was able to provide useful reports as indicated here.	Well yeah, we generated reports like, one that might not seem very useful, but was useful, one of the Catholic fathers in Durban used to ask us how many Catholic students and names and addresses of them. We used to, Hilton College used to ask for names of past Hilton college boys who'd been accepted by the university. Um, students who couldn't graduate, students who owed money, we kept details on like the
Focus shifts again to administration issues.	distance-learning students, that sort of thing. As well as how much they paid, and, of course, apart from normal admin information like who's registered for which courses, and who owes money, who's going to graduate, that sort of thing.
What was the problem, the Banner technology or the way the university set up the system?	No, it wasn't able to do everything. I mean it couldn't do the South African reporting requirements, so obviously we had to create that. That's really all the Management Information on Banner System (MIBS) stuff that

The MIBS system. Management Information on Banner System. The Wider Banner System continues to grow in complexity. Also would have cost implications for the university.	we had to create and add on which was a disaster and that's been taking years, to report to the government for subsidy purposes and that. So it couldn't do that, I think they had to make some changes to the matrics. I don't think that it suited the university because the university doesn't report the same way as they do in America
Banner said to be used more for administrative purposes than management information.	No. Administrative, because there were no reports at all with this system. That was part of their policy, that you write your own reports so there were no reports. That's why we also tried to introduce this additional management on Banner system, MIBS, 'cause not only was it to do government reporting but it was to do other reporting that we needed. You know, certain things that weren't in the system, we actually added on like, certain classifications of the course and things like that. So you know we added quite a lot of things on for reporting purposes that weren't there and also to make it possible to report to the government, you know for subsidy reporting.
Deals with some technical issues of Banner. Needed to add extra information to the Banner system.	
Indications that a large amount of the MIBS project had to do with SAPSE, government required information.	No, no, no. We had to set up quite a few databases. All right, some of the information was there. But some was not there. I mean certain classifications that the Government needed had to be set up for reporting so you know they were added on.

Banner said to have a good set of operational reports, I take this to mean administrative, but a poor set of management information reports. *Expectation for system to deliver management information as well as administrative information.* *SAPSE seen as "mission-critical" to the university. Add on system needed to be developed to accommodate this. Was this one of the trade-offs for more functionality elsewhere in the system?* *System didn't seem to provide a wide enough range of information for the different constituencies of the university, particularly at the management levels.*	Well, Banner came with a good set of, a pretty good set of built-in reports for operational purposes. Um, one of Banner's shortcomings that it didn't come with a very good set of management reporting tools. Um, and that's one of the things we had to do, was actually build something called MIBS onto that, um, which the management information people had to do. So it delivered operational reports and information but it didn't' deliver management information. And of course primarily being a North American system, it didn't deliver information in the SAPSE format. So I mean those are some key shortcomings of the system, given that SAPSE is all-important to the university. SAPSE is statutory reporting. SAPSE is the information that has to be reported in order to generate the university's subsidy. In that sense it's mission-critical. I mean, if you get SAPSE wrong, it's the very basis of which your income from the state is determined. So it's a statutory requirement. The higher level management reporting you know, wasn't well developed on Banner and it had to be developed, I think it probably wasn't even fully developed at the time we scrapped it. You know, people like deans and um, DVCs (Deputy Vice Chancellors) didn't have ready access to the kind of information at the level they needed.

Example of critical analysis of the information within the database. Probably a "non-standard" report and one that was not requested from many people, but still very valuable.	Okay, um, but one of the sort of things, for example, that I'm terribly interested in, is that I would like to have been able to plot how well students who get supplementary exams do in the next year. And that to me is very important academic information. I don't want to just know that this guy passed Accounts 1, Accounts 2 and Accounts 3, okay. I want to know if he got a sup in BIS (Business Information Systems)2, and passed the sup, how well did he do in BIS 3?
Highlights the need for valid, useful information in decision making. Indicates the powerful role technology and information systems can have in management support. Did the system provide this kind of support and information to the university?	That type of information is the sort of thing I would expect from a student record system, because those are big decisions, as to if the supplementary exam process is valuable at all. How do we know? We've just decided now, we've just got an instruction now from the executive that we will carry on having supplementary exams at the University of Natal. On what basis? How do we know that that's a good move? Okay? Where's the information to support that, or are they just saying we are too poop scared to say to the people, one shot, one shot only, and if you don't make it, repeat.
For this particular request, Banner was seen as unable to do it. Information had to be extracted from Banner and placed in	The only time I was ever involved in trying to do that kind of analysis ... in a group that was trying

another program to analyse the information. There could be a number of possible reasons why this happened - not solely the technology. *Lack of global understanding of Banner's functionality could have been a reason.*	to look at success rates and financial aid. To do that kind of processing, we had to get the information out of Banner and into the other statistics system and put in a lot of forms for that, which we really should have done in Banner. She was unable to do it in Banner. What we needed was the success rate of students as a means of trying to measure that success rate for the purpose of giving financial aid. So the average success rate. So someone performing above or below that you would say yes or no to financial aid. I don't know whether Banner could have done that. Um, but she couldn't do it in Banner. But whether that means Banner could not do it, I don't know.
Access to information controlled in a hierarchical manner. *Deans had to intervene to ask for report generation.*	For instance, I remember once the dean wanted to compare matric maths with varsity first year maths - you know that kind of thing. Those sort of reports we couldn't easily extract - those had to be run higher up - you know really higher up. I mean like information management had to write those reports.
Assumptions about positions, power and respect beginning to surface. *Common perception among participants was*	They would yeah - they would take along time - and they would be more dean requested. You know, they had to be sort of high priority because he (Management Information) is obviously very busy so he wouldn't just run any old report for anybody.

that Banner could deal efficiently with standard reports, but non-standard reports were problematic. *Interestingly, this person doesn't align problems with "Banner" as such but the Banner Office. The system is much wider than the technology.* *Users saw Banner as an administrative devise only.* *Lack of global understanding undermined the use of Banner. Highlights lack of engagement and ownership of the system.* *High expectations for Banner.* *Reports were identified as a problem.*	It worked okay, if it was a standard report, but if it was something that they hadn't heard of before, then their first reaction is that it can't be done. But then they would sort of think about it and you know, there was a person there who would then do it for us. So there was sort of a lot of antagonism at times because we felt that, you know, they were the only people who could do it and if they couldn't do it, there was no one else to go to. It wasn't like ITD, where there was a whole lot of people who you could ask. In fact, that was one of the reasons that they wanted to do away with the Banner Office because they felt that they were being held hostage by two people. Which wasn't a good thing. I saw it more as the administration - the taking of the student right through - that was my job here of using Banner. Certainly not the management information side. The administration of the students. From my side, it was an administrative system, but it also could give you the information, a lot of information. Um, maybe we didn't use it to its full potential. We didn't put enough into it, I don't know, we only put in what we needed. Uh, too much. We were expecting it to be able

	to run reports that we needed, statistics report and to produce information in a particular way and we also expected it to be much more responsive. Uh, report-wise, we had a little bit of a battle because, as I say, at that particular point in time the people that were supposed to develop the reports were the same people that were actually doing the training and the same people who were doing the audit trail. So that was a problem, the reports were not as we expected. Sometimes we'd say I want this information and you'd be told, you know, this hasn't been set up so you can't get such a report. Those were the hiccups.
Again, this example shows that the Wider Banner System had a strong influence on availability of information. This leading to negative perceptions of Banner. *The question that these examples beckon is "What exactly is the Banner system?" If you wanted to define the Banner system, where would you begin and what would be your point of conclusion?*	
Another user's perspective of what the purpose of Banner was. *How much does the mental model of the person trained to use a system effect the way that system is used within an organisation. The users trained within the university were administrative personnel.*	Yes, I think mostly it was to keep student records and pass that sort of information onto the fee system, you know. But, um, I'd say it was mainly for day to day recording of student, you know, enquiries, applications.

Should it be a surprise that Banner was then used mainly for administrative purposes?	
Interesting human response to change. It is almost as if the cycle is starting again. This comment was given in terms of the old SIMS system when Banner was introduced. Here we see it again, just different names.	As I said - if you had asked me this 12 months ago - there might have been some complaints - but if you speak to them (Faculty Officers) now, they would say that Banner is a far more advanced program than what we have at the moment. Had far more capabilities, was far more flexible and was more user friendly. A far better system.

The research completed for this study has shown that Banner was used mainly for student administration within the university. In addition to this, most participants indicated that non-standard reports were difficult to obtain and depended more on the response of the Banner Office than other factors.

The few examples presented in terms of academic information needed at a management level indicates that there were difficulties experienced in obtaining that information. This seems to have occurred for two reasons. Firstly, deans and heads of schools were not trained to know what Banner was capable of. Secondly, the way the system operated meant that if you wanted any information you had to go via faculty officers. This was problematic and not a very effective use of this kind of technology.

A key result of this was the increased "control" of information via faculty officers and the Banner Office. Whether this control was intentional or not is relatively unimportant. The study shows that these two positions became the effective gatekeepers of information for the entire university. I would argue that this was an unintended consequence and one that the university must learn from.

9.3 Conclusion

This chapter has presented an overview of the types of information that was accessible from Banner and the key role players involved in information processing on Banner. The research has shown that Banner was used mostly as a student record system which tracked students from entrance to exit at the university. In addition, the research has shown that management information on Banner was difficult to obtain and poorly developed at the time of the decision to move away from Banner.

CHAPTER TEN: CONCLUSION

10.1 Introduction

The research carried out in this pilot study has attempted to investigate, from an organisational learning perspective, the difference between the full capability and functionality of an information system and the way it was used in reality within an organisation. This was guided by the statement in the initial chapter:

From Promise to Practice: Information Systems Implementation
Why the Gap?

In this chapter, I will present the key findings that have emerged as a result of the research, and outline the key areas of learning that I believe would be useful for the organisation. Following this, I will conclude this chapter with some reflections on the methodology used and some suggestions for further research.

10.2 Key Findings

The key findings of the research can be grouped under the headings of the themes presented above. These are:

1. Why Banner
2. Wider Banner System
3. Training
4. Information

Conclusions and findings have been made at the end of each section and I will only briefly summarise these findings to avoid repetition and to present an overall and concise picture of the findings.

10.2.1 Why Banner?

The major findings under this theme were related to a lack of information to support decision making and some inconsistency with regard to an overall strategy for Banner and, more generally, university technology.

The decision to purchase Banner seemed to be made without the relevant information. This is with particular reference to the user requirements specifications. If this was the case and no user needs analysis was done prior to purchase, then the most obvious question in my mind would be, Why Banner? What did this system do that fitted the needs of the university and how was that established when those requirements were not known?

Although some overall strategy for Banner was evident in the research, it was not implemented. The question of strategy really relates to the above issue of what the university wanted to achieve through Banner. The quote from one of the interviewees that keeps ringing in my ears at this stage is " Let me put it another way, I don't think the university really knew what it wanted, apart from another system."

10.2.2 Wider Banner System

The Wider Banner System had a number of components to it. These were the project management of the implementation, the Banner Office and finally, the reasons for a new system. The findings will be presented under these headings.

10.2.2.1 Project Management

The key findings for project management were firstly, that the implementation was very focused and was driven by time and budget and secondly, that there was not enough emphasis placed on the management of change within the project.

The implementation was done on time and within budget, and considering the complexity that has been uncovered even by this pilot research study, this is extremely commendable.

However, some concerns about "bulldozing" the implementation were recorded. One of the dangers that lurk about when a project is so focused and has pre-defined deadlines and budgets and no flexibility is that you can disregard the systemic nature of a project and its boundaries. These issues often only become evident once the project is in 'motion'.

The problem that one is then confronted by when this type of rigidity occurs is maintaining relevance. Is the project still relevant within the dynamic and ever changing environment in which it was first implemented? Is the environment still the same? Are there any new areas of concern that need to be addressed that were not identified at the beginning of the project? (Kriener, 1995, 1996).

This may have been the case with the Banner project. The research completed does not give any concise findings in this matter. Concerns were raised but the research was not on a scale that I am able to confidently state that this happened or that the concerns were of a far reaching consequence.

The lack of change management seems to have been a weakness within the process. The only technique discovered to facilitate change was communication, training and workshops. As pointed out in the relevant chapter, no use of any change management process was evident, although certain aspects seemed to avail themselves to the Banner Implementation Team, such as the "burning platform" of the crumbling technology.

10.2.2.2 Banner Office

The key areas of concern under this heading were, the system of dependency that developed, lack of data integrity, identity issues related to the Banner Office and resource allocation.

The system that was implemented created a large degree of dependency on the Banner Office. Users were forced to rely on the Banner Office for the generation of reports. Even when this was not necessary, evidence was shown that users would rather use the Banner Office than generate the report themselves. The research also showed that both the people in the Banner Office and the users colluded to maintain this system.

Due to the dependency on the Banner Office, a user would often submit the request for a report and assume that what was in the report they received was the information they asked for. As such data integrity became an issue.

Issues relating to identity and the naming of the Banner Office were dealt with in some detail in the relevant chapter. The main focus of this discussion was identity with a particular product and not a particular role or function. I argued that this could have had some influence on perceptions of the new system and created some defensiveness when a critical review of Banner was needed to see whether the system was providing the university with what it wanted.

The final issue with regards to the Banner Office was that it was under-resourced. It was shown in the research that the Banner Office was not staffed in the manner originally suggested and that generally the post-implementation stage of the project was under-resourced.

10.2.2.3 Reasons for a New System

The key areas under this heading are cost, results of the user needs analysis and integration.

Most participants stated that cost and the rand / dollar exchange rate were the fundamental reasons for needing a new system. This area would have been difficult to predetermine at the point of purchase, 1993, and involves much larger systems such as the interaction of national economies.

The research states that a user needs analysis was conducted in the post-implementation stage and the information from this analysis was used as support for the decision not to continue with Banner upgrades. As mentioned in a number of places throughout this document, this kind of user needs analysis is essential to a systems implementation and should have been done prior to purchase.

The final reason uncovered by this study was the issue of integration. The university was operating with a number of systems that did not communicate with each other and hence difficulty was experienced when trying to interface between the systems. The research indicates that Banner was decided upon without much reflection into the implications of this system for the wider university computing system.

10.2.3 Training

The training model implemented was particularly problematic. It was an event-driven, repetition-based model that produced a number of unexpected outcomes.

A major problem with the training system was that it never produced a group of core, power users that had a good global view of the full functionality of the system and what it could do. People were shown what to do for certain events that were rapidly approaching in the university's calendar. It was shown that this was sometimes done without even explaining to the trainees why they are doing it. The training seemed to be a very technical 'step-by-step' process that failed to create any depth of understanding in terms of potential for use among the users. This again adding to the system of dependency that was created in the way the system was implemented.

Another unexpected development was the strong informal network that developed within the system. I would argue that this was mainly a result of a non-confrontational learning system (Model O - I Learning System, Argyris

and Schon, 1978) whereby people created another level of complexity within this system rather than confront the issue at hand.

As a final observation in terms of the training aspect of the implementation process, I would suggest that the strongest influence on the perceptions of Banner's usefulness within the university were faculty officers. How well these people could use the system and how much of a grasp of what the system could do for the university these people had, had a strong influence as to whether Banner was perceived in a positive or negative manner. This is directly related to the training of users.

10.2.4 Information

What emerged from the research was that the system was used more for administrative purposes than other functions. Access to useful management information was inherently problematic within this system. In fact, the complexity of the system grew again with the development of MIBS to cope with this type of reporting.

A guiding principle within the Banner system is that of being relatively report free. This is due to the different requirements of each university for reporting. In principle, I can see the benefit of this, but this needs to be matched with the requisite resources to make use of the inherent potential within the system.

A common comment from participants was that all the information was there, it just wasn't used. I raised the question at that point in regards to the value of unrealised potential. If the technology is capable of something, but the system as a whole is not operating effectively then is it fair, or even useful, to say that the potential is there. It would seem to be more of a blame shifting strategy than a useful suggestion.

10.3 Overall Findings

Two other areas of importance have been shown through the research. The first is the complexity of the system and the second is the question of what exactly the Banner system was.

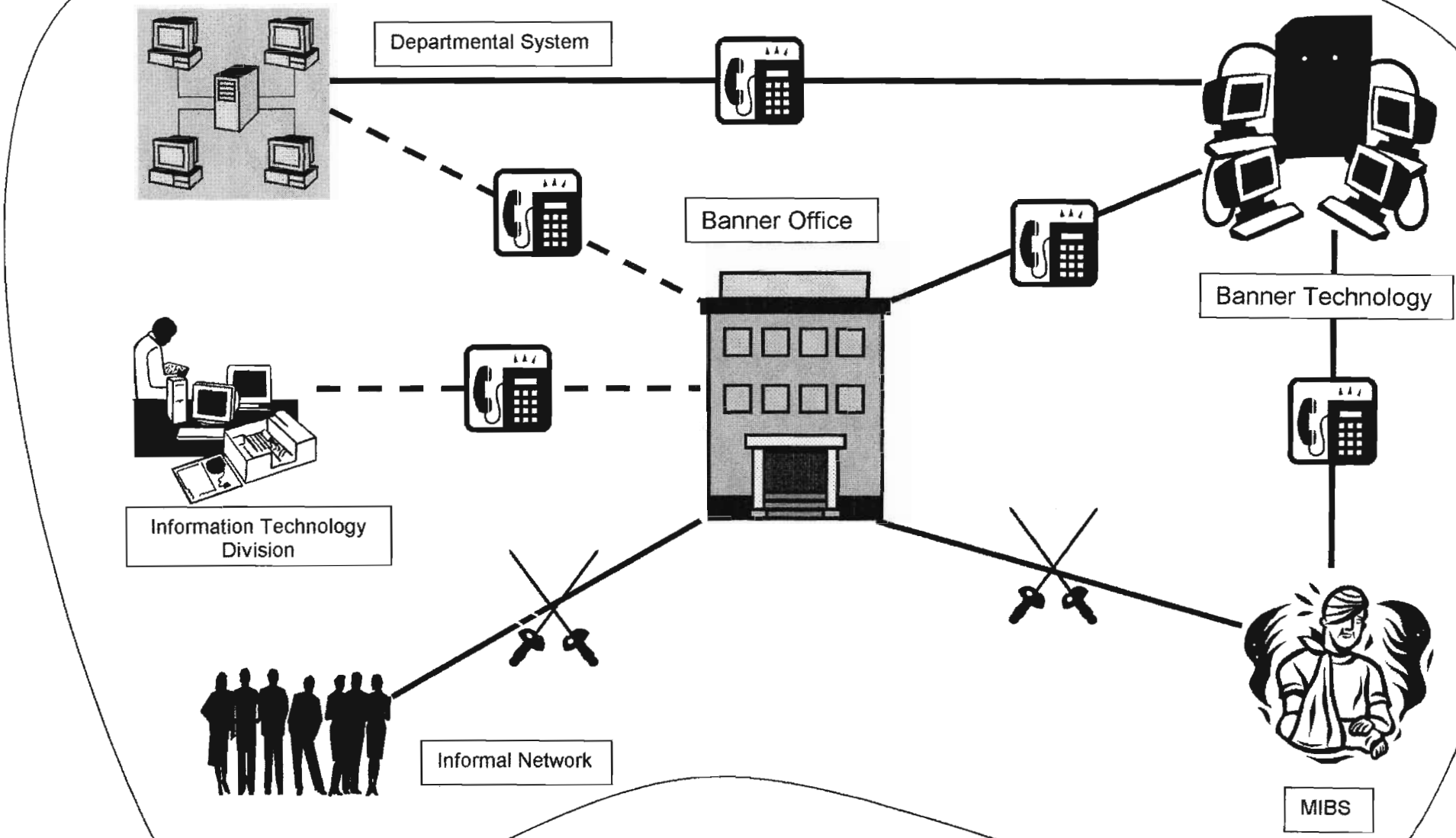
When I began to map out the extent of the overall system, I was amazed at the complexity that I saw. What amazed me even more was that this complexity existed in an environment where technology had been implemented in an attempt, one would hope, to bring about a greater degree of efficiency and effectiveness with regard to workplace procedures and operating practices.

I have attempted to show this complexity visually with the rich picture presented below. It shows a total of six systems operating within the one larger system and I have also attempted to show how these systems interact with one another. Although sometimes it is the case that the systems have developed very much so that they do not have to interact, and that is also shown. See Figure 12 on the next page.

The other area mentioned leads on from the discussion above and is concerned with what exactly the Banner system was. I think the results have shown that to think of it purely in terms of the technology implemented would be to dismiss aspects of the system that have had a vital and powerful impact on the Wider Banner System.

As mentioned before, I would argue that this is the route the university took. It certainly seemed to cut resources once the physical implementation was completed.

Figure 12: Rich Picture of the Wider Banner System



This issue really revolves around wider and more generic issue of the role of, what I would call, workplace operating systems and information systems. As mentioned earlier, an information system must fit the current workplace operating systems or the organisation must change so that workplace operating systems match the new technology. But this is not a simple, clearly defined situation. It is more of a messy, dynamic and intensely complex situation that requires a great deal of thought and investigation.

The case study used in this research shows what I believe to be a poor use of technology and indicates a lack of intensive investigation into the issue we are discussing. This point begins to touch on the importance of boundary definition in an implementation such as this.

10.4 Learning from the Banner Implementation

10.4.1 Decision support systems

The decision to purchase Banner was problematic. The research indicates that the decision-making context was pressurised and the decision to purchase Banner was based on insufficient information.

I suggest, therefore, that the university needs to develop some appropriate decision support systems to aid decision making within this context. The decision-making context is not unique, what therefore, needs to be addressed are the systems that can support and inform decision-making. As a point of clarification, I would like to state that when I talk about decision support systems, I am talking about support for decision making in a systemic sense. The term 'decision support systems' has a very specific meaning within the field of information systems and thus the above point of clarity is needed.

10.4.2 The role of technology within the university

The research indicates that at the time of the Banner implementation, a clear information technology / information systems strategy did not exist within the University. With regards to organisational learning and the role of technology, I suggest that a policy or strategy of this nature be developed.
This point is made with reference to the brief overview of the information systems literature. The majority of which recommends that this type of information systems strategy be used as the guiding policy for all information technology interventions within the organisation.

The research showed that the issue of what information and for whom was this information was not clearly thought through. An information systems policy would serve as the point of departure for such an investigation.

The other more obvious learning point for the university is associated with systems implementation and the systems development life cycle. For any future information systems implementations, the university should conduct a user needs analysis prior to purchase. The university should use this information as the basis for deciding which system will best suit their needs.

10.4.3 A systems approach to understanding the context of the university

The research clearly indicated that the system developed to maintain the Banner technology was complex and involved a number of different systems. As such, I would recommend that a systems approach, possibly utilising Checkland's (1981) Soft Systems Methodology (SSM), be used towards a more systemic understanding of the university context. One of the reasons Checkland (1981) developed SSM was to investigate complexity in what he termed soft systems. From this brief pilot investigation, the university environment presents itself as a system of great complexity and, I would argue, a system that Checkland would classify as a soft system. Checkland's SSM emphasises the importance of stakeholder participation and interaction patters between stakeholders within the system. The CATWOE tool is an

indication of this. I would also argue that the SSM method of inquiry would be very well suited to the university environment.

Mapping the context systemically would help the organisation discover some of the less obvious systems, such as the informal training system that developed within the Wider Banner System, currently operating. The university could benefit from such an understanding in that it may reveal the non-obvious points of intervention within the university system and allow for the development of an intervention that would take into account the causal nature of the system.

With particular reference to a systems implementation, a systemic understanding of the context would be beneficial with regards to the development of an information systems strategy. I suggest that this type of information may provide insight into the broader discussion of the role of technology within the university. A systemic understanding of the university context would help bring about a greater understanding of the interaction of both the human and technical systems operating and may lead to a more effective use of technology within the complexity of these interacting systems.

10.4.4 The learning systems operating within the university

Indications from the research show that the university is currently operating within a Model 0 - I limited learning system (Argyris & Schon, 1978). I therefore propose that an investigation into the learning systems operating within the university would be beneficial. Argyris and Schon (1978) claim that the Model 0 - I learning system is not only limiting, but also is difficult for the organisation to discover due to the camouflage aspect discussed earlier.

An investigation of this nature would allow the university to begin to recognise some of the limiting features of the Model 0 - I system and may help the university to move towards becoming more of a learning organisation.

10.4.5 Managing change

One of the major findings from the research was the lack of change management. In a systems implementation, the change aspect of the project is vital and has a strong influence on the overall success of the project.

For any future university-wide interventions, the university needs to place a greater emphasis on the change process. It needs to be carefully managed and monitored as the project progresses. Drawing from Dawson (1994), the university should be sensitive to the dynamic nature of change and learn how to manage a process of change that has the potential to change as each step of the process is implemented.

10.5 Reflections on Methodology

I found the learning history methodology to be a very interesting and useful way of investigating the problem context. It was the first time that I had conducted research of this scale using a systems methodology and I found it both rewarding and challenging.

I found that the learning history methodology lent itself very well to the analysis of the interview transcripts. I had taken a weeks leave to immerse myself in the analysis of the data. At the beginning of the week I felt daunted and overwhelmed with the amount of "stuff" that I had in terms of raw data.

I was very concerned whether the data was going to pull together to make a coherent whole and, at the beginning of the week, I certainly couldn't see myself telling a useful story of any sort from my pile of "stuff". This is why I say that the learning history methodology was challenging. It forced me to trust in the concept of emergence.

The guidelines presented by Kleiner and Roth (1996) where very helpful. These guidelines provided the scaffolding I needed to draw out themes from amongst the data. I really enjoyed this process. The coding of the data,

sorting of the codes and finally the use of the grouping exercise to consolidate the theme topics was useful. It was interesting to see how the themes began to reveal themselves from the data, well at least that is how it felt.

Once I had the themes, the process was very straightforward. It was enjoyable taking the quotes of participants and stringing them together into a meaningful story.

The difficulty I found with creating the stories was trying to be as truthful to the data as possible. The themes presented are my perception of the story, told in the voice of those involved at the time. This is where I would find the learning history team very useful. It would be a place to sound ideas and challenge perspectives prior to the document being written.

I learnt a great deal through the research process. I like the idea of a jointly-told tale and of story telling as a means of presenting an organisational document. The format is very accessible which could lead to more people reading the document, and more importantly, I believe that a learning history has the potential to become a powerful tool for organisational learning.

10.6 Recommendations for Further Research

As the introduction to this document reads, this research was a pilot study. The research has revealed a number of areas of interest for further study for the institution concerned and on a more generic level.

These areas are:

1) The relationship between workplace operating systems and new technology.
2) Decision making within higher education institutions.
3) The role of information technology and information systems in decision support and management support.
4) The role technology has to play in streamlining workplace procedures.

5) Change management processes within larger project-based implementations.

I believe that these areas of research would be of value to the organisation studied and to a much wider audience. It would also add some value to the field of information technology on a more general level.

10.7 Conclusion

This study has attempted to investigate organisational learning at the University of Natal, Durban campus. It has used the Banner student information systems implementation as the case study. The learning history methodology used within the research process was a useful tool that allowed the research findings to be presented in a meaningful and accessible manner. The research was limited by time and resources to a pilot study and has shed some light on different aspects that the university can learn from.

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