Large Scale Evolutionary Change using the Punctuated Equilibrium Model:

Case of Enterprise Resource Planning at the United Nations

BY

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October 2010

A Management Research Report submitted in partial fulfillment for the

Award of Master in Business Administration Degree, School of Business,

University of Nairobi

DECLARATION

This project as presented in this report is my original work and has not been presented for any other university award.

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D61/70575/2008

This Project has been submitted in partial fulfillment for the Master of Business Administration in Management Information Systems of the University of Nairobi with my approval as the University supervisor.

Signed: _____

Date: ____/_____/_____

Dr J .M Njihia

ACKNOWLEDGEMENT

This study could not have been completed without the vision, strength and continuous support of Dr. J. M. Njihia. You believed in me even before I began this voyage. You recognized the potential and helped me reach level that I did not even know existed. Thank you. You are amazing.

My great appreciation goes to the entire academic staff of the School of Business Administration especially in Management Information Systems Section for the knowledge they have imparted to me in the course of my studies.

My sincere gratitude goes to my employer, The United Nation Office at Nairobi (UNON), especially those who participated as respondents of this study, my supervisors and colleagues for their great cooperation and moral support in the entire period of this course.

I will also like to thank my entire MBA class of 2010 for their support and cooperation. They played a big role especially the many hours they gave to the study groups that we had during our study at the University.

To my family and friends, my father Peter, mother Patriciah and my wife Naomi for their prayers and support, my brothers George and Paul, sisters Josephine, Christine and Sarah for always believing in me.

Last but not least, to the almighty God whose generous strength and guidance enabled me to complete the project.

DEDICATION

To Naomi, Sahreet and Paul, I love you both.

ABSTRACT

The results of a Master's thesis project are presented in this paper. The thesis project is part of the study program Management Information System of the University of Nairobi.

The assumption at the start of the research was that many organizations have implemented some kind of large scale information system, but are affected by changes in organization's deep structures thus failing to fully meet user expectations. The research focused primarily on the evolution of an organization in regard to the changes in deep structures over long periods of time.

A scientific study reported all the important factors that play a role when talking about evolutionary change. These factors are core beliefs and values regarding the organization, its employees and its environment, services, technology and political time, the distribution of power, the horizontal and vertical integration arrangements (organizational arrangements), and the nature, type and pervasiveness of control systems. The results of the literature study are combined and put into a theoretical framework to show the relations between all the important factors.

The literature study was complemented with in depth interviews from UN employees. This formed the first step of evolutionary change model. A case study was then conducted which consisted of interviews with employees. The organizations that participated were from a mix of administrative, finance and logistics organizations. The results of these interviews were used to understand the evolutionary changes that affect the performance of large scale information systems which are implemented in a particular organization.

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1 CHAPTER ONE: INTRODUCTION

1.1 *Background*

Enterprise resource planning systems (ERP) are an example of large scale information systems that presents unique challenges in their design, development and implementation. Enterprise resource planning (ERP) is an integrated computer-based system used to manage internal and external resources including tangible assets, financial resources, materials, and human resources. It is a software architecture whose purpose is to facilitate the flow of information between all business functions inside the boundaries of the organization and manage the connections to outside stakeholders. Built on a centralized database and normally utilizing a common computing platform, ERP systems consolidate all business operations into a uniform and enterprise wide system environment. ERP systems are commercial software packages that enable the integration of transactions oriented data and business processes throughout an organization. From a base in manufacturing and financial systems, ERP systems may eventually allow for integration of inter-organizational supply chains (Davenport, 1998; Markus and Tanis, 2000). The Figure represents the architecture of ERP systems as an example of a large scale information system, Laudon and Laudon (2002)

Suppliers,
Business Partners

Customers,
Distributors

Processes

Enterprise
Systems

Supply
Chain
Management
Systems

Customer
Relationship
Management
Systems

Processes

Processes

Knowledge
Management
Systems

Sales and
Marketing

Manufacturing
and Production

Finance and
Accounting

Human
Resources

**FUNCTIONAL
AREAS**
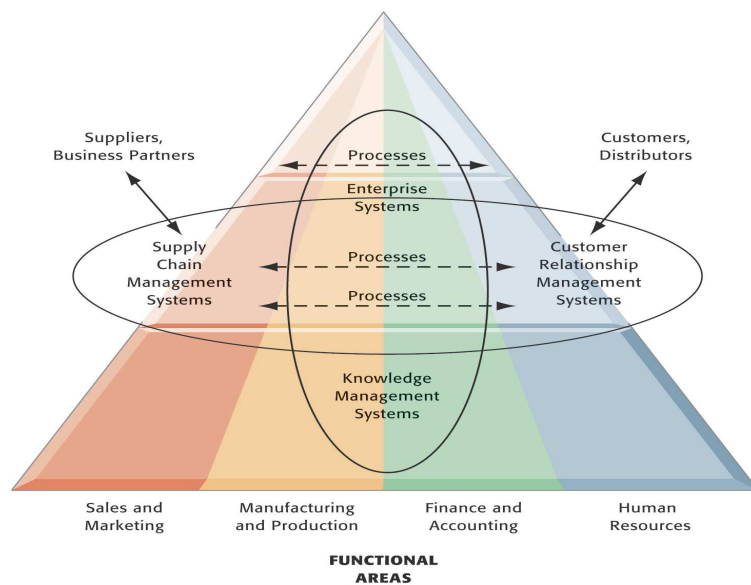
Figure 1 Enterprise application architecture Source: Laudon and Laudon (2002)

1.1.1 ERP project performance

Research shows that the success rate of ERP system implementation is low with a failure rate of up to 90 percent (Zabjek et al., 2009). Some of the main factors leading to the success large scale information systems in organizations include support from top managers, effective management of the project, continuous and effective training of users and having a look at ERP systems as a business solution. On the other hand, the major challenges facing large scale information systems such as ERP systems implemented in organizations are lack of top management commitment, inadequate requirements definition, poor ERP package selection, inadequate resources, poor project design and management, poor communication, inadequate training and education and miscalculation of time and effort.

Wang and Chen (2004) conclude that the success of an ERP project may be analyzed from three perspectives that depend on the different stages in the system life-cycle. These are operational perspective, financial perspective and project implementation perspective. Kumar (2003)

attempts to establish the meaning of large scale information systems' success. According to project managers, the most used project success criteria are the completion of the implementation process on time and on budget while users of large scale information systems measure success by the ease of use and the enhancement of daily tasks. The three above-mentioned perspectives ensure that in order for an organization to realize the expected benefits from use of large scale information systems, it is important to start with a successful implementation, then to continue with having a system that functions at the expected parameters and that is used according to the established objectives, and finally ending with the financial returns of the system investment. These evaluation problems/difficulties may be understood if we consider it from a large scale information systems' perspective.

1.2   *Large Scale Information systems*

According to Laudon and Laudon (2002) an information system is composed of people, technology and organization that are integrated into a single cohesive system that serves organization's needs, the customer requirements and the desires of the employees.

Brussaard (1999) suggests that Large Scale Information Systems are difficult to define because, firstly it is rather difficult to define a generally applicable variable or variables indicating the size of information systems. Secondly he points out is that what is considered large in one administrative unit (for instance a personnel system), may be relatively small elsewhere and lastly, however size is measured, it may differ significantly, depending on the type of information system and nevertheless be equally relevant to the study of success or failure.

Some theoretical approaches that can be used to evaluate the performance of large scale information systems include the punctuated equilibrium model (Silva and Hirschheim, 2007) and Heek's ITPOSMO model (Heeks, 2002)

Elderidge, Gould, Van De ven and Poole (1995) explain that the theory of punctuated equilibrium describes variations in organizations as occurring mainly in periods of gradual evolution that are "punctuated" by sudden, revolutionary periods of rapid change. Punctuated equilibrium as a theory of organizational change has emphasis on radical change occurring in extended periods of time. (Chang et al. 2003; Fox-Wolftramm and Boal 1998; Gersick 1991; Haveman et al. 2001; Tushman and O'Reilly 1996; Tushman and Romanelli 1985).The other theoretical approach is the evolutionary model. Silva and Hirschheim (2007) define evolutionary model in regard to punctuated equilibrium model as evolutionary periods or incremental change where an organization's deep structure undergo little change. These deep structures are composed of core beliefs and values, services, technology and political time, distribution of power, horizontal and vertical arrangements and lastly, the nature, type and pervasiveness of control systems.

Another useful theoretical approach is the Heek's ITPOSMO model, (Heek's, 2002) that measures the success or failure degree in the planning of Information Systems using design reality gap analysis. Heek's framework ties in with the idea that the failure of an ICT system is a multi-dimensional problem, which requires success in many different areas and aspects to achieve overall success. Silva and Hirschheim (2007) notion of deep structures and evolution change would be a useful framework in understanding ERP systems in organizations over time.

1.3   United Nation's Integrated Management Information System

According to the United Nations Session Paper (1988) the United Nations performing its administrative functions, operates without much of the sophisticated automation aids available in today's world. Information systems development has not kept up with the state of the art or the needs of the organization. In the area of administration and management, there are, at its headquarters alone, 22 independent computerized information systems. Many of these systems require the same data and therefore partially duplicate each other and overlap. They provide limited support to the administrative functions of the organizations. They employ a level of data-processing sophistication widely used two decades ago. While efforts have been made over the years to improve and enhance them, the resources required to support and maintain these aged systems provide little or no return in automated assistance.

In addition to problems which are simply a result of the aging of the systems, there are problems attributed to the piecemeal development of systems designed to serve individual functional requirements and to meet particular needs without adequate regard to the benefits of integration. The situation extends beyond Headquarters to the systems installed in the overseas offices. At the United Nations Office in Geneva, for example, not only are the systems similar in characteristics and functionality to those operating at Headquarters, but they are modified versions of those systems. The United Nations Office at Geneva Currently operates and maintains its own versions of the Headquarters' accounting and payroll systems because the special requirements of the Office are not satisfied by the Headquarters systems, thereby incurring additional computer and staff costs. It is suggested that the organization requires is a consolidated, corporate database of information which would be current, consistent and reliable, easily accessible and conducive to improved efficiency and productivity.

The development of Integrated Management Information System (IMIS) was thus a milestone as it marked the emergence of information technology, as a discipline touching all areas of administration and management in the Organization. IMIS was developed as a functionally integrated system to support key processes such as human resources management, payroll, finance and accounting, requisitioning and funds control, budget execution and travel management. The United Nations session paper (2008) indicates that after the launch of IMIS and the 2002 MIS strategy, these were subsequently affected and conditioned by major developments in the technology market, and an accelerated shift of focus in the United Nations to field activities. In short, IMIS was designed and developed at a time when the context began to change rapidly and profoundly. This led to IMIS not meeting its expectations and is due for replacement without being fully used.

1.4   Problem statement

Esteves & Pastor (2000), outline the typical key benefits of large ERP systems which include effective and efficient business processes, access to accurate, timely and authoritative data, informed decision making, faster response to issues and problems, consolidation and elimination of current systems, compliance with best practices and standards and last but not least, improved transparency and accountability. According to the sixty-second United Nations' sessional paper, agenda items 128 and 140, after the implementation of ERP, there were initial high expectations of the new system to transform the key running of business processes in the organization. Since then, there has been radical change in business processes, technological advancement and requirements in system performance. These radical changes include reorganization of organizational structures, increased duty stations especially in peace keeping missions, increased personnel and huge increment in volumes of work load. This study thus aims to explore the ERP

system in relation to changes in organizations' deep structures. To explain this complex scenario we shall use the punctuated equilibrium model or the evolutionary approach, since models such as Heek's ITPOSMO (2002) provide only a snapshot and would be too simple to explain such changes over time. Silva and Hirschheim model (2002) has not been used elsewhere, hence its use shall also serve to test and validate it for MIS research.

1.5 *Research Objectives*

1. To study the deep structures and its relationship with ERP system development in relation to Silva and Hirschheim (2002) Punctuated equilibrium model.

2. To understand why the ERP system has not lived up to its expectation from long term historical perspective.

1.6 *Research Questions*

1. How has the relationship between the organization's deep structures in the United Nations and ERP system development changed or evolved over time?

2. How can the low performance of IMIS be explained from the evolutionary perspective?

3. How useful or adequate id Silva and Hirschheim model for evaluating large scale information systems?

1.7 *Justification of the study*

This research would benefit the following people;

Policy Makers: Decision makers at various levels of management will have valuable information on causes of ERP system performance. This will enable them be prepared for any problems that might occur after system implementation from context of deep structures.

Academics: Academicians will be able to have literature that they can refer regarding ERP systems and will enable them have a deeper view of the issues when doing their own research.

Business people: For organizations intending to implement or have already implemented ERP systems, this research will act as a guiding factor if and when they run into system problems. The study will enable them avoid mistakes of the past and have a smooth running of their system.

United Nations: This research will act as a guide in the UN to show previous gaps, current progress and advice on the best approaches to take in regard to future implementation of large scale information system.

2   CHAPTER TWO: LITERATURE REVIEW

This chapter covers relevant research on ERP systems and their implementation in different organizational contexts.

2.1   *Organizational Performance and Investments in Information Technology Systems*

Researchers started analyzing the impact on business performance of the organizational changes that complement IT investments. Osei-Bryson et al. (2003) explored the relationship between IT investments and organizational productivity using multivariate adaptive regression splines (MARS). The main result was the discovery of a statistically significant positive impact of the IT asset on productivity only when the value of the investment surpasses a certain threshold value. Dehning et al. (2004) investigated whether the "productivity paradox" claimed until 1991 is explained by organizational slack. The findings were that before 1991, IT investment was followed by an increase in the organizational slack, a situation that was not valid after 1991.By the late 1990's, the research concerning the IT impact on financial performance broadened with a new research path that focused on the business value of Enterprise Resource Planning (ERP) systems. Once adopted within and across organizations, ERP systems achieve the integration of such business functions as accounting, sales and marketing, operations and logistics, and human resources. ERP systems are built on a single database that enables modules to share data, thus speeding up the information flow within organizations.

2.2   *ERPs as Large Scale IS Systems*

Large scale information technology systems include ERP systems. Zhang (2002) states that ERP utilize ERP software applications to improve the performance of organizations' resource

planning, management control and operational control. In addition, ERP software is multi-module application software that integrates activities across functional departments, from product planning, parts purchasing, inventory control, product distribution, to order tracking. ERP software may include application modules for the finance, accounting and human resources aspects of a business.

According to Raj (2006), ERP software business solutions are designed for companies that work in a wide variety of areas. IT combines a large number of different elements into a single unit. The three of most important ERP tools available today are manufacturing, human resources, and finance. The finance tools allow companies to successfully maintain their financial information like that of the assets, accounts, budgets and cash. ERP can also assist a company in managing internal as well as external factors affecting it. A company that uses ERP financial products can save a great deal of money over the long term, since the productivity of the organization will be improved. Enterprise Resource Planning is instrumental in getting rid of time consuming activities as paper management. A company is able to study their processes, earnings, and performance by merging their operational information with their financial information. Once this information is connected together, a company can become more competitive and productive.

Synergy is an important part of ERP solutions. The concept of combining multiple processes into a single whole will allow the company to become successful in the long term. In addition to finance and business processes, it is also important to look at materials maintenance. Enterprise Resource Planning will allow a company to successfully automate the process of buying materials and maintaining them. There are modules that track the supplies that are purchased and can also make calculations about how these materials should be distributed. It also becomes possible for a company to predict the demand of the market based on history, economic statistics,

and data from their employees. They can even decide when a product should be produced, and they can do this based on the raw material that is available. (Raj, 2006)

2.3   *Approaches to Large Scale Information Systems*

Silva & Hirschheim (1998) outline the special problems associated with large IS systems to be the radical changes brought about by the organization's adoption of a large system, secondly the political factors of influence in that organization, the organization's social dynamics which include, core values, distribution of power and mechanisms control, and last but not least, the influence of newcomers who may be brought in to solve the crisis.

In this study, we are going to look at three approaches to large scale information systems which include, standard approaches like efficiency, business process re-engineering, the Heek's ITPOSMO model (2002) and lastly the punctuated equilibrium model.

Carter (2005) defines business process reengineering (BPR), as the main way in which organizations become more efficient and modernize. Business process reengineering transforms an organization in ways that directly affect performance. BPR exercise preceding the ERP implementation, according to Carter (2005) can help the organization significantly. It may also increase a combined time of implementing BPR and ERP significantly. There is also a risk that particular ERP software selected later may not be able to implement the reengineered processes. A simultaneous BPR and ERP exercise saves time and also minimizes the risk of sequential implementation of BPR followed by ERP. One rarely comes across the instance where BPR is followed by ERP. As such the ordering of ERP and BPR must be based on the needs of a specific organization. Most BPR projects fail due to the radical changes of re-engineering the business processes, Carter (2005).

Secondly, Heeks (2002) argues that the success or failure of information system is dependent on the degree of mismatch between the conceptions of that reform and the realities into which it is introduced. After a review of a number of case studies, he concludes that mismatches between conceptions and reality can be classified into seven categories summarized by the ITPOSMO acronym (Heeks 1999).These categories are: Information: Information provided by the system versus actual information needs, and the extent to which the organization can access the information. Technology: Technological capacity required for participation and actual technology capacity of target organizations. Process: technology features in relation to existing processes. Objectives and values: the accordance of objectives and values incorporated in the system in relation to objectives and values of users. Staffing and skills: how well the system fits with human capability requirements. Management and structures: how well the system fits within existing organizational structures. Other resources: How available resources such as time and money match with required ones (Heeks 2001, p.21).

Heeks et al.'s (1999) conception-reality gap theory of IS implementation in public sector organizations executed in the ITPOSMO model has some parallels with soft system methodology developed by Checkland and Scholes (1990). Under the guidance of their Health Care Information Systems (HCIS) experience they notice: There is no straightforward method for analyzing the gap between current reality and the conceptions assumed within a proposed new health care information system. One approach arising from Checkland's Soft Systems Methodology (1990) Soft systems methods often advocate recognition of gaps as potential changes, which can then be discussed in participative forum to identify those which are desirable and feasible. Where gaps are identified by participating stakeholder groups as both desirable and

feasible changes to current reality, it may well be that they will be successfully implemented (Heeks et al. 1999, p.17).

However the identification of gaps in this model has great value. Success or failure of the IS in organizations are depends on the size of those gaps. As Heeks and Bhatnagar (1999) propose "The smaller the gap, the greater the chance of success. Conversely, the larger the gap, the greater the risk of failure" (Heeks and Bhatnagar 1999, p.59). The authors also underline the three major points in the evaluation of conception-reality gaps: Gaps are not necessarily bad. They may influence the implementation process in favorable or unfavorable ways. An initiative involving no gap between conception and reality will be a hundred percent successful. But no gap means that nothing changes in the organization. If something will change, it must require some kind of conception-reality gap. Consequently implementation of these systems may bring some risk but that risk being proportionate to the size of the gap. Gaps bring both risks and benefits. Larger conception-reality gaps may bring greater risks of failure, but they may also bring greater organizational benefits. If the implementation becomes successful it may then improve organizational efficiency and effectiveness (Heeks and Bhatnagar 1999).The key approach to large scale information systems is the punctuated equilibrium model which is able to evaluate organizational changes over time.

2.3.1   Punctuated Equilibrium

Elderidge and Gould (1972); Van de Ven and Poole (1995), state that the variations in organizations over periods of gradual evolution are caused by revolutionary periods of rapid change which they explain by the theory of punctuated equilibrium. This theory is used to study organizational change, with some of these changes being how firms respond to sudden changes

in their internal composition and their environment (Chang et al. 2003; Fox-Wolftramm and Boal 1998; Gersick 1991; Haveman et al. 2001; Tushman and O'Reilly 1996; Tushman and Romanelli 1985 in Silva and Hirschheim, 2007.

The key concept of punctuated equilibrium theory is that of deep structure which consists of a set of fundamental choices that a system makes of the basic parts into which the units will be organized and the basic activity patterns that will maintain its existence, (Gersick 1991 ,p .14).According to Tushman and Romanelli (1985, p. 176) in Silva and Hirschheim (2007), an organization's deep structures are composed of five attributes which are core beliefs and values regarding the organization, its employees and its environment, services, technology and political time, the distribution of power, the horizontal and vertical integration arrangements (organizational arrangements), and the nature, type and pervasiveness of control systems. These attributes of an organization's deep structure are shown in the Figure.
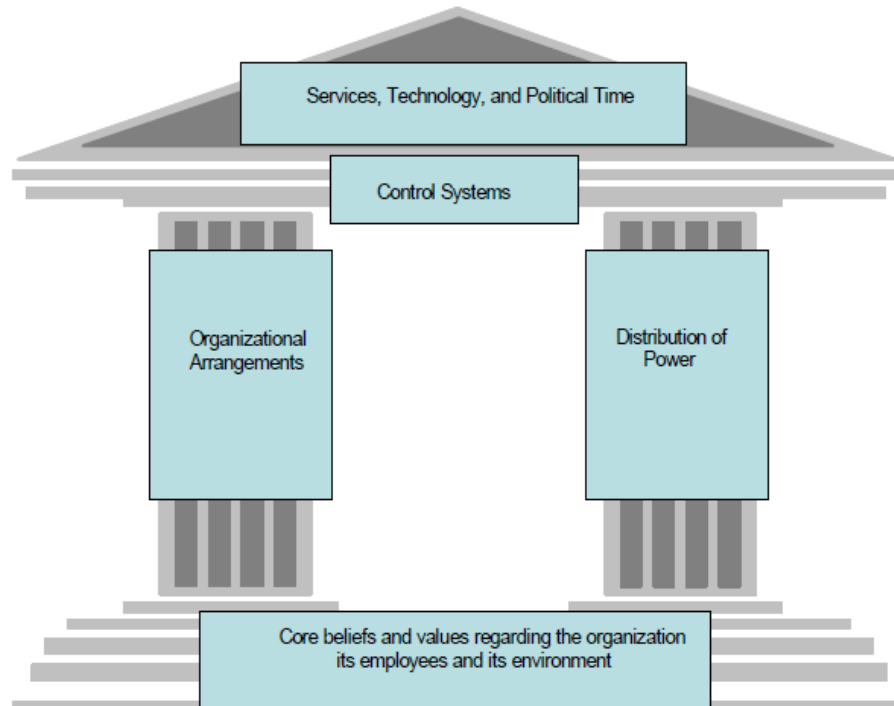
Figure 2 attributes of an organization's deep structures Source: Silva and Hirschheim (2007)

These components of the deep structure are the policy for operations and delivery of services which means that any radical changes in an organization's services, technology, and political time will require modifications in the underlying components of its deep structure. (Tushman and Romanelli, 1985, p. 176 in Silva and Hirschheim, 2007). The concept of deep structure will be appropriate for our study because the application of large scale information systems entails revolutionary change. According to Silva and Hirschheim (1998), in their definition of deep structures, evolutionary periods (incremental change) are times when the deep structures undergo little change, and revolutionary periods (radical change) are times when the deep structures are completely transformed.

The difference between the incremental changes of equilibrium periods and revolutionary changes is like the difference between changing the game of basketball by

moving the hoops higher and changing it by taking the hoops away. The first kind of

change leaves the game's deep structure intact. The second dismantles it. The definitive

assertion in this paradigm is that systems do not shift from one kind of game to another

through incremental steps. Such transformations occur through wholesale upheaval

(Gersick 1991, p. 19 in Silva and Hirschheim, 2007).

Table 1 summarizes our theoretical assumptions on how large scale information system implementation

affects the deep structure of the organization.

Table 1. Summary of Assumptions Regarding Large Scale Information System use and Deep Structure

Assumption	Deep Structure Attribute	Justification
The use of large scale information system will bring about high task interdependence and that will imply transformation of work tasks and services.	• Services technology and political time • Horizontal and vertical integration arrangements	Benjamin and Scott Morton 1986; Caudle et al. 1991; Galliers et al. 1995; Hartono et al. 2003; Henderson and Venkatraman 1992; Porter and Millar 1985; Rackoff et al. 1985; Segars and Grover 1999; Venkatraman 1994; Walsham and Waema 1994
The use of large scale information system will imply relocation of resources and definition of organizational roles which may affect the distribution of power and may be the source of resistance; hence the need for top management support and strong leadership.	• Distribution of power • Core beliefs and values regarding the organization, its employees and its environment	Chan et al. 1997; Davenport and De Long 1998; Lederer and Sethi 1988; Premkumar and Ramamurthy 1995; Reich and Benbasat 1996, 2000; Sharma and Yetton 2003; Silva and Backhouse 2003; Teo and Ang 1999; Teo et al. 1997; Thong et al. 1996
Project management skills and procedures for acquiring and retaining skillful personnel are fundamental for the success of the large scale information system use.	• The nature, type and pervasiveness of control systems	Applegate and Elam 1992; Charalambos 1999; Hartono et al. 2003; King and Teo 1996; Lederer and Mendelow 1988; Newkirk et al. 2002; Sharma and Yetton 2003

Adapted from Summary of Assumptions Regarding SIS Implementation and Deep Structure:

Source Silva and Hirschheim (2002).

In our case study, we will use the revolutionary period's approach of the deep structures because it involves radical change in relation to large scale information systems.

2.4   Information Systems at the United Nations

At the forty-second session of the General Assembly in the year 1988, the Secretary General submitted a report concerning the design of a master plan for and the development of an integrated management information system (IMIS).The advisory committee on administration and budgetary questions (ACABQ), having considered the report of the Secretary General, recommended that the Secretary General proceed in the first instance with the design of the master plan for IMIS and, on the basis of the outcome of the design, resubmit his proposal for the subsequent phases of the project. In its report, the group of high level intergovernmental experts to review the efficiency of the administrative and financial functioning of the United Nations expressed the view that, through increased efficiency, the sizeable share of the budget of the organization devoted to administrative and related functions could be reduced without affecting the quality of services provided .This was in view of eliminating duplication, suppression, hierarchical layers and the use of modern automation equipment.

The progress reports on the implementation of the recommendations of the group of high level intergovernmental experts as endorsed by the General Assembly's resolution described a number of changes that have been made in the administrative structure of the department of Administration and management and indicated the initiatives being taken with respect to information systems in the administrative areas. With the new structure in place, the priority was given to reviewing the methods of work in the administrative areas in order to simplify current

processes and procedures, shorten lines of communication, improve information flows, reduce delays and facilitate further delegation of authority to programme managers while at the same time introducing greater accountability. Thus it was believed that IMIS was essential and that a carefully laid out plan was needed. As had been envisaged in the report of the Secretary – General to the Assembly at its last session, external consultants were engaged to assist in undertaking a preliminary analysis for the design and implementation of an integrated management information system. The analysis consisted of three phases, which were a review of the current situation, the identification of the major components that would constitute IMIS and of the hardware and software configuration needed to operate such as system and lastly, a plan for the implementation of IMIS.

2.5 *System Development at the United Nations*

IMIS was designed to capture, on a more universally available and much more current basis that a present, of financial data which provide for good expenditure information and trend analysis. The development of a personnel system to expedite the processes performed by the office of human resources management with particular emphasis placed on the recruitment and placement processes, the need to develop and retain staff and the early identification and filling of vacancies

Other objectives included the provision of training to staff members to ensure that they are fully capable of using computer technology and the improvement of monitoring of programme implementation. The simplification of existing procedures was also another objective, particularly in the personnel area, to increase efficiency and possibly eliminate some links in the existing chains of approval and lead to increased delegation of authority to, and greater

accountability on the part of, executive and administrative offices at all locations. In addition, the following were identified to serve as guiding principles in the design and development of IMIS;

It was to incorporate modern design features, such as on-line updating and data retrieval, database organization, user interfaces designed for ease of use and end-user programming taking advantage of high-level programming languages and to produce efficiencies and facilitate improvements in management effectiveness. IMIS was to contain powerful and extensive administrative reporting capabilities, particularly for financial and personnel reporting and administrative data (financial, personnel, assets, procurement) all of which will be accessible for analysis to support management decision-making and have audit trails for all changes to financial and personnel records, must limit access to authorized staff only and must provide appropriate reporting and controls for audit purposes.

Other guiding principles were that IMIS was to be global in scope and modular in nature. That is, it was to support administrative functions at overseas duty stations as well as at Headquarters and the technical environment of computing hardware, software and communications facilities must support efficient and effective communications between United Nations Offices. Last but not least, IMIS was to be maintainable; with a little effort, to ensure that changes and additions to subsystems respect the overall integrity and that IMIS would not deteriorate over time.

2.6   *Evaluation of Information Systems at the United Nations*

In the United Nations session paper, 2008, the analysis of benefits is based on four general assumptions. First, the current operational environment in each office and location serves as the basis for the description of benefits. Secondly, these descriptions are based on the premise that the current procedures will be revised where possible prior to final implementation to take full

advantage of IMIS capabilities. Thirdly, the potential benefit will be greater in locations that will be moving from manual systems to IMIS than in locations that already have some degree of system automation.

Finally, the benefits are based on expected performance once IMIS is fully implemented and when all relevant staff are making full use of IMIS features. This typically occurs about six to nine months after implementation. Currently, the information systems that support the administration and management functions at the United Nations suffer from a number of shortcomings that were identified in the report of the Secretary-General proposing IMIS, including duplication and inaccuracy of data, inadequate central control over data, incomplete data, limited management reporting capabilities and lack of integration between administrative systems. The existing systems evolved over the years and were sometimes linked to each other more to meet individual functional requirements than to support system integration.

As a result, the United Nations current administrative and management systems are marked by redundant data entry, an inability to compile consistent data for managing, planning and decision-making and time-consuming reconciliations between systems and processes. In comparison with DeLone & McLean's analytical model (1997), success or failure of an ERP project uses five evaluation criteria which are system quality, information quality, use and user satisfaction, individual impact, and organizational impact. This will provide an objective basis for evaluating the ERP system. A second analytical model used to evaluate success or failure of ERP system implementation is the design reality gap framework. Using Heek's (2002) rating scale evidence gathered on seven 'ITPOSMO' dimensions, this will show whether there was a large gap between ERP system design expectations, and case organization realities prior to implementation.

The capacity of the United Nations administrative and management information systems to support the growing number of activities mandated by the General Assembly, such as large-scale peace-keeping operations, is severely strained. IMIS is a key component in the reform efforts of the United Nations to ensure that the future activities of the United Nations are carried out with all the efficiency and effectiveness required by the mandates and priorities legislated by the General Assembly. Other direct benefits of IMIS included the a custom-built application system that addresses the unique needs of the United Nations Secretariat, a powerful and flexible data retrieval capability that allows the United Nations to produce ad hoc reports in response to management and legislative requests. An integrated, world-wide, relational data base that implements a consistent set of coding structures and values throughout the Secretariat with a user-oriented software and development tools that ensure that the system is easy to use. The capture of the data in the system from one source to prevent duplication of effort and inconsistency of data and security of access to data and processes to protect the system from unauthorized use.

2.7   Conclusion

The implementation of ERP systems in organizations is an enormously a complex undertaking. ERP systems can affect nearly every aspect of organizational performance and functioning and measures of ERP systems success must reflect this fact. This research shows that different measures of success are appropriate at different points in the ERP experience cycle and that the outcomes measured at one point in time are only related to outcomes measured later.

In short, the connections between starting conditions, experienced problems and outcomes in the ERP experience are not the key factors. While this can be construed as bad news for academic

theory, it is good news for both ERP adopters and for IS researchers. For large scale information systems like ERPs, which are complex systems may need an evolutionary approach such as Silva and Hirschheim (1998) punctuated equilibrium model.

3 CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter highlighted the type of research design, target population, sampling method/ procedure, data collection and data analysis technique that was used.

3.2 Research design

Case study is the research design that was adopted in this research. It is a suitable research approach due to its capacity to examine a phenomenon in its real-life context, Benbasat (1987). Because of the suitability of the case study to deal with poorly structured, lightly researched problem domains, it has been judged as well suited to the exploratory phase of an investigation. However, the case study can be shown (Yin, 1994) to be well suited for descriptive and explanatory research as well. In this investigation of evaluation of large scale information system, we used the case study method for exploration, description, and testing of theory. In this study, we adopted the Silva and Hirschheim (2007) theory of punctuated equilibrium to interpret/analyze our case study.

3.3 Population

This is set of individuals, items, or data from which a statistical sample is taken. The target population in this case was various United Nations organizations and the departments within that use the large scale information system.

3.4 Choice of case study

In regard to large scale information systems, the United Nations Nairobi office was our choice of case study. This is due to the fact that, the United Nations office in Nairobi uses an ERP system

which is an example of a large scale information system, it has a long history with the system and has experienced radical changes over the years in terms of changes in business processes, technology, personnel and increase in the number of duty stations. (United Nations session paper, 1988).

3.5   *Sampling*

Robert Magnani (1997) states that sampling is the act, process, or technique of selecting a suitable sample, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population. The people that we interviewed were old IMIS employees, ICT people and senior management staff.

3.6   *Data collection*

Data collection was through in depth interviews and secondary data from documents and reports.

3.7   *Data analysis*

Data analysis is a practice in which raw data is ordered and organized so that useful information can be extracted from it. The process of organizing and thinking about data is key to understanding what the data does and does not contain.

The data analysis technique that used in this research was content analysis (Weber and Philip, 1990). The analysis was through the construction of a historical line of the data collected, in relation to the punctuated equilibrium model so as to explain the relationship between changes in the organization's deep structures versus the large scale information system which in our case, was the ERP system. The Figure shows the rate of change against time in regard to the

organization's deep structures based on the Punctuated Equilibrium model that will assist us to
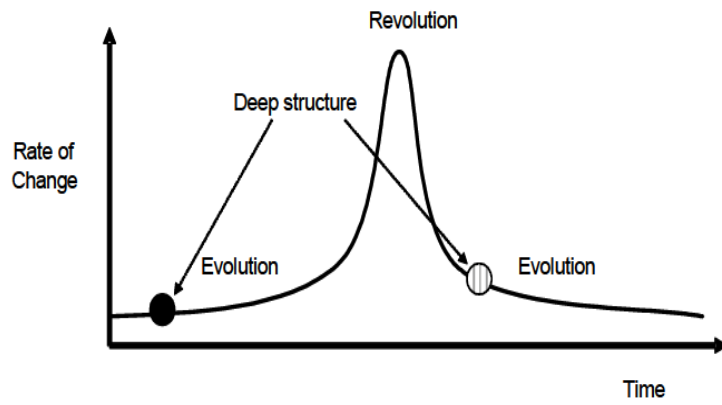
analyze our case study.

Figure 3 the essence of Punctuated Equilibrium model. Source: Silva and Hirschheim (2007)

4 CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Data Analysis

This chapter describes the case study based upon the methodology discussed in Chapter three. The purposes of the case study were to identify whether ERP systems have lived up to expectations over a long term historical perspective and to describe organizational changes in relation to deep structures of the punctuated equilibrium model.

Case study descriptions of UNON and IMIS were derived from in depth interviews done on employees of the UN. The data collected through these interviews was collated in to 5 themes of the Punctuated Equilibrium which included distribution of power, core beliefs and values, services technology and political time, organizational arrangements and finally the nature, control systems. The research was arranged into a time line which presented the unique phases in changes over time. These unique phases or intervals were used to analyze the historical changes using the punctuated equilibrium model as a framework.

4.2 Results: Case Study Descriptions

4.2.1 United Nations Offices in Nairobi

The case study was conducted at the UNITED NATIONS in Nairobi. The secondary data from UN Sessional Papers was supplemented by information gained through in depth interviews. The five participants involved were employees who have been employed over a long period of time and were directly working with the ERP system. These participants were selected because they met all of the selection criteria discussed in Chapter three. They represent a cross-section of programmers, senior administrative assistants and managers.

Based on the interviews conducted, the following data was collected which represented the organization's changes over a long period of time. The organization under study is the UNITED NATIONS in Nairobi which has several organizations like UNEP, UNON and UN_HABITAT. The organization as a whole in the year 1983 had 200 employees and currently there are over 3000 employees. The system in use then was an IBM system 36 which was replaced by a Wang system 65 after 3 years.

There was an increase in user requirements that the existing systems could not handle. Other organizations were being moved to the UN Nairobi as it was a strategic location for UN's operations in Africa. The United Nations of the nineties was in the forefront of efforts by public and private organizations to reinvigorate their operations to meet the challenges of today's fast-paced global community.

In order to respond effectively to the demands of peace-keeping operations around the world and expectations by Member States to do more with less, the UN was, among other efforts, tapping the fountain of cutting-edge technology. High-tech information management and communications technologies were strengthening the administrative heart of the Organization.

With around 15,000 employees and 16 multinational peace-keeping operations scattered globally, the administrative demands on the UN's technological infrastructure were enormous. To the typical difficulties associated with payroll, benefits, accounting and everyday management, add the complexities of administering for 185 nations and daily operations in more than 100 currencies.

"Even the best equipped organizations would have blown a fuse doing what we must do on a daily basis", said Gian Piero Roz of the Office of the Under Secretary-General for Administration and Management, who was working on a project to revamp the UN's administrative systems. "We're changing the way we do business here", said Roz, noting that until now, the UN, like many public and private establishments, had relied on mainframe technology from the 1960's to support what was essentially a paper-based system.

It was further encumbered by systems that did not talk to each other, tedious manual data entry, and long delays in receiving routine information. A variety of ad hoc technological solutions had been adopted to overcome the historic limitations imposed on information management by time, distance and storage space.

4.2.2   Large Scale Information System: Integrated management Information System (IMIS)

The large scale information system was implemented in the year 1992 as IMIS release 3.The system takes a global approach to information management, enabling personnel and computers at UN Headquarters in New York and its major duty stations Geneva, Addis Ababa, Amman, Bangkok, Nairobi, Santiago and Vienna as well as other UN offices around the globe, to share and manage information related to the Organization's human resources, finances, purchasing and contracting, and travel management.

This computer infrastructure marked a new technological era for the UN. From contracts for services, travel authorizations and housing allowances, to tracking employment applications, purchasing equipment and generating payroll in multiple currencies, the system did not only speed up procedures But enabled effective monitoring and analysis of the data handled, but identified certain existing business procedures as complex and sometimes contradictory, and has prompted a comprehensive review of what had for years been standard practice.

Focus soon shifted from the implementation of the new system to two elements considered critical to its long-term success: ongoing development and maintenance. As stated in the seventh progress report of the Secretary-General on the large scale information system, in the past, inadequate resources were devoted to the development and maintenance of the UN's information systems. It is important, noted the report, that a careful maintenance plan be established so that the software and its various elements do not become obsolete, but can evolve along with the needs of the Organization.

While IMIS is probably one of the lesser-known acronyms in UN, the Organization's extended use of modern technology was evident in the rapid increase in the number of personal computers used, which were inter-connected through networks. In New York alone, from just 200 connections in 1993 to 5,000 in 1995, the UN's local area networks (LANs) were the webs that linked individual personal computers at a given site to each other. Over a wide area network, or WAN, the local clusters of computer terminals at each UN mission, while independent, will eventually be connected to one another, creating an organization-wide link.

Thus in the UN Nairobi, the large scale information system changed the way the organization was structured in regard to distribution of power. Fig 4.0 shows the historical time line of the different phases from the implementation of the large scale information system through its review and finally the recommendation for another large scale information system.

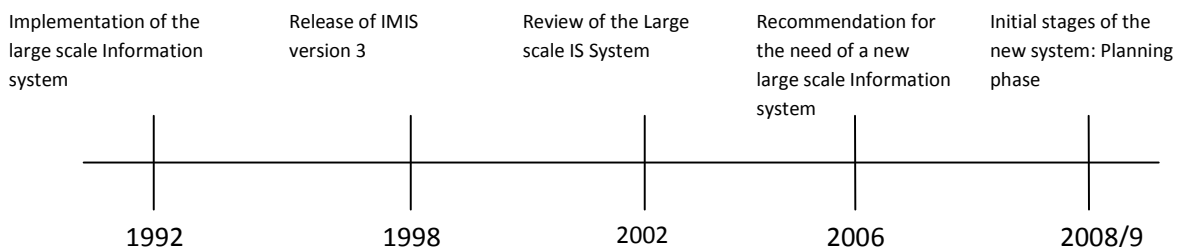| Implementation of the large scale Information system	Release of IMIS version 3	Review of the Large scale IS System	Recommendation for the need of a new large scale Information system	Initial stages of the new system: Planning phase
1992	1998	2002	2006	2008/9

Figure 4 Time line of the case

Evolution of the Components of Deep Structures at UNON

The interviews conducted in regard to the evolution of the components of deep structure at UNON, brought about the following findings;

a)   Core Beliefs and Values

These relate to the organization, its employees and its environment. The core beliefs and values of an organization are those beliefs and values we hold which form the foundation on which we perform work and conduct ourselves. In our case, in 1991 going backwards, before implementation of the large scale information system, UN employees had weak core beliefs and values since the systems in place then were almost manual and fully paper based. This made the working environment unpleasant and hard.

In 1992, after the implementation of the large scale information system, the employees were skeptical and in doubt since they did not know the outcome and changes that the new system would bring. But with the release of another version of the new large scale information system in the year 1998, the core beliefs and values were growing stronger with the hope that positively, drastic change would occur and have new ways in work performance. In the review stage in 2002, of the large scale information system, the system was better than the paper based system but much had not been achieved in the hope of the large scale information system meeting all the user expectations. This led to more skepticism about the system thus a recommendation for another large scale information system was done in the year 2006, with users hoping that once implemented, all the user requirements will be met.

b)   Distribution of Power

In the interviews conducted there was concentration of power on the highest authority. The Secretary General had most of the powers since there were no proper organization structures for UNON, especially before the implementation of the large scale information system. With the implementation of the large

scale information system in 1992, the employees hoped that power would be more decentralized to other senior and middle level managers. There was the establishment of the ICT section in UNON which led to the decentralization of power and managerial functions from UN Headquarters in Newyork. The establishment of ICT Section was further complimented by the establishment of IT departments each with its departmental head. This was a clear indication of changes in the decentralization of power which led to UNON wide changes. After the release of a new version of the large scale information system in 1998, changes decentralization of power was experienced but not as anticipated by the employees. This decentralization of power was through the creation of regional offices that had the powers to make own decisions but still tied to the policies and procedures of the UN Secretariat .However, there was rapid increase in the number of UN organizations and duty stations which naturally led the need for further decentralization of power which was only realized with the review of the large scale information system in the year 2002.

The recommendation of the need for a new large scale information system as required should lead to a further decentralization of power due to the expected growth of the UN in terms of the number of employees and physical locations.

c) Services, Technology and Political Time

The paper based systems had a lot of problems since rendering of services was a difficult task for the employees. An example here was the processing of payroll which was a monthly nightmare. Technologically, the organization was behind and there was need for change. In that political time, changes in the way things were done was at a snail pace since most of the processes were manual.

With the implementation of the large scale information system, there was expected high task interdependence which was deemed to change work tasks and services. Release of a newer version of the large scale information system in 2002 increased more hope of better services and further adoption of

latest technology. This however was slowed down due to the bureaucratic nature of the organization due to long processes and procedures in place and higher authority that had to be consulted in the UN Secretariat for any minor or major change in the organization to be implemented. In 2006,due to changes of top managerial staff especially in the IT section and the subsequent creation of IT offices regionally, there was the recommendation of a new large scale information system so as to offer better services and to be able to adopt new technology as it emerges. The timing was correct and changes in terms of another new large scale information system were more successful and are ongoing.

d) Organizational Arrangements

The organization structure before the implementation of the large scale information system was not clear and was very confusing to the employees at that time. In 1998, after the implementation of the large scale information system, some order began to emerge in term of the organizational arrangements. Bureaucratic arrangements reduced but changes were still slow.

In 2002 and 2006, a review and recommendation of the large scale information system was done to replace it with another large scale information system that would revolutionalise the organizational arrangements within changes in political time. Thus organizational arrangements changed over time from vertical arrangement which was top down approach to creation of horizontal type of organizational arrangement through the creation of each regional office with its own regional head and some percentage of independent decision making capacity. These changes were not as fast as expected.

e) Control systems

 Control systems were informal and were based on confidence and influence. This made the working environment difficult for management who had to trust what was done by the staff. With the implementation of a large scale information system in 1992, formal information technology supported control systems were slowly established to the delight of management staff. With the release of a newer

version of the large scale information system, the control systems were slowly taking shape, slower than the demands or expectations. In 2006, after the review of the existing system, a new large scale information system was recommended which was deemed to bring in the expected comprehensive changes in control system.

4.3 Discussion

In this section we present the results of our findings of the case. It is revolves around the concepts of punctuated equilibrium theory. Initially we will discuss the deep structure of the organization before the implementation of the large scale information system. This is will be followed by the description of the factors and mechanisms of change related to the implementation of the large scale information system. This process is depicted in Figure 5.
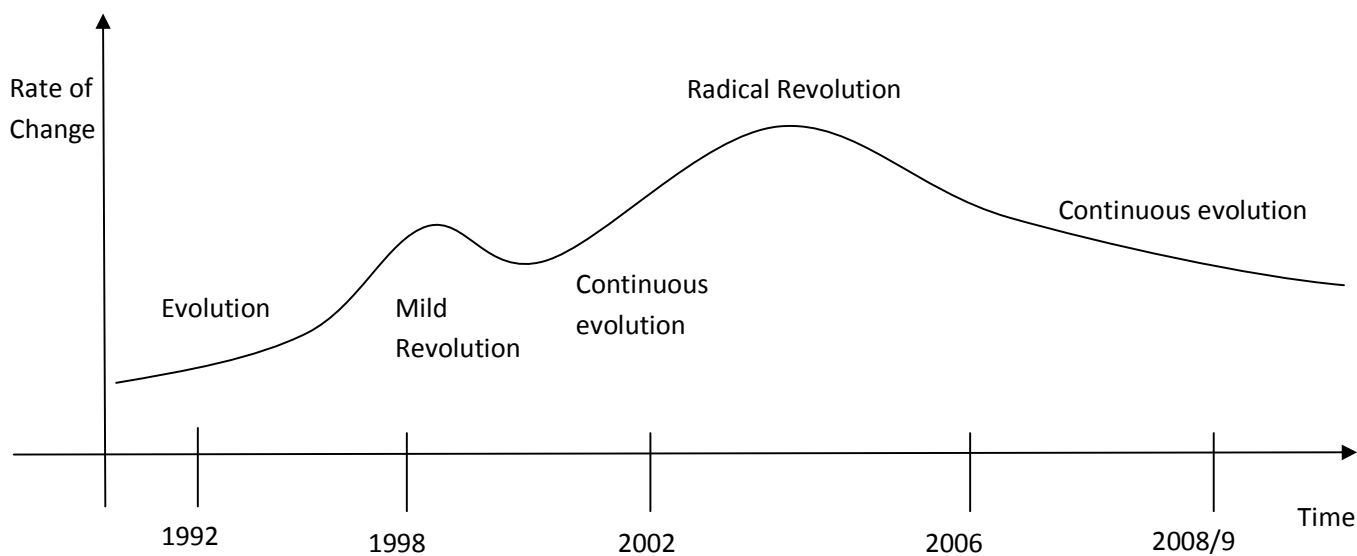

Figure 5 Organizational evolutionary changes over time

The Fig 5 above show s a graphical representation of the rate of change in terms of the organization evolution, mild revolution and radical revolution against time which is in years. In the year 1992, when the large scale information system was implemented, there was evolution of the organization which meant

mild changes. These changes were characterized by for example, a new system to perform daily tasks that was more efficient than what was there before. In 1998, there was mild revolution which meant significant changes in the organization's deep structures. This lead the first peak in the graph depicting the mild revolution which was caused by release of a second version of the large scale information system, IMIS By this time, changes in organizational structure, decentralization of power better services where gradually changing hence the continuous evolution depicted in the graph.

Increasing user requirements, expansion of the UNON organization, employment of more employees and failure of IMIS to match up with these demands led to the second peak shown as radical revolution on the graph. This meant there were radical changes experienced by the organization brought about by both internal and external factors. Some of the internal factors creation of regional offices and subsequent establishment devolution of power and authority while the external factors included rapid changes in technology, and increased demand for better services from the clients. In 2006, 2008 and 2009 there was continuous evolution brought about by the recommendation for a new large scale information system which was agreed upon by the UN Secretariat. The new system in the last two years has been under the planning phase. Thus the graph shows the changes that have led to the evolution of the UNON organization in terms of its deep structures caused by internal and external factors, over a long period of time. The following sections on the deep structure before the implementation of the system, post implementation of the large scale information system further explain the changes in the organization's deep structures and why these changes occurred.

4.3.1   The deep structure before the implementation of the system

Before the implementation of the large scale information system, the core values and beliefs of the organization were doubtful. This resulted due to the existing systems that the users were using before the new system was implemented. Services, technology and political time were characterized as centralized.

They were centralized because major decisions and resources were made at the Secretariat level, the organizational structure was vertical since it was organized hierarchically with the secretary general being the highest authority based in UN Headquarters in New York.

The distribution of power was concentrated in the Secretariat level, more specifically the Secretary General who could formulate and execute their own processes and procedures. Last but not least, the control systems were manual which meant output was not linked to input so the outcomes could not be associated with operations, resources and costs. The informality of this kind of system led to loose controls thus corruption and lack of administrative efficiency. Implementation of IMIS was expected to change most of the issues discussed above and have more effective and accurate control systems.

4.3.2   Post Implementation of the Large Scale Information System

According to Silva and Hirschheim (2002), punctuated equilibrium theory proposes that an organization will remain static for long periods of time which are punctuated by revolutionary periods. Gersick (1999) states that there are two source of disruption which provokes revolutionary changes the first one being internal disturbances and the second being environmental changes or variations. These disturbances threaten the organization's ability to obtain resources from its environment thus an organization need to rearrange its deep structures so as to fit the new environment.

In our case we found that after the implementation of the large scale information system, some of the factors that led to under performance of the new system were changes in the governing of the organization, lack of top level support, insufficient user training, minimal resources and increased number of duties stations. Resources to support the new systems were minimal in terms of well trained staff, interconnectivity of duty stations and follow up after the implementation. Initially, the system was able to

meet the user expectations but with the revolutionary periods of the organization, more and more user requirements increased and the system in place could not handle.

The need to integrate other crucial systems that were being developed with emergence in new technology also contributed to the failure of the large scale information system. This was so because, the existing system, IMIS could not be integrated with other systems thus led to a need for a new system. Thus IMIS has not fully met the user's expectations and has been over taken by technology without really realizing its full potential or capacity. The recommendation of a new system by the UN Secretariat and the further advancement into phase one, the planning phase, replace IMIS is another indication that it failed to meet the required user needs. The organizations deep structures demonstrate the failure of the system over periods of time since pre-implementation up the time of planning phase of system to replace IMIS.

4.3.3 Performance of Integrated Management Information System

The low performance of IMIS is pegged on many different combined factors according to our research findings. Through the evolutionary perspective using Silva and Hirschheim model (2002), the organization's deep structures present the major factors that affected the low performance of IMIS. The rapid expansion of the UN as a whole and increased number of employees meant more requirements on the system. The system was unable to meet these requirements since there was no future projection of these changes when the system was being implemented.

The failure of IMIS to integrate with other existing systems that were in use or which were introduced for further functionality also contributed to its low performance. Our research further showed that the institutionalization of IMIS required profound modifications in the organization's regulations and statuses, specifically on those that concerned the Information System function and the role of IS professionals which were not laid down thus contributing to the low performance of the large scale information system.

The core beliefs and values of the organization also led to the low performance of IMIS since the employees were not well prepared in term of training, structural changes and other effects that would take place with its implementation. In conclusion, IMIS expectations were high but its performance degraded over time due to various different factors explained above which resulted in its low performance.

4.3.4 Evaluation of the punctuated equilibrium model

The punctuated equilibrium model, through its components of deep structures has been able to clearly evaluate changes in an organization over a long period of time, specifically the UN since 1998 up to 2006 which was the period of our study. The model shows specific changes regarding, the revolution of organization structure, control systems, services offered and last but not least core beliefs and values.

In comparison with other models like business process reengineering, (Carter 2005) which looks at transforming an organization in ways that directly affect performance would not explain changes in our research since it was over along period of time. Silva and Hirschheim (2007) punctuated equilibrium model suited our research because it explains changes in organization's deep structures over a long period of time. The other model was Heek's ITPOSMO Model, (Heeks 2002) which argues that the success or failure of an information system is dependent on the degree of mismatch between the conceptions of that reform and the realities into which it is introduced. This model would also not explain our study since our case involved changes not only in the system view but also organizational wise in terms of establishment of new offices, establishment of more processes and procedures, increase in duty stations and employment of new employees with diverse cultures and backgrounds.

The result concluded from this research validates the Silva and Hirschheim (2002) punctuated equilibrium model since it was able to explain an organization's deep structures over time. These changes were in terms of decentralization of power, organizational hierarchy, changes in services and technology and more

so the factors that led to evolution and revolution in these deep structures reflecting to periodic changes of the organization as a whole.

5 CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The objectives of our research were to study the deep structures of an organization and its relationship with large scale information systems in relation to Silva and Hirschheim (2002) Punctuated equilibrium model and to understand why the large scale information system has not lived up to its expectation from long term historical perspective. We clearly defined the methods to be use in data collection, data analysis and interpretation so as to meet our objectives. A historical analysis of the organization was done using the punctuated equilibrium model framework which included the deep structures rooted in an organization. A historical time line was drawn from the analysis of the data so as to give a clear understanding of the specific periods of change.

5.2 Conclusion

This research was carried out to with the following objectives which were firstly to study the deep structures and its relationship with ERP system development in relation to Silva and Hirschheim (2002) Punctuated equilibrium model and to understand why the ERP system has not lived up to its expectation from long term historical perspective. From our findings we note that changes in an organization are affected by its deep structures over long periods of time. These deep structures may cause evolution of the organization which means mild changes or revolution of the organization which is radical changes with each change being brought about by varying aspects of the deep structures.

Our research displayed two major revolutions which were the two peaks in Fig 5 and slight evolutions. These revolutions were brought about by changes in technology and rapid expansion of UNON and its regional offices respectively which meant a more sophisticated system to deal with increase user demands

was required and consequently recommended. These findings could not have been explained by other frameworks hence Silva and Hirschheim model was a worthwhile framework as it was able to clearly demonstrate the evolutions and revolutions over time of the deep structures and other factors affecting the changes that occurred in the organization.

Other findings were that the implementation of the large scale information system challenged the organization's deep structures and it meant dealing with bureaucracies that were there for a long time. Thus implementation efforts should consider on how to deal with these deep structures of an organization. What we learn from this case study is that for a large scale information system to be successful, it requires more than simple acceptance from managers. It requires a change in the organization's deep structures which involve core values and beliefs, service, technology and political time, distribution of power, organization structure and nature, type and pervasiveness of control systems. Silva and Hirschheim model allows us to understand why it is difficult for a large scale system to be successful due to evolutionary changes in an organization's deep structures.

5.3 Recommendation

Recommendations for the United Nations in regards to this research are that the overall performance of an organization should be looked at from a holistic view. This means all factors like changes organization's deep structures should be reviewed regularly so as to know the direction of change over periods of time. UNON on the other hand in review organizational changes specifically in regard of the large scale information system performance, checks should be put in place to synchronize the changes in organization's deep structures over time with that of system performance an example being the large scale information system.

Other recommendations are that the people element and training aspect of large scale information system is one of the most important factors and organizations should avoid insisting on assigning a fixed cost or percentage to the training effort. Change management is starting at the project phase and continuing throughout the entire life cycle. Enterprise wide culture and structure change which include people, organization and culture change should be managed. Planning a large scale information system such as an ERP project should not be taken lightly or with little forethought. Planning should be closely identified with maintaining scope during an implementation.

5.4   Limitations of the Study

The research presented in this thesis had some limitations that are mentioned hereafter.

a) Number of interviews

For the case study interviews were held with employees. One of these interviews was less useful because the interviewee was not eager to tell anything about the organizational changes that have occurred, but the remaining interviews provided many new insights and thoughts about changes in an organization's deep structures over some period of time. Due to limitations of time and resources, the study had to be restricted.

b) Interviewees from Nairobi offices only

All the interviewees were from organizations in the Nairobi offices only. Therefore the conclusions in this research report mainly originated from these offices perspective and could present a somewhat one-sided picture of the reality. To gain a more balanced view on organization's evolutionary change, employees from other offices and different levels have to be interviewed as well.

c) People aspect not included

When looking at the evolutionary change of an organization, the aspect of human behavior could also be an important factor. This aspect was however not included in this research as it did not fit the scope of the study.

5.5   Suggestions for Further Research

This research confirmed that a lot of interest exists for evolutionary changes in an organization over a long period of time. Not all aspects of this phenomenon have been investigated and therefore recommendations for further research are mentioned.

a) Compare other companies that have implemented large scale information systems.

In future research, to make results more suitable, other organizations like the private sector, governments could be involved in the research where people from different management levels should be interviewed.

b) Differences between organizations that fully utilize these large scale information systems and those that use them rarely but have implemented them.

Revealing differences that exist between total reliance on large scale information systems and those that use them partly could be another interesting topic for further research. What impact does the level of utilization of large scale information system have on evolutionary changes in an organization's deep structures'?'

c) People or employees behavior versus evolutionary changes in deep structures

Another Recommendation would be to involve some social sciences in the research. This should focus on the behavior of employees within an organization when evolutionary changes in deep structures occur.

How does the behavior of employees change when they understand on the changes that will affect them when changes in the organization's deep structures occur?

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Appendix A:

Interview Guide:

General Information:

Organization Information:

    Company:

    Location:

    Number of employees:

    Project start date:

    Project end date:

Interviewee information:

    Name:

    Department:

    Title:

    How long have you been with company?

Implementation Information:

1) What infrastructures did the organization have before implementation?

2) How was computer and IT culture before implementation?

3) How did you attribute management support to the implementation of the ERP?

4) How was the organization ready for changes?

5) How was the training for the staff?

6) How was the planning for the project?

7) How did the implementation of the ERP change the performance of the organization in comparison with the previous systems?

8) Did the ERP meet the user requirements?

9) What were the challenges facing the ERP system?

10) What were the weaknesses of the ERP system?

11) In regard to the organizations deep structures, based on the punctuated equilibrium model with emphasis to changes over time, how did the following factors affect the organization's evolution/revolution?

a) Core beliefs and values?

b) Services, technology and political time?

c) Distribution of power?

d) Organization structure?

e) The nature, type and pervasiveness of control systems?

Appendix B:

List of Interviewees

Title	Position
1) Senior Administrative Assistant	General Staff
2) IMIS Support Assistant	Professional Staff
3) Chief Resources Management	Managerial staff
4) Projects Coordinator	Professional Staff
5) Application Developer	General Staff
6) Chief Client Services	Managerial staff
7) Help Desk Administrator	General Staff