WORKFLOW PROCESSES IN THE FINANCIAL AID OFFICE: NORTHWEST UNIVERSITY, MAFIKENG

Itumeleng Mokgabudi

Student number: 16872622

A Mini-dissertation submitted in *partial* fulfillment of the requirements for the degree *Masters of Business Administration* at the Mafikeng Campus of the North-West University

Supervisor: Prof Sam Lubbe

November 2013

Acknowledgements

Many hours of hard work and patience contributed by different people made the research to be a success. Therefore, I would like to thank the following for their contribution to the successful completion of this dissertation:

- Professor Sam Lubbe for his tireless effort, unfailing supervision, guidance and dedication throughout the research project.

- The invaluable assistance from a mutual friend in gathering the literature utilised in the research, motivation, encouragement, and always believing in me. Thanks a million.

- Mr. Thabang Matabane, Bursary Officer: North-West University Mafikeng campus, for his assistance and willingness with the available information to complete the research.

- Special thanks should go to the finance team, North-West University for their willingness and support in allowing the research to be undertaken at their department.

- My mother, Amelia Seodi Mokgabudi for always believing in me and giving me her unconditional love and support. Thank you, Mom I love you for being the best mother ever.

- My siblings, Lebogang, Letlhogonolo and Keabetswe for having faith in me, their words of encouragement and motivation.

- Thank you to Mr.Etienne Mostert, Director of Finance North-West Universisty, Mafikeng campus and Ms.Bogadi Sito Financial Aid office manager for authorising and allowing me to conduct my research on the workflow processes in the financial aid office in the university.

Abstract

With the education industry becoming more competitive, tertiary institutes resort to workflow processes in order to review and enhance the staff performance constantly (Manisha, 2004). The study investigates the current workflow processes in the North-West University finance department as well as how this department interacts to make the process run smoothly in order to ensure the success of the process in line with the organisation's goals and objectives. The study determined whether there is a communication or collaboration problem in the North-West University finance department and identified factors that influence motivation and how important motivation is to the sustainability of workflow management systems. Finally, questions to the organisation's workflow processes were also examined. A variety of research methods such as qualitative and quantitative were used. The research methods looked at instrumentation, research type, population, sampling method, and data gathering method from a theoretical perspective. A questionnaire was developed and used to gather primary data based on demographics, e.g. age, gender, years of service in the department, and position. Other related questions were used to further extract information or data from the sample population. Results of the study indicated that all the departments in the workflow process need to be made aware of and understand the workflow of other departments in order to facilitate the smooth running of processes and thereby positively contributing to the final goal, which is the bottom line.

Table of Contents

List of Tables

List of Figures

CHAPTER ONE

OVERVIEW OF THE STUDY

1.1 Introduction

The North West University Mafikeng Campus Financial Aid Office directly operates under the finance department in the campus. The line managers of the financial aid office report directly to the financial director like all other finance sections. Each section within the department has its own processes, which in turn has to link all financial data in one software program in order to achieve a complete workflow process for financial reports.

This study is about how the workflow process in the Financial Aid Office (FAO) of the university is addressed. The researcher considered the process of workflow from the application of financial assistance of both prospective undergraduate and postgraduate students at the university. It also looked at how student data is captured on the system, how effective and reliable data is retrieved upon approval of bursaries and loans, payment plans and finally the financial report. The FAO has three different systems used by the bursary officers. The two systems are SBL (Students Bursary Loan) and Oracle system which is used by all finance departments. SBL is used for capturing students' information and executing payments where Oracle is used by all financial accountants for financial reporting purposes.

This chapter covers the background to the problem statement, the problem statement, objectives of the study, the research design and the layout of the study. In conclusion, the researcher will summarise the problem statement to the study and the value it will have for the institution in question.

1.2 Background to the Problem Statement

According to the NWU FAO Quality Manual compiled September 2013, the purpose and role of the Financial Aid Office is to provide effective and efficient services related to providing financial support services to students, staff, parents, donors and any other stakeholders. All services provided to internal and external clients are aimed at supporting the vision and mission of the NWU and are driven by the needs of the clients. Executive management spend vast amount of time in planning, developing, joining forces and finally documenting effective workflow processes.

The main limiting factor affecting workflow process of the financial aid office is the system adopted by the sub section. According to the Quality manual (2013), FAO uses a system called Student Bursaries and Loans (SBL), while other sub-sections in the finance department that is, the accounts payable and student ledger office, use a software program called Oracle. Oracle is a system used by the accountants and the support staff dealing with financial budgets of the whole Mafikeng Campus to process and access all the faculties' financial records and for all faculty management to view their financial information pertaining to the institution.

According to NWU FAO, Quality manual compiled in September 2013, the functional reporting lines are as follows:

a. The manager FAO Mafikeng campus reports to the Director Finance, who in turn reports to the Rector with a functional responsibility to the executive director finance at the Institutional office.
b. Four bursary officers report to the manager FAO. The main specific objective of the FAO is to maintain students aids records/files, manage allocation of bursaries and loans, process bursary/loan application forms, maintain up-to-date knowledge of relevant regulations pertaining to loans and bursaries and to process refunds to eligible students and sponsors where applicable.

The NWU FAO, Quality Manual complied in September 2013 further states the roles and responsibilities from the manager's side to the bursary officer. The FAO manager

manages the unit, allocates responsibilities to staff, contributes to formulation of campus and institutional policies, determines budget for the campus bursaries, promotes image of the university, develops annual and mid-term plans and strategies, communicates with internal and external stakeholders allocates and oversees registration responsibilities, as well as training new staff members on the bursary system.

The bursary officer's role and responsibilities is to provide data reports, assist and facilitate meeting with various sponsors, send statements and results to sponsors, attend sponsors enquiries, receive bursary/loan application, process all applications according to policies, claims funds from various funders, manage allocate of allowances to students according to policies and attending students enquiries. Junior bursary officers issue application forms, advertise available bursaries, receive and verify application information, provide solutions to queries, attend to all enquiries and assist bursary office when required

According to NWU Quality Manual (2013), the overarching steering process of the FAO support unit is divided into primary and secondary processes. Primary processes are processes relating to the main tasks of the FAO. Secondary processes are processes relating to the actual implementation of the primary processes. Primary processes are referred to as the provision of financial support service to students who would not afford to study at the university.

Recognition is given for academic merit to prospective students across all faculties. Administration of various bursaries and loans which are funded by the North West University, Government, private sponsors and National student Financial Aid Scheme is administered by the FAO. In discharging these bursaries, FAO adheres to strict rules, processes and procedures as well as applicable criteria; only students who meet the required academic merit and financial need are considered. Criteria will differ from one bursary to another, reports are written thrice in a year for institutional committee and twice in a year for external sponsors.

Secondary processes flow from primary processes and describe their actual implementation. The execution of primary processes leads to accomplishing the vision and mission of the FAO unit and details the task and objectives that need to be carried out.

The workflow process in the FAO is developed and implemented by management without proper walkthrough or consultation with the bursary officers. The challenges they encounter following their roles and responsibilities and the systems to be like and how information should be put into the system to achieve a successful result. The problem statement highlights the challenges that the FAO face in following the designed process.

1.3 Problem Statement

According to Rasmussen and Brown (2012), multiple layers of management, centralised and expensive systems as well as accumulation of control procedures and regulations remain to be formidable obstacles in ensuring the efficiency, economy and productivity of public sector organisations. Likewise, the traditional working practices of the NWU FAO have their own limitations when coming to the system adapted by the unit and human processes.

The focus of the study was on the Financial Aid Office with a total amount of R128, 668.184 granted as bursaries and loans to prospective students in the 2013 academic year (SBL, R220 bursary and Loans annual report). The FAO is in use of the Student Bursary Loan system on full time basis and this system is not properly linked with Oracle finance program. The problem faced by the finance department is called update challenges. The challenges lead to lost updates, inconsistent retrievals and uncommitted transactions. When pulling financial data, it is assumed that bursary officer captures all the student information required by the SBL system, the total transactions from SBL system even after being committed will then differ with the Oracle Finance system.

The accuracy of the transactions losses update along the way. Inconsistent retrievals happen when a transaction summarizes a range of results while some are being changed. The system reads some data before they are changed or after they have been changed. Uncommitted transaction happens when isolation property of transactions are violated. This happens when one transaction is rolled back while the next transaction has already read the uncommitted earlier transaction. The two systems are not linked leading to financial information ending up being unreliable.

The problem does not only lie with the inaccuracy of the financial information from the two systems, but also with isolation of responsibilities and accessibility of the system. By this, the researcher has identified that the bursary officer using the SBL can use the same user code with another bursary officer for releasing payments on the system. The user codes are not personalised as per bursary officer resulting in one officer being able to process payments within another officer's batch. During the process, the list of students on another officer's batch get pulled through for payment process with the other officer's batch without the application process information being completed.

The finance department does not have a separate bank account to be utilised by the external bursaries and loans to deposit money for different bursary earners. This leads to unidentified deposits in the financial records of the NWU bank account and failure to emphasize furnishing of detailed students' information from the sponsors.

The problem not only lies with FAO bursary officers' roles and responsibilities as designed by management, but also with the system processes and the sequence of operations. The method of solving the problem at hand could be that in future, management, bursary officers and accountants from the finance department should all be involved in the design of the FAO workflow processes. This is because bursary officers are more likely to be dealing with the administrative side of bursaries and loans and the accountants are more into financial services of the whole department and have to ensure the accuracy of the financial data. The purpose of the study is to find out how

to involve management, the FAO and accountants in the improvement of workflow process within the FAO unit. The study also aims at determining whether all relevant individuals in the department are conversant with the processes in order to achieve the organisation's objective.

1.4 Objectives of the Study

The main focus of the study is to obtain guiding principles that will help the Financial Aid office workflow process to be successful.

The objectives are as follows:

- To bring about the ideas of improving the two systems to be linked in order to produce accurate system by working with the IT department.
- To come up with ways of involving the bursary officers, management and finance department to have one common system that will be able to pull out reliable and accurate reports regarding the Financial Aid Office.
- To bring about the workflow process that will be able to separate or segregate duties within the FAO unit.

1.5 Research Design

In this study, a quantitative research approach was used. Quantitative research has two strategies of enquiry, the experimental design and non-experimental designs, such as survey (Creswell 2009). Creswell further explains that survey research provides a numeric description of the trends, attitudes or opinion of a population by studying a sample of the population. All the NWU, FAO in the Mafikeng campus served as the population of the study. Census counts were necessary to adjust the sample to be representative of a population by weighting them as it is common in opinion polls. Since the sample is measured, a descriptive study I enabled the researcher to measure if the workflow process in the FAO meets the objectives of the FAO unit.

For an accurate estimate of the relationship between variables, a descriptive study usually needs a sample of hundreds or even thousands of subjects; an experiment, especially a crossover, may need only tens of subjects (Hopkins 2008). The estimate of the relationship is less likely to be biased if you have a high participation rate in a sample selected randomly from a population. The descriptive study requires a larger number of subjects and experimental study needs a lesser number of subjects to find out the relationship among variables.

Hopkins (2008) continues to explain that when using quantitative study, the researcher can be able to measure the variables. The North West University finance department employees, that is, accountants, student ledger officers and bursary officers served as the population of the study. Census count was used as the finance department is not a large section. This afforded the study to give every finance employee and equal opportunity of being selected to participate in the study.

The target population was the North West University, Mafikeng campus, and finance staff. The population size is 24 based on 2013 head count. The whole population was therefore covered as it was 100 percent. The sample included all ages from 21-65. Qualification of the respondent's ranged from diploma level to post graduate level. The sample covered the race, age and gender. A questionnaire was used in the study to gather data.

1.6 Plan of the Study

Chapter 1: In this chapter, the general rationale of the study is discussed. The study includes the introduction, background to the problem statement, a framework of the problem statement as well as a clear objective of the study which is the workflow process of the NWU FAO unit and the research design.

Chapter 2: It presents literature review with respect to the description of theories and findings of previous researchers concerning problems identified in this study. Also research questions addressed by those affected by the problem.

Chapter 3: It covers the research methodology utilised in the study as well as the research design discussed in detail.

Chapter 4: It covers the research results and analysis. All data collected are analysed, summarised and assumptions and conclusion will be drawn up. The research report tries to achieve the main objectives of the study by combining the findings and research framework done in the literature study.

Chapter 5: It is the conclusion of the study. In this chapter a summary is given of the road map followed of the study through to the problem statement, a summary of data collected, questionnaires completed and analysed as well as findings in the study and finally recommendations to the study.

1.7 Conclusion

In summary, this chapter gave an overview, a problem statement which is the most important part and a direction of the study. It reflected on workflow business processes in North West University, Mafikeng Campus and Financial Aid Office. The objectives of the study and research design are also important part of the study. The plan of the study was also discussed describing how the study is structured. The conclusion is at the end of the chapter and it has a link to the next chapter of the study.

The value of the study would be to improve the institution's workflow processes, be at a bringing more efficient and effective workflow processes, thereby also giving guides as to what the study should achieve. The other value of the chapter is the research design which explains the type of research taken and the methodology undertaken in the study.

The workflow process concerning the two software systems, that is SBL and Oracle are going to be looked into. The responsibilities of bursary officers as well as management intervention will also be investigated. Chapter 2 will have an introduction of the chapter,

followed by literature review. Literature reviews will contains subheading that will explain the crucial aspect of the study. Lastly the research questions will be obtained with conclusion of the chapter.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Workflow can be defined as a structure of connected steps, a depiction of a sequence of operations, declared as a work of a person, a group of people, or one or more simple or complex mechanisms (Mentzas et al., 2001). Furthermore, The Encarta Dictionary defines workflow as the growth or rate of development done by a business, department or persons.

Keywords utilised to obtain the research articles are definitions, workflow, processes, models, finances, systems, services, management, skills, environment, electronic sales, advisor, flexibility, business, modelling, policies and tasks. Search engines utilised to obtain this information are Duckduckgo and Google Scholar for articles while electronic databases such as Science Direct and EBSCO were also consulted. The chapter deals with the literature review. Articles have been collected in order to discuss different workflow processes, their advantages and disadvantages, similarities and difference as well as advice to people as to which techniques to adopt.

2.2 Classification of Work Flow

There are different classifications of Workflow Management Systems (WMS) where managers have to identify which techniques to adopt to match different processes (Mentzas et al., 2001). Disjointed communications between departments being viewed and approaches such as Translational Research support an integrated environment (Rasmussen and Brown, 2012). Consideration should be given for a complicated bioinformatics analysis. Bioinformaticians have biological data available and these come in many types. These are cons even per with different classes of analysis (Zhen et al., 2009b).

In the insurance industry systems are typically inflexible in supporting new product lines or expanding business into new locations and are able to assist in increasing policy volumes (Kannan and Thangavel, 2007).The efficient implementation of workflow techniques and workflow management is directly influenced by the performance analysis of workflow models.

Deelman, Gannon, Shields and Taylor (2009) note that workflow systems can be classified into two broad categories such as task-based or service-based. Task-based systems such as Pegasus focuses on the mapping and execution of capabilities and it leaves the higher-level composition tasks to other tools, even employing the use of semantics service based.

Workflow Management Systems (WFMSs) development is driven by the observation that workflow management can increase effectiveness and efficiency of many administrative processes both in commercial and public environments (Grefen and de Vries, 1998).The development of new workflow management systems is influenced by the increase of both functional and technical requirements. There are various WMS developed for every paradigms, the lack of theoretic foundation and model verification block workflow technique research application (Vivas et al., 2010).Process logic, timing constraint logic, resource dependency logic and information dependency logic are aspects to be carried out to verify confirmation analysis (Zhen et al., 2009b).

A Petri Net is a mathematical modelling tool which is a formal technique to be used for structural modelling and a range of analyses. The dwelling time in a model should therefore satisfy deadline requirement (Liu and Wall, 2006). A heterogeneous workflow consists of a set of processes that can in the process of one type of task. Each task of the workflow process is of a certain type and is subject to failures. Each processor can be adapted to process one type of task. The mapping of one-to-one is required and assigned to a similar task. The window constraint based failure model is adapted to a distributed system. Faults should take into account as the tasks to be done in the micro-factory are typed (Benoit et al., 2011).

Present workflow initiatives have embraced a Web service model (Buhler and Vidal, 2005). The policy-based authorisation model is proposed for workflow enabled processes. Vendors are proposed by researchers (Van Der Aalst et al., 2003) to facilitate the implementation of process model representations for workflow management (Zhen et al., 2009).

Complete process models are created to meet business requirements and are stored in a library. Dynamic business processes need to be supported by the development of an authorisation model (Zhen et al., 2009). The system development node of the process comprises an incorporation of activities where each activity can in turn be used as an instance of the component development process (Zhen et al; 2009).

Dynamic task permission policy modelling and enforcement in a business process environment is proposed to be sustained by a framework (Zhen et al., 2009). Collection of all related activity policies and coordination policies are the tasks supported from a workflow process model (Rinderle, Reichert and Dadam, 2004). The capability to dynamically adapt in-progress workflows (WF) is an essential requirement for any workflow management system (WMS) has been recognised by the WF community for a period time and different approaches in the area of adaptive workflows have been developed so far. WF instance changes can be classified according to different criteria and the central one distress the basic method used for automatic failure detection and for change realisation.

It is important to present work processes to be supported by the work process model. It has to be created to allow for an integration model. The implementation of such a model needs refinement of a model (Wang, Wang and Xu, 2005). Collaborative workflow creation incorporates cooperative and workflow model analysis. Collaborative workflow should assist a team leader to assess workflow models. The workflow analysis considers that the workflow model is constructed and is the result of the cooperation of partners (Held and Blochinger, 2009).

WMA assists leaders in collaborative design. Work flow languages do not have any module concept and activity is treated as black boxes. The workflow is locked, overall to allow that only the leader has access to it (Held and Blochinger, 2009). There is a flaw in workflow models as they lack semantics to represent specific activities. Business models are represented by data oriented techniques (ERD) and Petri-Nets (Weigand and Heuvel, 2002).

A change in a model can be costly and time consuming if done by hand because the domain analysis may have many entities and dependency relationships on different levels. Users are able to select dependencies and analyse the dependency relationships (Wang, Wang and Xu, 2005).

A B2B Reference Workflow Model (RWM) entails three interfaces such as Application Interface, Human Interface and B2B Interface. Workflow integration can be illustrated by using a purchase order through the example (Vivas et al., 2010).

In order to build a good model, time and knowledge is required, even though the principle is easy to grasp. Manually-constructed models steps in the process are often forgotten and hence simulation models are usually too optimistic and describe behaviour quite differently from reality (Wickboldt, et al., 2011).

During document configuration processes, capturing the component of a document and a process are associated. This is the basis for automatically creation of various versions and for a user at a certain set stage of the process (Wickboldt et al., 2004). BPR has become fashionable among large organisations due to its present solutions that improve customer service and retention. Few have focus on automatic generation of processes and rather focused on the automatic regeneration of process models. Similar models model in order to handle process calculation. Usually business processes are represented as workflow which is computerised generated models needed for completion of the process (Morena and Kearney, 2007).

2.3 Capabilities to Adopt Workflow

An analysis of the pros and cons is done in order to adopt communication-based or activity-based workflow representation techniques when using workflow systems in the management of a process (Mentza et al., 2001). Information Systems created to integrate research data cannot integrate a technique for new areas (Mentzas et al., 2001).

The advantages of ESP framework are that the approach is modularity, extensibility and adaptability. The basic workflow description is kept modest while variations to the basic process are described separately in a modular manner. One can add new ESP rules and corresponding base and meta workflows when a new situation arise thus giving extensibility. Minor changes may be made to ESP rules to adapt the workflow to certain situations and such small changes would be tough to make on a monolithic workflow. Finally, the simplicity of the approach helps in minimising errors while at the same time making it easier to describe difficult situations (Kumar and Wainer, 2005).

Qiu and Wang (2007) describe workflow as either static or dynamic. A static workflow has to be finished or aborted once it is initiated whereas a dynamic workflow can change during execution time. For organisations adopting workflow solutions processes should be static since (1) static processes can be applied in scale with minimal training on personnel and (2) dynamic behaviours of business processes make involved elements, including human, equipment, information and are problematic to handle since these elements are initially designed to deal with specified processes.

Organisations rarely change business processes that are established and workflow management solutions are designed to cope with static business processes in three steps: (1) defining a workflow template, (2) initiating a workflow instance from the template and (3) executing the instance till its completion (Qiu and Wang, 2007). These

solutions do not handle dynamic behaviours such as dynamic changes on running workflow instances.

The limitations of Workflow Management Solutions are that they support single predictable process but do not change complex processes present in organisations (Cheung et al., 2001). Ontology's supports writing in providing a vocabulary with meaning and in turn avoids misunderstanding. Communication between agents is supported whether it is human or software agents. This is useful especially in situations where experts need to work together (Wang, Wang and Xu, 2005). Examples of different aspects of a domain need to be related to provide flexible support in a non-trivial business situation. It is difficult to capture different that considers their relationships (Cheung et al., 2001).

2.4 Workflow and Policies

Information technology and the distribution of information should be retained to create a competitive advantage by improving internal processes, customer services, and products to create a moral working environment for the employees (Fourie and Schilawa, 2004). A workflow can be defined as a composite set of tasks comprised of coordinated computer-based and human activities. In fact, Tanna, Gupta, Rao and Upadhyaya (2005) note that workflow can be defined as follows:

1. An integration of software tools for automating and improving business processes.
2. A process consisting of a number of individual tasks that needs to be coordinated to achieve a particular business goal.

Heeks (2002) states that the purpose of witness in paper-based workflow is to provide non repudiation support. In workflow, depending on the domain requirements, non-repudiation and witness may be performed by the SM or by a third party actor. Non-repudiation service is obtained by having the form signed with the private key of the SM or the third party actor.

Qiu and Wang (2007) argue that once a process change occurs, new workflow templates are defined and workflow instances are initiated accordingly. It is necessary to handle the previous workflow instances which are initiated from old workflow templates. Principally, there are four optional policies to follow:

1. Forward recovery: These old workflows are aborted and handled outside of the workflow management system.

2. Backward recovery: These old workflows are stopped and restarted according to the new workflow template.

3. Proceed: These old workflows proceed as if the change does not occur. New cases are executed based on the new template.

4. Transfer: These old workflows are transferred to the new workflow template and executed all over again.

Most workflow management systems such as IBM Domino, iPlanet, Fujisu iFlow, TeamCenter (a PDM system with built-in workflow management capability), and Epaf, are able to implement the first three policies in various degrees (Qiu and Wang, 2007).

2.5 Workflow and e-Science Needs

Wickboldt et al. (2011) note that a Workflow Management System (WMS) is defined as system that partly or fully automates the definition, creation, execution, and management of work procedures (workflows). Through the use of software that is able to interpret the workflow definition, interact with workflow participants and invoke the use of IT tools, scripts and applications, the majority of WMS's infrastructures are used for deploying and enacting workflow service. It has been pursuing the distributed computing paradigm, which is abstractly focusing on parallelisation, distribution and

sharing over distributed computing environments such as server–client, clustering, grid and P2P computing environments.

Wang, Wang and Xu (2005) argue that the data analysis protocol consisting of a sequence of pre-processing, analysis, simulation and post-processing steps is a typical workflow scenario in e-Science applications. The goal of e-Science workflow systems is to provide a specialised programming environment to simplify the programming effort required by scientists to orchestrate a computational science experiment.

The goal of e-Science workflow systems is to provide a specialised programming environment to streamline the programming effort required by scientists to orchestrate a computational science experiment. Deelman, Gannon, Shields and Taylor (2009) note that graphical renderings of workflow easier for small workflows with fewer than a few dozen tasks. E-Science workflows are complex and therefore most graphical tools allow some form of graphical nesting based on sub-workflow hierarchies. Another source of graphical complexity involves expressing for-each concurrency in a workflow. However, this problem can be addressed by providing specialised control primitives in the graphical vocabulary.

As e-Science applications have grown in complexity from simple batch executions of data analysis tasks, workflow has emerged as an imperative enabling technology. A host of tools supporting workflow design and enactment have been developed and are now in use in the scientific community (Deelman, Gannon, Shields and Taylor, 2009). In many cases these scientific workflow systems were developed in close collaboration with the scientists and resulting systems are well designed to handle the use-cases of that community. Because scientific research is so diverse in the method used from one discipline to another, the resulting collection of workflow tools demonstrate a wide variety of capabilities.

Mapping a distributed scientific workflow to a set of computational and data resources is a task that may be done prior to execution but it may be done on-the-fly at runtime. Deelman, Gannon, Shields and Taylor (2009) state that when one has good workflow

tools has enabled one to automate the process of building data and workflow provenance. Combined with good data catalogues and data management systems it is now possible to provide complete experimental workbenches for entire communities of scientific users. Data and workflows can be shared through community use and refinement, evolved to meet new challenges. Having data provenance allows a scientist to return to the point of creation of a data object to understand the workflow (Deelman, Gannon, Shields and Taylor, 2009)

Heeks (2002) argues that with a workflow system, different procedures are required to handle digital signature for different purposes. For example, signatures for authorisation purpose have to be checked against organisation structure. This is because organisation structures record the information as to which occurs has the right to do the authorisation. Handling the signatures without referring to the organisation structure may lead to inappropriate handling of the workflow process. Therefore, there is a need to integrate the digital signature processing scheme and the enterprise workflow model together (Heeks, 2002).

Qiu and Wang (2007) argue that in addition to handling changes on workflow instances from a single template this approach can also change individual workflow instances by informing the underlying workflow system their former and present workflow templates. Since dynamic workflow change management handles changing aspects workflow version management is necessary to track the change history of workflow templates and instances.

2.6 Levels and use of Workflow Support Systems

The conflict resolution principle which can be used for shared hybrid resources allows to solve conflict situations in real time without a backtrack mechanism. As a future work proposal, it will be interesting to study the possibility of introducing some fuzzy sets in the Petri net model in such a manner the natural flexibility of human behaviour will be

represented in an expressive way at the Workflow Management System level (Julia, Oliveira and Valette, 2003).

Kumar and Wainer (2005) argue that a meta workflow is a higher level control process that consists of five control commands being start, terminate, suspend, resume and wait and suspend. An ESP rule causes a meta workflow to run when an event occurs and a workflow case is in a certain state. This may cause a meta workflow to execute, perform control operations like suspending certain workflows and starting other workflows, etc. Thus, one makes a clear distinction between two types of workflows such as base workflows and meta workflows. The management of business processes and transactions in banking systems is a consistent activity. The volume and the criticality of protecting customer data pose a challenge to the analysis of these systems. This is because traditional database need synchronization of work, cooperation between concurrent workflows and non-serialisable access to shared resources. Also, the transactions are vastly voluminous than other traditional database applications (Tanna, Gupta, Rao and Upadhyaya, 2005).

Task-level workflow systems focus on the resource-level functionality and fault-tolerance; service-level systems generally provide interfaces to certain classes of services for management and composition (Deelman, Gannon, Shields and Taylor, 2009). Service availability forms part of the composition process since it represents the available tools that can be composed within a system.

The Open Source Software (OSS) phenomenon has revolutionised the way in which organisations and individuals create, distribute, acquire, using information systems, services and making it an important topic for information systems researchers. One should consider the YAWL system as an example of open-source workflow management system (Kumar and Wainer, 2005).

Two reasons for this choice are: 1) the YAWL system represents a state-of-the-art open-source workflow management system that is developed based on a solid grounding in research, 2) the system is supported by a wide and diversified user community that includes three distinct user cohorts such as student users, academic users and professional users. YAWL system is an OSS system that aims to address three different purposes: (i) to serve as a platform upon which researchers can prototype cutting-edge workflow technology; (ii) to educate students on business process modelling and automation; and (iii) to generate industry uptake (Kumar and Wainer, 2005).

Basu and Blanning (1999) argue that growing automation of business processes has led to the necessity for decision support tools that assist in the management of the complex workflows that are created due to the various activities in these processes. In recent years, there has been much interest, both within academic research circles and among business practitioners, in software systems for this purpose. In other words, the existence or nonexistence of a metapath in such a system may be helpful in determining whether and how the system can be used to link known source information to desired target.

Metagraphs can be used to integrate the different information types, stored data, decision models, and expert knowledge found in a DSS (Basu and Blanning, 1999). There appear to be substantial additional opportunities for research in WSS, for example, in the incorporation of intelligence into a workflow system. Although metagraphs have been applied in a preliminary way to analyse knowledge bases there is substantial room for additional work in this area, both inside and outside of the workflow context. Metagraphs may provide a useful foundation for WSS development and for the integration of WSS and DSS.

2.7 Models

The approach described in integrates standard object-oriented structure modelling using UML diagrams with Petri nets in order to model Workflow Process an extended Workflow Petri net model is defined. Such a model allows for the handling of critical resources which have to be used for specific activities in real time and in an extension of Workflow Nets is presented. This model is called Time Workflow Nets and associates time intervals with the transitions of the corresponding Petri net model. For example, a health care system is used to illustrate the approach where a nurse who takes care of two patients is represented by a single token in a shared place. In clock specifications are combined with the Petri net theory for the specification of temporal requirements in Business Processes. This new formalisation allows for some verification which depends on the construction of a new reachability graph (Julia, Oliveira and Valette, 2003).

Guerrero-García (2013) argues that In Software Engineering (SE), the evolutionary prototyping is a software development lifecycle (SDLC) model in which a software prototype is progressively created for supporting demonstration to customer and for elicitation of system requirements elaboration. The evolutionary prototyping model includes four main phases: (1) definition of the basic requirements, (2) creating the working prototype, (3) verification of the working prototype, and (4) improvement of the requirements elicited.

Although there is a large amount of workflow based on different paradigms, the lack of sever theoretic foundation and effective model verification and analysis has blocked workflow techniques' research and application. Petri nets can be utilised for structural modelling and a wide range of qualitative and quantitative analysis (Sheng et al., 2009).

Grefen and de Vries (1998) argue that requirements dictated by sophisticated workflow applications are receiving diverse and complex. Workflow management systems should support complex procedures regularly involving actors which may be geographically

distributed and workflow management systems should allow flexible task allocation to actors in the context of advanced organisation models.

Process-oriented field's architectures have been designed to deal with process management (Grefen and de Vries, 1998). An example is the field of process-cantered software engineering environments where workflow management focuses on improving general administrative processes, software process support focuses on models and technology to improve processes in complex software production in which an integrated software project support environment architecture has been designed that allows for sorting and enactment of project-specific software production process. Descriptions of the interfaces are useful in the first place to obtain interoperability between heterogeneous workflow management systems and are essential to the development of heterogeneous modular architectures support (Grefen and de Vries, 1998).

Workflow management involves process modelling, process reengineering, workflow implementation and automation. Rule or constraint-based workflow specification languages, workflow and data flow structure and typically specified by routing rules of constraints. Conditional, rule-based or parallel is encompassed in routing. Condition routing on the other hand encompasses task based data values (Mentzas et al., 2001).

The benefits of workflow process can be stipulated as follows; it provides a single computing framework allowing the planning, execution and monitoring of processes, it permits flexibility process modelling and planning so that process plans may be revised in the light of events and experiences gained through the process and it improves the quality of decision-making because of the effective management of information while its spreading to interested parties as it becomes available (Cheung et al., 2001).

2.8 Challenges of Workflow

There are various non-trivial interdependencies among altered kind of changes that exist which must be carefully understood before we come to a complete solution. For example, current adaptive WFMS do not allow propagating Work Flow type changes to individually modified WF instances. However, this is vital for the adequate support of long-running Workflows (Rinderle, Reichert and Dadam, 2004).

Qui and Wong (2007) argue that the present manufacturing industry is facing challenges to satisfy customers and compete in market. To stay competitive, manufacturing companies are adopting IT solutions to facilitate collaborations and improve their product development. Among these IT solutions, product data management (PDM) systems play an essential role by managing product data electronically. A tool to model execute and control business processes, a workflow management tool is a key part of a PDM system.

Julia, Oliveira and Valette (2003) note that the advantages of an approach are diverse and the fact to work with hybrid resources permits to represent in a realistic way human behaviour. The originality of the time constraint propagation mechanism comes from the idea of combining on a same Petri net model duration intervals which represent durations of activities in a Workflow Process and date intervals which represent the waiting times of the cases between activities.

Business Process Execution Language for Web Services (BPEL4WS) has emerged as a new standard for describing web services (Kumar and Wainer, 2005). PEL4WS provides a variety of constructs for describing a workflow, the complex coordination arrangements between various activities involved in it and also the flow of data between the activities. The present discussion of BPEL4WS is primarily limited to features that are relevant to support of exception handling and meta-level control. The advantages of the ESP framework are:

- performing various actions based on the state of the workflow; and

- The ability to exercise Meta control on the base workflows.

The strengths of BPEL4WS lie in formal notions of different types of handlers for events, compensation and faults. ESP does not make such a distinction and treats all handlers in the same way (Kumar and Wainer, 2005).

2.9 Problems

Process change occurs regularly in business environments due to two primary reasons: (1) at design time the specification of the workflow is not complete due to lack of knowledge and at run time errors happen (2) during executing of workflows, changes occur and cause various problems, such as breakdowns, reduced quality of services, and inconsistencies (Qui and Wang, 2007). Therefore, workflow management systems should handle these undesired results introduced by the dynamic aspects of workflows.

Rinderle, Reichert and Dadam 2004) argue that the following problems are in the context of dynamic changes and therefore provide a good basis for comparing the following approaches:

a. Changing the Past (CP). The CP problem corresponds to the rule of thumb not to change the past of an instance. Neglecting this rule may lead to inconsistent instance states or missing input data of subsequent activity executions.
b. Loop Tolerance (LT). The LT problem refers to an approaches ability to correctly and reasonably deal with changes on loop structures. In particular, approaches should not need less excluding instances from migrating to a new schema solely based on the fact that the respective changes concern loops.

c. Dangling States (DS). The DS problem arises in conjunction with approaches not distinguishing between activated and started activities as a consequence, very often such approaches such as loss of work.
d. Order Changing (OC). The OC problem refers to adapting instance markings when applying order changing operations like parallelisation, sequence, and swapping of activities.
e. Parallel Insertion (PI). As opposed to the PI problem arises when inserting a new parallel branch. Concerning Petri-Nets, for example, after such a change we may have to insert additional tokens to avoid deadlocks in the sequel.

Julia, Oliveira and Valette (2003) note that they already used UML notations for the specification of Workflow Processes but the notations have their limitations when they are used for specifying the real time characteristics of Workflow Management Systems. For example, activity diagrams do not represent real time constraints in a formal way and they do not show in an explicit resource allocation mechanisms. Late deliveries in an organisation are due to the problem of resource overload. Time management of Workflow Processes is crucial for improving the efficiency of Business Processes within an organisation.

2.10 Benefits

For various reasons the provision of a help desk or the availability of dedicated consultancy services would be out of reach as the YAW community could still be leveraged to enhance other facilitating conditions. There are various ways in which this could be achieved. For example, the host team of YAWL could outsource the maintenance and development of specific sections of the user manual to wider parts of the YAWL community. The community itself could also best to provide tutorials, illustrative videos and examples and to manage a user-based wiki around the product. Leveraging a com- munity to assist the wider management of university-led product development has been demonstrated to yield benefit (Recker and Rosa, 2011).

Guerrero-García (2013) notes that continuous feedback between the evolving designs representations on each design activity can benefit from information derived in the other steps. For example, user interface design benefits from task analysis, problems in the task analysis can in turn be revealed during user interface design and allowing benefit to be derived in both directions.

The taxonomy of these propagations is as model-to-model (M2M) transformations in the Human Computer Interaction (HCI). The evolutionary prototyping model allows us to create working software prototypes quickly, it may be applicable to projects where system requirements are not known in advance, new software needs to be created and developers are not confident enough in existing software development experience (Guerrero-García, 2013).

2.11 Frameworks and Workflow

The ESP framework involves the conceptions of workflows, events, states and meta activities. The ESP framework has two components: the workflow description part and the ESP rules (Kumar and Wainer, 2004). The description component is of the form is Base-workflow-id - workflow-definition. The description component describes a workflow activation rules refer to it by that name and there would be several base workflows.

Tanna, Gupta, Rao and Upadhyaya (2005) note that the threats along with the components of the architecture are then tied together in a framework model that may aid IT security managers of such systems to measure the security levels that are in place to protect them and monitor them regularly on a proactive basis. Finally, for the example system discussed in the paper, the step-wise computation of the VSCORE is also shown.

The fact that the VSCORE encompasses and quantifies all the possible threats with its impact value uses sensible and realistic probabilities of attacks that exploit those

threats, making it a useful metric. Tannaa, Gupta, Rao and Upadhyaya (2005) note that caution should be taken in the following:

- A single score does allow risk based assessments of the whole system and can serve as first step in hardening the system as well as the environment, yet, could appear deceptive and should not be taken as the final measure.
- The conceptual framework developed could be extended for like systems and a security benchmark analysis could be a definite outcome.

UsiXML is an XML-compliant mark-up language which involves a declarative User Interface Description Language and it describes user interfaces for multiple contexts of use such as Graphical User Interfaces (GUIs), Auditory and Multimodal User Interfaces and their constituting elements such as widgets, controls and containers. Using UsiXML, a UI developer is able to model a description of interactive applications such as WFLS with different types of interaction techniques and modalities in a device and computing platform independent notation. UsiXML provides an MB-IDE approach for the specification of user interfaces and is based upon the architecture of the CAMELEON Reference Framework (Guerrero-García, 2013).

This framework defines UI development steps for multi-context interactive applications. The framework is composed of four steps. Firstly, Task and Concepts describes the various tasks to be carried out by the user and the domain-oriented concepts as they are required by these tasks to be performed. The framework uses the information related to the organisational structure such as user's definition, location, objects needed for task performance (Guerrero-García, 2013).

Morena and Kearney (2007) argue that WMS are situated in sectors such as insurance, banking, accounting, manufacturing, telecommunications, administration and customer services. Actions to resolve the challenges can be activated or human operations forewarned in case of exceptions.

2.12 Research Questions

Much of the problem statement had been resolved. However, there are still some items missing and the research questions help with this. These are:

1. Is there a communication or collaboration problem in the NWU finance department and if identified it will improve the sustainability of workflow management systems?
2. What are the factors that influence motivation and how important is motivation to the sustainability of workflow management systems?
3. What are the capabilities of workflow management systems, its causes of and its impact on reliability?

2.13 Conclusion

In this chapter, articles have been summarised and discussed. The following chapter will be an analysis of the questionnaire. This chapter makes a meaningful contribution to the society as it indicates the use finance and workflow to cut across the markets of various countries in order to enhance the payment methods through e-commerce (Perz-Hernandez and Sanches-Manga, 2011). It also showed the issues that were not addressed. The chapter has addressed many of the things that impact on the skills acquired by the NWU that are sufficient for self-sustenance. This is no way comprehensive but still good enough for a mini-dissertation. The next chapter will discuss the research methodology.

CHAPTER 3

Research Methodology

3.1 Introduction

In the previous chapter, the problem was specified in terms of three research questions that remain unanswered from the literature reviewed. This chapter defines the research methodology used in this study to give answers to the raised questions.

The research questions of the study are: 1) Is there a communication/collaboration problem in the NWU finance department and if identified it will improve the sustainability of workflow management systems? 2) What are the factors that influence motivation and how important is motivation to the sustainability of workflow management systems? 3) What are the capabilities of workflow management systems, its causes of and its impact on reliability?

The aim of the study is to determine the extent to which the use of finance and workflow to cut across the markets of various countries in order to enhance the payment methods through e-commerce. To validate this, it is essential to collect information from targeted population using correct methodology and analyse the responses. This chapter defines the research methodology used in this study, the data collection method chosen, types of questions that can be asked and development of the questionnaire the survey population and sample size determination; data handling and conclude.

3.2 Research Types

3.2.1 Qualitative and Quantitative Research

Lumberg, Cooper and Schindler (2005) note that there is a distinction between quantitative and qualitative research and the appropriate data have different

characteristics but they require differed techniques for their analysis. Natural science has concentrated on quantitative analysis while qualitative analytical methods were evolved, which took account of the soft personal data.

Qualitative research is a method of inquiry appropriated in different academic disciplines, traditionally in the social science, market research and further contexts. Qualitative methods investigates the why and how of decision making, what, where and when (Creswell, 2003). Quantitative research produce information on the cases studied and any conclusions are informative guesses. Quantitative methods can be used to verify which of the hypotheses are true.

Quantitative method or type highlights its quantifiable nature and are concerned with identifying its predictive categorising organisations into cultural or by measuring distinct elements or dimensions of culture in as objective way as possible (Berg, 2004).

3.2.2 Research method(s) used in the Study

The qualitative approach can aid in the purposes of description, interpretation, verification and evaluation. Quantitative research is aiming at observation studies, correlation research, development designs and survey research (Maxwell, 2005). This study utilised the qualitative approach.

3.2.3 Required data

Primary data refers to original information that is collected by the researcher precisely for the study at hand that is data obtained through interview and surveys. Secondary data refers to information that has been formerly gathered by someone else for some other purpose which can be reused by the researcher. Secondary sources include books, journal articles, and reports. Leedy and Ormrod (2005) refer to primary data as

layer closest to the truth and secondary data as a layer father away which not derived from the truth itself but from the primary data instead.

3.3 Data Collection Method

A survey was conducted to collect information in relation to the financial aid staff from the North West University office. Only the survey is discussed here.

3.3.1 Method for collecting primary data

The questionnaire was used as a method to collect primary data in the research study. There are other ways of gathering information from participants if such information cannot be obtained from observation. The various ways of collecting data information from participants is through interviews, questionnaires as these methods have their advantage and disadvantages (Cooper and Schindler, 2003).

There are several types of research methods that can be used to collect primary data. Interviewing is probably the most common data gathering method in qualitative research (Prasad, 2005).

a) Interviews

Cooper and Schindler (2003) note that quantitative research interviews are structured than in qualitative research. In a structure interview the researcher will ask standard questions.

b) Structured interview

Schuman and Kalton (1985) state that structured interviews involve total control over the format of the questions and answers and the structured interview a questionnaire which is administered face to face with a respondent. The researcher has a

predetermined list of questions to which the respondent is invited to offer limited-options responses. Structured interviews are often associated with social surveys where researchers are trying to collect large volumes of data from a wide range of respondents.

c) Semi structured interview

A semi-structured interview is where the interviewer still has an indistinct list of issue to be addressed and questions to be answered. Therefore, the interviewer is prepared to be flexible in terms of the order in which the topics are considered to let the interviewee develop ideas and speak widely on the issues raised by the researcher (Altizer, 2004).

d) Unstructured interview

An unstructured interview involves the extent to which emphasis is placed on the interviewee's thoughts. The researcher's role is to be not intrusive as possible to start introducing a theme or topic and the letting the interviewee develop his or her ideas and pursue his or her train of thought (Leedy and Omrod, 2005).

e) Survey

A survey is characterised by the efficient collection of numeric or quantitative data from a group of entities using direct observation. The aim of a survey may be to:

1. Describe (investigative research);
2. Examine correlations and associations;
3. Explore differences;
4. Identify a development; and
5. Test a theoretical model.

In this study, the primary data was collected by means of survey using a structured questionnaire which was emailed to the SP financial units who were asked to fill in the questionnaire as well disseminate it to other decision makers in their areas. The reason

for taking this route is time and cost efficiency given the geographic location of units and the size of the university.

A survey is a virtuous way of getting a picture of the current state of a group, a community, an organisation, an electorate, a set of corporations, a profession. These surveys are snapshots, picture of a particular point or period in time, although there are longitudinal surveys which take place over longer periods. Leedy and Ormrod (2005) agree with that the survey research capture a fleeting moment in time mush as a camera takes a singly-frame photograph of an on-going activity. A survey is the collection of information on an extensive range of cases each case being investigated on the specific aspect under consideration (Bless and Higson-Smith, 1995).

3.3.2 Questionnaire

A questionnaire is a structured way of getting information from respondents by means of a scheduled structured interview. This method is based on an established questionnaire a set of questions with fixed wording and sequence of presentation as and indications of how to answer each question (Bless and Higson-Smith, 1995). A structured questionnaire was favoured because it can be thoroughly scrutinised to ensure proper response to the questions raised.

Hague and Jackson (1999) argue that a questionnaire is to draw accurate information from the respondents, to provide structure to interviews, to provide a standard form on which facts, comments and attitudes can be drawn and to facilitates date processing.

Advantages	Disadvantage
Wide coverage	Poor response rate
Cheat	Incomplete or poorly completed answers
Pre-coded data	Limit and shape nature of answers
Abolish the effect of personal contact with researcher	Unable to verify truth of answers

Table 3-1: Advantage and disadvantages of questionnaires (Bless and Higson-Smith, 1995)

The questionnaire was used as the data gathering tool, it allowed for the collection of quantifiable and qualitative data and allow for the analysis of this data to determine patterns and relationships. The survey questionnaire was a word document. The finance personnel who were selected were asked to complete the questionnaire.

A copy of the questionnaire was attached as a convenience to the participant and to prevent the loss of the questionnaire from being cited as a reason for the lack of a response. A questionnaire should be as brief as possible and solicit that information essential to the research project (Leedy and Ormrod, 2005). In order to aid in maximising the number of responses to the questionnaire, a number of question was limited to no more than 22 questions. The first section of the questionnaire was aimed at gathering biographical data on the respondents including age, gender, qualifications and frequency as the level of decisions that are made by a respondent, while the second section focused on specific questions with regards to the extent of the use of finance and workflow to cut across the markets of various countries in order to enhance the payment methods through e-commerce. Other questions required a lickert type. There were no open ended questions where the respondent is expected to support their response by providing details.

3.3.2.1 Advantage and Disadvantage of Mailed questionnaires

The advantage is that a huge coverage of the population can be realised with little time or costs and it is relatively easier to select 2000 or even 5000 people in different areas

of a country and sent them questionnaire by email. Although these advantages seem to be considerable, self-administered questionnaires and emailed questionnaire have disadvantages when used in developing countries (Bless and Higson-Smith, 1995).

Other questions required a yes or no answer while others were open ended questions where the respondent is expected to support their response by providing more details. To ensure that respondents shared a common notion of incentives/rewards, dentition was given in the questionnaire. The table below refers to the questionnaire outline.

Table 3-2: Questionnaire Outline

A short disclaimer describing the purpose of the study – Refer to Appendix A	
A letter to the respondents Appendix B	
Questionnaire – Refer to Appendix A	
'Thank You' – Refer to Appendix A	
PART 1	Personal Particulars: Names, address telephone number/cell numbers and signature.
PART 2 Questions 1 to 6	General Personal Particulars gathers biographical data on the respondents including age, gender, qualifications and their disability.
PART 3 Questions 7 to15	Focuses on specific questions with regards to the communication/collaboration problem in the NWU finance department and if identified it will improve the sustainability of workflow management systems?
PART 4 Questions 16 to 18	Focuses on specific questions with regards to the financial processes in the NWU department and their impact on the sustainability of workflow management systems
PART 5 Questions 19 to 22	Focuses on specific questions with regards to the capabilities of workflow management systems, its causes of and its impact on reliability

3.3.3 Sampling Method

Sampling strategy that is a design and the size depends on the research paradigm. The quantitative method requires unsystematic and representative sampling characterised by bigger samples (Leedy and Ormrod, 2005). Fink (1995) defines sampling as a means of asking any portion of the population as representative of the target population.

3.3.4 Types of variable

Each question in a questionnaire or collected in quantitative research gives rise to a variable and a variable is an empirically observable characteristic of some phenomenon that can take on more than one value or response category such as gender job level, level of agreement with a statement, profit, percentage of budget spent on advertising (Diamantorpoulos and Sechlegelmilch, 2004).

The participants had to meet the following criteria to be included in the sample:

- Participants must be a lower, middle, manager and other finance employees.
- The participants must have worked at least three years. Three year is chosen due to the fact that it is considered a fair experience to perform in one's position.

3.3.5 Types of variables

Nominal variables – the response categories can be placed in any order and the number assigned to the response categories has no other property except to serve as labels.

1. Nominal variable allow us to categorise responses.
2. For nominal variable one can determine how frequency or what percentage of responses fall in each category.
3. The response categories should be mutually exclusive and collectively exhaustive.
4. Numbers assigned to the categories have no numerical meaning.

5. Nominal scale: With this type of scale a variable is measured in terms of two or more qualitatively different categories such as male and female. The scale indicates differences of category but these have no arithmetic value. (Gill, 2000).

Ordinal variable - As with nominal scales, an ordinal scale contains two or more categories that allow the difference of variables in terms of the categories. As the name implies some degree of ordering is involved as different points on the scale indicate the quantity being measured (Gill, 2000).

The response categories have a certain order and the numbers assigned to the response categories also have an order.

1. An ordinal variable allows us to categorise responses
2. Can determine how many of responses are in each category
3. The order of the numbers assigned to ordinal variable do not have meaning
4. An ordinal variable allows us to rank or order responses
5. The difference between consecutive categories need not be the same

Ratio variable – a numerical variable where there is some standard unit of the property being measured. The distance between consecutive numbers is the same. Hence one can make accurate statements on the differences between cases.

1. A ratio variable allows us to categories responses
2. We can determine how many of responses are in each category.
3. The numbers assigned to a ratio variable have numerical meaning.
4. A ratio allows us to rank or order responses.
5. The distance between two cases can be calculated, that how much more or less of the measure property cases contain.
6. The ratio of two responses can be calculated.

A combination of variables was used in the survey. In order to identify participants, nominal and ordinal would be used. Survey questions would vary from ordinal to ratio

variable, depending on how the questions are posed. Therefore, multiplication and division of points on a ratio scale becomes meaningful (Gill, 2000).

3.4 Ethical Consideration Pertaining to the Study

Bennett, Merritt and Wolin (2004) argue that ethic in terms of the personal relationships is often involved in research projects. Social research, other forms of research which study people and their relationships to each other, to the world, need to be sensitive about issues of ethical behaviour. Researchers must be aware of necessary ethical standards which should be observed to avoid any harm which might be caused by carrying out or publishing the results of the research project.

According to Bennett, Merritt and Wolin (2004), the researcher can delete all names, identifiers from the data and report on the broad categories of responses to help ensure confidentiality. In this study, participants remained anonymous and the participation was entirely voluntary. It was considered unethical to use any personal details of respondents in the reports, which can identify who the respondent is. Participants were assured that the information provided would not be used for any purpose other than stated. Participation in the questionnaires was voluntarily, confidentiality was considered ensuring the protection of the respondents.

3.5 Conclusion

In this chapter the justification for the choices of research method was given. An overview of the research approach was presented. Quantitative research method was used to gather information required for the study. Questionnaires were used as data-gathering tools thus giving the study credibility. Advantages and disadvantages of qualitative research, quantitative research and questionnaires were discussed in this chapter. The following chapter will deal with data presentation, interpretation and analysis.

CHAPTER 4

DATA DISCUSSION

4.1 Introduction

The research methodology was proposed and the research questionnaire was structured one, as presented in the previous chapter. Research questions were crafted to assist the researcher with the testing and further understanding of the problem. This chapter discusses the research findings and provides analysis and interpretation of data. In the survey, certain specific questions were asked and the analysis was done based on the application of Pearson correlation coefficient and value.

The Pearson correlation method correlates that are listed variables with each other and indicate which of the resulting relationships are statistically significant. The p-value provides more information on how far down in the significant region the results lie (Diamantopoulos and Schlegelmilch, 2004). The layout of this chapter begins with the rate of return of the questionnaires at 4.2 then 4.3 is the discussion and analysis of variables. Section 4.4 deals with the correlation co-efficient analysis for coefficients greater than or equal to 0.3 in the negative and in the positive, while 4.5 is the conclusion

4.2 Rate of Return

Twenty five (25) questionnaires were distributed in the Finance department to personnel of all salary levels and both genders. A total of 25 questionnaires were returned meaning that the rate of return was 100%.

4.3 Analysis of Variables

4.3.1 Demographic variables

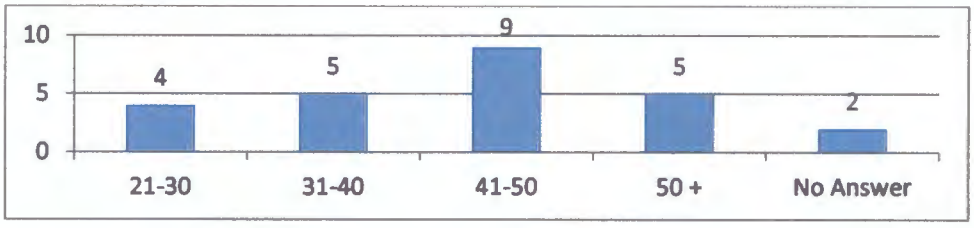

Figure 4-1: Age Distribution

The majority of respondents were aged between 41 and 50 years. This implies that the majority of Finance employees are aged between 41 and 50 years, which is an average age group within the working class that may have acquired sufficient work experience to understand the role of skills development and its significance in managerial decision making.

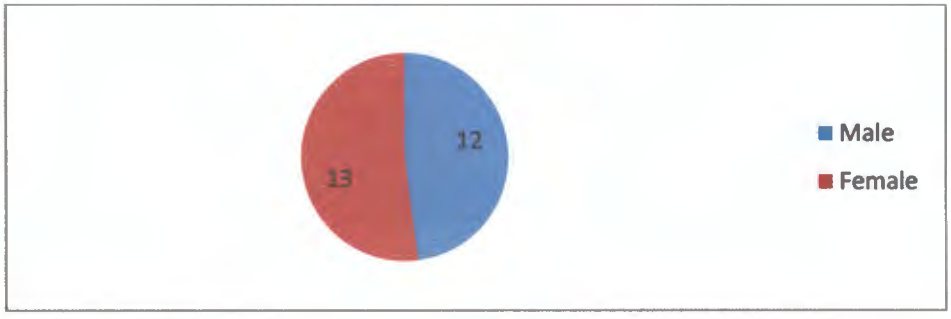

Figure 4-2: Gender Distribution

Figure 4.2 indicates that out of a total sample of 25 respondents, 13 were female. No choice was given to sex and the sample breakdown is considered as being a rational representative of the demographics of the Finance Aid Office at the North West Campus. These figures reflect that the personnel in the Finance aid roles are dominantly female employees. There is strong racial and gender bias in the experience of joblessness and black people, especially female South Africans. South African females were denied access to development in Finance and had received no recognition for their skill levels and on-the-job knowledge (McGrath and Akoojee, 2007).

The burden of unemployment falls on the African population because jobs that exist for them are casual, low-wage and are without benefits.

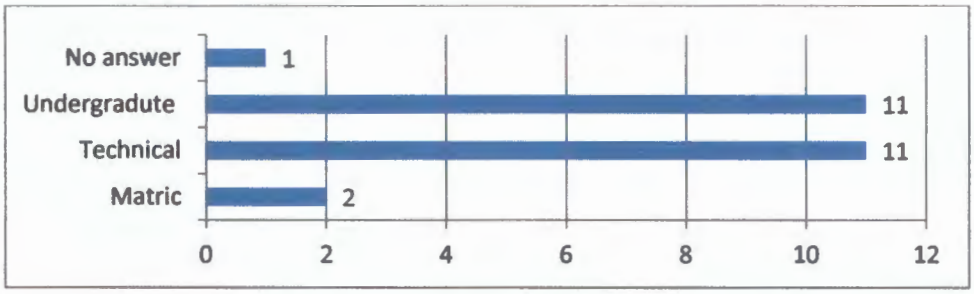

Figure 4-3: What is your highest level of education?

Figure 4.3 indicates that the respondents' education status is up to standard, as the majority of the respondents have a diploma or degree. Two respondents have passed matric, eleven respondents have a technical diploma, eleven respondents have an undergraduate degree and one respondent did not want to give this information. The respondents' educational status is an indicator for the better handling of projects and organisations should improve their education through further studies.

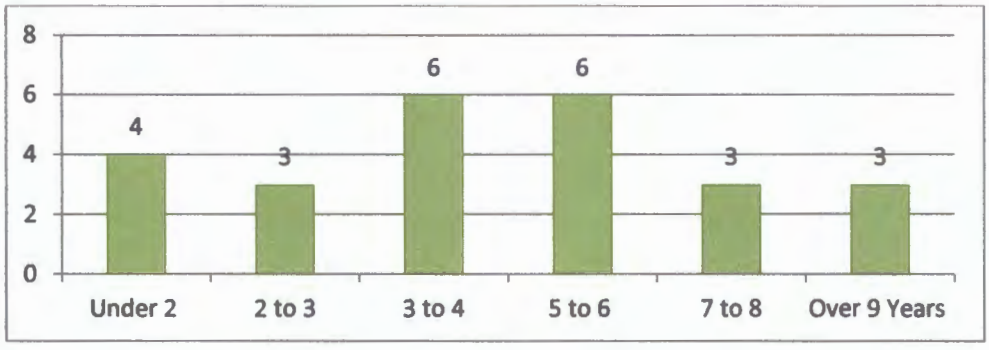

Figure 4-4: How long have you been working at the Financial Office at the NWU?

Most of the respondents have a working history of between 3-4 years and 5-6 years. There were four that worked for under 2 years. There were three workers from 2 to 3 years. There were six workers from 3 to 4 years. There were six workers from 5 to 6 years. There were three workers from 7 to 8 years. There were three workers who have been working for over 9 years. This is a good spread from the study. Figure 4.2 shows

that females have been interacting in Finance aid development to do their activities frequently than men, and thus females are better skilled and at their work place. After the 1976 Soweto Uprising, the Government reformist positions through the De Lange Reports, three joint investigations of training by the Human Sciences Research Council and the National Training Board and a series of reforms to legislation (Kumar and Wainer, 2006).

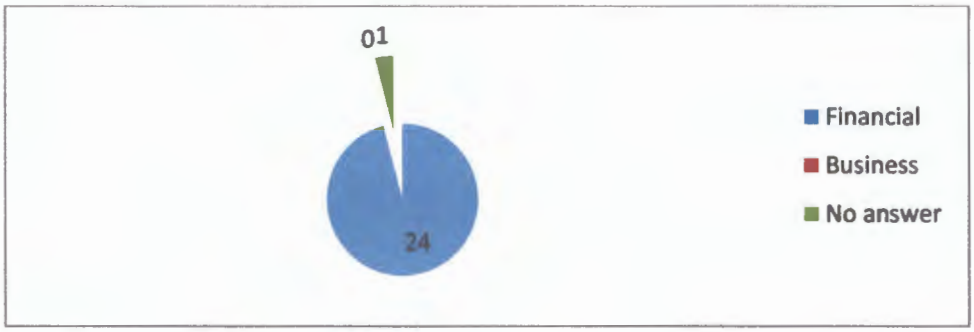

Figure 4-5: Was your involvement in workflow planning for the Financial Department advisor staff from a Financial or Business perspective?

Figure 4.5 shows that most respondents were involved with workflow planning for the Financial Department advisor staff from a financial perspective. Twenty four respondents were involved in workflow planning for the Financial Department advisor staff from a financial perspective and one respondent did not want to answer. It seems that the respondents who have involvement in workflow planning development with a financial perspective interact in activities often, and are likely to do all their activities in less than several times a week than the rest of the respondents.

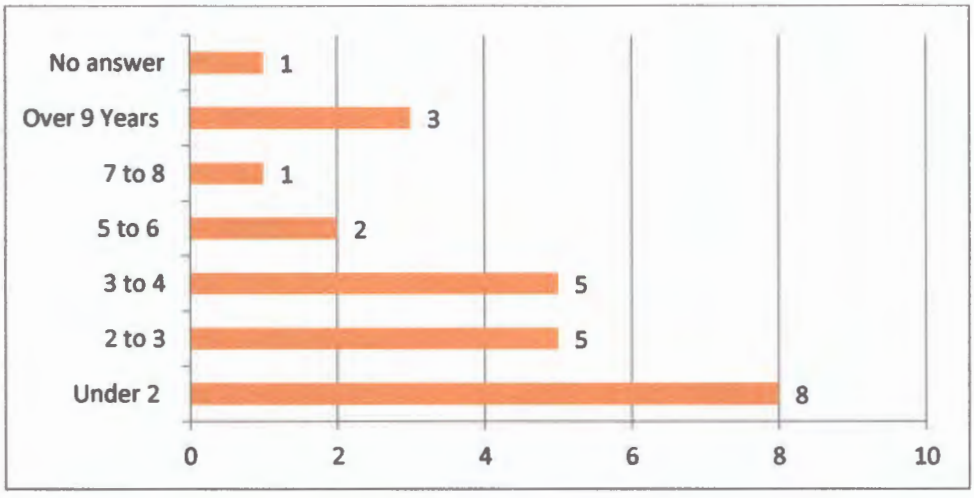

Figure 4-6: How many workflow planning implementations have you been involved in including this one?

Figure 4.6 shows that eight respondents have been involved in under two workflow implementations including this one, five respondents have been involved 2 to 3 workflow implementations including this one, five respondents have been involved 3 to 4 workflow implementations including this one, two respondents have been involved 5 to 6 workflow implementations including this one, one respondent has been involved 7 to 8 workflow implementations including this one, three respondents have been involved over 9 workflow implementations including this one and one respondent did not want to answer this question. Decision making is based on the intervention of government's agencies and large organisations causing the dominance of external often foreign capital and the taking no notice of people locally (Liu and Wall, 2006) .There is a noticeable gap between government's desire to improve the business environment and its actual achievements.

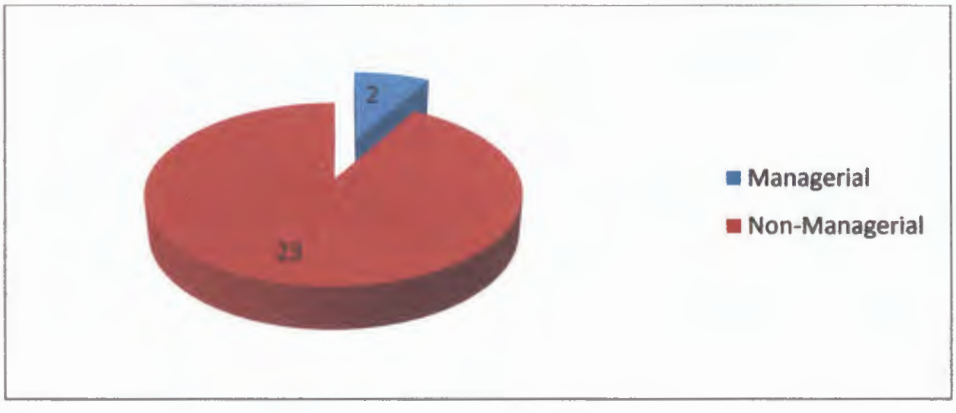

Figure 4-7: What type of post are you in at work?

Figure 4.7 indicates that most respondents are in non- managerial positions at work (23). There are 2 in a management position. The national response to the recession provided little in terms of the strife for equity. The tripartite contract between the South African government, business and labour reached in February 2009 did not deal implicitly with this transformational imperative (Akoojee, 2010).

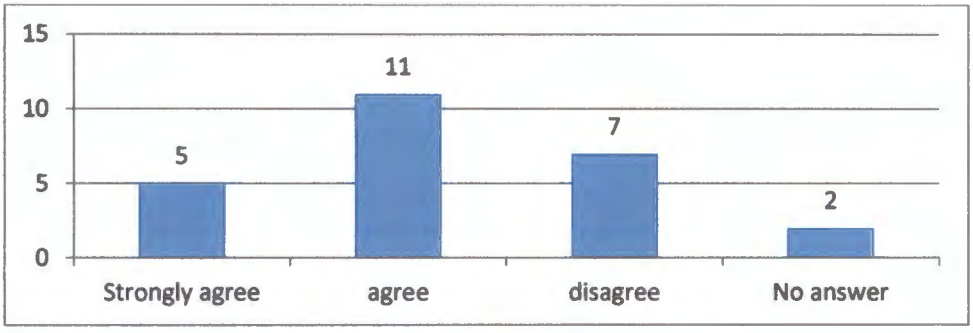

Figure 4-8: Your functional area of workflow planning was implemented within the timelines originally stipulated.

Most of the respondents (11) agree that their functional area of workflow planning was implemented within the timelines originally stipulated. Five respondents strongly agree that their functional area of workflow planning was implemented within the timelines originally stipulated, seven respondents disagree that their functional area of workflow planning was implemented within the timelines originally stipulated and two respondents did not want to answer this question. Qui and Wang (2001) argue that the lack of coordination and networks between agencies apprehensive with training and with self-employment start-ups have led to a disorganised approach to informal micro-enterprise support.

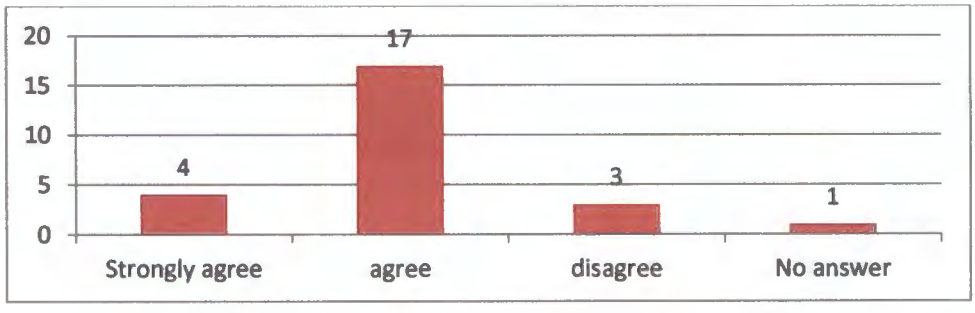

Figure 4-9: The plan assigned while assuming you understand financial aid was appropriate?

Most of the respondents agree (17) that the plan assigned while assuming that you understand financial aid was appropriate. Four respondents strongly agree that the plan assigned while assuming that you understand financial aid was appropriate, three respondents disagree that the plan assigned while assuming that you understand financial aid was appropriate and one respondent did not want to answer. Cheung et al. (2001) define a person that performs complex tasks while working without help or supervision as an experienced and well trained worker. Therefore, employee attitudinal and social skills are regarded to be critical for one to be successful.

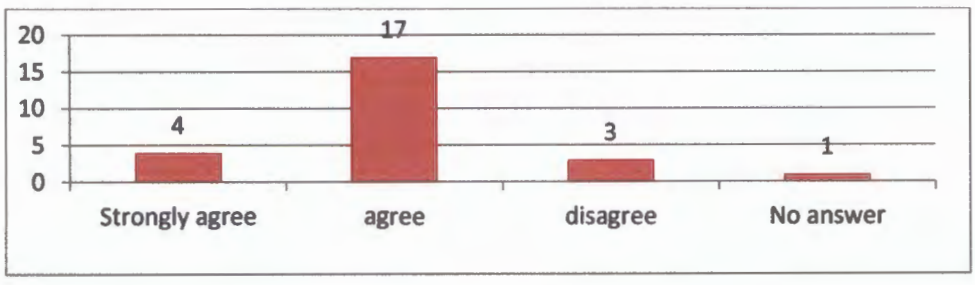

Figure 4-10: Workflow planning had enough people resources assigned to it in your functional area.

Most of the respondents agreed (17) that workflow planning had enough people resources assigned to it in your functional area. Four respondents strongly agree that workflow planning had enough people resources assigned to it in your functional area, three respondents disagree that workflow planning had enough people resources assigned to it in your functional area and one respondent did not want to give this information. The graph above indicates that the majority of the respondents know what the importance of adequate people resources to be allocated throughout but there is a lack of judgement but is a positive result.

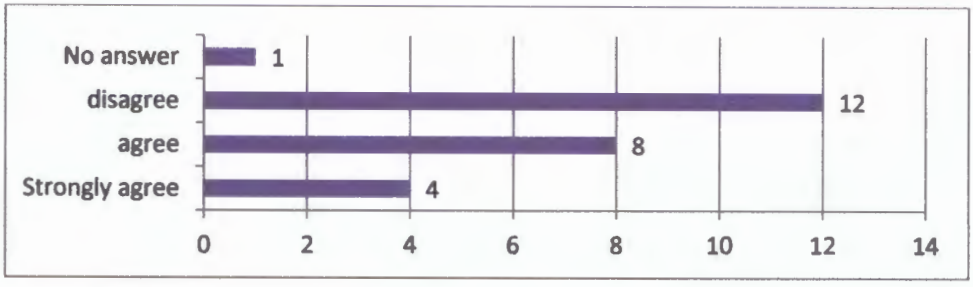

Figure 4-11: Your functional area received sufficient and timeous training for workflow planning

.

Figure 4.11 indicates that the majority of the respondents disagree (12) that their functional area received sufficient and timeous training for workflow planning. Four respondents strongly agree that their functional area received sufficient and timeous training for workflow planning. Eight respondents agree that their functional area received sufficient and timeous training for workflow planning and one respondent did not want to answer. This is a positive result. Information security must be addressed as a commercial governance responsibility which should involve risk management exertions, reporting and accountability on the ration of executive leadership and boards of directors (Kim, 2012). Most of the respondents believe that appropriate planning for workflow integration is essential and they are eager for continuous training and managerial delegations to develop further in their skills.

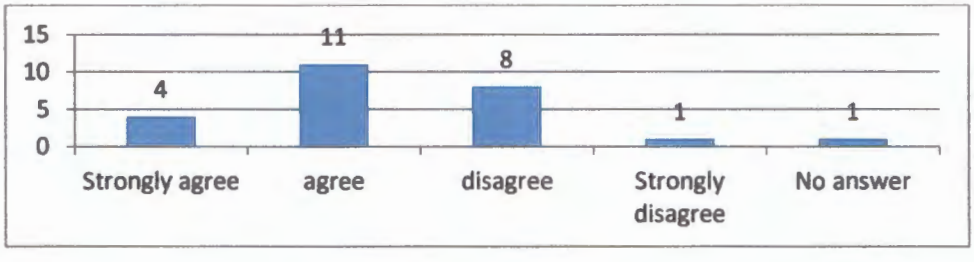

Figure 4-12: There adequate management support and commitment throughout the workflow planning.

Most of the respondents agree (11) that there was adequate management support and commitment throughout the workflow planning. Four respondents strongly agree that there was adequate management support and commitment throughout the workflow

planning, eight respondents disagree that there was adequate management support and commitment throughout the workflow planning. One respondent strongly disagrees that there was adequate management support and commitment throughout the workflow planning. One respondent did not want to give this information. This means that the majority of the respondents identify what the importance of adequate management support and commitment throughout the workflow planning is, but there is a lack of awareness and judgement but it's a positive result. Therefore, the respondents rely and need leadership qualities from a manager to lead them (Heeks, 2002). The organisation determines its own ethics and the transmission of an organisation's ethical values are made by its employees'. The manager's attribute and decisions in all aspects are essential for staff members to function well in their positions. Also, the respondents rely and expect leadership qualities from a manager to lead them (Sargent and Matthews, 1997).

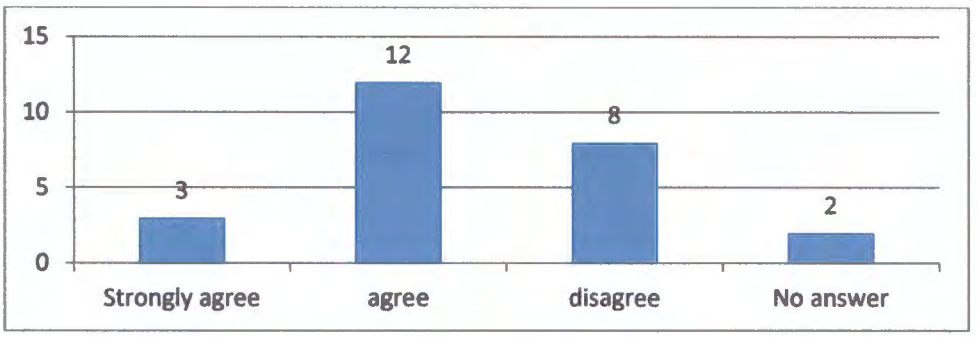

Figure 4-13: Satisfactory accountability was placed on the workflow planning team for their function in the project?

Figure 4.13 indicates that most of the respondents agree (12) that satisfactory accountability was placed on the workflow planning team for their function in the project. Three respondents strongly agree that satisfactory accountability was placed on the workflow planning team for their function in the project. Eight respondents disagree that satisfactory accountability was placed on the workflow planning team for their function in the project. One respondent did not want to give this information.

The respondents between 41-50 years at the Finance Office understand the importance of accountability placed on the workflow planning team for their function in the project. Management is beneficial, essential and helpful for staff members to run all the operations in the organisation (Deelman, Gannon, Shields and Taylor, 2009).

Governance provides a structure for determining organisational objectives and monitoring performance to ensure that objectives are attained.

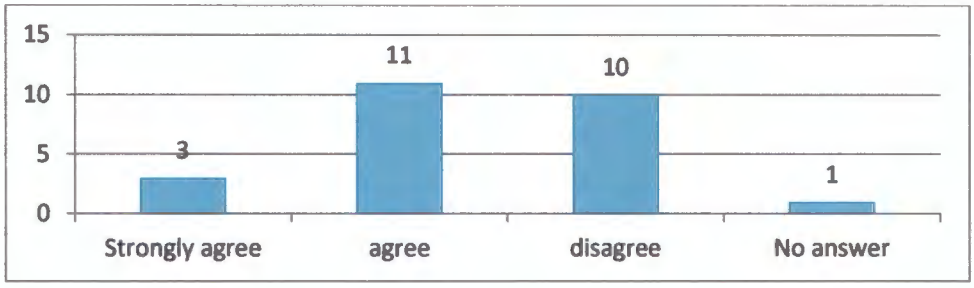

Figure 4-14: Satisfactory accountability was placed on the business for their function in the project.

Figure 4.12 indicates that the majority of the respondents agree (11) that there is satisfactory accountability placed on the Business for their function in the project. Three respondents strongly agree that there is satisfactory accountability placed on the Business for their function in the project and ten respondents disagree that there is satisfactory accountability placed on the Business for their function in the project and one respondent did not want to answer this question. This is a negative finding. Most of respondents acknowledge that the Business is essential for their success in projects. This is in accordance with Guerro-Garcia (2013).

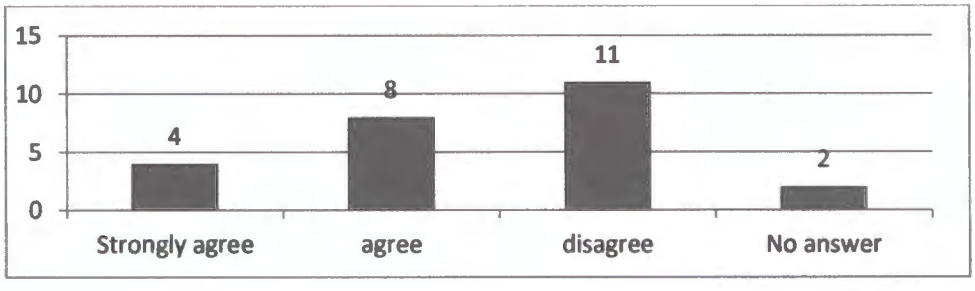

Figure 4-15: Project team leaders were sufficiently monitored to ensure that they were fulfilling their functions.

The majority of the respondents (11) disagree that project team leaders were sufficiently monitored to ensure that they were fulfilling their functions. Four respondents strongly agree that project team leaders were sufficiently monitored to ensure that they were fulfilling their functions; eight respondents agree that project team leaders were

sufficiently monitored to ensure that they were fulfilling their functions and one respondent did not answer. This is a negative result. Relational identities, in contrast, define the self in terms of specific roles or relations including others in the definition of one's own self-identity (Lord and Hall, 2005). Thus, each identity level provides an alternative basis for self-regulation, and alternative ways to define leadership.

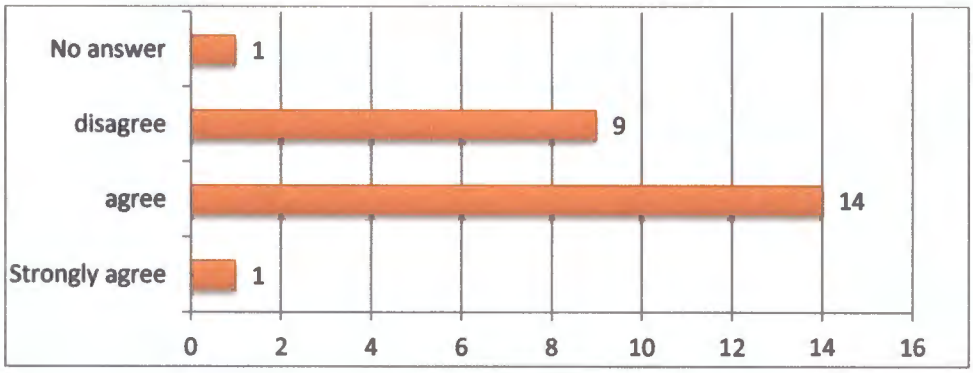

Figure 4-16: An appropriate planning measure was implemented for workflow planning?

Figure 4.16 indicates that fourteen respondents agree that an appropriate planning measure was implemented for workflow planning, 1 respondent strongly agrees that an appropriate planning measure was implemented for workflow planning, nine respondents disagree that an appropriate planning measure was implemented for workflow planning and one did not want to answer. The majority of respondents believe that appropriate planning measures implemented for workflow planning is necessary to complete and execute their work. Tannaa, Gupta, Rao and Upadhyaya (2005) note that components of the architecture are then tied together in a framework model that may aid IT security managers of such systems to measure the security levels that are in place to protect them and monitor them regularly on a proactive basis.

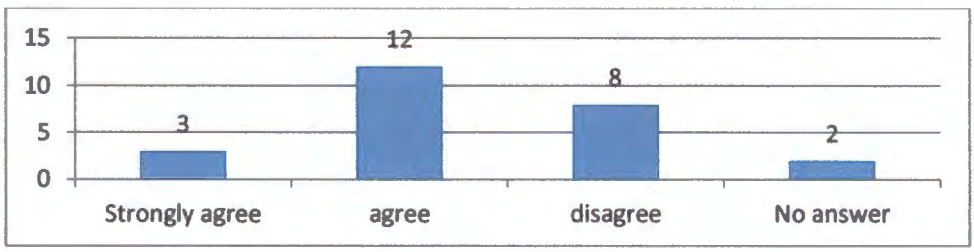

Figure 4-17: The original business case adhered to for project workflow planning?

Figure 4.17 shows that 12 respondents agree that the original business case was adhered to for project workflow planning; three strongly agree that the original business case was adhered to for project workflow planning and eight strongly that the original business case was adhered to for project workflow planning and two respondents did not want to answer. Majority of the respondents believe how important the original business case is adhered to for project workflow planning. This is a positive result an in agreement with Sheng et al. (2009). Enterprise Resource Planning (ERP) initiative can be viewed as a strategic IT decision to add value to the organisation's IT infrastructure, and to be safeguarded by effective IT governance methods.

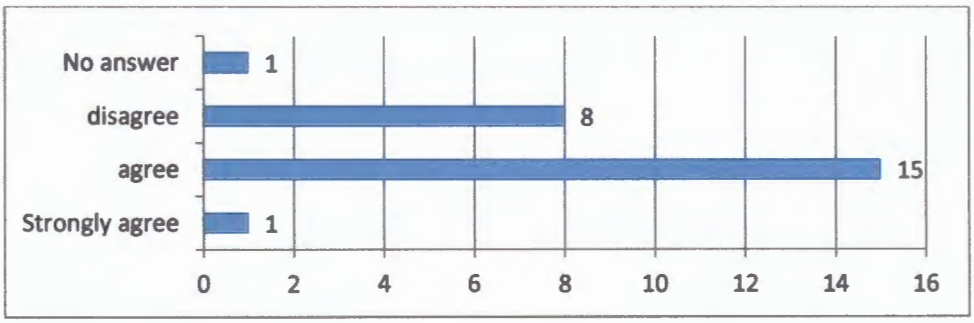

Figure 4-18: Sufficient workflow planning was exercised throughout the phases of the financial office at the NWU?

Figure 4.18 indicates that the majority of respondents agree (15) that sufficient workflow planning was exercised throughout the phases of the financial office at the NWU. One respondent strongly agrees that sufficient workflow planning was exercised throughout the phases of the financial office at the NWU, eight respondents disagree that sufficient workflow planning was exercised throughout the phases of the financial office at the NWU and one respondent did not answer. Kumar and Wainer (2003) note that the benefits of workflow process can be stipulated as follows; it provides a single computing framework allowing the planning, execution and monitoring of processes; it permits flexibility process modelling and planning so that process plans may be revised in the light of events and experiences gained through the process; and it improves the quality of decision-making because of the effective management of information while its spreading to interested parties as it becomes available. Guerrero-García (2013) argues that In Software Engineering (SE), the evolutionary prototyping is a software development lifecycle (SDLC) model in which a software prototype is progressively

created for supporting demonstration to customer and for elicitation of system requirements elaboration. The evolutionary prototyping model includes four main phases: (1) definition of the basic requirements, (2) creating the working prototype, (3) verification of the working prototype, and (4) improvement of the requirements elicited.

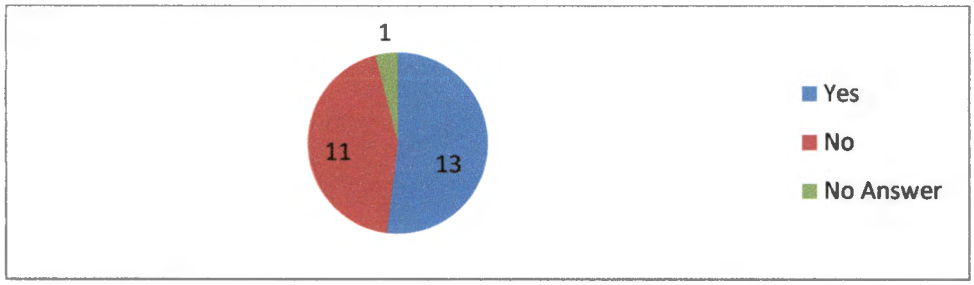

Figure 4-19: Did you participate in any workflow planning event?

Figure 4.19 indicates that the majority of respondents (13) did participate in a workflow planning event. Eleven respondents did not participate in a workflow planning event whereas one respondent did not to disclose this information. This is because the majority of the respondents believe that there are weaknesses in their development or noticed weaknesses in the leaders who lead them. This means that the majority of the respondents believe that there are weaknesses in their development in the leaders who lead them. Sheng et al. (2009) argue that the weakness of the relevant ways that the financial and performance management systems of the public sector have undervalued abilities issues.

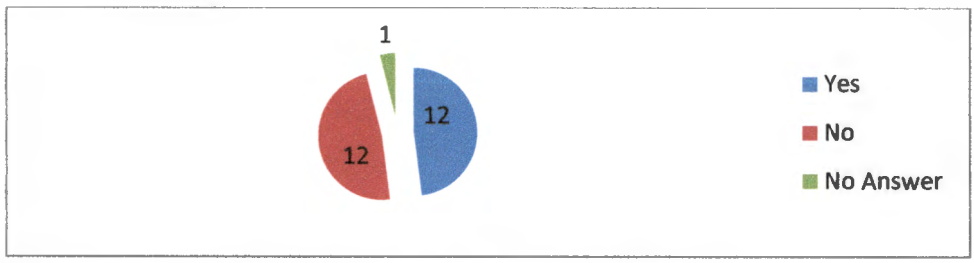

Figure 4-20: Were you part of a workflow planning team?

The majority of the respondents (12) were part of a workflow planning team. Twelve respondents were not part of a workflow planning team and one respondent did not want to answer this question. This indicates that most of the respondents depend on on communication for all their work issues and it is important for workers to be proactive

within their work place in their daily activities for administration and development skills. Julia, Oliveira and Valette (2003) state that working as a leader of an interdisciplinary team requires excellent communication skills, assertiveness, adaptability and gain better knowledge of team functions. Acquiring these skills takes practice and an environment where one can learn from their mistakes without fear of harming their career.

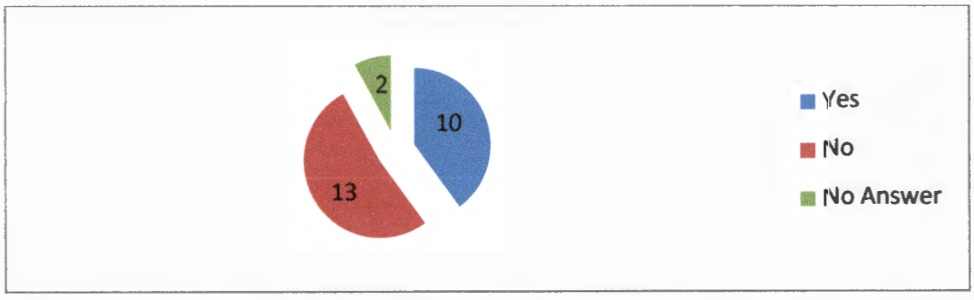

Figure 4-21: Do you know what the financial office at the NWU Business Plan and how workflow planning impacts upon it?

Figure 4.21 shows that the majority of respondents (13) know about the financial office at the NWU Business Plan and how workflow planning impacts upon it whereas ten respondents do not know what the financial office at the NWU Business Plan and how workflow planning impacts upon it. One respondent did not want to answer this question. This is because most of the respondents are in a non-managerial position that have not required developed skills or experience and do not have the ability to communicate well with other members with confidence about the Business Plan and how workflow planning impacts upon it. This is a negative result. Information Security Governance, which provides the framework in which such protection must take place, is therefore clearly a corporate governance responsibility (Qiu and Wang 2001).

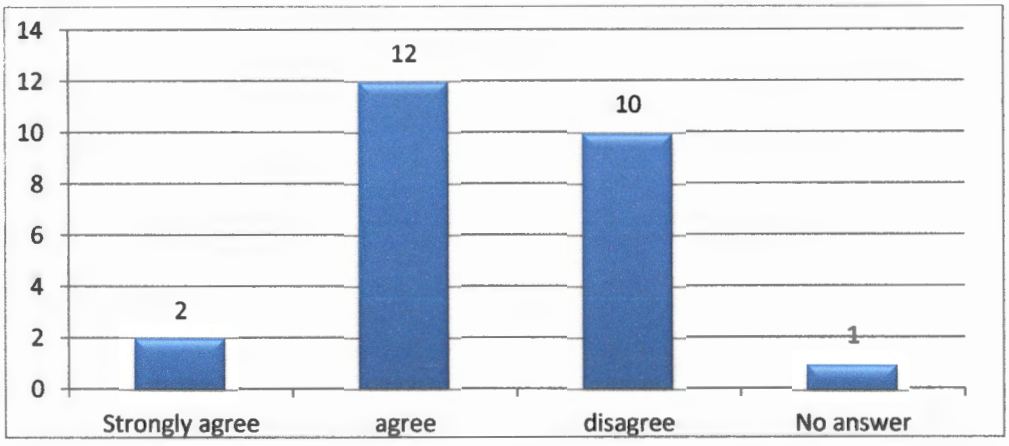

Figure 4-22: The workflow planning was aligned to the business strategy for the 2011/2012 financial year, which is the workflow implementation, was appropriate to the financial office at NWU business strategy?

Figure 4.22 indicates that the majority of respondents agree (12) that the workflow planning was aligned to the business strategy for the 2011/2012 financial year, which is the workflow implementation, was appropriate to the financial office at NWU business strategy. Two respondents strongly agree that workflow planning was aligned to the business strategy for the 2011/2012 financial year, which is the workflow implementation, was appropriate to the financial office at NWU business strategy. Ten respondents disagree that the workflow planning was aligned to the business strategy for the 2011/2012 financial year, which is the workflow implementation, was appropriate to the financial office at NWU business strategy and one respondent did not want to answer this question. This is a positive result. This means that most of the respondents believe that the workflow planning strategy was aligned to the business strategy and it is necessary for further developments in Finance. Kim (2012) argues that the select of an internal perspective is appropriate because managers have better control over internal antecedents compared to external ones.

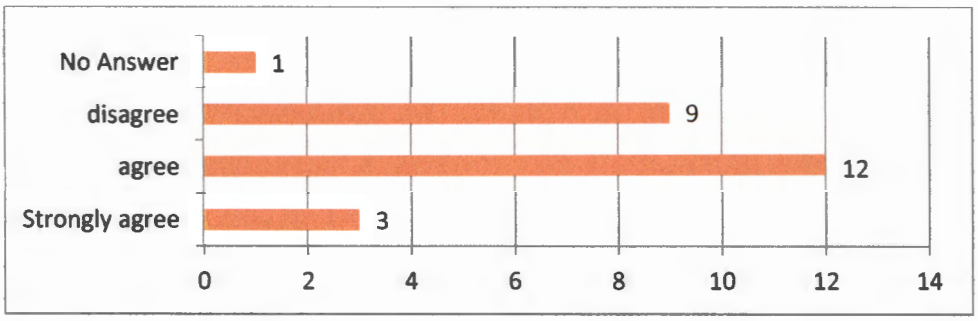

Figure 4-23: The concurrent restructuring and centralisation process at NWU finance department had a negative effect on the workflow planning implementation?

Figure 4.23 indicates that twelve respondents agree that the concurrent restructuring and centralisation process at NWU finance department had a negative effect on the workflow planning implementation. Three respondents strongly agree that the concurrent restructuring and centralisation process at NWU finance department had a negative effect on the workflow planning implementation. Nine respondents disagree that the concurrent restructuring and centralisation process at NWU finance department had a negative effect on the workflow planning implementation and one respondent did not want to answer this question. This indicates that most of the respondents believe that from the integration of restructuring and centralisation processes at the NWU finance department has motivated them positively in their daily planning. Mentzas (2001) notes that economic restructuring and decline globalisation, privatisation internationalisation and world cities' competition and democratisation have all led governments to realise that they are losing their capacity to steer public policy making in some areas alone. Instead, they are required to collaborate with a wider network of agencies for building strengths and accessing and utilising resources. Furthermore, acquiring skills takes practice and an environment where one can learn from their mistakes without fear of harming their career.

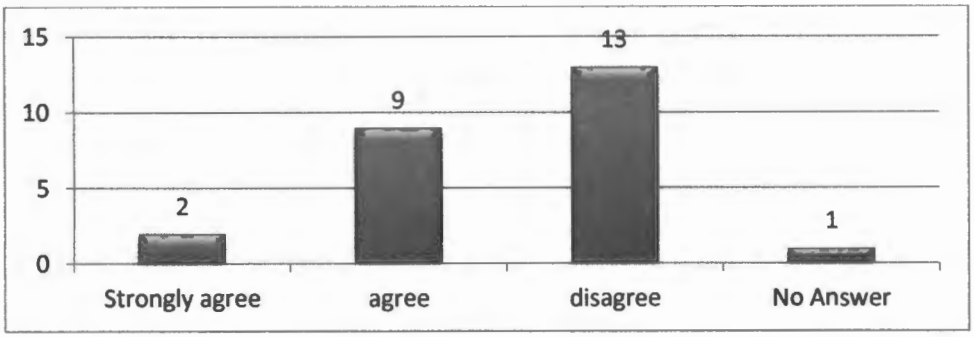

Figure 4-24: I attend seminars or workshop on workflow planning?

Figure 4.24 indicates that thirteen respondents disagree that they attend seminars or workshop on workflow planning, two respondents strongly agree that they attend seminars or workshop on workflow planning, nine respondents agree that they attend seminars or workshop on workflow planning and one respondent did not want to answer the question. This means that the employees are in non-managerial positions and there is a need for further training to be implemented by the NWU to improve their workers skills in workflow planning. McGrath and Akoojee (2007) argue that there is uncertainty, changing circumstances and a lack of communication among team members. Working as forerunner of an interdisciplinary team involves exceptional communication skills, assertiveness and adaptability, as well as knowledge of team functions.

4.4 Correlations

The correlation between how many years you have been working at the NWU finance office and age shows +0.677– a positive association. This means that workers are generally happy with the team leaders and that older people are capable in their functions. The correlation between gender and status shows +0.955 which is a high positive association. This means that employees are happy in their workplace and have sufficient resources from managers for workflow development. The correlation qualification was satisfactory while accountability placed on the workflow planning team for their function in the project shows +0.827 – a positive association. This could be interpreted that people are satisfied with the role of organising in the scope of the business financial strategy through the realisation of development in terms of the years

and experience they have in the organisation. The correlation between qualification and age was your involvement in workflow planning for the Financial Department advisor staff from a Financial or Business perspective shows +0.972 –, a very high positive association. This means people are somewhat satisfied with the organisation's way of resources are assigned in their functional areas and team performance, especially the age group 41-50 years. The correlation between was your involvement in workflow planning for the Financial Department advisor staff from a Financial or Business perspective shows and project team leaders were sufficiently monitored to ensure that they were fulfilling their functions -0.943 - a low negative association. This could be interpreted that staff members are not content with the organisation's way of change management assigned to workers areas and resources available. The correlation between was sufficient change management performed throughout the phases or project integration and was there adequate management support and commitment throughout the project shows -0.445 – a positive association. This indicates that there was a lack of management abilities in workers project integration and this need to be looked at by NWU. The correlation between was there adequate management support and commitment throughout the project and was the IT governance strategy alignment for 2012/2013 implementation appropriate to the departmental strategy shows +0.639– a positive association. This means that workers are working as a team with the support of management and have experience in the IT governance strategy. The correlation between did the original business adhere to for project integration and do you know what the National Tourism Sector Strategy? (NTSS) this shows +0.704 – a positive association. This shows that most of the workers between the ages of 31-40 years are well educated and know what the National Tourism Sector Strategy entails for project integration. The correlation between there adequate management support and commitment throughout the workflow planning and I attend seminars or workshop on workflow planning shows +0.946 – a positive association. This means that the workers in a managerial position are well trained, skilled and part of workflow events implementing these strategies. The correlation between I attend seminars or workshop on workflow planning and the concurrent restructuring and centralisation process at NWU finance department had a negative effect on the workflow planning implementation shows -0.765 – a positive association. This means that the workers believe that there is a lack of managerial skills throughout phases of the projects and

this need to be addressed by finance department. The correlation between an appropriate planning measure was implemented for workflow planning and the workflow planning was aligned to the business strategy for the 2011/2012 financial year that is the workflow planning policy was appropriate to the Financial office at the NWU business strategy shows +0.935-- a positive association. This means most of the respondents who are in a managerial position a have an understanding on what workflow planning policy is and are able to align appropriate business strategies for NWU.

4.5 Conclusion

The next chapter amalgamates all the work done and comprises of the summary of the study, findings per research questions, identifies gap areas, provides opportunities and future research opportunity. Conclusions of the study are drawn and recommendations are also being outlined. In this chapter detailed results of the research have been provided. The results have been demonstrated in the form of graphs and stats. A correlation analysis has been also provided to see the relationships between main variables in this study. The analysis of the results revealed that age, level of education and years of experience are not determinants of whether respondents are positive or negative about the improvement of skills development in Finance.

The findings have highlighted some of the issues raised in the on-going debate regarding the challenges of integration development implementation. The findings have also established a link between literature that was reviewed in this study with the data which was collected and presented. The study used a quantitative approach to describe and analyse the findings on the impact of implementation of improvement in Finance. This was followed by the findings and measures of association statistics. The next chapter presents the recommendations as per the results displayed in this chapter. The recommendations and conclusion will add value in the existing literature. Further research areas are also suggested as an indication of gaps in this field of study

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study investigated the current workflow processes in the finance department as well as how this department interacts to make the process run smooth in order to ensure the success of the process in line with the organisations goals and objectives. There are appropriate workflow processes in place, however, the majority in non –managerial positions do not understand the role they play in the workflow process. Most of the employees do not understand the organisation's vision and mission statement and the flaw between departments seemed to be communication. Planning sessions are held and contingency plans are made but not successfully implemented and not filtered correctly to bottom line staff.

The study was concerned with posing the following questions in the main: (1) Is there a communication or collaboration problem in the NWU finance department and if identified it will improve the sustainability of workflow management systems? (2) What are the factors that influence motivation and how important is motivation to the sustainability of workflow management systems? (3) What are the capabilities of workflow management systems, its causes of and its impact on reliability?

This chapter presents the summary of the study, and address the findings per research question. It also provides managerial guidelines for opportunities. Conclusion of the study will be drawn and recommendations will also be outlined.

5.2 Summary of Study

The research study was informed by the review of literature which included the following concepts: classification of workflow, capabilities of workflow, workflow and policies,

workflow and e-science needs, levels and use of workflow support systems, models, challenges of workflow, problems, benefits and frameworks and workflow. This was to enable the research study to be defined and suggested appropriately with relevant definitions, theories and other empirical studies. A variety of research methods such as qualitative and quantitative were used. The research methods looked at instrumentation, research type, population, sampling method, and data gathering method from a theoretical perspective.

A questionnaire was developed and used to gather primary data based on demographics, e.g. age, gender, years of service in the department, and position. Other related questions were used to further extract information or data from the sample population.

5.3 Response to the Research Questions

The main findings of this research in relation to each research question will now be discussed. Each question is followed by a discussion of the findings relating to that question.

5.3.1 Is there a communication or collaboration problem in the NWU finance department and if identified it will improve the sustainability of workflow management systems?

Mentzas et al. (2001) argue that there are different classifications of workflow management systems managers (WMS) to identify which techniques to adopt to match diverse processes. The fight against increased R&D costs, late stage attrition, safety, bad pipelines and pricing pressure in the pharmaceutical and biotech industries, has resulted in lower valuations and poor market conditions (Vivas et al., 2010).

Disjointed communications between departments being reviewed as and approaches such as Translational Research are supporting an integrated environment (Vivas et al., 2010).

Ontology's supports writing in providing a vocabulary with meaning and in turn avoids misunderstanding. Communication between agents is supported whether it is human or software agents. This is useful especially in situations where experts need to work together (Cheung et al., 2001). Examples of different aspects of a domain need to be related to provide flexible support in a non-trivial business situation. It is difficult to capture different that considers their relationships (Cheung et al., 2001).

Moreno et al (2007) argue that WMS are situated in sectors such as insurance, banking, accounting, manufacturing, telecommunications, administration and customer services. Actions to resolve the challenges can be activated or human operations forewarned in case of exceptions. Few organisations have focused on automatic generation of processes and rather focused on the automatic regeneration of process models. Similar models model in order to handle process calculation. Usually business processes are represented as workflow which is computerised generated models needed for completion of the process (Morena and Kearney, 2007).

Software Engineering (SE), the evolutionary prototyping is a software development lifecycle (SDLC) model in which a software prototype is progressively created for supporting demonstration to customer and for elicitation of system requirements elaboration (Guerrero-García, 2013). The evolutionary prototyping model includes four main phases: (1) definition of the basic requirements, (2) creating the working prototype, (3) verification of the working prototype, and (4) improvement of the requirements elicited.

Workflow can be described as either static or dynamic. A static workflow has to be finished or aborted once it is initiated whereas a dynamic workflow can change during

execution time (Qiu and Wang, 2007). Organisations adopting workflow solutions processes should be static since (1) static processes can be applied in scale with minimal training on personnel and (2) dynamic behaviours of business processes make involved elements, including human, equipment, information and are problematic to handle since these elements are initially designed to deal with specified processes.

Deelman, Gannon, Shields and Taylor (2009) note that graphical renderings of workflow easier for small workflows with fewer than a few dozen tasks. e-Science workflows are complex and therefore most graphical tools allow some form of graphical nesting based on sub-workflow hierarchies. Another source of graphical complexity involves expressing for-each concurrency in a workflow. However, this problem can be addressed by providing specialised control primitives in the graphical vocabulary.

Julia, Oliveira and Valette (2003) note that they used UML notations for the specification of Workflow Processes but the notations have their limitations when they are used for specifying the real time characteristics of Workflow Management Systems. For example, activity diagrams do not represent real time constraints in a formal way and they do not show in an explicit resource allocation mechanisms. Late deliveries in an organisation are due to the problem of resource overload. Time management of Workflow Processes is crucial for improving the efficiency of Business Processes within an organisation.

5.3.2 What are the factors that influence motivation and how important is motivation to the sustainability of workflow management systems?

Workflow management systems (WFMSs) development is driven by the observation that workflow management can increase effectiveness and efficiency of many administrative processes both in commercial and public environments (Grefen and de Vries, 1998).The development of new workflow management systems is influenced by increase of both functional and technical requirements. There are various WMS developed for every paradigms, the lack of theoretic foundation and model verification

block workflow technique research application (Liu and Wall, 2006).Process logic, timing constraint logic, resource dependency logic and information dependency logic are aspects to be carried out to verify confirmation analysis (Liu and Wall, 2006).

Most workflow management systems such as IBM Domino, iPlanet, Fujisu iFlow, TeamCenter (a PDM system with built-in workflow management capability), and Epaf, are able to implement the first three policies in various degrees (Qiu and Wang, 2007).

Workflow tools have enabled one to automate the process of building data and workflow provenance. Combined with good data catalogues and data management systems, it is now possible to provide complete experimental workbenches for entire communities of scientific users. Data and workflows can be shared through community use and refinement, evolved to meet new challenges. Having data provenance allows a scientist to return to the point of creation of a data object to understand the workflow (Deelman, Gannon, Shields and Taylor, 2009).

Task-level workflow systems focus on the resource-level functionality and fault-tolerance, service-level systems generally provide interfaces to certain classes of services for management and composition (Deelman, Gannon, Shields and Taylor, 2009). Service availability forms part of the composition process since it represents the available tools that can be composed within a system.

Basu and Blanning (1999) argue that growing automation of business processes has led to the necessity for decision support tools that assist in the management of the complex workflows that are created due to the various activities in these processes. In recent years, there has been much interest, both within academic research circles and among business practitioners, in software systems for this purpose. In other words, the existence or nonexistence of a metapath in such a system may be helpful in

determining whether and how the system can be used to link known source information to desired target.

5.3.3 What are the capabilities of workflow management systems, its causes of and its impact on reliability?

Deelman, Gannon, Shields and Taylor (2009) note that workflow systems can be classified into two broad categories: Task-based or service-based. Task-based systems such as Pegasus focus on the mapping and execution capabilities and it leave the higher-level composition tasks to other tools, even employing the use of semantics.

e-Science applications have developed in complexity from simple batch executions of data analysis tasks, workflow has emerged as an imperative enabling technology. A host of tools supporting workflow design and enactment have been developed and are now in use in the scientific community (Deelman, Gannon, Shields and Taylor (2009). In many cases these scientific workflow systems were developed in close collaboration with the scientists and resulting systems are well designed to handle the use-cases of that community. Because scientific research is so diverse in the method used from one discipline to another, the resulting collection of workflow tools demonstrate a wide variety of capabilities.

ESP framework approach is modularity, extensibility and adaptability. The basic workflow description is unassertive while variations to the basic process are described separately in a modular manner. Minor changes may be made to ESP rules to adapt the workflow to certain situations and such small changes would be tough to make on a monolithic workflow. The simplicity of the approach helps in minimising errors while at the same time making it easier to describe difficult situations (Kumar and Wainer, 2005).

Kumar and Wainer (2005) argue that an ESP rule causes a meta workflow to run when an event occurs and a workflow case is in a certain state. This may cause a meta

workflow to execute, perform control operations like suspending certain workflows and starting other workflows, etc. Thus, one makes a clear distinction between two types of workflows such as base workflows and meta workflows.

There are various WMS developed for every paradigms, the lack of theoretic foundation and model verification block workflow technique research application (Vivas, 2010).Process logic, timing constraint logic, resource dependency logic and information dependency logic are aspects to be carried out to verify confirmation analysis (Vivas, 2010). A change in a model can be costly and time consuming if done by hand because the domain analysis may have many entities and dependency relationships on different levels. Users are able to select dependencies and analyse the dependency relationships (Vivas et al., 2010).

5.4 Limitations

The use of sampling in this study limited the chance of members of the target population to be included in the sample. This limited the potential of the study to extract a complete picture of the challenges from the perspective of other members.

5.5 Managerial Guidelines

From the results of this study the following guidelines are given to the Finance Office employees at NWU that have a sustainability solution or are planning to develop and implement sustainability in the future:

- Employees in the Financial Department at the NWU have an understanding of what is expected of them, however, training should be implemented whereby they understand the role that hey play in the process in relation to other departments in the chain of events.

- Sufficient training is provided by the organisation, however, monitoring and implementation of material covered have to be monitored by the team leaders of the respective departments

- A close monitoring system needs to be put in place in order to track queries as well as turnaround time closely monitored to enable the reduction in costs of duplicating tasks

- Combined effect between departments need to be implemented and closely monitored

- Plans discussed at the beginning of the month need to be implemented and closely monitored by the respective team leaders

- Manpower needs to be increased during peak period to ensure quality of work produced and to increase the turnaround time of cases to be issued

- Change in system procedures and policies should be discussed with root level employees in order to get their input as well as to obtain their opinion and thereby ensuring the smooth implementation thereof

- Contingency plans should be out in place and monitored to cater for absenteeism. This will be achieved by employing experienced casual staff who understands the processes thoroughly. By employing casual staff, the organisation will not incur addition costs on staff benefits.

- In order for any organisation to develop, changes need to be implemented. A culture of acceptance embracing of change need to be inculcated amongst staff and they need to be psychologically trained to accept and deal with change in the workplace.

5.6 Conclusion

All departments in the workflow process need to be made aware and understand the workflow of other departments in order to facilitate the smooth running of processes and thereby positively contributing to the final goal, the bottom line. Furthermore, findings can improve organisational performance, quality of education and development of human resources.

The objectives of the workflow processes is to redefine and reconstruct the components of lengthy business cycles so that the time required to execute a task is minimised and the transfer time between tasks is eliminated. This means that there will be improved efficiency through the elimination of many task steps. Better business process control will be achieved by standardizing work methods and creating audit trails especially involving FAO bursary officers in the workflow that will make them not to isolate their responsibilities. Value adding will be able to bring flexible bred from software control over processes, which enables the business unit in redesigning processes that will cater the FAO.

Qiu and Wang (2007) argue that in addition to handling changes on workflow instances from a single template, this approach can also change individual workflow instances by informing the underlying workflow system their former and present workflow templates. Since dynamic workflow change management handles changing aspects workflow version management is necessary to track the change history of workflow templates and instances.

REFERENCES

Altizer, L. (2004). Survey research: a summary of best practices. Washington, D.C, *Ethics Resource Centre*. http://www.ethics.org/resources/article_detail.cfm?ID=847. Date of access: 25 September 2013.

Berg, B. (2004). Qualitative research methods for the social sciences, 5th edition. Boston, Pearson (6).

Cresswell, J. W. (2009). Research Design: Qualitative, Quantitative and Mixed Methods Approaches.

Bless, C and Higson-Smith, C. (1998). Fundamentals of social research methods: An African perspective, (2nd edition). Kenwyn: 164: 9.

Cooper, D.R. and Schindler, P.S. (2003). *Business research methods* (8th ed.). Boston: McGraw-Hill Irwin.

Cheung, O. S., Wong, P. S. P. and Wu, A. W. Y. (2001). Towards an organizational culture framework in construction. *International journal of project management*, 29:184-196.

Diamantopoulos, A and Schlegelmich, B. (2004). The relationship between country-of-origin image and brand image as drivers of purchase intentions: a test of alternative perspectives. *International marketing review*, 28:508-524.

Deelman, E, Gannon, D, Shields, M and Taylor, I. (2009). Workflows and e-Science: An overview of workflow system features and capabilities. Future Generation Computer Systems, 25, (5): 528–540.

Fallows, D, 2004. The Internet and Daily Life. Many Americans use the Internet everyday activities, but traditional offline habits still dominate, Pew/Internet, Washington, D.C. 20036.

Fink, L. H., K, Lee, K. L., and Lui, C. C. (1995). From generic restoration actions to specific restoration strategies. *Power Systems, IEEE Transactions, 10*, (2): 745 – 752.

Gill, M. (2000). The Application of the Workflow Primitive Framework to e-Commerce Business-to-Business. Processes: Enhancing the Electronic Supply Chain. *AMCIS 2000 Proceedings,* pp138.

Grefen, P. and De Vries, R.R. (1998). A Reference Architecture for Workflow Management System. Elsevier 27:31-57

Guerrero-Garcia, J. (2013). Evolutionary Design of User Interfaces for Workflow Information Systems. Journal homepage: www.elsevier.com/locate/scico.

Hague, P. N and Jackson, J. H. (1999). Market Research: *A Guide to Planning, Methodology and Evaluation*, (2nd ed). Kogan Page, London, pp.155-7.

Held, M and Blochinger, W. (2009). Structured collaborative workflow design. *Future Generation Computer Systems*, 25, (6): 638–653

Heeks, R. (2002), Information Systems and Developing Countries: Failure, Success, and Local Improvisations. *The Information Society*, 18: 101–112.

Julia, V., Oliveira, F. F and Valette, R. (2003). Real time scheduling of Workflow Management Systems based on a p-time Petri net model with hybrid resources. *Simulation Modelling Practice and Theory*,16, (4): 462–482.

Kumar, A.and Wainer, J. (2004). *Meta Workflow As A Control And Coordination Mechanism for Exception Handling In Workflow Systems*, 40:89-105.

Leedy Y and Omrod, D. (2000). The determinants of perceived service quality and its relationship with satisfaction. *Journal of Services Marketing*, 14(3), 217-231.

Liu, A. and Wall, G. (2006). Planning tourism employment: a developing country perspective. *Tourism management*, 27:159-170.

Maxwell, J.C. (2008). *The four pillars of leadership.* Cape Town: Struik Christian Books.

McGrath, S. and Akoojee, S. (2007). Education and skills for development in South Africa: Reflections on the accelerated and shared growth initiative for South Africa, p421-434.

McGrath, S. and Badroodien, A. (2006). International influences on the evolution of skills development in South Africa. *International journal of educational development*, 26(5):483-494.

Mentzas, G., Halaris, C. and Kavadias, S. (2001). Modelling Business Processes With Workflow Systems: An Evaluation of Alternative Approaches. Pergamon 21:123-135.

Moreno, M. D. R., and Kearney, P. (2007). Integrating AI Planning Techniques With Workflow Management System. Elsevier 18:257-266

Prasad, P. (2005). Symbolic processes in the Implemetation of technological Change: A symbolic interactionaist Study of Work Computerisation. Academy of Management Journal, 36, (6), p. 1400-29.

Qui, R., Ennew, C. and Sinclair, M. T. (2005). The impact of regulation and ownership structure on market orientation in the tourism industry in China. *Tourism management*, 26:939-950.

Qui, Z. M and Wang Y. S. (2007). Dynamic Workflow Change in PDM Systems. Elsevier 58: 453-463

Recker, J and La Rosa, M. (2011). Understanding User Differences in Open source Workflow Management System Usage Intentions. Elsevier Ltd. 37: 200-212

Rinderle, S., Reichert, M and Dadan, P. (2004). Correctness Criteria for Dynamic Changes in Workflow Systems.- a survey. Elsevier Ltd. 50:9-31.

Schuman, H., and Kalton, G. (1985). Survey methods, The handbook of social psychology. New York. 3, (1), p. 635-698.

Tanna, G.B., Gupta, M., Rao, H.R and Upadhyaya, S. (2005). Information Assurance Metric Development Framework for Electronic Bill Presentment and Payment System Using Transaction and Workflow Analysis. Elsevier 41:242-261

Vivas, J.L, Fernandez-Gago, C., Lopez, J and Benjumea, A. (2010). A Security Framework for A Workflow-Based Grid Development Platform. 32:230-245.

Wang, M., Wang, H and Xu, D. (2005). The Design of Intelligent Workflow Monitoring With Agent Technology. 18: 257-266

Wickboldt, J.A., Bianchin, L.A., Lunardi, R.C., Granville, L.Z., Gaspary, L.P. and Bartolini, C. (2011). A Framework for Risk Assessment Based on Analysis of Historical Information of Workflow Execution in IT System. 55:2954-2975

Zhen, L., Huang, G.Q., Jiang, Z. (2009a). Collaborative Filtering Based on Workflow Space. 36:7873-7881

Zhen, L., Huang, G.Q., Jiang, Z. (2009b). Recommender System Based on. 48:237-245

APPENDIX A: MATRIX

ARTICLES	Definitions of Workflow	Capabilities to adopt workflow	Policies and Workflow	e-Science and Workflow	Levels and Use Of Workflow support systems (WWS)	Models	Workflow Challenges	Problems	Benefits	Frameworks and Workflow
Workflows and e-Science 1	•	•	•	•	•	•	•		•	•
A deductive system for proving workflow models 2	•									
Correctness criteria for dynamic changes in workflow systems 3	•			•	•		•		•	
A reference architecture for workflow management systems 4	•	•		•		•		•	•	•
Real time scheduling of Workflow Management Systems based on p-time Petri net model with hybrid resources 5	•	•	•		•		•	•		•
Meta workflow as a control and coordination mechanism for exception handling in workflow systems 6			•		•	•	•		•	
Understanding user differences in open-source workflow management 7	•		•	•	•	•	•	•		•
A model-driven workflow fragmentation framework for collaborative workflow architectures and systems 8	•	•	•		•		•	•	•	
Handing signature purposes in workflow systems 9		•			•	•	•	•	•	
Dynamic workflow change in PDM systems 10		•			•			•	•	•
Evolution design of user interfaces for	•	•	•	•	•	•	•	•	•	•

workflow information systems 11										
Information assurance metric development framework for electronic bill presentment and payment systems 12		•		•	•		•	•		•
Recommender system based on workflow 13		•		•	•	•	•	•	•	•
Metagraphs in workflow support systems 14	•	•	•		•	•	•		•	•
Modelling business process with workflow systems Alternative approaches 15			•	•	•	•	•		•	•
A security framework for a workflow-based grid development platform 16	•	•			•	•	•	•	•	•
An operational approach to the design of workflow systems 17	•				•		•	•	•	•
Integrating AI planning techniques with workflow management system 18	•	•			•		•		•	
The design of intelligent workflow monitoring with agent technology 19	•		•	•		•	•	•		
Collaborative filtering based on workflow space 20		•	•					•		
Goals description and application in migrating workflow system 21		•		•			•	•		
Developing a reusable workflow engine 22				•	•	•	•	•		
A framework for risk assessment based on analysis 23		•				•				•
Estimated financial savings associated with health information exchange 24		•		•		•	•		•	
A reference model for team-enabled workflow management systems 25	•	•	•	•	•	•	•	•	•	•

APPENDIX B: Questionnaire Development Matrix

Questionnaire section	Types of Research Questions	Question No.	Development Matrix				
			Survey Question/ Statements	Response Options	Data Type	Appropriate Data Measure	Appropriate Statistical Test
Section 1	Demographic Questions	1.1	Please tick your age group in the appropriate block:	21-30, 31-40, 41-50, 51-60, 60+	Discrete	Ordinal	Basic descriptive statistics, single group t test, the z proportions test the X^2 test. (Use demographic data to characterise your respondents)
		1.2	What is your gender?	Male or Female	Dichotomous	Nominal	
		1.3	How long have you been working at the North West University Financial Department.	1-2, 3-4, 5-6, 7-8, 9-10, 10+	Discrete		
		1.4	Was your involvement in workflow planning for the Financial Department advisor staff from a Financial or Business perspective?	Financial or Business	Dichotomous	Ordinal	
		1.5	How many workflow planning implementations have you been involved in including this one?	1, 2, 3, 4, 5+	Discrete	Nominal	
		1.6	What type of post are you in at work?	Managerial or Non-Managerial	Dichotomous		
		2.1	Your functional	Strongly Agree -	Continuum (= Cline)	Scalar (Likert	Any member of

Section 2	**Is there a communication/ collaboration problem in the NWU finance department and if identified it will improve the sustainability of workflow management systems?**		area of workflow planning was implemented within the timelines originally stipulated.	Agree-Disagree-Strongly Disagree		Scale)	the X^2 Any member of the X^2 family or correlation tests, e.g., Phi co-efficient, the contingency coefficient and Cramer's V, the lambda co-efficient or the un-certainty coefficient (U) or the Pearson significance test. (Continuous data reveal attributes of whatever one studies, allow one to determine general trends and establish significant correlations = co-relation trends between two attributes)
		2.2	The plant assigned while assuming you understand financial workflow was appropriate.	Strongly Agree - Agree-Disagree-Strongly Disagree	Continuum	Scalar (Likert Scale)	
		2.3	Workflow planning had enough people resources assigned to it in your functional area.	Strongly Agree - Agree-Disagree-Strongly Disagree	Continuum	Scalar (Likert Scale)	
		2.4	Your functional area received sufficient and timeous training for workflow planning	Strongly Agree - Agree-Disagree-Strongly Disagree	Continuum	Scalar (Likert scale)	
		2.5	There are adequate management support and commitment throughout the workflow planning.	Strongly Agree - Agree-Disagree-Strongly Disagree	Continuum	Scalar (Likert Scale)	
		2.6	Satisfactorily accountability was placed on the workflow planning team for their function in the project	Strongly Agree - Agree-Disagree-Strongly Disagree	Continuum	Scalar (Likert Scale)	
		2.7	Satisfactorily	Strongly	Continuum	Scalar	

			accountability was placed on the business for their function in the project.	Agree - Agree-Disagree-Strongly Disagree		(Likert Scale)	
		2.8	Project team leaders were sufficiently monitored to ensure that they were fulfilling their functions	Strongly Agree - Agree-Disagree-Strongly Disagree	Continuum	Scalar (Likert Scale)	
		2.9	An appropriate planning measure was implemented for strategic planning.	Strongly Agree - Agree-Disagree-Strongly Disagree	Continuum	Scalar (Likert Scale)	
		2.10	The original business case adhered to for project workflow planning	Strongly Agree - Agree-Disagree-Strongly Disagree	Continuum	Scalar (Likert Scale)	
Section 3	**What are the financial processes in the NWU department and their impact on the sustainability of workflow management system?**	3.1	Sufficient strategic planning was exercised throughout the phases of the financial department	Strongly Agree - Agree-Disagree-Strongly Disagree	Continuum	Scalar (Likert Scale)	Any member of the X^2 family or correlation tests
		3.2	Did you participate in any workflow planning event?	Yes - No	Dichotomous	Nominal	Basic descriptive statistics, single group t test, the z proportions test the X^2 test
		3.3	Were you part of a workflow planning team?	Yes - No	Dichotomous	Nominal	

Section 4	**What are the capabilities of workflow management systems, its causes of and its impact on reliability ?**	4.1	Do you know what the Financial Department Business Plan and how workflow planning impacts upon it	Yes - No	Dichotomous	Ordinal	Any member of the X^2 Any member of the X^2 family or correlation tests, e.g., Phi co-efficient, the contingency coefficient and Cramer's V, the lambda co-efficient or the un-certainty coefficient (U) or the Pearson significance test. (Continuous data reveal attributes of whatever one studies, allow one to determine general trends and establish significant correlations = co-relation trends between two attributes)
		4.2	The workflow planning was aligned to the business strategy for the 2011/2012 financial year that is the strategic planning policy was appropriate to the Financial department business strategy.	Strongly Agree - Agree- Disagree- Strongly Disagree	Continuum	Scalar (Likert Scale)	
		4.3	The concurrent restructuring and centralisation process at Financial department had a negative effect on the workflow planning implementation.	Strongly Agree - Agree- Disagree- Strongly Disagree	Continuum	Scalar (Likert Scale)	
		4.4	I attend seminars or workshop on workflow planning.	Strongly Agree - Agree- Disagree- Strongly Disagree	Continuum	Scalar (Likert Scale)	

APPENDIX C: QUESTIONNAIRE

FOR OFFICE USE ONLY: **Respondent Code:** _____

"Factors effecting Workflow Process in the Financial Department for Financial aid Office in the NWU and management role in the process"

Graduate School: North-West University

Researcher: Itumeleng Mokgabudi

Supervisor: Prof S Lubbe

Note to the respondent:

- We need your help to understand the factors affecting effecting Workflow Process in the Financial Department for Financial aid Office in the NWU and management role in the process.
- Although we would like you to help us, you do not have to take part in this survey.
- If you do not want to take part, just hand in the blank questionnaire at the end of the survey session.
- What you say in this questionnaire will remain private and confidential.

The questionnaire as three parts:

Part 1 asks permission to use your responses for academic research.

Part 2 asks general personal particulars like your age, gender etc.

Part 3 to 5 asks questions relating to the use of Workflow Process in the Financial Industry.

How to complete the questionnaire:

1. Please answer the questions as truthfully as you can. Also, please be sure to read and follow the directions for each part. If you do not follow the directions, it will make it harder for us to do our project.

2. We are only asking you about things that you and your fellow colleagues should feel comfortable telling us about. If you don't feel comfortable answering a question, you can indicate that you do not want to answer it. For those questions that you do answer, your responses will be kept confidential.

3. You can mark each response by making a tick or a cross, or encircling each appropriate response with a PEN (not a pencil), or by filling in the required words or numbers.

No	2 PART 2: GENERAL PERSONAL PARTICULARS	8.	The plan assigned while assuming you understand financial aid was

1	**Part 1: Permission to use my responses for academic research**

I hereby give permission that my responses may be used for research purposes provided that my identity is not revealed in the published records of the research.

Initials and surname _____ _____

Postal address: _____

Postal code: _____

Contact numbers: Home: _____Cell: _____

Thank you very much for filling in this questionnaire.

	3 Please tell us a little about yourself ***Please mark only ONE option per question below.***			appropriate? ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree
1.	How old are you? ❑ under 21 years ❑ 21-30 years	❑ 31-40 years ❑ 40-50 years ❑ Over 50 years		
2.	What is your gender? ❑ Male	❑ Female	9.	Workflow planning had enough people resources assigned to it in your functional area. ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree
3.	What is your highest level of education? ❑ Some schooling or less (low or high) ❑ Matric ❑ Technical qualification ❑ Undergraduate degree		10.	Your functional area received sufficient and timeous training for workflow planning. ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree

4.	How long have you been working at the No Financial Office at the NWU? ❑ under 2 years ❑ 2- 3years	❑ 3-4 years ❑ 5-6 years ❑ 7-8 years ❑ Over 9 years	11.	There adequate management support and commitment throughout the workflow planning. ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree
5.	Was your involvement in workflow planning for the Financial Department advisor staff from a Financial or Business perspective? ❑ Financial ❑ Business		12.	Satisfactory accountability was placed on the workflow planning team for their function in the project. ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree
6.	How many workflow planning implementations have you been involved in including this one? ❑ under 2	❑ 5-6 ❑ 7-8 ❑ Over 9	13.	Satisfactory accountability was placed on the business for their function in the project. ❑ Strongly agree ❑ Agree ❑ Disagree

	❑ 2- 3 ❑ 3-4			❑ Strongly disagree
6.	What type of post are you in at work? ❑ Managerial ❑ Non-Managerial		14.	Project team leaders were sufficiently monitored to ensure that they were fulfilling their functions. ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree
	PART 3: Is there a communication/collaboration problem in the NWU finance department and if identified it will improve the sustainability of workflow management systems? *Please mark only ONE option per question* *Below*		14.	An appropriate planning measure was implemented for workflow planning. ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree.
7.	Your functional area of workflow planning was implemented within the timelines originally stipulated. ❑ Strongly agree ❑ Agree		15	The original business case adhered to for project workflow planning. ❑ Strongly agree ❑ Agree

	❑ Disagree ❑ Strongly disagree		❑ Disagree ❑ Strongly disagree.
No.	4 PART 4: **What are the financial processes in the NWU department and their impact on the sustainability of workflow management systems?** ***Please mark only ONE option per question below.***	19	Do you know what the Financial office at the NWU Business Plan and how workflow planning impacts upon it? ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree.
16.	Sufficient workflow planning was exercised throughout the phases of the Financial office at the NWU? ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree.	20.	The workflow planning was aligned to the business strategy for the 2011/2012 financial year that is the workflow planning policy was appropriate to the Financial office at the NWU business strategy? ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree
17	Did you participate in any workflow planning event?	21.	The concurrent restructuring and centralisation process at NWU finance department had a negative effect on the workflow planning

	❑ Yes ❑ No		implementation? ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree
18	Were you part of a workflow planning team? ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree.	22.	I attend seminars or workshop on workflow planning? ❑ Strongly agree ❑ Agree ❑ Disagree ❑ Strongly disagree.
No.	PART 5: **What are the capabilities of workflow management systems, its causes of and its impact on reliability?** ***Please mark only ONE option per question below.***		**THANK YOU FOR YOUR TIME** **THE END**