



**ENTERPRISE RESOURCE PLANNING TOOLS MANAGEMENT IN  
PRIVATE HIGHER EDUCATION IN SOUTH AFRICA**

By

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**Thesis submitted in fulfilment of the requirements of Doctor of Philosophy  
Degree in Management Sciences, in the Department of Business Administration,  
Faculty of Management Sciences, Durban University of Technology.**

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**2021**

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**DECLARATION**

I do thus announce that this thesis is the consequence of my own research and enquiry and that it has not been submitted for examination to some other University.

...23 April 2021 ....

Mithi, J.

Date

**APPROVED FOR FINAL SUBMISSION**

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## **ACKNOWLEDGEMENTS**

I am thankful to Dr S. Govender for taking me through the PhD study. Professors: Shalin, Kay and Govender were greatly refreshing for coordinating the research thoughts before setting out on it.

My vote of thanks to Dr Zizwa Msukuma Chisi who afforded me the opportunity in molding the course of my study proposition at the beginning of the research. Special thanks to Dr Junior Mabiza for giving me clear direction in choosing the Universities /s to embark PhD studies with; Gracious Banda and Abdul Majeed Fundi for their awesome bits of knowledge into the theme.

I do appreciate my mum: Nyathela, for her support in my PhD studies.

My appreciation cannot be finished without giving a series of acclaim to my extraordinary Professors; Kay, Shalin, Govender, Rampersad and the entire DUT post graduate team not forgetting Ms Mitha, Lavisha, Mesha Naicker, Ms Jeslyn Hoover, Rueben and Mr Shanil Singh, in the Faculty of Management Sciences for their administrative support.

The list would not be complete without acknowledging the material and financial support from the two automobile service entrepreneurs , Alafin Osman and Alpha in the course of my studies, who ensured that automobiles that I used, were always up and running and in good condition.

## **DEDICATION**

This PhD Thesis is dedicated to My Mum Florence Nyathela for her continued support and encouragement in not giving up in life.

## ABSTRACT

**Purpose of the study:** In this thesis on Enterprise Resource Planning Tools Management in Private Higher Education in South Africa, the study utilised multiple sources of data collection in a mixed manner, namely; use of interviews and focus groups (in-depth interviews) in qualitative investigations and questionnaires in the survey method in order to determine critical issues influencing Enterprise Resource Planning (ERP) tools in academic management in Private Higher Education Institutions (PHEIs) in South Africa.

**Research problem:** Mithi, Mabiza, and Edoun (2016:42), stated that the integration of digital software technological tools (ERPs) to support academic management showed that it was “possible to digitalise learning systems and find adequate acceptance from stakeholders. However, there is still a need to understand whether an improvement in Enterprise Resource Planning Software tools is appreciated, fully supported in the vision of contributing to the academic activities of PHEIs as businesses.

**Research methods:** A mixed methods (qualitative and quantitative) research methodology was used pragmatically in the study paradigm to triangulate the results of the research from an interpretive position. The research analysed and reported on subjective and quantitative data to ascertain knowledge about the participants’ recognition of critical issues affecting management of ERP tools in academic management in Private Higher Education Institutions (PHEIs) in South Africa.

In this study, the following groups of participants were purposefully sampled: students, lecturers and management staff working in the three PHEIs in Gauteng. The study found that academic attainment in PHEIs could be enhanced through ERP tools management in ICT integration.

**Findings and recommendations:** In light of the research outcomes, the study suggests that there is enhanced coaching and students personal interactions through online

conference tools, a practice that may be backed up and carry the same weight and recognition as physical learning contact hours. The qualitative data analysis raised a debate that HE ERPs must or may integrate all those particular factors that coordinate and interact as changes made in one factor should also reflect in another factor or module. ERP tools security features should be instituted at all levels of the main tools. Issues of integration in the selection of any robust, dynamic PHEI tools may call for a firm's financial readiness and company-wide consultations with potential users of the system. Bringing in such a discussion in preparation to single out tools that may be selected over time may be an issue that is seldom shared by top HE executives, as other decisions in the ERP tools selection may seem to be imposed upon departments. HE ERP that does not have a student portal, without integrated online issues of applications, checking of results, enhancement of teaching and learning but partly integrating one or two departments in isolation to others, may not be considered fit or robust as a higher educational ERP.

**Keywords:** Private Higher Education Institutions (PHEIs), Enterprise Resource Planning (ERP) tools, Information and Communication Technology (ICT); Factor analysis, Higher Education (HE). Nvivo qualitative data analysis, Reliability statistics, SPSS version 25 (Statistical Package for the Social Sciences).

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

4IR	Fourth Industrial Revolution
5IR	Fifth Industrial Revolution
ADvTECH	Private Enterprise in Schools, Higher and Further education and Training, and Skills Outsourcing
AIMA	Industry chartered associations in India
AI	Artificial Intelligence
AL	Absorptive Limit
ANOVA	Analysis of variance in statistics
APS	ADvTALENT People's Solutions (HR & Payroll tool)
ASC	Adjusted Score Card
AU	Actual Use
AX	Nomenclature of Microsoft Dynamics integrated solutions
BAC	Basic Achievement Components
BAE	Basic Achievement Elements
BAF	Basic Achievement Factors
BAV	Basic Achievement Variables
BI	Behavioural Intention
BLM	Business Leadership Matrix
BPM	Business Process Management
BPO	Business Process Organisation
CAMS	Comprehensive Academic Management System
CDEES	Complexity, Dissemination of Innovation, Equilibrium, Elaboration Probability Display and Self Efficacy Stream case in ERPs
CE	Client Execution

CII	Industry chartered associations in India
CLASS NP	Arrangement of choice issues in CUH that are explained By non - determination over a period of time
CLASS P	Arrangement of choice issues in CUH that are explained determination over a period of time
CMMI	Comprehensive Academic Management
CMMI-SVC	Advanced Customer Relationship Management System
CRA	Client Relationship Administration
CRM	Customer Relationship Management
CSF	Critical Success Factors
CUH	Computational Unpredictability Hypothesis
DC	Dynamic Capacities
DC	District of Columbia
DI	Data Innovation
DIT	Diffusion of Innovation
DTPB	Decomposed Theory of Planned Behaviour
E-ASSETS	Electronic Assets
ELM	Elaboration Likelihood Model
ENN	Elets News Network
EPD	Elaboration Probability Display
ERP	Enterprise Resource Planning
ET	Equilibrium Theory
FBC	Folding Blade Chart
FC	Facilitating Conditions
FICCI	Industry Chartered Associations in India
HE	Higher Education
HEIs	Higher Education Institutions
ICAS	Integrated Campus Administration System
ICT	Information Communications Technology
ID	Identification Document
IIE	Independent Institute of Education
IIECA	Industry Chartered Associations in India
IoT	Internet of Things
IS	Information Systems
ISCHOOLS	Data Schools

IT	Information Technology
ITS	Integrated Tertiary Software
KEP	Key Execution Pointers
KDIA	Key Data Innovation Administrations
LDS	Library and Data Science
MI	Maintainable Improvement
MIS	Management Information System
MRP	Material Requirements Planning
MRP II (MRP)	An Extended Materials Prerequisites Arrangement
NVIVO	Qualitative Data Software
PAE	Private Advanced Education
PET	Punctuated Equilibrium Theory
POV	Places of Value
PBH	Punctuated Balance Hypothesis
PC	Pocket Computer / Computer
PCSV	Pocket Computer (Computer) Self-Viability
PDR	Predominant Rationale
PFRISPA	Procedure for Request of Inclination by Similitude to Perfect Arrangement
PHEIs	Private Higher Education Institutions
PHIs	Private Higher Education Institutions
QCA	Quality Capacity Arrangement
RC BRAAM	Rosebank College Braamfontein
RC	Rosebank College
RC PTA	Rosebank College Pretoria
SAAS	Software as a Service
S-AH	Self-Adequacy Hypothesis
SAM	System Academic Management
SAP	System Application Product
SEM	Structural Equation Modelling
SLAs	Service Level Agreements
SLR	Systematic Literature Review
SME	Small Medium Enterprise
SRMU	Shri Ramwaroop Memorial University

SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
TEL	Technology Enhanced Learning
TiE	Industry Chartered Associations in India
TOE	Technological Organisational Environment
TPB	Theory of Planned Behaviour
TCO	Total Cost of Ownership
TRA	Theory of Reasoned Action
T-TESTS	Probability Tests in Statistics
TTF	Technological Task Development Fit
UK	United Kingdom
UP	User Performance
UTAUT	Unified Theory of Acceptance and Use of Technology
UTAUT2	The extended Unified Theory of Acceptance and Use of Technology
Wi-Fi	Wireless Fidelity Technology
WLQ	Work Life Quality

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## **CHAPTER 1**

### **INTRODUCTION AND ORIENTATION TO THE STUDY**

#### **1.1 Introduction**

Enterprise Resource Planning (ERP) is described as the ability to convey an incorporated suite of business applications. ERP tools share a typical procedure and information model covering wide and significant operational start to finish forms. Examples are found in the areas of accounting, human resources management, production, administration, distribution and supply chain networks (Gartner 2019, Mirzaee and Ghaffari 2018).

Pertaining to Enterprise Resource Planning Systems (ERPs), ERP applications mechanise, robotise or automate and support an extent of administrative and operational business forms over different endeavors, including line of business, Customer Relationship Management (CRM), managerial and asset administrative functions of a business. ERP establishments are expensive and complex endeavors and some firms battle to characterise or depict the business benefits thereof (Abdullah and Babaseheb 2017).

ERP benefits, as categorised by Gartner (2019) follows as an impetus for business advancement; a stage for business process proficiency; a process institutionalisation vehicle; and Information Communications Technology (ICT) as a cost saving channel.

Regarding expanded ERPs, as revealed by Abugabah, Sanzogni and Alfarraj (2015:45-64) in Enterprise Resource Planning (ERP) Frameworks, framework quality, undertaking innovation “fit and data quality are the essential factors that prompt better end-client” observation. This confirms the propriety of expanding data framework models as a valuable method to give all the more ground-breaking bits of knowledge to client perspectives and framework affect.

Despite the fact that the researched factors clarified a huge segment of the fluctuation in client recognition, there is a part of the difference that remains unexplained. There has been a general absence of mindfulness reported about the significance of assessing ERP frameworks from a client point of view as. The primary focal point of past

investigations was either on basic components and usage issues or on client acknowledgment and fulfilment.

In the researcher's view, with the dynamic changes in organisations to adapt to expanding requests in consumer loyalty and undertaking development, PHIs are embracing virtual institutions. Hence this study underscored the significance of this issue in exploring critical issues influencing ERP tools management in higher education administration.

As highlighted from a review of general literature accompanying this study, authors have announced that it was of principal significance to build up a proof-based approach to the utilisation of ERP models inside ERP's administration's regularly evolving region. General assessments on post-ERP execution were urged to happen frequently for recognisable proof of non-conformists and towards constant change. Crafted by the previously mentioned authors, it is recommended to the Specialist to be watchful for extra factors that could have an effect on ERP device or tools administration.

Moreover, with respect to the plan of a coordinated structure and advancement of proper procedures as a progressive tool other than existing quality models in administration frameworks, observational investigations that came about gave a head start to future research for a more successful combination in ERP administration.

In light of the above perspective, there was a hypothesis that there ought to be a careful readiness of an aggregate quality administration data framework or Total Quality Management Information System (TQMIS) on current practices in ERP administration or principal innovation, emphasising fundamental hardware for access to the web and the system framework. Relating to TQMIS, a contention was introduced that the apparent successful ERP administration utilised an integrative approach intending to accomplish an adjustment or balance amongst certain key institutional components.

The writings above demonstrate that over the span of the last couple of decades, advanced education establishments have been open to the solicitations of changed overall business conditions to upgrade their suitability. The motivation for this study was to assess the execution of an undertakings asset arranging (ERP) structure in training and the related points of interest, with an accentuation on undergraduate students' execution, while applying a framework application item course of action.



### **1.1.1 The history of ERP and Evolution**

ERP providers and fashioners must consider client needs and concerns in the planning of ERP bundles. Understanding client qualities and their communication will prompt better advantages. For instance, when ERP clients have little computer access, framework fashioners ought to put more into making the frameworks less demanding to use in order to encourage more framework effects and advantages.

Abdullah and Babaseheb (2017:1-5) postulate “on the development of the Enterprise Resource Planning Systems (ERPs)”, that ERP has come a long way and has undergone various stages of transformation. The first stage was in the mid twentieth century in that the different offices inside associations used to work autonomously. These offices were frequently named practical storehouses. Normally, frameworks were denied the advantages of coordination. The “advancement of ERP frameworks nearly took after the significant improvements in the field of Pocket Computer (PC) equipment and programming frameworks.” Likewise, on account of the immense multifaceted nature of business capacities and changing of aggressive condition, associations began hunting down new innovations to satisfy their capacities or necessities. Along these lines, from 1960 upwards, “most associations planned, created and actualised concentrated figuring frameworks, generally computerising their stock control frameworks, utilising stock control bundles”. This was the original processing framework brought together.

Additionally, the second era was Material Prerequisites Arranging or Material Requirements Planning “(MRP) frameworks, which were created in the era of 1970 and included principally arranging the items or parts necessary as indicated by the main generation plan. The third era of the new programming frameworks called Assembling Assets Arranging (MRP II) was presented in the 1980s with an accentuation on streamlining fabricating forms by integrating the materials with generation prerequisites. MRP II included territories, for example, shop floor and dissemination administration; venture administration; human assets and designing”.

Furthermore, the fourth era was Endeavour Asset Arranging “(ERP) frameworks, which initially showed up at the end of 1980 to the beginning of 1990, with the intensity of coordinating business-wide operations. In view of the technological advancements of MRP and MRP II, ERP frameworks coordinate business forms, including all capacities

as assembling, circulation, bookkeeping, budgets, human asset administration, venture administration, stock administration and support, transportation, giving availability, perceivability and consistency over the Enterprise”. As reported from 1990 to date, ERP merchants or Providers have included more modules and capacities bringing forth the expanded ERPs.

## **1.2 Context of the research**

This study looks at ERP tools management in PHE in South Africa: critical issues affecting ERP tools in academic management.

Business organisations tend to have centralised continuous improvement operations. Quality teams work directly with business units to help implement standard practices around competency, processes and procedures. Quality is expressed as an ever-changing state associated with people, processes, services and products in an environment that seeks to meet customers’ needs and expectations for superior value-add (Goetsch and Davis 2014).

As reported by Ahmer, Demir, Tofallis and Asad (2016:1), Higher Education Institutions (HEIs) in Pakistan realised the “challenges of continuously improving the quality of higher education, stimulating growth and the use of innovation, leading to educational developers increasingly opting for Enterprise Resource Planning systems (ERPs) to reduce operational costs, enhance effectiveness and gain a competitive advantage. Countries where ERPs have been implemented and studied include” Belgium, Columbia, France, Switzerland, Jordan, Australia, Slovenia, United Kingdom and the United States of America. The past few years have recorded significant growth in the use of ERPs in the Higher Education sector globally. The aforementioned authors in corroboration, showed a gap in that there have been many implementation studies on ERPs in different areas, but few had been conducted exploring issues influencing the managing of systems in academic management.

According to Ben and Wan (2013), regarding contingency modelling in the enterprisation of operations, ERP was viewed as a software platform with software tools that connect information from all the main areas of the institution in the sense that it is an Information Communications Technology enabler that harnesses the technological

power in organisational systems literacy by using computers in the management of information. ERP tools cut across the different parts of the organization with the purpose of continuous improvement in decision-making. Laudon and Laudon (2012) agreed with Ben and Wan (2013) and Swink, Melnyk, Cooper and Hartley (2014) in that all core business areas (customer, supplier and employee relationships) are digitally enabled.

This section highlights the use of ERP systems / tools as a Management Information System in PHEIs in South Africa, with a particular focus on three PHEIs in Gauteng: In Pretoria, Rosebank College Pretoria and Damelin Menlyn and in Johannesburg, Rosebank College Braamfontein.

Rosebank College (RC) in Gauteng, a PHEI tertiary arm of the Independent Institute of Education (IIE); which is a subsidiary of the ADvTECH group, had positioned itself in its enterprisation of operations by adopting an Enterprise Resource Planning System before 2014. The IIE, in partnership with SIS global, a Microsoft Gold Certified partner, implemented a full ERP integrated solution for RC based on Microsoft Dynamics CRM, Microsoft Dynamics AX and CAMS (Comprehensive Academic Management System). The software tools, also known as technological solutions to RC's ERP system are: a "Proprietary Learning Management System – for students; ADvTECH People Solution System – an advanced technology-driven HR and Payroll System; System for Academic Management (SAM) – which provided the foundation for future technological development; and E-Learning Platforms –for the Schools" (ADvTECH Case Study 2014:2).

Van Niekerk (2003) cited in ITWeb (2017:1) stated that Damelin Education Group, in partnership with Strive Software International, implemented the Integrated Campus Administration System (ICAS), an integrated ICT system for the elevation of quality of service to students and users.

The above-mentioned tools are for the processing of integrated management activities. This presented a gap in the management of the ERP tools to enhance academic attainment.

In terms of this developmental aspect, the future required looking at systems in a futuristic holistic approach to its technological solutions by looking at the lapse of time;

which explored the internal and external factors that had an influence in managing the ERP tools in academic management for enhanced academic attainment.

### **1.2.1 The research problem**

According to Debrosse-Bruno (2017), ERPs present an organisational administration issue for various enterprises, including Private Higher Education Institutions (PHEIs), in light of the fact that they are expensive to establish and normally neglect to meet foreseen desires because of the sort of tasks that ERPs support. The importance of discoveries hoped to basically understand the research inquiries of the goals of this study. The audit of writing as an auxiliary information source was likewise viewed as important to expand the comprehension of Enterprise Resource Planning tools management in Private Higher Education in South Africa: critical issues influencing Enterprise Resource Planning tools in scholarly administration within the enquiry of a contextual examination, in order to explore and determine the inner and outer factors that have an influence on overseeing of ERP instruments for coordinated administration frameworks. The study aimed at developing and prescribing a system within best practices towards continuous improvement.

Mithi, Mabiza, and Edoun (2016:42), stated that the integration of digital software technological tools (ERPs) to support academic management showed that it was “possible to digitalise learning systems and find adequate acceptance from stakeholders. However, there is still a need to understand whether an improvement in Enterprise Resource Planning Software tools is appreciated, fully supported in the vision of contributing to the academic activities of Rosebank College (RC) Pretoria” and Braamfontein and Damelin Menlyn as businesses. This research will be published in journals for knowledge sharing, with a view to ensuring more effective academic programme management. The study will contribute to academic knowledge in trying to implement new approaches towards an ERP tools management framework in an academic system.

System access challenges in accessing the digital learning Enterprise Resource Planning (ERP) software tools was of concern to students and stakeholders generally. Slow system access through computers connected to the digital learning platform impacts on

learners' performance, quality and the usefulness of service in an enterprise (IIE Rosebank College 2016).

According to Tabbara (2016), DeLone and McLean's model (1992) within the Information System success models, was used in United Arab Emirates HEIs' ERPs, in the construction of a post-ERP measurement framework, identifying and measuring the value of ERPs in higher education. A critical study of this case confirmed that problems exist in both system and service quality.

Recent studies have highlighted the need for South African Higher Education Institutions to take into consideration the user experience in ERP tools as a prerequisite to user perceptions, in the acceptance of technology and to apply the post-implementation measurement framework. The infusion of technologies to learning management systems enterprise resource software tools was shown to be at the heart of Information Communications Technology (ICT), within a guided framework (Stolkenkamp and Siebrits 2015).

The current situation in the management of digital or ICT co-ordination is of concern to all students and staff in general (IIE Rosebank College 2016). Studies also showed that technology-enhanced learning (TEL) communities had made students' digital experiences a central concern (Beetham 2014). IIE Rosebank College Pretoria's Developmental Needs Questionnaire (2016) pointed to difficulties in connecting to the institution's network with one's digital devices and the absence of fast computer system access and accessing of files, although the Wi-Fi connection was ubiquitous across the campus and in spite of stakeholders having ready access to the institution's software and computers. A network is explained by Ciccarelli, Faulkner, Fitzgerald, Dennis, David, Skandier and Miller (2013) as computers that are electronically connected through specialised computers called servers.

IIE Rosebank College (2016), a tertiary division of the ADvTECH group (Private Enterprise in Schools, Higher and Further Education and Training and Sills Outsourcing), acknowledged the "conflicts in adaptating from the current system and digital learning enterprise resource tools, sometimes arising to the extent of challenging adaptability and later, the system" effectiveness (ADvTECH Case Study 2014:1).

To overcome critical issues presented by the management of ERP software tools in academic management, the study sought to understand whether Rosebank College (RC) Pretoria and Braamfontein and Damelin Menlyn were fit in managing the system's deficiencies and service quality levels in such an environment without their core businesses being jeopardised.

Looking at critical issues regarding managing ERP tools for integrated management systems in academic ERP could reveal what was actually happening within ERP integration and would help formulate a clearer picture through which conclusions and recommendations can be drawn. The study could suggest a framework for effectively managing service quality and system deficiencies. It was believed that academic attainment in PHEIs could be enhanced through ERP tools management in ICT integration as published in "the Policy for the Provision of Distance Education in South African Universities, in the context of an Integrated Post-school System as set out in the Schedule as policy in terms of section 3 of the Higher Education Act, 101 of 1997" (Saide 2014:3).

This research will contribute to the academic body of knowledge by sharing insights regarding PHEIs' ERPs.

### **1.3 Research objectives**

**To respond to the critical issues affecting system access in System Academic Management, the following are the objectives of the study:**

- To assess current ERP management practices in place in the selected HEIs;
- To explore the use of models in the integrated ERP management system (and their applicability);
- To analyse service quality levels in terms of the perceived usefulness of the Enterprise Resource Planning system;
- To examine the extent to which academic ERP is responding to the needs of all stakeholders within the selected HEIs;

- To ascertain the internal and external factors that impact the Enterprise Resource Planning system at the selected private higher education institutions; and
- To develop/formulate a framework for utilisation of ERP tools in Higher Education Institutions.

#### **1.4 Research questions**

From the above stated objectives, the following were the research questions:

- What are the challenges of ERP management practices in the selected HEIs?
- Why is it important that ERP be effectively managed and applicable when using models in the integrated ERP management system?
- What service quality levels are in place in terms of the perceived usefulness of the Enterprise Resource Planning system?
- To what extent are the academic ERP tools responding to all stakeholders' needs?
- What are the internal and external factors impacting the ERP system at the selected private higher education institutions?
- How to develop/formulate a framework for utilisation of ERP tools in Higher Education Institutions?

#### **1.5 Importance of tools management**

The use of Enterprise Resource Planning tools Management in Private Higher Education is currently dominating discourses on how to attain greater efficiencies and improved outcomes in education in South Africa. It is for this reason that this study seeks to determine the issues influencing ERP tools management in PHEIs.

Chapter 1 presents the prologue to the research study and Enterprise Resource Planning tools Management in PHE in South Africa, with a particular focus on critical issues affecting ERP tools in academic management.

## **1.6 Research focus**

### **Critical issues affecting Enterprise Resource Planning Tools in academic management**

ERP tools management in PHEIs in South Africa is the central phenomenon studied.

## **1.7 Statement of purpose**

The motivation of this research is to determine critical issues influencing ERP tools in academic management in PHEIs in South Africa within the enquiry of a case study in order to explore and determine the internal and external factors that influence managing of ERP tools for integrated management systems. The study developed and recommended a framework within best practices to be used towards continuous improvement. The study involved various participants, namely individual users of the system; students, academic staff and management groups at three sites in Gauteng: in Pretoria: Independent Institute of Education (IIE) Rosebank College Pretoria, Damelin Menlyn (The Education Group) and in Johannesburg: IIE's Rosebank College Braamfontein.

## **1.8 Nature of the study**

In this research, the theoretical framework underpinning the study contained hypotheses or speculations that controlled the reasoning with respect to how to comprehend and design the exploration of the study. This incorporated ideas and definitions from the hypotheses that were pertinent to this research.

In this exploration, DeLone and McLean's Model (1992) was utilised as hypotheses supporting the investigation, apart from other Data Framework general speculations in ERP tools administration. DeLone and McLean's hypothesis was produced in 1992 and had been broadly utilised as the standard for the legitimisation of ward factors in Data



Framework or Information Systems Achievement (IS). DeLone and McLean's hypothetical system clarified critical issues under examination by looking at integrated elements that were having an effect on ERP Administration. Six expansive regions supporting the hypotheses were delivered, ordered as: Framework quality; Data quality; Utilise; Client fulfilment; Singular effect; and Authoritative effect. DeLone and McLean's hypothesis on Dispersion of Innovation meant to recognise an interrelated arrangement of maintainability factors on an officially settled ERP framework (post execution) and further promoted that the round of questioning of supportability factors helped in expanding ERP client esteem, being a focal centre of administration, inside the Technological Hierarchical Condition also known as the Technological Organisational Environment (TOE). The TOE was seen as an idea of Data Frameworks, by and large, in understanding the ERP's post usage factors and the difficulties around clients' points of view and authoritative execution.

From DeLone and McLean's Model (1992), there is a linkage or derivative of Basic Achievement Elements (CSFs) Structure within it, incorporating other IS hypotheses that may fill in as rules for following the ERP tools administration and business change hones in meeting partners' necessities; in managing gaps or inadequacies in the ERP framework; and further streamlining the techniques for ERP tools management as the establishment required in the commencement, selection and change of the ERP instrument's administration.

The derived conceptual framework from DeLone and McLean's Model (1992) and IS general speculations connected to DeLone and McLean's model (1992) may fill in as a focal point in comprehending things under investigation, and might for the most part be valuable when it coordinated significant hypotheses which catch diverse perspectives of the study, and may not simply be an arrangement of hypothetical modules and thoughts. Yet additionally, some sort of intelligibility to the related pieces that are being united. Applied structure would be grounded on important hypothetical survey of writing, and experimental discoveries of past research, concentrating on researcher's own knowledge, duties, qualities and convictions.

The study indicates how the created structure, the upcoming conceptual framework in Chapter 3, got its underlying foundations from DeLone and McLean's Model as theory supporting the exploration inside Information System general theories in ERP tools

organisation (Grant and Osanloo 2014; Nizamani, Khoubati, Ismaili and S Nizamani 2014 and Lofty 2015).

## **1.9 Research methodology**

This mixed methods study sought to address whether RC Pretoria and Braamfontein and Damelin Menlyn were fit in managing the systems and service quality levels in such an environment without their core business being compromised.

”A convergent mixed methods design was used”, which is “a type of design in which qualitative and quantitative data are collected” simultaneously and analysed “separately, and then merged” to provide an analysis of the research problem” (Creswell 2015:18).

In this study, quantitative data using the survey method was used to test the proposed framework, predicting that ERP Critical Success Factors (CSF) within the Technological Organisational Environment (TOE) positively or negatively influenced users’ perceptions within the cross impact analysis of the ERP systems at the selected Private Higher Education Institutions in Gauteng.

The data collection instruments were administered to students, academic staff and management as ERP users.

Qualitative data was collected by making use of focus groups and in-depth interviews that explored critical ERP management issues impacting the ERP tools in the selected PHEIs. Quantitative data was collected by making use of a survey that included a sample selected from the population under research study.

The reason behind gathering both quantitative and subjective data was to triangulate the results, allowing for an in-depth understanding of ERP tools management towards better recommendations for future studies and continuous improvement.

### **1.10 Final contribution of the research**

This research will be published in journals for knowledge sharing and the findings could help the institutions to improve the ERP systems. The study will contribute to academic knowledge in trying to implement new approaches towards an ERP tools management framework in an academic system, with a view to enhancing academic attainment.

### **1.11 Aim of the study**

The aim of this study is to explore Enterprise Resource Planning tools management in Private Higher Education Institutions in South Africa by identifying the Critical issues affecting Enterprise Resource Planning tools implementation in academic management.

### **1.12 Rationale for the Research**

Recent studies have highlighted the need for South African Higher Education Institutions to take into consideration user experiences in ERP tools as a prerequisite to user perceptions in the acceptance of technology, as well as to apply the post-implementation measurement framework. The infusion of technologies in learning management systems enterprise resource software tools was shown to be at the heart of Information Communications Technology (ICT), within a guided framework (Stolkenkamp and Siebrits 2015).

The research study explored the gaps in the management of ERP tools and developed a framework that could enhance academic attainment in PHEIs. It is believed that academic attainment in PHEIs could be enhanced through ERP tools management in ICT integration as published by “the Policy for the Provision of Distance Education in South African Universities in the Context of an Integrated Post-school System as set out in the Schedule as policy in terms of section 3 of the Higher Education Act, 101 of 1997” Saide (2014:3).

### **1.13 Delimitations/scope**

This research is conducted based on the critical issues influencing ERP tools management in academic ERP; confined to three PHEIs in Gauteng.

#### **1.13.1 Limitations**

The attributes that influence the interpretation or understanding of the study are alluded to as limitations (Cresswell 2018).

This study is not generalised to other PHEIs in Gauteng, South Africa as the nature of the topic is dynamic.

#### **1.13.2 Structure of the Study**

- Chapter One presents the commencement to the study on Enterprise Resource Planning tools Management in Private Higher Education in South Africa and includes a unique focal point of critical challenges affecting the longevity of Enterprise Resource Planning devices in tutorial administration. This chapter presents the gaps in the administration of ERP tools and highlighted a roadmap on a suggested structure that could improve scholastic achievement in PHEIs. It is trusted that scholarly accomplishment in PHEIs could be improved through ERP tools administration.
- Chapter Two constitutes the Literature Review (section 1) and presents the hypothetical structure within which the issue was tended to. Chapter Two points to the proven approach in the utilisation of ERP models in the ERP tools administration arena. General assessments on post - ERP usage were greatly encouraged to take place frequently.
- Chapter Three constitutes the review of literature; section 2. It covers an audit of the fundamental original writing sources (for the most part academic diaries, but in addition, books, media articles, Internet and different sources are utilised). Furthermore, this chapter covers the theoretical conceptual framework within which

the problem is addressed. Chapter Three reviews literature exploring the usefulness or importance of an ERP Management System in private higher education institutions as well as critical issues influencing managing ERP tools in academic management. Additionally, the review focuses on other Management Information System models and best practices widely used in private higher education institutions.

- Chapter Four clarifies the exploration approach utilised in this examination. This section demonstrated the outline of the exploration representing models in the coordination of ERP administration frameworks and their appropriateness. Chapter Four shows the study design as a configuration in research that incorporated the hypothetical reason enveloping hypothesis advancement or testing, methodological reason, organising generalisability, exactness in charge and estimation, and the credibility of the setting. In exploring the critical issues influencing ERP devices administration, the researcher utilised an expressive outline in evaluating models, looking for bits of knowledge to questions.
- Chapter Five presents the discoveries of the examination. This section assessed the findings from the study (quantitative approach) and the concentration gathering of inside and outside meetings (subjective approach).
- Chapter Six shows a discourse of the consequences of the investigation. These discoveries were displayed graphically, numerically in the quantitative approach and there was a translation of the discoveries in the subjective approach.
- Chapter Seven constitutes a summary of the investigation, conclusions and proposals to upgrade scholastic achievement.

## **1.14 Conclusion**

The above chapter explained the ERP system tools in private higher institutions, with a call to continuously improve the quality of tools management by exploring challenges impacting the overseeing of the ERP devices currently being used in the chosen Private Higher Education Institutions (PHEIs); assessing extra components inside combination, for example, the administration of the ERP tools; and as the ERP framework gets punctuated in meeting the present needs of the firm, exploring the gaps in clients expectation and appraisal of their own execution inside ERP administration and structuring a system to empower the successful usage of ERP apparatuses to improve scholarly fulfilment. This chapter explores a need to understand the management of the software of ERP tools to determine whether managing software tools is optimized and fully supported in the vision of contributing to the academic activities.

The next chapter looks at a review of literature on ERP tools management.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

Chapter Two constitutes a review of the main seminal literature sources (mainly scholarly journals, books, media articles and the Internet). This review of literature on dissected accessible ERP frameworks was conducted to address this study's research questions and critical concerns. The motivation behind this exploration or the purpose of this writing audit was to determine and build knowledge around critical issues influencing ERP tools management in PHEIs in South Africa.

#### **2.2 Review of literature on previous (empirical studies)**

- *Use of models in the integrated ERP management system and their applicability*

Findings from previous studies by Peng and Nunes (2017), Schniederjans and Yadav (2013), Alhirz and Sajeev (2015) reported that it was of paramount importance to establish an evidence-based approach in the use of ERP models within ERP management's ever changing area. Regular evaluations on post-ERP implementation were greatly encouraged to be taking place regularly for the identification of misfits and towards continuous improvement. The work of the aforementioned authors suggested to the Researcher to be on the lookout for additional factors that could have an influence on ERP tools management. The study sought to explore the challenges influencing the managing of the ERP tools currently in use in the selected PHEIs.

In agreement with DeLone and McLean's Model (1992:60-95), (the Information Systems (IS) in general), the Foundations Systems Approach was used by Somerville and Mirijamdotter (2014) to study the collaborative information approaches reflecting knowledge creation and experiences through transferrable learning capabilities in an organisation. The systems approach indicated that sustainable continuous learning in an institution emanates from collaborative practices and system functionalities. As applied

to this study, this theory held that the domain knowledge transfer was to be at the centre of user experiences in the ERP system, with the view of not just looking at the technological fit and information quality, but also post-ERP implementation phase user experiences. This Foundation Systems Approach provided an opportunity for exploring insights into user aspects and ERP tools management for integrated activities.

Consequently, the Systems thinking in assessing individual capacities reflected within DeLone and McLean's theory (1992:60) as applied by Jaradat (2014), extrapolating the spawn and lagging brought about as a result of exponential technological advances, brought an understanding of the methods that bridged such a gap or divide. Sansogni and Alfrraj (2015), in tandem with Jaradat (2014), showed that most studies in ERP systems focused on factors that affect ERP implementation in terms of user acceptance and satisfaction, with less emphasis on antecedents like user groups and their computer knowledge experiences within the system. As such, this area presents a gap in the study in investigating the users' perspective awareness in ERP tools management.

Furthermore, the ERP systems in relation to DeLone and McLean (1992) have confirmed that there are few conceptual and theoretical frameworks in place to guide the implemented ERPs, hence the application of IS general theories (Kalema, Olugbara and Kekwaletswe 2014:65-84). Success Factor Theory, as developed by Kalema *et al.* (2014), brought a cross-impact analysis on "a wide range of factors that influence the success of ERP systems" in African Universities. This theory indicated that factors impeding success were closely examined within the Integrated Tertiary Software (ITS) in deriving what constituted "successful implementation and the use of ERP systems". "The cross-impact analysis" factors were presented as being complex and costly. At the centre of ITS is the daily use and perceptions of stakeholders of the ERP system. As applied to the research, this presented a gap in exploring the critical factors influencing ERP tool management. The research also proposed to draw on the premise that there was a recommendation for the consideration of indirect relationships, demanding further investigation in specific areas within the cross-impact analysis of the ERP system (Kalema *et al.* 2014).

Generally, Venture Resource Planning (Enterprise Resource Planning) usage had difficulties with a specific end-goal to expand the execution (Wijawa, Kosala, Meyliana and Prabowo 2017:513).



The motivation behind the examination was to propose an elective approach for the ERP “framework, with a specific end-goal to” improve the association execution. The technique for the approach was a Systematic Literature Review (SLR) for building up a spry (agile) structure for an ERP framework that included 54 papers for inquiry. The examination discoveries uncovered a coordinated structure as an instrument for a more improved ERP framework. The exploration propelled data from different analysts and practices to build up a deft structure for ERP framework as an elective arrangement “keeping in mind the end-goal to upgrade the execution and expanding upper hand of associations” towards business competitive advantage.

ERP Agility was clarified as the ERP device territories of cost, quality, reliability and adaptability that went past the capacity to react quickly to any unforeseen changes in the business condition (Wijawa *et al.* 2017:513).

Furthermore , Babaian, Xu and Wendy (2017) demonstrated that few ongoing investigations of ERP framework interfaces have affirmed that their poor ease of use blocks labourer profitability, despite the enormous speculations that organisations make in supporting and preparing clients or users. Ease-of-use challenges emerged from the unpredictability of ERP frameworks, which were planned as a general instrument for plenty of authoritative practices and settings. Figuring out how to work inside an unreasonably tremendous landscape of ERP assignment pages and parameters was a noteworthy test for most ERP clients. The proposed arrangement in this study conducted was dependent on the framework itself to share errand and process data-keeping in mind the end-goal to direct clients through learning and playing out their business assignments with the framework. This point of view emerged from utilising the human-PC joint effort way to deal with the plan of User Interfaces, which were applied as a directing system for the research. This research displayed two interface segments for giving ERP framework clients assignment and process direction: Computerised Playback and Intelligent Process Representation. The oddity of approach originated from utilising the historical backdrop of past cooperations to progressively make enlivened exhibitions out of assignment interfaces and to give an intuitive graphical guide to the present procedure being dealt with by the client.

The above research presented an opportunity to PHEIs to explore how ERP practices, amongst other factors, influenced ERP agility within the ERP tools integration.

### ERP as “Software as a service (Saas)”

## Automating Requirements Elicitation of Cloud-Based ERPs

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**Abstract.** Cloud computing (CC) imposed its presence in various domains as a computing model based on what it offers for enterprises. ERP systems as a domain is one of the beneficiary domains of SaaS applications. Eliciting requirements for cloud ERP systems is a challenging process due to the complex nature of ERP systems in addition to the distributed nature of CC. Most of the current techniques for eliciting ERP requirements do not take into consideration working in cloud environments. This paper is concerned with automating the requirements elicitation process for cloud-based ERPs. It also presents an interactive prototype to be used in a distributed environment, which uses the principals of the Form-Based Model (FBM). We use a real-life case study to demonstrate the automation process.

**Keywords:** Automated prototype · Cloud ERP · Form-Based Model · ERP requirements · Requirements elicitation · SaaS ERP

**Figure 2. 1: “Automating Requirements Elicitation of Cloud-Based ERPs”**

Source: Elmonem, Nasr and Gheith (2017:1)

In terms of the developments or the expansion of ERP instruments and the administration thereof, the more noteworthy commitment was from the ERP-appropriated condition (clients) instead of simply getting arrangements on the web or somewhere else. It was this reality that the study investigated . ERP was viewed as one of the spaces as a Software as a service (Saas) inside distributed computing (Elmonen *et al.* 2017).

Yatika and Hasija (2017) stipulated that within the integrated ERP management system, expanded rivalry had persuaded numerous senior chiefs in assembling associations to assess their focused techniques and assembling hones with the point of enhancing hierarchical execution.

Endurance in an engaged space has reliably been a test in the cutting edge of technology. In these days of globalisation, advancing or progressing digital firms think that it is difficult to endure competition, except if they have the competitive advantage. The experimental proof proposes that competent administrations of high caliber will out-perform the opposition advantages and increase the market entrance rate.

Regarding ERP tools, Quality Management had picked up in ubiquity chiefly as a result of expanding client cognisance of value and developing universal focused weight with the expanding need to take into account the developing requests of the clients and to adapt to increasing rivalry. Quality introduction was by all accounts the fitting methodology to stay focused. The absolute, most basic factor required for the survival and development of an association is quality. This had turned out to be significantly more imperative in extending worldwide commercial centres confronting real difficulties through rivalry amongst players within and through expanded clients' desires.

Organisations giving quality items and administration had increased their aggressive edge and more noteworthy pieces of the overall ERPs.

Step by step, the quantity of instructive establishments was expanding and the vast majority of them were being overseen by private administration. As benefit was their real concern, the part of value was being disregarded. Today, higher instructive Institutions are confronted with worldwide rivalry and a ton of issues. For example, low graduation rates, higher drop-out rates, less employability and so forth. Accordingly, instructive associations must adjust quality approaches to enhance the nature of advanced education. This study looked at the integrative models or frameworks and their applicability in PHE1s.

In turn, the expansion of advances was changing economies from various perspectives. This was especially valid in the purchaser confronting enterprises where the

development of computerised administrations was empowering novel offers, nearer buyer connections and a more prominent mechanisation of customer confronting business forms (MIS Quarterly Executive 2017). Applied to PHEIs, there was an opportunity to explore the ERP tools integration within the applicable frameworks.

New computerised benefits in customer confronting associations offered novel offers, nearer buyer connections and a higher mechanisation of shopper confronting forms. Be that as it may, changing to completely advanced administrations required an association to obtain particular capacities. This article exhibited an association's ability to evaluate its present capacities and distinguish gaps. Two top-to-bottom contextual investigations exhibited the utilisation of the model and recognised the capacities in pressing need of change. The suggestions were worked around four situations for utilising the model. The reference to the model demonstrated the possibility for evaluating the condition of shopper confronting advanced administrations, Customer Relationship Management (CRM) is referred to as CMMI for administrations (CMMI-SVC). It was an individual from the ability development show combination (CMMI) group of process level change and examination programs and portrayed great practices in 24 process regions. For example in prerequisites administration, limit and accessibility administration and hierarchical process definition. CMMI-SVC gives general direction on the advancement of customer relationship management systems and associated benefits yet needs particular bearing for the outline of computerised administrations. For instance, it addresses overseeing limit as a rule, without talking about the particular innovation-related abilities of advanced administrations, for example, client information administration (Wulf, Metler and Brener 2017).

From the above, the abnormal state of variety in the degree of advanced abilities proposed that organisations confront impressive difficulties in building up the essential transformational capacities. These difficulties incorporate constrained access to ability; an absence of business understanding and hierarchical dexterity; the non-appearance of a trial mentality; and wrong IT frameworks.

Managers looking for help on the best way to advance capacities and needing to gain from the gathered encounters of others routinely swung to reference models that depicted basic abilities and gave examples of how those capacities advanced after some time. Such models were extremely famous on the grounds that they empowered

organisations to survey their present state and recognise the future states which they yearned for. In any case, the models were regularly scrutinised for overlooking an association's situational setting and for producing a bureaucratic mentality, which had a tendency to block as opposed to empowering development.

Relating to PHEIs, the above examination featured the need to take a gander at the utilisation of models in the coordination of ERP administration frameworks towards scholastic achievement.

As indicated by Khan, Xuehe, Atlas, Pitafi, Saleem and Khan (2017:2), firms have a place with social groups that are specialists in making new information from conditions. Learning that is produced from past involvement and from conditions may influence an association's procedure decidedly. In order to prepare learning osmosis better, solid initiative capacities are required that can perceive information from conditions in the feeling of chance and danger. In this story, the impact of absorptive limit (AL) and predominant rationale (PDR) are examined with respect to big business asset arranging (ERP). Dynamic Capacities (DC) of the best directors to retain the learning from grassroots and absorb it as indicated by the requirements that enhance a company's venture asset arranging (ERP). The fundamental concentration in the examination was information “and how top-level supervisors utilise routine learning to get the future advantages for their individual firms. The model was figured from past writing that demonstrates the impact of absorptive limit, its subsets and predominant rationale and its measurements on ERP” osmosis.

“For this investigation the examination was about Chinese firms situated in Hefei City, Anhui territory in China. Hefei is one of the quickest creating and developing financial centres in China. Workers from the top level were the objective for gathering data in this research. The outcomes demonstrated that absorptive limit and overwhelming rationale affected ERP in Chinese firms. These did not just build the profitability and execution of the firm, but additionally helped in the designation of assets and basic leadership procedures to remain in the dynamic market and contradict any sort of dangers”. The outcomes indicated a positive connection between every one of the factors. This investigation from the Chinese firms from the area of Anhui might be applied to PHEIs in South Africa in discovering systems that may improve the advantages in the ERP apparatuses administration inside the coordinated condition.

Consequently, Awa, Ojiabo and Orokor (2017) presented an advancement affiliation condition (T-O-E) framework in which the association amongst the appointment and the factors inside the settings of development, affiliation, condition and task were authentically maintained. However, some had negative coefficients.

T-O-E logical characterisation is seen to acknowledge effective scholarly honour, yet it occasionally maintained unmistakable errors and individual factors. Regardless of the way that errand and individual settings had been freely tended to by task development fit (TTF) and bound together by the theory of Affirmation and Usage of Advancement (UTAUT) independently, the explanation behind this paper was to supplement and in addition grow the “T-O-E's bits of learning by planning TTF and UTAUT frameworks, and making and precisely testing a 12-factor structure that crosses five settings”.

“The system of approach used was reviewing data that was generally accumulated from six get-togethers of little organisational attempts with strong errands in Port Harcourt, Nigeria. The technique for assessing was purposive and used the snowball method, while the examination included ascertained likelihood backslide. It was uncovered that the association amongst gatherings and the segments inside the settings of advancement, affiliations, conditions and undertakings were genuinely maintained. However, some had negative coefficients. For a particular setting, social factors had a genuinely essential negative coefficient. Yet a ravenous drive was not quantifiably maintained. The study conducted is confined by its degree of extension. Along these lines, extended data are required to apply the disclosures to various regions/wanders, as well as to factor in the utilisation and post-apportionment stages and business-to-business gatherings in order to produce a more consolidated and widely inclusive determination framework. The disclosures bolster dealers and system makers to place more premiums on progressive and undertaking factors than on mechanical, regular and individual factors, as well as to make instructed and promoted programs that would intrigue certified and potential adopters and make them progress in the” unwavering quality venturing stool.

This paper included creating a research development gathering as it used factors inside the “T-O-E, TTF and UTAUT frameworks to” clear up the apportionment of progressions and to set up the shrouded associations “amongst T-O-E factors through planning other” profitable structures. The confinements and disclosures from this study understand an open entryway, enabling the change and usage of a framework in regulating ERP courses of action or instruments in private higher education.

Additionally, Ruivo, Oliveira and Mestre (2017) created and tried a hypothetical model to gauge the effect of big business asset arranging (ERP) and client relationship administration (CRA) frameworks and directing connections of framework and process mix on business esteem.

ERP and CRA frameworks were broken down “with the asset-based view hypothesis and estimated by their effect on business esteem, bearing in mind the control of framework and process joining. The model was tried and broken down with information gathered by Microsoft from firms that have embraced both ERP and CRA frameworks in their association. The ERP framework was observed to be a vital resource for business esteem. However, CRA frameworks' effect on business esteem was observed to not be noteworthy. Framework incorporation as an arbitrator of the ERP or CRA framework was observed to be not critical, but rather had a positive and noteworthy effect on business esteem. For process reconciliation, the examination found that it was critical while directing the CRA framework variable. The model demonstrated that the directing impacts of framework and process incorporation were essential factors for understanding the joint business estimation of ERP and CRA”. Embracing an ERP framework and guaranteeing framework reconciliation had an immediate effect on business esteem. In order for a CRA framework to positively affect business esteem, process combination with ERP framework must be guaranteed. This research gave new information on how ERP and CRA frameworks, utilised together, may decidedly impact an incentive from IT ventures, and how framework reconciliation and process mix gave business esteem.

The above empirical study by Ruivo *et al.* (2017:8) provides impetus to explore the incorporated ERP instruments in private higher schooling towards academic excellence.

The next section looks at current practices in ERP tools management.

### **2.3 Current practices in place to ERP management**

Generally, findings by Srimala and Wannapiroon (2013), Tabbara (2016) and Al-Mashari (2017) postulate that there should be a thorough preparation of Total Quality Management Information System (TQMIS) in current practices in ERP management in terms of principal or fundamental technology, placing a focus on basic equipment for access to the Internet and the network system.

Furthermore, the above-mentioned authors argue that the perceived effective ERP management uses an integrative approach, aiming to achieve a balance amongst certain key institutional elements. The findings in this section were pertinent to this research in that there was regard of network systems and Internet connections at the heart of the main technology. This resonated well in giving a compelling reason to exploit the gaps in ERP tool management misfits.

It is shown that academic associations spend a great deal of cash, time and assets on big business framework (ERP) execution. However, regularly do not understand the normal advantages from these mind-boggling frameworks. There was a gap in the literature in giving adequate knowledge on the usage procedure in terms of how ERP devices may impact or add to a culture change. The reason for the exploration, led by Skoumpopoulou and Waring (2017:1), was to address the gap in the ERP writings around culture by investigating the usage that was attempted in an expansive or extensive UK college.

This examination added to the advanced education ERP writing through an inside and out investigation of an ERP Key Data Innovation Administration (KDIA) execution by a college “in the UK. The investigation was attempted over a three-year time-frame, where one of the creators was located within the association. Utilising a social examination system, the broad rich information was broken down and the results demonstrated that KDIA has affected the way of life of the college”. The innovation's inflexible structure has forced numerous progressions that had not been foreseen.

ERPs have as of late developed in the higher education institutions where they are planned to help the administration of undergraduate information and give vital administration data. Despite the fact that there are numerous studies which have researched imperative parts of the execution of ERPs, one region that seems to have been ‘under-looked into’ is the means by which these frameworks are embroiled in culture change inside associations. The after-effects of this investigation would empower administrators and additionally IT masters to increase rich bits of knowledge into tools or solutions management in the PHEIs to utilise this learning for future usage.



In respect of the above, it may arguably be seen that PHEIs had to re-look at their internal cultures. As explained by Kasemsap (2018) in the study directed, there was a disclosure review of learning exchange; information exchange, work portability and work assorted variety; learning exchange and backup points of view; hindrances to information exchange; information exchange and absorptive limit; learning exchange and information securing; learning exchange and virtual groups; and the propelled issues of learning move in current associations. Exchanging information was a continuous movement of picking up, modifying and making strides. At the authoritative level, information exchange shows itself through changes in the learning of a unit. Best learning exchange endeavours effectively include both the wellspring of the information and its recipients. Setting up execution desires for the individuals who will utilise the learning further evaluates the estimation of the exchange. Institutions considering or utilising information exchange forms ought to persistently assess their web-based life status. The advantages of information exchange for working environments incorporate increments in efficiency, speed, readiness, benefits and development.

In PHEIs, this research exhibited a superior chance to explore routes in how ERPs might be utilised as a social centre-point in the production of information that might be regarded as profitable towards the grant of research, like campus distributions centre-points inside and across the board ERP frameworks, guided by the ERP tools administration frameworks, other than simply utilising ERPs for ordinary regular learning connections or correspondence.

In support of the ERP business execution in HE above and amidst different procedures cross-wise over three areas, a university administration framework that was not up and coming and a loss of learning on account of statistic changes and undocumented conflicting procedures, Jade College of Connected Science executed a grounds administration framework created by Hochschul Informations Framework. This framework incorporated a coordinated reference show for forms that were identified by the administration team. The college needed to utilise basic norms and required a guide in view of best practices. Actualising business process administration gave a chance to report, institutionalise and unify forms within their respective areas (Buhrig, Schoormann and Knackstedt 2018: 577 - 592).

Usage of the Campus Administrative framework and reference forms was organised in steps that could be portrayed utilising a Business Procedure Administration lifecycle display that spreads initialisation of ERP; process distinguishing proof; process revelation; process investigation; process upgrade; process execution and process checking. Every one of these means was specifically identified with the utilisation of Hochschul Informations Framework reference model across the board in order to acquire proposals in view of best practices. Both expected and surprising outcomes were acquired from the execution of the Campus administration framework, exemplifying the institutionalisation of procedures crosswise over three areas was enhanced by embracing best practices, and inward workshops to institutionalise procedures. This fortified Jade College's general camaraderie or unity of direction. All in all, singular boundaries to utilising process models and process documentation were decreased and a Business Procedure Administration steady culture was created to such an extent that a few offices started to report different procedures and to consider the usage of a more extensive Business Process Administration division.

Five essential exercises were found amidst the venture. For example, situating existing arrangements like process reference models that bolstered the initialisation of new undertakings and institutionalisation restricted the included partners' imagination. Rules for reliably archiving the usage's advance were essential to effortlessly give important data to all partners constantly. Incorporating significant partners into the procedure empowered the norms over various areas to be resolved and restricted venture assets were considered with a specific end goal to design appropriate and attainable activities (Buhrig *et al.* 2018).

The above proposals continuing from the examination above presented a gap to investigate current practices into private advanced education ERPs.

As indicated by Comuzzi and Parhizkar (2017), ERPs are difficult to keep up since they insert an expansive part of authoritative information and assignments which are frequently interwoven and exceptionally related. The explanation leading the investigation proposed a strategy for ERP present execution change administration to help business experts amidst perfective support. The approach drew parallel with building change administration and considered the means of mapping the conditions amongst ERP apparatuses; understanding the gradually expanding influences of

progress; and characterising measurements to evaluate and survey the effect of progress. The strategy was explained on account of ERP frameworks, for which a device had additionally been actualised and assessed by ERP usage specialists. Specialists decidedly assessed the proposed system. General outline standards to substantiate the procedure on account of frameworks other than ERP had been inferred. While existing ERPs change administration procedures helped to distinguish the requirement for change, the proposed strategy was said to structure the change procedure, supporting the errand of perfective upkeep in a proficient way.

Stemming from the examination above, there was a chance to continue exploring ERP current practices in PHEIs towards better ERP tools arrangement administration.

In light of the above, the investigation by Thennakoon, Bandara, French and Mathiesen (2018:487-500) illuminated that there was a wide assertion that ERP arrangement, “people from all levels of” a relationship “in process” organisation “activities and process” accepting was a vital supporter of the accomplishment or dissatisfaction, and viability of business process organisation (BPO). BPO getting ready was given in all BPO exercises and incorporated the wander of critical budgetary, human, information and diverse resources. In any case, little research had focused on this domain. In this way, there was a nonattendance of bearing for relationship in driving worth including BPO getting ready. The inspiration driving the examination was to consolidate the current disseminated data on BPO getting ready as an unmistakable composition study to depict the present work, recognise “gaps and propose a program of work for” what was to come.

A sorted written work overview was directed to grasp the present status of composing planning in the space of BPO. Upon a fundamental review of ninety appropriations, 64 creations, dispersed in the region of 1994 and 2015, were isolated and investigated in light of their criticality to answer the examination question composing of planning people for BPO. This examination proposed an investigation “design in light of this. A Grounded Theory coding approach was used, where NVivo 10 was used as a gadget to help the examination. A total of 234 codes addressing rising subjects were inductively perceived from the data. These codes were moreover broken down”, achieving eight focus subjects identifying with getting ready in the Business Process Management (BPM) setting.

The study displayed an unmistakable illustrative outline of the back and forth movement “status of research in BPO, recognising gaps in the written work and demonstrated a research inspiration which reinforced a call for action”.

The study above presented a gap that explored the present practices within the ERP tools arrangements administration in PHE organisations.

It may be concluded that Upkeep administration was an indispensable vital errand, given the expanding request on supported accessibility of machines. Tools management execution depends basically on recurrence and downtime. Consequently, positioning basic tools in light of these two criteria is essential to deciding the suitable support methodology. The motivation behind this study analysed two techniques, utilising contextual investigations to dispense support procedures while organising execution in view of recurrence “and downtime to Repair the Decision-Making Grid” which can be termed to be the Basic Leadership Matrix (BLM) and Jack-Knife Diagram, which is the Folding Blade Chart (FBC). The account above was an investigation by Seecharan, Labib and Jardine (2018:61-78) which delivered the writing that demonstrated the requirement for a way to deal with the capacity to coordinate the upkeep execution and system to adjust existing information on gear disappointments and to routinely alter preventive measures. Upkeep methodologies were exceptional as one technique ought not be connected to all tools, nor all procedures to a similar tool.

Contrasted with “the Pareto histogram, the BLM and FBC gave visual portrayals of the execution of the most exceedingly bad machines” concerning recurrence and downtime; thereby enabling support specialists to apply the suitable upkeep procedure. Every technique has its own particular benefits. This work looked at just two strategies in light of their unique conceptualisation because of their likenesses in utilising the same information and their principle highlights. Be that as it may, there was a degree of contrast with different strategies or varieties of these techniques. The examination featured how the FBC and BLM can be fused in modern applications to allot proper support procedures and track machine execution after some time. Neither BLM nor FBC have been thought about in the writing. As of now, the BLM has been utilised to rank machines, and has been utilised to decide support techniques.

In view of the exploration, the positioning of machines idea might be connected in positioning ERP devices or instruments in helping ERP solutions or tools administration within current practices in private advanced education.

Furthermore to the above positioning of ERP devices, Nandi and Vakkayil (2018:21) grasped two interchangeable “perspectives of an affiliation's absorptive capacity, specifically the favourable position perspective and the capacity perspective that looked at its impact on ERP osmosis. While prior ICT learning addressed the favourable position perspective, affiliation's combinative capacities, for instance formalisation, cross-reasonable interfaces and connectedness, addressed the limited perspective of an absorptive breaking point”.

The research made theories based on the speculation of the absorptive point of confinement. “Data for hypotheses testing was assembled from Indian affiliations using a cross-sectional diagram methodology. Mostly the smallest squares framework was used to test the proposed hypotheses”.

“The results reaffirmed before work showing the importance of connectedness and cross-viable interfaces in ERP osmosis. Another two factors (prior ICT data and formalisation) were not seen to be significantly related to ERP retention. To secure more encounters concerning the last startling results, the study checked the affiliation effect of the nature of association ownership (private or state-guaranteed). The results demonstrated the nearness of a negative association between prior ICT learning and ERP processing, particularly by virtue of private affiliations” that appeared differently in relation to state-asserted affiliations.

Past examinations “on ERP have dissected the effect of absorptive capacity on ERP execution at customer level. The exploration fixated on absorptive breaking point at a progressive level using two perspectives. By utilising two perspectives on absorptive capacity in particular, the favourable position perspective and the capacities perspective, it traces how phenomenal parts of the absorptive cut-off can be revealed while thinking about its belongings”.

The research above gave a persuading inspiration to explore current practices within ERP ingestion and how they may affect the ERP gadgets organisation at a PHE tutoring level.

It followed that the reception of Data and Innovation in little and medium undertakings or Small Medium Enterprises (SMEs) had a few quirks that would rely upon the consolidated impact of size and the aggressive condition of the business. The motivation behind this study was to utilise a possible way in dealing with how SMEs create authoritative abilities (Neirotti, Raguseo and Paolucci 2018). A review of “284 SMEs in Italy was led and information examined, with relapse models for testing seven speculations on the natural effect of the advancement of ICT-based abilities by firm size. The outcomes demonstrated that the ERP environment impacted the advancement of such capacities in an unexpected way”, contingent upon estimate. ICT-based abilities were more diffused amongst bigger SMEs. However, under natural unpredictability, this example was reversed, with bigger SMEs showing a more restricted arrangement of ICT in both their inside and remotely situated procedures. Under ecological dynamism, medium-sized firms had a tendency to grow all the more inside situated ICT abilities. However, they fell short in detailing predominant capacities for overseeing outer connections.

This examination aided to comprehend the connection “between the ERP environment and ICT interests in SMEs. Since the consolidated impact of size and the aggressive condition may impact significantly on the ICT interests in SMEs, this study explored the authoritative reactions on how SMEs utilise ICT to address their outer condition. This concentration gave a commitment to comprehend the difficulties that SMEs are faced with in the current innovative and market condition, where changes in the ICT worldview raised the level of many-sided quality and dynamism and rivalry” levels that leave a couple of assets for development to SMEs.

The research above presented an opportunity in exploring how ERP practices are influencing ERP tools management capabilities in PHEI settings.

The following section highlights service quality and perceived usefulness within ERP management.

## **2.4 Service quality levels in terms of perceived usefulness of the Enterprise Resource Planning system**

Several studies by Moonsamy and Singh (2012), Eid (2017), Spathis (2013), Hitt, Wu and Zhou (2017), Lotfy (2015), and Maas, Fenema and Soeters (2016) reported on the formulation of an integrated framework and the development of appropriate strategies as revolutionary tools, besides the existing quality models in management systems. As indicated by the afore mentioned authors, the study results provided a direction for future research for more effective integration in ERP management. It is this gap that the current study intended to exploit as additional elements within integration, such as the management of ERP tools as the ERP system gets punctuated in meeting the current needs of the firm.

Subsequently, Ha (2018) directed an exploration in which there was a study of how the gap between the normal advantage of the current ERP framework and that, without confinement, influenced user conduct while receiving another innovation.

The research configuration stretched out the hypothesis to set up a basic model of desires gap, foreseen regret and conduct expectation.

The study discoveries demonstrated that the normal advantage of the present framework is not just an immediate priority factor for user conduct, but in addition shapes the foreseen regret through correlation with the normal advantage of the overhauled framework later on along these lines, demonstrating that this eventually influences user conduct.

Concurrently, the research directed by Correa, Cataluna and Gaitan (2018:1) was to investigate the part of visual feel as a key in creating fulfilment in the Student Data Usage Framework and to find connections to different forerunners. This work likewise considered how sexual orientation separates those connections. “DeLone and McLean's model of data frameworks achievement, visual feel and sexual orientation socialisation hypothesis were utilised as a hypothetical system for the study. A logical model was proposed in light of the empirical studies”. Thereafter, this model was approved utilising an example of college students. Fractional Slightest Squares was picked as the way to deal with the direct factual study.

Right off the bat, the discoveries demonstrated that the change clarified by the proposed display in user fulfilment of Student Data Framework Clients was 67 out of 100. Besides, visual feel had a critical direct impact on client fulfillment with the Student Data Framework. However, the aberrant impact is substantially “higher through its relationship to framework quality and data quality. Thirdly, the outcomes demonstrated that there are noteworthy contrasts” amongst people in the immediate connection between visual style and client fulfilment with the Student Data Framework, with this relationship being significantly more extraordinary on account of ladies.

The study featured the “role of visual feel as a variable that clarifies learner fulfilment in data frameworks. This reality stressed the significance of considering style when planning data frameworks. Furthermore, the discoveries bolstered the presence of a novel connection between visual feel and data quality. At last, new confirmation on sexual orientation contrasts” concerning client fulfilment in data frameworks was introduced. This outcome demonstrated another way to ongoing studies that suggest a specific homogenisation of sex in connection with the discernments related with the advancements of the data.

In agreement with Ha and Correa *et al.* (2018); Haq, Magoulas, Jamal, Majeed and Sloan (2018) directed a research study which featured that digital-learning conditions and administrations appropriation and achievement rates challenge digital-learning situations and administration architects, experts and associations. ERP chiefs keep seeking viable instruments in propelling such frameworks. The motivation behind this paper was to comprehend clients’ impressions of digital-learning conditions and administrations adequacy and build up a hypothetical system that enhances the comprehension of accomplishment factors for appropriation.

A Grounded hypothesis technique was utilised to think about the connections between changing user prerequisites and desires, innovative advances and digital-learning conditions and administration adequacy models. A longitudinal report was used to gather information from web-based life for more than four years, which was confirmed in light of the setting assessment, dialect structure and conversational development.

Recognisable proof of another centre measurement named Idea Usefulness could be utilised to comprehend the connections between digital-learning viability factors incorporating the associations with different areas (for example, security). The



discoveries were additionally used to approve major existing models for the achievement of digital-learning conditions and administrations.

The new structure conceivably enhances the framework configuration process in the fields of instruction innovation and ERP frameworks. Idea usefulness measurement could offer more bits of knowledge to comprehend digital-learning situations and administrations viability and further enhance the framework configuration process in an assortment of spaces including ERP frameworks and training innovation.

From the above and despite the way that the study concentrated on purchaser or user conduct in receiving another system or framework, it might be inferred that this gave a chance to explore the gaps in ERP framework appropriation and user appeals and the influence it might have on users in general as far as handiness of the Enterprise Resource Planning framework in overseeing ERP tools management in PHEIs was concerned.

In view of the above, learning appeared as the key factor and the key asset for gaining resources and immaterial authoritative abilities, which could prompt further development and advancement, production of significant worth and the upside of intensity. The purpose behind this examination was to assess the impact of data frameworks on information sharing (Mirzaee and Ghaffari 2018: 501-520).

The above study's approach was the factual society, the specialists of "the registry office in Tabriz, East Azerbaijan Territory, Iran. A poll was utilised as the instrument for gathering information. Additionally, Keen fractional Minimum Square was utilised for testing the theories of the study". The research findings uncovered that Information System measurements such as benefit, quality, framework quality and innovation assume a critical part in sharing information amongst the staff of an association.

As if this was not enough, Santa, Ferrer, Jorsfeldt and Scavarda (2018) investigated arrangement of administrations from data frameworks or data innovation offices helping associations to accomplish solid tasks and changes in operational execution from perspective of the clients. The Auxiliary condition demonstration model was utilised to inspect basic connections between the arrangement of watched factors and the arrangement of non-stop inert factors from reactions of an example of 138 people from large administration associations in Australia that had of late executed ERP data frameworks. The outcomes recommended that there was no immediate impact of the nature of the administration from ICT offices on the change of operational execution.

However, there was a circuitous relationship through the accomplishment of operational adequacy. The discoveries likewise proposed that concentrating exclusively on the adequacy of the ERP advancement is inconvenient to enterprise operational advantages in the long-run.

PHEIs have an opportunity to investigate different variables other than exclusively concentrating on the ERP adequacy of the innovative management tools.

Additionally on ERP quality framework and innovation, the motivation behind the research directed by Mourad (2017) was to study the comprehension of partners of the advanced education area to the inside quality affirmation framework and its part as a driver of data administration methodology in Poland. The study utilised a subjective approach. It began with an exploratory research as 12 top-to-bottom meetings with the Bologna procedure specialists, trailed by experimental research by means of 30 up-close and personal meetings with instructive sources in five chosen colleges in Poland.

The discoveries demonstrated that a key component for effective usage of the Quality Confirmation framework is the partners' own comprehension of the method of reasoning behind it as a data administration technique. Furthermore, this research places accentuation on the needs before the best level administration to make the quality and data culture inside the scholarly network. The study proposed to help with finding worldwide down-to-earth cloud ERPs, making a benchmark for policy-makers concerning the data administration procedures in light of Poland's understanding. Inferring to the PHEIs in South Africa, it presented a good opportunity in exploring the ERP system service quality levels in terms of the perceived usefulness of the Enterprise Resource Planning system.

A study conducted by Eden (2018:44), clarified that there was a polarity inside library and data science (LDS) instruction today. This was bound to happen and the ascent of data schools (iSchools) in LDS instruction, with their attention on ranges of abilities that supplement libraries and their central goal at the end of the day to get ready understudies for vocations and occupations “outside of librarianship, is one of numerous contributing components”.

Numerous licensed “library programs that used to center around getting ready understudies for work in libraries were presently extending their courses and degrees

more toward data as opposed to libraries. This was justifiable given that numerous library science programs had been subsumed into different divisions and schools. For example, business, instruction and data innovation”, where their skill in teaching and preparing understudies toward graduate degrees was very respected and where the accessible occupations and pay rates outside of libraries were significantly more varied and attractive.

This study sought to outline the present difficulties from the point of view of one individual from the propelled librarianship affiliation board of trustees on accreditation.

Pertaining to ERP tools management in private higher education, it might be said that the study above on library science highlighted a gap in exploring how the ERP system information influenced the service quality and perceived usefulness of the ERP tools management administration. It followed that cloud ERP empowered an association to pay for the administration they needed and evacuated the need to keep up a Data Innovation (DI) foundation. In this research, there was an observational test on the part of cloud construct ERP administrations with respect to the execution of an association. The execution was sorted as inventory network execution and authoritative execution that contained monetary execution and promoting execution. An Unforeseen Asset-Based View hypothesis was utilised to build up a hypothetical structure in which supply base intricacy went about as a directing variable on the connection between cloud ERP and the execution (Gupta, Kumar, Singh, Foropon and Chandra 2018).

The Unexpected Asset Based View hypothesis was utilised to clarify the connection between every single recognised variable in the study. Incomplete Minimum Squares in light of Auxiliary Condition Displaying was utilised to exactly test the hypothetical system.

The study utilised 154 respondents that appeared to help the Unexpected Asset Based View hypothesis. Six speculations out of the eight theories planned in this study were upheld by information.

The study above gave a good reason to explore the gaps in ERP tools management in private higher education that may be influenced by service quality and perceived ERP system usefulness tied to organisational performance.

As reported by Wilkesmann (2017), the ascent of new data and correspondence innovations shapes the foundation for the future improvement of work. The term Business 4.0 alluded to the vision of a Fourth industrial Revolution (4IR) that depended on a system of self-sufficient, self-controlling, self-arranging, learning based, sensor-based and spatially appropriated creation assets. All things considered, one can watch distinctive types of the utilisation of the Business 4.0 idea going from independent calculated transport frameworks drawn upon swarm insight to brilliant information administration frameworks. This research built up a hypothetical structure that broke down various utilisations of Business 4.0 on an arranging continuum. The general research questions were as per the following: what types of arranging digitalised-work prompted the generation of schedules?, and, what shapes encouraged advancement within Business 4.0? Hereafter, the research was on the outcomes of various types of sorting out of work on labourers' discernments and the after-effects of the working procedure.

This investigation utilised cases and an examination of 295 financed ventures dependent on the Stage Business 4.0 Guide, which was a piece of the Business 4.0 activity of the German Government Service of Monetary Issues and Vitality and the German Elected Service of Instruction and Exploration. The outcomes for individuals acting in such authoritative and carefully upheld structures were talked about in light of the level of formalisation, the area of control specialist, the area of information and the level of professionalisation. At the correct side of the sorting out the continuum, the digitalisation arrangement in a workplace that used ERPs supported exceedingly qualified people.

The study above on Business 4.0 developments was limited to Germany within its comparability. For this reason, the study presented a good reason to apply or derive from the Business 4.0 technological elements into PHEIs in South Africa as technology advances to Fifth Industrial Revolution (5IR) and higher in exploring the influences of managing private higher education through distant learning and the ERP tools management thereof.

Emerald (2018) considered disclosures to have audited the most recent administration advancements over the globe and pinpointed useful ramifications from leading research and case studies. The features were set up by an autonomous author who included their own particular fair-minded remarks and set the articles within the setting. By taking a

look at associations in South Korea, it was seen how urgent hazard capacity administration was for securing ERP information services dissemination network advancement. Both were required for an association to enhance and gain the upper hand. Based on the study above from the South Korean environment on management developments, this might be imported into PHEIs in South Africa by exploring how the ERP tools management system might bring in best and relevant information to ERP system users in a friendly format.

The following section highlighted how ERP responded to stakeholder needs.

## **2.5 Academic Enterprise Resource Planning responding to all stakeholders needs**

The study by Mate, Bacs and Takacs (2017) in Hungary showed that in the course of the most recent couple of decades, associations as well as Higher Education Institutions ought to be more receptive to the requests of the changed worldwide business condition and enhance HEI viability. The inspiration in this research was to evaluate the execution of an Enterprise Resource Planning (ERP) framework in advanced education and HEIs' related advantages, with emphasis on undergraduate students' execution while applying a System Application Product arrangement. This paper investigated the precision of college undergraduate students, concentrating essentially on the idea of self-appraisal as ERP users anticipate and assess their own execution with respect to their remotely evaluated accomplishment. In the pre-and post-examination expectations, the higher education understudies appear to anticipate and assess their examination more precisely than their lower-accomplishing colleagues. Despite the fact that a gender gap cannot be found in self-estimation, the study discovered significant contrasts by looking at the chosen dialect. Outside undergraduate students appear to over-estimate their own particular examination execution to a more prominent degree than Hungarians do. Thus, the outcomes may enable leaders to distinguish why self-evaluation is imperative while actualising pilot ERP ventures. The after-effect of this research additionally provides proof to gatherings of customers and different partners, keeping in mind the end-goal to lessen disappointment in both advanced education and business condition.

The above analysis gave an opportunity to PHEIs in South Africa to explore the gaps in user anticipation and conduct an assessment of their own execution within ERP management solutions. The study conducted by Shri Ramwaroop Memorial University (SRMU) is making and spreading information and giving undergraduates an exceptional

learning foundation in Science, Technology, Medicine, Management and diverse areas (Agarwal 2018:1); Chancellor of SRMU and Executive Director, Shri Ramsawroop Memorial Group of Professional Colleges, in a gathering with Elets News Network (ENN). Better propelled instruction realises upgraded business openings. What components should undergraduates recall while picking a specialisation for their graduation and further examinations?

Picking the right course and establishment is champion amongst the most imperative decisions that will impact an undergraduate's entire life. This is simply the reason undergraduates need to first overview, recollecting their destinations. While evaluating an establishment, they should separate whether the techniques for learning will be simply customary or if the association offers current instructing educating strategy. Furthermore, the level of industry focus, nature of the work force and worldwide learning openings should moreover be evaluated. It is also important that the undergraduate pursue studies that have accreditations and affiliations required in the desired course. Having said that, the most basic factor is that the undergraduate should feel that the course and establishment will give the required scope of capacities to achieve the set calling objective.

*How are the “Internet of Things (IoT) and Artificial Intelligence (AI)” helping propel training systems with getting more understudy support and work-force responsibility?*

Rising advancements like IoT and AI are making a pivotal move in the way insightful undertakings are run today. In the coming years, they will make new things and organisations that extend openings and will fill in as a face changer for cutting-edge training structure. IoT and AI are helping the business in liberal courses by offering access to unlimited information spill out of wherever and at whatever point, as well as by progressing new thoughts, plots and ensuring utilisation of the same. Further, they are similarly upgrading educational outcomes by giving wealthier learning experiences and by expanding continuous, important encounters into understudy execution.

*How is development helping the SRMU University in maintaining the lifestyle of progress, a culture that invigorates business, exposure and experimentation amongst its undergraduate studies?*

Development is the best mechanical assembly that drives a circumstance of progression, business and experimentation in the educational blood of an association. Given this, there is a move from on-begin ERP utilisation to Oracle Cloud ERP, in light of the fact that it is not in the slightest degree like the on-present programming which requires visits and industrious time-raised and costly overhauls. SaaS courses of action reliably remain revived, giving brisk access to new limits and features as they end up open. By completing such modern-age development, SRMU could support a circumstance of progress in the school. For instance, now the undergraduates can perform convoluted examinations using germane headways. At a school level, there is a preparation to give a run-of-the-mill interface to know and grasp the business essentials, give openings of multi-disciplinary mission for learning and research to undergraduates, and impact research to business identified with any available field from over the globe.

*How best can a school put over a development vision and an ICT control for general change in institutional execution and undergraduate accomplishment?*

To ensure that the change system is constant, solid and dealing with what a school should immediately realise a development arrangement that ties together insightful and related non-academic activities - making watching and surveying possible. Further advancement should be used to give steady understudy appraisal and to make the entire method detectable to both the work force and watchmen, beside concerned understudies, to manufacture chances of progress. Eventually, all assignments should be composed using a single bound together platform to ensure straightforwardness and high capability. Using development stages helps in all activities-related data of all participants. This immense data can be moreover used for research to draw noteworthy and more unique decisions related to work, finances, et cetera. SRMU uses Oracle Peoplesoft to grow capability and feasibility and for administration of classroom activities, evaluation of academic assessments, materials storage and human resources administration.

Assignment-based learning, innovative-based learning and demand-based learning are gaining vitality nowadays. These three are the latest and most creative strategies that have made adjusting more expressive and standing. At SRMU, this has been made possible by raising the industry interface to give hands-on routine with respect to certified scenarios. By using robotised programming and running group programs from

Oracle and other development vendors, there has been the ability to progress shorter learning curves, as well as by inviting industry professionals who share their experiences and impact young identities to ask and learn.

Furthermore, the predictable appraisal system keeps undergraduates on track and gives them distinctive opportunities to improve. There has to be an incredible degree qualified workforce to propel a demeanour of research and consultancy. The planned endeavours with various outside associations and master bodies like CII, AIMA, TiE, IICA, FICCI and many more gives colossal opportunities to both the workforce and undergraduates to take up research and consultancy endeavours. Propelled India and Skill India are two most objective situated endeavours of the Government of India.

*How is the HEI setting up its understudies to be helpful, employable and instructed?*

This study constantly assumed that the most fundamental qualities of cutting-edge training is through ERP cloud instructions to undergraduate studies, the approach of education on what is being told. In case a restrictive desire of ERP higher education is kept up, there will be the ability to set up undergraduates to be more capable and very much educated, achieving better employability.

At SRMU, there was the assurance that staff is chosen from head establishments of India and guided by relentless industry coordinated efforts to keep both workforce and undergraduates revived. Additionally, there is a set-up of best-in-class labs which are furnished with the latest machines and advancement. SRMU orchestrated workshops and field visits to test and realise classroom training. SRMU has also tied-up with various industry masters who show the University about current industry necessities. There was an increase in quick ground in the field of cutting-edge training and the same is obvious from the number of schools and universities working in the territory today. To make redesigns and get set on the overall rankings there is need to have access to resources for success. For example, upgrading the idea of the workforce, propelling research conditions, contributing to outfitting laboratories with latest developments, using advancements like IoT and AI to get to all capacity focus over the globe; creating business visionaries by setting up large business ERP cells; making an industry interface to know the aptitudes looked for; and after, by finally setting up advancement stages to organise and improve inside errands.



*What incited SRMU to execute Oracle Cloud Services? What were the diverse challenges being stood up to previously?*

The motivation to move from an on-premise ERP use to Oracle cloud ERP relied upon different parts. Immediately, the on-introduce game plans require the purchase of the item and additionally help costs for licences, additional hardware, management of work within organizational tools and that is only the start. In the SaaS appears a critical number of these costs fused into the participation itself – which ensures a lower mean cost of ownership and diminished complexity or overheads, straightforwardness of execution, the ability to try or experiment it before you buy, and the ceaseless trader duty and responsibility were amongst various factors that were considered (Agarwal 2018).

Based on the gathering from Elets News Network in India from above summary, there is compelling evidence for PHEIs in South Africa to continuously explore ways of promoting the culture of research and innovation within ERP tools organisation.

Khalid, Smash, Soliman, Khaleel and Islam (2018) are in tandem with Mate *et al.* (2017) and Argawal (2018) towards ERP management tools for digital universities. The digitisation has provoked learning, especially having education at a quick pace. Advanced Education Institutions are in basic need to execute current innovations to remain carefully important and separate themselves as computerised pioneers. Despite the fact that numerous colleges have particular advanced plans and systems, usage of these up to the most noteworthy models is something numerous foundations are inadequate with. This research accentuated that higher education institutions need to ponder the effects of a dynamically advanced world. The developing innovations and their impacts on the foundation of advanced grounds have been studied and illuminated. Besides, the conceivable hindrances and the approaches to outfit digitalisation effectively have likewise been explored. The study, at last, proposed an advanced model for advanced education institutions to execute a computerised technique for the whole foundation to receive the rewards joined to the innovative movement. This study managed to help higher education institutions to comprehend the basic need of computerised vital plans and aid the adaption of the advanced change.

In light of the above, Awuzie and Emuze (2017) directed an investigation that meant to survey the enthusiasm displayed by colleges in South Africa towards adjusting institutional orders of educating, learning, research and group commitment to the maintainable improvement (MI) motivation. The usage of the MI plan over advanced education foundations (HEIs) keeps on drawing consideration from the more extensive society. This was on the grounds that HEIs are progressively being looked upon for administration in such a manner. In any case, albeit a few investigations rush to recognise different components which have driven the selection of economical practices in HEIs, the lack of studies trying to distinguish the drivers for MI usage are glaring. This was especially so in growing nations like South Africa.

From the research above, there was need for private higher education to explore issues that were affecting stakeholders' needs through a community of engagement in ERP tools administration towards group commitment to maintainable improvement motivation.

In addition, the study by Okuonghae, Ijeh and Erhabor (2018:1) researched client wrongdoing as a factor influencing compelling administration conveyance in college “libraries in the Ekiti and Ondo provinces of Nigeria. The research analysed the different acts in the library that influence successful administration conveyance in the library. The engaging overview technique was utilised for the investigation. The number of inhabitants in this examination was 76 curators in college libraries in the Ekiti and Ondo territory of Nigeria. Specialists received the whole 76 bookkeepers” as the example measure for this investigation, utilising the entire enumerative inspecting strategy. Surveys were utilised as the instrument for information accumulation and 76 participants took part in this examination. Accordingly, 71 responses were received and analysed. The results of the findings of the investigation showed a reaction “rate of 93%. The information was investigated utilising frequencies and rates. The examination contributed altogether to learning as it has possessed the capacity to view that a critical relationship exists between client misconduct and viable” administration conveyance in the library.

The discoveries showed that the college libraries carry out an extensive variety of administrations, for example, “data and referral administration, reference benefits, charging and releasing of library materials, recording and grouping of library materials

and client training administration. Client misconduct in college libraries, for example, the theft of library materials, eating in the library, making noise in the library, refusal to return over-due obtained books, mutilation of library materials and abuse of library Pocket Computer frameworks influenced powerful administration conveyance in the college library to a high degree. The study prescribed that Library staff ought to receive strict safety efforts to guarantee that client misconduct in libraries is diminished to the barest, if not totally disposed of in the libraries. The research likewise prescribed that library administration should endeavour to secure various duplicates of data materials in the library while additionally guaranteeing that appropriate and general library introduction or client training programs are completed for library clients as this will help them to remember the tenets administering the utilisation of the library (rules and regulations). The study presumed that sufficient consideration ought to be paid to unprincipled acts in the library since it influences” viable administration conveyance.

From the research summary above, there was a gap presented to PHEIs to explore ways of fully optimising the ERP system, presenting a part as the on-line library to get rid of unprincipled acts in a quest to optimise stakeholders’ needs in promoting higher education in an ERP tools management environment.

Additional to the above maintainable improvements in advanced education, Kostic (2018) inspected the connection amongst advancement and computerised change from one perspective, and again of the states of rivalry. The serious utilisation of cutting-edge innovations prompts a computerised progress, which organisations that work in a changing situation must go through. The piece of the overall industry relied upon, amongst different variables, the speed of computerised change. One of the ramifications of this procedure is the reinforcing of aggressive weight amongst organisations. The relationship between presentation to digitalisation and profitability caused impacts that were mirrored in an expanding gap between the best organisations and those less effective who are attempting to get by in the market. The inquiry explored what is the part of developments in present day business conditions and whether they speak to substitution for value rivalry. The outcomes demonstrated that effective undertakings in the static neo-classical sense cannot withstand the weight of their rivals without developments. Along these lines, it could be noticed that advancements are significant for the survival of organisations in the entrepreneurial economy.

This research above could be applied to PHEIs to seek ways of maintaining progressive and dynamic ERP tools to be able to survive competition in the private higher education sector.

The next section reviews internal and external factors that could possibly have an influence on ERP tools in System Academic Management.

## **2.6 Internal and external factors that impact the Enterprise Resource Planning system**

Findings of Kinuthia (2014), Pishdad and Haider (2013) and Whitcomb (2016) scarcely reported on the speed and bandwidth of cloud ERP management. Despite this reporting, the authors are advocating firms to have a better understanding of ERP institutionalisation drivers of success. Learning Management Systems within the general systems theory are reported to be one component that is independent of other areas within ERP management, interacting with the outside world. The area of speed and bandwidth, as stipulated by the authors in this section, presented a gap to be studied within ERP tools management.

As described by Pernsteiner, Drum and Revak (2018), there have been numerous studies that explored the reasons for workarounds, yet there was less research on their results, for example, the effect on inner control. The study researched the utilisation of workarounds by a multinational association that actualised Framework Application Item ERP around ten years prior, and how those workarounds affected interior controls. A subjective report approach was performed by breaking down meetings with organisation faculty for a multinational association. Representatives chosen for interviews were principally clients of the Framework Application Item's bookkeeping capacities. The investigation found that workarounds influences affect the inner controls over budgetary revelations. Workarounds cause repaying controls to be actualised, which were frequently manual in nature, and declined the authoritative proficiency and viability.

Workarounds end up coordinated into an association's exercises to meet their business needs. The ebb and flow exploration brings up issues concerning the choice of decisions in keeping up hierarchical productivity and control and the need to give client benefit and different business needs. This research moved past finding the reasons for

workarounds and extended to what was thought about workarounds and their effect on an association. A vital commitment of the present examination is to think about the convergence of workarounds, ERP frameworks and interior controls. Applying the investigation of workarounds to PHEIs, the spotlight might be set on inside and outer components that may have influenced the utilisation of manual controls to the ERP framework influencing ERP instruments administration.

In view of the workarounds above, the study was conducted on account of the approach created “and the lessons learned in the usage of the checking and control layer for non-stop observation of business process controls in the United States’ inward IT reviewed division of Siemens” Organisation. The design created by the analysts in the study executed a totally autonomous Business Process Control framework running without anyone else undertaking data framework, which had perused just collaboration with the application level of the venture framework. Amongst key conclusions is that formalisability of the review methodology and review judgment was horribly thought little of. Furthermore, while cost funds and practicality compeled the execution to nearly take after the current and endorsed inside review program, a specific level of re-engineering of reviewed forms was unavoidable because of the need to isolate formalisable and non-formalisable parts of the program. The research recognised the administration of review alerts and the counteractive action of the caution surged as basic assignments in the Business Procedure Control execution process. A way to deal with taking care of these issues used the various leveled structure of cautions and the part-based way to deal with doling out alert goals was created that examined the substance of the review trail of Business Procedures and Control (Alles, Brennan, Kogan and Vasarhelvi 2018:219-246).

Importing from the Siemen’s environment from the United States, PHEIs might take advantage of the gap in managing ERP tools to fully function and be utilised as audit tools due to the formalisable nature of the audit procedures in an ERP run organisation.

As stated by Hyde and Rodger (2017), Data Frameworks readiness is a present subject of enthusiasm for the Data Framework industry. This study followed up on dealing with the meaning of the buildup of Data Framework spryness and characteristics for detection, determination and choice and execution in a nimble (agile) Information System. Information System spryness was characterised by Alles *et al.* (2018) as the ability of an IS to detect an adjustment progressively; analyse it continuously; and select

and execute a reaction continuously. Architecting a light-footed or agile system was a complex and asset escalated assignment, and thus research of its advantages was exceptionally needed and proper. This study looked at the advantages of a Coordinated Data Framework. Advantages of a coordinated Information System were obtained from related scholarly writing and afterwards refined utilising expert writings and subjective information. The advantages considered were the primary request or direct advantages. These advantages were then exactly approved through a review of IT professionals. The after-effects of the overview were investigated and a rank request of the advantages was looked at. An exploratory factor investigation was additionally done to locate the basic measurements. It was recommended that associations can utilise the observationally approved advantages from this research to legitimise and kick-off their capital and work consumption to incorporate readiness with their Data Framework.

Similarly, Campbell (2018) reported that in the advanced education segment, outside powers are affecting financing sources, which impacted both open and tuition based schools. Establishments need to respond to the new ordinary monetary scene. As establishments of higher learning adjust to the evolving conditions, they should embrace better approaches to utilise data all the more effectively in their basic leadership. Information investigation could possibly enable schools to perceive patterns, inquire as to whether the addressing and application of prescient models to enhance their vital ability would make a more manageable future with better instructive administrations and plans of action. However, in the wake of a quickly evolving condition, moderate moving associations regularly thought that it was hard to react to such new difficulties. In the advanced education division, the absorption to include business investigation basic leadership processes remained a test.

Utilising institutional hypotheses and asset-based hypotheses focal points, the thesis utilised a consecutive blended techniques approach, including a three-section experimental investigation to address the exploration question on how information examination could impact institutional execution in advanced education. The main subjective investigation explored the utilisation of information examination in advanced education management. This examination offered proof of the under-execution of the ERP usage by advanced education foundations and considered the impacts of hierarchical culture; the level of self-sufficiency at the departmental level; and the solid dependence on the utilisation of different dash-on or shadow frameworks to utilise data from the center ERP framework. The second investigation examined the ERP adequacy

and the intervening impacts of apparent hierarchical help. The third examination considered the connection between investigation speculation and hierarchical execution, as interceded by an information driven-culture and information quality. As reflected by Alles *et al.* (2018), this exploration gave observational help, demonstrating that information quality and an information driven-culture were key precursors to utilise an information investigation to enhance authoritative execution. Understanding the similitudes and contrasts amongst open and private foundations had suggestions for the expert. The hypothetical commitment presented an intermediary for productivity and hierarchical execution in the advanced education segment into the writing. These discoveries broadened ideas in bookkeeping data frameworks hypotheses and additionally, inside advanced education writing. Picking up understanding in the matter of what were the key levers to enhance information quality and efficiencies could prepare for a more manageable future in advanced education.

Agility may be brought into private higher education ERPs by looking at the summary of the study above. This gave a compelling need to look at the internal and external factors in higher education ERP tools management that may have an influence on ERP agility within ERP tools integration.

The next section reviews frameworks for the effective utilisation of ERP solutions.

## **2.7 IS Establishments**

Information Systems foundations look at hypothetical focal points in investigating phenomena of interest inside ERP and integration.

### **2.7.1 ERP and Integration:**

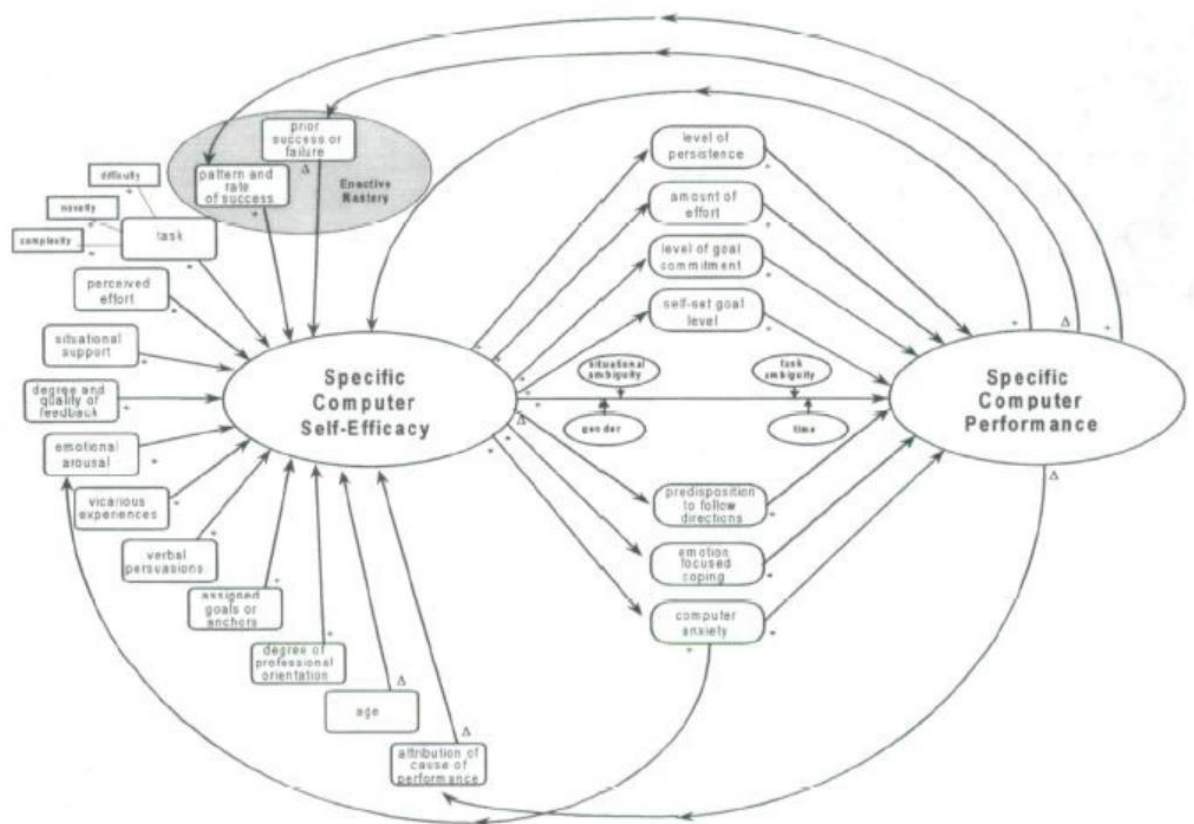
Inside ERP and reconciliation, there is a ceaselessly refreshed perspective on core business procedures utilising regular databases within a database management framework. Considering information frameworks establishments, this area features the accompanying hypotheses.

#### **2.7.1.1 Self-efficacy theory (Self – Adequacy Hypothesis)**

Self-Adequacy Hypothesis (S-AH) is known as PC (Pocket Computer) self-viability (PCSV). Its primary ward developed are Result desires, PC execution, Execution. Moreover, primary free factors are: PC nervousness, individual ingenuity in ICT, quality uneasiness, undertaking attributes, earlier execution and seen exertion.

Self-adequacy is an individuals' impression of their capacity to plan and make a move to achieve a specific objective.

PC self-viability (PCSV) alludes to people's judgment of their abilities to utilise PCs in various circumstances (guides.lib.byu.edu 2018).



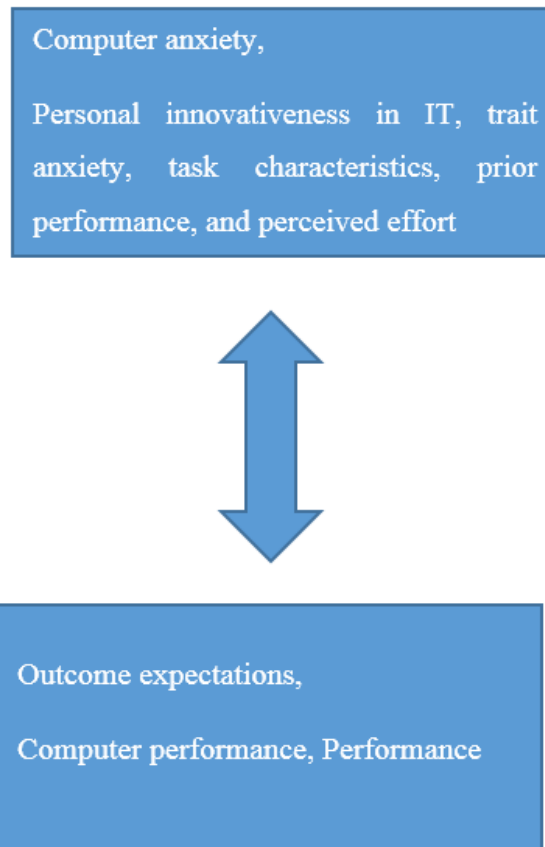
**Figure 2. 2: Self – Adequacy Hypothesis (1998)**

Source: guides.lib.byu.edu (2018: 2)

### 2.7.1.2 Simple layout of S-AH



### **Particular PC Self-Adequacy (Specific Computer Self- Efficacy)**



### **Particular PC Execution (Specific Computer Performance)**

**Figure 2. 3: Self – Adequacy Hypothesis (Specific Computer Performance)**

Source: [guides.lib.byu.edu](http://guides.lib.byu.edu) (2018)

In view of the S-AH above, an opportunity was presented to PHEIs to explore the factors influencing System Reliability in ERP tools management solutions. On the other hand, S-AH is complemented by the Fit-Suitability hypothesis elaborated below.

#### **2.7.1.3 Fit-Suitability Hypothesis**

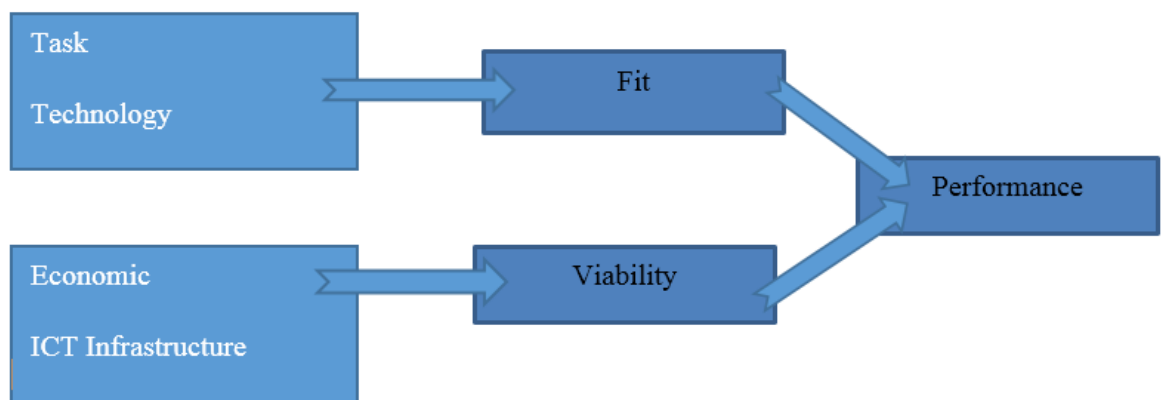
Fit and practicality were two fundamental ideas that were thought to influence the execution of innovation appropriation in associations. This was an expansion of the undertaking innovation fit model by Goodhue and Thompson (1995) referred to in [guides.lib.byu.edu](http://guides.lib.byu.edu) (2018: 1) at the individual level examination of innovation use.

The Fit-Practicality Display was otherwise called Fit-Reasonability Structure. The fundamental ward factor in this hypothesis is Execution and the autonomous build is Fit Suitability.

The model was initially proposed by Tjan in 2001 for assessing the authoritative appropriation of Web activities. It incorporated two measurements. One was fit and the other was reasonability. Fit measures the degree to which new system applications are steady with the centre capability, structure, esteem and culture of association. Feasibility measures the degree of esteem and included the capability of new system applications, necessities of human assets, capital needs, et cetera. It proposed four non-specific procedures in view of levels of fit and feasibility: contribute, update, offer/turn out and execute.

This model was later adjusted to evaluate the reception of portable business advances as detailed by Liang, Wei and O'Donnell (2007) referred to in guides.lib.byu.edu (2018:2). In the changed model, the fit measurement measured the degree to which the component of an innovation coordinates the requirements of the undertaking. The reasonability alluded to the degree to which the foundation of the association is prepared for embracing the innovation. This needed to think about the general financial attainability, specialised foundation and the social preparation of the association. Numerous hierarchical elements have been distinguished to be basic to the accomplishment of ICT execution.

#### **Fit-Suitability Hypothesis diagram**



**Figure 2. 4: Fit-Suitability Hypothesis**

## **2.8 Current practices in ERP:**

### **2.8.1 Complexity theory (Unpredictability Hypothesis):**

The Unpredictability hypothesis is also known as the Computational Unpredictability Hypothesis (CUH). The Primary ward factors are Time (Many-sided quality), Space (Memory) and Parallel Processors.

This theory's Fundamental free builds is the Size of the Information.

A succinct depiction of the hypothesis states that a many-sided quality hypothesis is a piece of the hypothesis of calculation managing the assets required amidst the calculation to take care of a given issue. The most widely recognised assets are time (the number of steps it takes to take care of an issue) and space (the memory it takes). Different assets can likewise be viewed as for example, what number of parallel processors are expected to tackle an issue in parallel. The Unpredictability hypothesis varies from the processability hypothesis, which manages whether an issue can be explained by any means, paying little mind to the assets required. After the hypothesis clarifying which issues can be settled and which cannot be, it was normal to get some information about the relative computational trouble of processable capacities. This is the topic of computational many-sided quality.

The time multifaceted nature of an issue is the quantity of steps that it takes to take care of a case of the issue as an element of the extent of the information (generally estimated in bits), utilising the most effective calculation. The correct number of steps will rely upon precisely what machine or dialect is being utilised.

Quite a bit of the multifaceted nature hypothesis manages choice issues. A choice issue was where the appropriate response is dependably yes or no. Choice issues were regularly considered on the grounds that a self-assertive issue could simply be diminished to a choice issue.

The intricacy class P is the arrangement of choice issues that could be explained by a deterministic machine or tool in polynomial time. This class compared to an instinctive

thought of the issues which could be viably understood in the most pessimistic scenarios.

The intricacy class NP was the arrangement of choice issues that could be explained by a non-deterministic machine in polynomial time. This class contained numerous issues that individuals might want to have the capacity to explain viably, including the Boolean satisfiability issue, the Hamiltonian way issue and the Vertex cover issue. Every one of the issues in this class had the property that their answers could be checked successfully.

An essential outcome in the intricacy hypothesis was the way that, regardless of how hard an issue could get, (for example: how much time and space assets it required) there would dependably be significantly more difficult issues. In any event, for time many-sided quality and for polynomial-time choice issues, this was controlled with the progressive system hypothesis. A comparable space progression hypothesis could likewise be inferred (guides.lib.byu.edu 2018).

## **2.9 Perceived usefulness of ERP:**

ERP perceived usefulness is how much an individual accepts that utilising ERP tools would upgrade or enhance the activity execution or job performance.

### **2.9.1 Dissemination of Innovation Theory and Technology Acceptance Model**

The following section portrays a dissemination of innovation and technology acceptance model regular builds:

#### **2.9.1.1 Dissemination of Innovation Theory (DIT)**

Dissemination or Diffusion is clarified as a procedure by which a development is imparted through specific channels after some time amongst individuals from a social framework. The DIT hypothesis ostensibly expresses “that the potential clients to the framework may receive or dismiss a development on the preface of convictions that may shape about the advancement.

Development Diffusion Theory (DIT) and Technology Acceptance Model (TAM) share regular builds (Mithi *et al.* 2016:48-49), that of:

- Relative preferred standpoint: the level to which a development might be thought to be superior to past thought;
- Compatibility: the advancement seen to be reliable with end clients' esteems and encounters;
- Complexity: seen as the level of trouble or usability of advancement by end clients;
- Trialability: the degree to which a development might be tried on a constrained scale; and
- Observability: the level or degree to which a development can be seen or might be noticeable to other individuals”.

### **2.9.1.2 TAM and Information Systems**

The “Technology Acceptance Model has been broadly utilised as a model for seeing how users acknowledge Data Frameworks (IS) innovation, with a significant spotlight being on undergraduate students in HEIs in instructive frameworks. Despite the fact that TAM might be utilised as a part of foreseeing end-users’ acknowledgment of a computerised or innovative framework, it does not adequately reflect end-users’ acknowledgment of the framework in a foundation”. Additionally, Mithi, Mabiza and Edouin (2016:48) express that TAM is viewed as a magnificent model to explain the acknowledgment of Technological Innovation. TAM may not be utilised or connected to investigate each case or event of selection and usage of a Data Framework or Data Innovation. It is prescribed to coordinate innovation models other than TAM, as reflected in “affective tools for e-learning”.

In consent to compelling instruments for advanced education, Lwoga and Sife (2018) assessed whether quality predecessors and individual attributes can impact employees' continued use of electronic assets (e-assets) in the chosen state-funded colleges in Tanzania. A sum of 204 employees took an interest in the study from three state-funded colleges in Tanzania. The research utilised basic condition displaying, Analysis Of Variance (ANOVA) and t-tests to perform investigations. The examination discoveries demonstrated that better-instructed and moderately-aged employees with a wide experience of utilising e-assets will probably keep utilising e-assets. Data quality had a positive association that proceeded with the utilisation of e-assets, while benefit quality had circuitous effects that proceeded with the use of data and framework quality.

In view of the DeLone and McLean data frameworks achievement show, this investigation incorporates quality elements (data, administration and framework quality) and individual attributes as forerunners to be proceeded with the utilisation goal of e-assets. The investigation extensively archives exact discoveries on effects of value variables and individual qualities on e-assets in an upcoming nation. This study uncovers outcomes that are valuable for the upgrading and use of e-assets by workforce, in different organisations with comparable conditions.

In the perspective of the investigation above, it calls PHEIs to investigate the ERP basic achievement factors that are having an impact on the acknowledgment of innovation inside the ERP instruments organisation.

## **2.10 Stakeholders needs**

Stakeholders' needs in this study's context speak to the perspectives of those at venture activities level, comprising ERP system-users, clients or customers and different partners as they identify with the opportunities or relate to problems within the system for solutions. The hypothesis on stakeholders' needs follows:

### **2.10.1 Equilibrium Theory (ET) / Punctuated Equilibrium Theory (PET)**

PET recognises rapidly changing situations that business enterprises are encompassed with. The following is a breakdown of different elements within PET:

#### **2.10.1.1 Principle subordinate factors of ET**

Equilibrium theory subordinate factors include system changes, structure changes and power conveyance changes.

#### **2.10.1.2 Fundamental autonomous elements**

Fundamental autonomous elements cover natural changes and innovation changes.

#### **2.10.1.3 Brief portrayal of hypothesis**

Eldridge and Gould featured in [guides.lib.byu.edu](http://guides.lib.byu.edu) (2018:1) postulate "that the focal suggestion of punctuated balance epitomises three ideas: stasis, accentuation and predominant relative recurrence. Stasis alludes to an extensive stretch of a moderately unaltered frame; accentuation is radical change over a brief length; and predominant

relative recurrence is the rate at which these occasions happen in a specific circumstance. Punctuated harmony was produced as a contrasting option to phyletic gradualism, which stresses predictable, aggregate changes to species. Inside the setting of hierarchical conduct, the punctuated balance pertaining to stasis, accentuation and predominant relative recurrence” comprises profound structures, balance periods and progressive periods. Profound structure is the arrangement of central decisions a framework has, made of:

- The fundamental parts into which its subsets will be dealt with and
- The basic development outlines that will keep up its existence.

Gersick, referred to in [guides.lib.byu.edu](https://guides.lib.byu.edu) (2018), states that Harmony periods are portrayed by the support of authoritative structures and action designs, where little incremental alterations are rolled out to modify for natural improvements without influencing the profound structure. Progressive periods happen because of critical changes in the condition that prompts discount change, where a framework's profound structure falls apart, abandoning it in confusion until the point that the period closures and decisions are made around which another structure shapes.

One of the key accentuations noted in the ET study is major ecological change caused by ICT advancement, where an innovative intermittence triggers a time of shakiness which is shut by the rise of an overwhelming plan or business worldview. The presentation of a troublesome, or ability decimating, ICT development can be viewed as an accentuation that intrudes on the current stasis, devastating the current profound structure. It ought to be noticed that progressive results, in view of the connections of framework's chronicled assets with current occasions, are not unsurprising and they could conceivably leave a framework happier.

While its utilisation in IS studies has expanded as of late, punctuated balance is definitely not a collectively acknowledged theoretic system. Inside the field of science, its main adversary is Richard Dawkins, who is regularly seen as the central enemy of the late Stephen Jay Gould, one of punctuated balance's originators. Inside the field of authoritative conduct, Lichtenstein referred to in [guides.lib.byu.edu](https://guides.lib.byu.edu) (2018), contended that the self-association hypothesis could be a more adequate system with more noteworthy logical power.

Subsequently, Peter and James (2017) who are in tandem with guides.lib.byu.edu (2018), led a study to address the Punctuated Balance Hypothesis (PBH) applies to business, financial aspects and enterprise in China with regard to development. With the requirement for change and development quickening inside all nations, it was progressively critical for China to receive an imaginative business methodology that coordinates another administration display into their general key arranging process. Also, the exploration exhibited how new advancements and new markets are made and coordinated by new plans of action that create an entrepreneurial locale.

The idea of Punctuated Harmony was a radical thought initially proposed by Stephen Jay Gould and Niles Eldridge in 1972. Today, it is broadly perceived as a valuable model for looking at transformative change and has developed as an unmistakable hypothetical system for clarifying significant changes in business and financial action.

This study examined techniques that connected the punctuated balance hypothesis to business and monetary development in the Unified States from 1980 to the present, with business and financial development in China amidst a similar period. A noteworthy bit of this examination depended on discussions with in excess of “350 key impacts in Shanghai, Beijing, Hong Kong, Singapore and Washington, D.C. over a period of 26 years starting in 1988 and most as of late in mid 2016”. A noteworthy exertion has additionally been made to look at customary information and records from an assortment of sources when and where they were accessible.

The emphasis of the research was to locate the most recent patterns in globalisation techniques with a specific accentuation on social change as it identifies with advancement.

The research above gives a superior chance to PHEIs in South Africa to explore better approaches for developing its understudy base locally and globally by exploring ERP tools arrangements administration inside the radical PHE condition, in a journey to take care of the developing demand of private advanced education.



## **Internal and External factors influencing ERP:**

Pertaining to the internal and external factors influencing a framework, there is need for an enquiry into the conceivable endogenous (internal) as well as exogenous (external) basic elements impacting the present situation of a framework (Chisi 2018). Based on this premise, the segment below highlights the Elaboration Likelihood Model and framework in ERPs.

### **2.10.2 Elaboration Probability Display (Elaboration Likelihood Model)**

As indicated by guides.lib.byu.edu (2018:1), the Elaboration Probability Display (EPD), known as the Elaboration Likelihood Model (ELM) fundamental ward development is Changed Demeanor (Changed Attitude) and the primary autonomous factor is Contention Quality (Argument Quality) and Fringe Signals (Peripheral Cues).

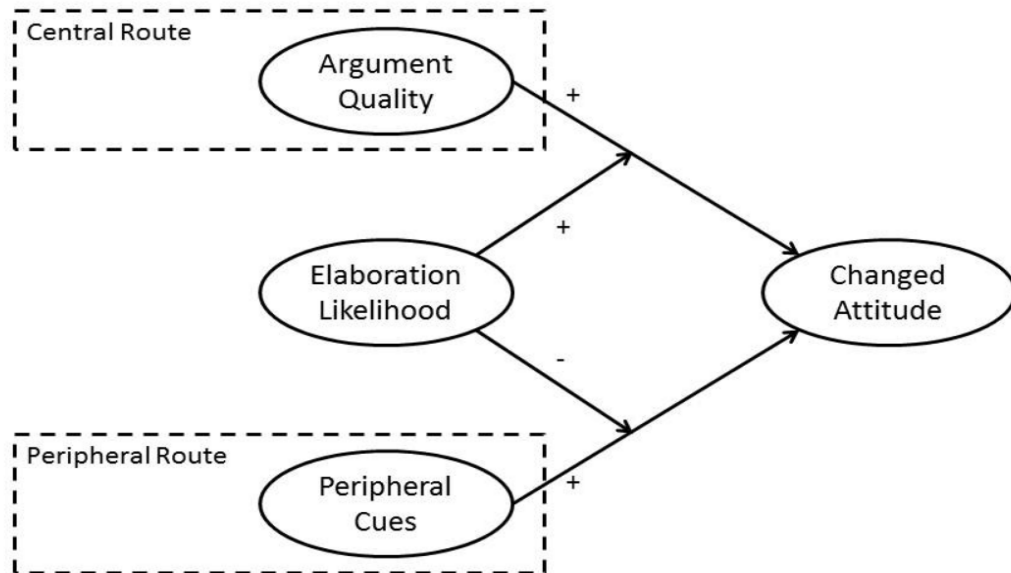
The EPD is a mental hypothesis that tends to the procedure of influence. In particular, it is a double procedure hypothesis: that is, a hypothesis that clarifies that there are two courses that influence what happens: the focal course and the fringe course.

In the EPD, data is the essential driver of state of mind change. At the point when data is painstakingly viewed, intellectual exertion is used and after that an educated judgment is made, thus an individual is utilising the focal course of data handling. When utilising the focal course, people psychologically expand “on the substance of an educational message, assess its substance and consider different issues significant to the data. Elaboration in the EPD in this way refers to the degree to which a person investigates the issue pertinent contentions contained in the enticing correspondence. At the point when elaboration levels are high, the individual is utilising the focal course”.

At the point “when elaboration levels are low, the individual is utilising the fringe course. This course requires less subjective exertions than the previously mentioned focal course”. Heuristics, signs and fondness with the wellspring of the data shape the reason for a state of mind change when utilising the fringe course. Basic choice standards are utilised here instead of a dynamic, effort-ful investigation of data.

The EPD clarifies that adjustments in states of mind are an element of the nature of the data or contention, fringe signs, including heuristics and other boosts that impact influence and elaboration probability.

### EPD (ELM) Chart



**Figure 2. 5: EPD Chart**

Source: Adapted from guides.lib.byu.edu (2018:2)

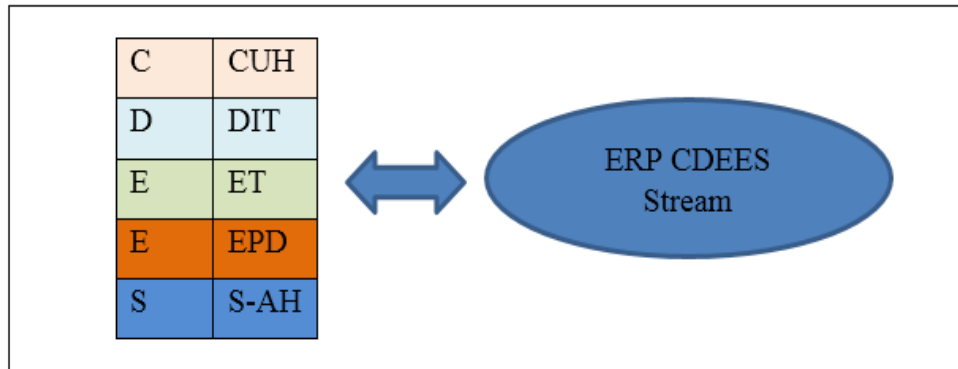
The above segment (2.2) on the survey of related literature; ERP and Reconciliation (Integration), Current practices in ERP frameworks, Perceived Convenience of ERP systems, Partners' needs and Endogenous (Internal) and Exogenous (External) factors influencing ERPs, offer ascent to the CDEES (Complexity, Dissemination of Innovation, Equilibrium, Elaboration Probability Display and Self Efficacy) Stream case in ERPs by Mithi (2018), as shown in the outline below:

### 2.10.3 CDEES Stream or flow capsule:

#### Denoting:

Complexity – CUH, Dissemination of Innovation- DIT , Equilibrium - ET / PET, Elaboration -EPD and Self Efficacy - S-AH.

## ERP tools management environment within CDEES



**Figure 2. 6: CDEES Stream**

Source: Mithi (2018)

### 2.11 Conclusion

Regarding CDEES Stream as demonstrated above, it remains to be seen as to how it would or might have evolved within and after the enquiry of the next sections, including the findings of the study.

Normal assessments on the post - ERP usage were enormously urged to occur consistently, for distinguishing proof of mavericks and towards nonstop change. Chapter Three is the following area that looked at the Theoretical Conceptual Framework.

## **CHAPTER 3**

### **THEORETICAL CONCEPTUAL FRAMEWORK**

#### **3.1 Introduction**

Chapter 3 covers the theoretical conceptual framework within which the problem was addressed. This part reviews literature exploring the usefulness or importance of an ERP Management System in private higher education institutions, as well as critical issues influencing the management of ERP tools in academic management. Furthermore, the review focuses on other Management Information System models and best practices that are widely used in private higher education institutions. This section is divided into a theoretical framework and conceptualisation of an ERP system.

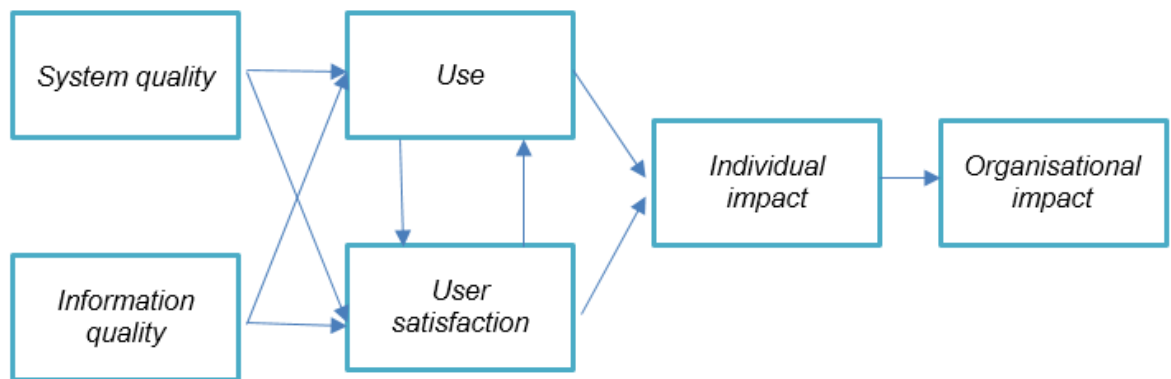
#### **3.2 ERP Theoretical Framework**

As reported by Grant and Osanloo (2014), theoretical frameworks comprise theory or theories that guide one's thinking with regard to how one understands and plan to research a topic. This includes the concepts and definitions from the theory that are relevant to one's study.

In this study, DeLone and McLean's Model (1992) was used as the theory underpinning the study, besides other Information System general theories in ERP management. DeLone and McLean's theory was developed in 1992 and has been widely used as the standard for the justification of dependent variables in Information System (IS) Success. According to DeLone and McLean's (1992) theoretical framework as reported by Nizamani, Khoubati, Ismaili and Nizamani (2014:1), important issues under study are explained by looking at a set of factors in combination that have an influence on ERP Management. Six broad areas underpinning the theory are brought forth, categorised as: "System quality, Information quality, Use, User satisfaction, Individual impact and Organisational impact". As propounded by Lofty (2015), DeLone and McLean's theory within the Diffusion of Technology: aims to identify interrelated set of sustainability factors in an already established ERP system (post-implementation). Lofty (2015) further advocates that the cross examination of sustainability factors helps in

maximising ERP user value, being a central core of management within the Technological Organisational Environment (TOE). The TOE is viewed as a concept of Information Systems in general in understanding the ERP post implementation factors and the challenges around users' perspectives and organisational performance.

***Diagram Of Model of DeLone and McLean's (1992) Model***



**Figure 3.1: DeLone and McLean's Model (1992)**

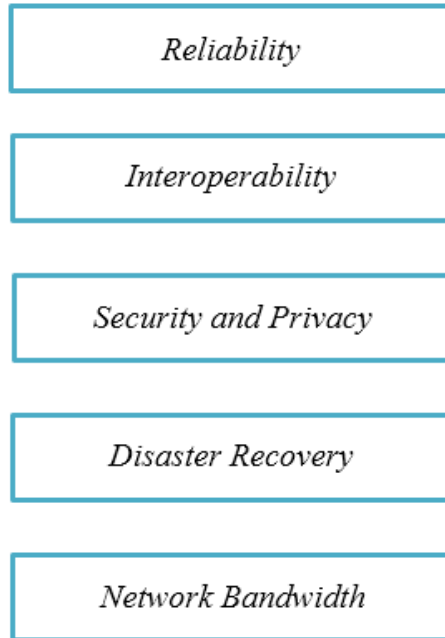
Source: Nizamani *et al.* (2014).

Regarding this research, various models in ERP Management were analysed in the context of an evaluation model of IS implementation by DeLone and McLean in exploring critical issues influencing the management of ERP tools.

As envisaged by Alharthis, Willis, Walters and Alzahrani (2017), the development of a Critical Success Factor Model is reflected in DeLone and McLean's IS Theory for ERP Cloud Migration as a type of management within two categories: Technological Critical Success Factors and Organisational Critical Success Factors. This presented an area of study regarding ERP tools in academic management in terms of system reliability and interoperability, amongst other factors.

### 3.2.1 Critical Success Factors (CSF's) Framework for Digital System ERP in the cloud

#### TECHNOLOGICAL CSFs



#### ORGANISATIONAL CSFs



**Figure 3.2: CSF Framework for digital system ERP**

Source: Alharthis *et al.* (2017)

CSF Framework as described by Alharthis *et al.* (2017:1):

#### 3.2.1.1 Reliability

The ERP system should continuously be reliable and available in the provision of relevant services. Failures in leveraging commodity hardware results in a “loss of internet connectivity between customer and provider networks”, consequently causing “interruptions of” a varied nature. Issues of internet connectivity and system access are of paramount importance.

### **3.2.1.2 Interoperability**

Interoperability ensures “that the Cloud-based Information Technology (IT) solutions must be interoperable and compatible between different providers”, with uninterrupted “access to secure, reliable networks; and the ability to create, deliver and share content campus-wide on any number of devices”.

### **3.2.1.3 Security and privacy**

Security and privacy deals with information privacy offered by the ERP system.

### **3.2.1.4 Disaster recovery**

Disaster recovery ensures data recovery and backup plans during disasters affecting data centers in the cloud-based system.

### **3.2.1.5 Network bandwidth**

Low bandwidth increases the latency of communication, thereby slowing the services in the ERP system.

### **3.2.1.6 Educational policies**

Educational policies ensure compliance with legislation and data policies protecting sensitive information.

### **3.2.1.7 Management support**

The capabilities of top management have an effect on facilitating or driving of changes in ERP cloud adoption. This could be viewed in the evolution of technical support being a considerable part of the Total Cost of Ownership (TCO) of the technology, expressed as the total amount that a company spends over its life-time (Knapp 2014).

In view of the Management Support, the study conducted by Wija and Yanto (2017) stated that ERP has an imperative part in supporting the acknowledgment of Indonesia as an intense nation in worldwide rivalry, through the advancement and usage of Data and correspondence innovation. The usage of ERP turns into a request and need in the administration of colleges. The purpose for this study was to examine the part of best administration bolster in the execution of ERP HE colleges in East Java, Indonesia. The research utilised an example of 164 colleges including 492 respondents. The outcomes demonstrated that the impression of best administration bolster in guarding the execution of HE ERP in East Java, Indonesia, was great.

#### **3.2.1.8 User awareness**

The successful utilisation of new technology requires proper planning and educating stakeholders on the ERP system.

#### **3.2.1.9 Service level agreements (SLAs)**

Service level agreements (SLAs) give access to the provider of ERP technology for enhancements. Customised requirements by the institution to the provider help cover end-users' experience and customer operations.

#### **3.2.1.10 Degree of control**

The degree of control is highlighted in the variation of control that the user has in the cloud environment. The user does not have full control over the services accessed in a cloud-based environment. Decisions are made as to what may be controlled, migrated and accessed in the cloud system.

### ***3.3 ERP Conceptual Framework***

Ravitch, Sharon and Riggan (2016) view a conceptual framework as a lens in making sense of things under study. It is mostly useful when it integrates relevant theories which capture different views of one's subject. It is not just an assortment of theoretical modules and ideas, but also lends some kind of coherence to the related pieces that are being brought together. A Conceptual framework is grounded on a relevant theoretical



review of literature and empirical findings of previous research, focussing on researchers' own experiential knowledge, commitments, values and beliefs.

As illustrated above, from DeLone and McLean's Model and the CSFs Framework by Nizarmani *et al.* (2014), it is believed that the concepts shown in the diagrams serve as guidelines, tracking the ERP tools management and business improvement practices in meeting stakeholders' requirements in managing gaps or deficiencies in the system. Furthermore, the model and framework streamlines the methods for ERP tools management as the foundation required in the initiation, adoption and improvement of ERP tools management.

Dependent variables as inferred from Nizamani *et al.* (2014):

### **3.3.1 System quality**

The ITM Web Conference (2017:1) states that the augmentation of scope and objectives in advanced education scholarly project offerings has been developed in areas geographically scattered, which administration requires strong data frameworks ready to adjust to the setting needs and particularities. There is an exhibit of distinct contextual analysis directed in one of the head workplaces of "Corporación Universitaria Minuto de Dios working in 34 regions of Cundinamarca office in Colombia" featuring challenges that were confirmed during the time spent outlining and usage of a custom ERP framework. The instance of study gives wide logical insights about the choice and outline of parts, customisation, reconciliation and assessment of the ERP framework. Through this investigation is reported the difficulties in the mix, scalability and interoperability of ERP frameworks in advanced education that are confirmed in a setting of regionalisation with geographic scattering factors, and the differential highlights given by a custom ERP framework with regard to the frameworks that are utilised now in advanced education. To highlight the expanding higher education services, this presents room within the IIE workspace to continuously look at its education expansion in the new areas and deal with the challenges that ERP growth may bring with it.

### **3.3.2 Service quality**

The ERP examination by Ali, Raza, Qazi and Puah (2018) highlighted college understudies' acknowledgment of e-learning frameworks in Pakistan. A Web-based learning framework was another type of using mechanical highlights. Albeit that upcoming nations had started and built up the idea of Enterprise Resource Planning, developed nations required exact help to actualise e-learning.

There is a clarification of theoretical models within the IS general theories that depend on the innovation acknowledgment of a Technology Acceptance Model (TAM). Prior hypotheses, for example the hypothesis of contemplated activity (Theory of Reasoned Action TRA); the hypothesis of arranged conduct (Theory of Planned Behaviour TPB) and disintegrated hypothesis of arranged conduct (Decomposed Theory of Planned Behaviour DTPB) had led to client behavioural expectation (Behavioural Intention BI). The Acceptance model in Technology was considered as the most important structure in a Web-based setting. To dissect the present examination's findings, auxiliary condition demonstrating Structural Equation Modelling (SEM) had been utilised to factually break down self-announced information from 424 college understudies (Ali *et al.* 2018).

The outcomes uncovered that TAM, with the mix of new builds, clarified college undergraduates' acknowledgment of the e-learning framework sensibly well. Moreover, work life quality (WLQ) and encouraging conditions (Facilitating Conditions FC) affect the BI and the real utilisation (Actual Use AU) of the e-learning framework separately. Presenting the way forward in the PHEIs in South Africa, this examination additionally gives significant ramifications to scholars and specialists for approaches to upgrade the acknowledgment of the e-learning framework in advanced education.

### **3.3.3 User satisfaction**

Angles identified by the enthusiastic measurement started to be considered, keeping in mind the end-goal to produce dedication in the arrangement of instructive administrations. This added to the foundation of a dynamic long haul association with the association. Subsequently, this investigation looked to dissect the effect of a full of

feeling sense of duty regarding the college, support in benefit co-creation and client engagement on the steadfastness of graduate understudies. To analyse this, an exact informative and transversal research was directed, and individual reviews were connected to 484 graduate understudies in Mexico. The outcomes demonstrate that the faithfulness of postgraduate understudies to the college is clarified by both emotional responsibility and support in co-making the administration. Moreover, there is a circuitous impact between full of feeling responsibility and faithfulness through investment in co-creation. In any case, in this specific circumstance, the impact of engagement on dependability could not be affirmed (Orozco, Francisca, Arroyo and Judith 2017).

Within the South African environment, Scholtz, Calitz and Haupt ( 2018) are in tandem with Orozco *et al.* (2017) in that advanced education establishments (HEIs) confronted various difficulties in successfully overseeing and writing about managing data, for example silos of information and a restricted conveyance of data. Business insight could help with tending to the difficulties looked at by associations. It is this gap that this concept exploited in gaining an insight into the user satisfaction in the ERPs of HEIs. ERP is demonstrated as a valuable framework in the present associations that could prompt various advantages for them. The workers and management staff are the most imperative partners of this framework who could both influence it and be influenced by it. This investigation meant to examine the strengthening benefits that come about because of ERP usage in technological organisations (Rouhani and Mehri 2018).

This exploration researched the ERP benefits through overview by characterising 31 enabling advantages for this endeavor framework in view of checking on the writing and arranging them into four gatherings of engaging advantages, including instructive, informative, development and learning and vital advantages. The factual populace of the study was the center master and directors of these companies. The outcomes demonstrated that the open, vital and instructive enabling advantages are as vital normal points of interest. Moreover, the consequences of figuring the relapse coefficient speak to that of the engaging advantages of vital, educational, informative development and learning had the greatest effect on the Enterprise enabling advantages from ERP execution.

The discoveries of this study gave a general review of what is in store from ERP as for strengthening and in light of it, highlights modules and advancements that ought to be

available for understanding these desires from the implemented ERPs. Summary of the study above gave a gap to explore ERP user satisfaction in PHEIs.

Saygili, Ozturkoglu and Kocakulah (2017) featured that the present aggressive world was given the basic part of ERP for organising the work process in organisations from various businesses. To give profitable bits of knowledge into ERP, recognising the basic elements were the most essential issue in making quality and progress. Both in writing and practice, there were many accomplishment factors for ERP applications. One of the reasons for this research was to observationally order the most vital basic components alluded to by researchers in past investigations. Another reason was to decide the basic achievement factors in the light of end-client discernments. In this regard, exploratory factor examination was directed to decide the factorial structure of the scale. Information was gathered from 128 ERP end-clients from various divisions of enterprises in assembling industry. The consequences of the study gave a six-dimensional structure to basic achievement factors in quality and fruitful ERP applications.

The study above gave a reason to private higher education to continuously improve their ERP management tools in a quest to provide better services to ERP users.

### **3.3.4 Individual impact**

According to Sanzogni and Alfarraj (2015), the motivation behind the individual impact was to assess the effects of big business asset arranging (ERP) frameworks on client execution (CE) or User Performance (UP) in advanced education organisations, with a view to better comprehend the ERP marvel in these foundations and to decide if these frameworks function admirably in such an intricate domain.

A quantitative system was utilised as a part of this investigation and information was gathered by methods for a composed poll. The discoveries showed that framework quality, undertaking innovation fit and data quality are the most imperative factors that prompt better UP. These give proof of the fittings of expanding IS models as a helpful method to give all the more effective experiences into client angles and framework affects. Planners must consider client needs and worries in the outline of ERP bundles. Understanding client qualities and their connection will prompt better advantages. For

instance, if ERP clients are dominating people with little PC encounter; the framework creators ought to put more into making the frameworks simpler to use to encourage more framework effects and advantages.

There has been a general absence of mindfulness about the significance of assessing ERP frameworks from a client viewpoint, or maybe the fundamental focal point of past investigations was either on basic variables and execution issues as well as on client acknowledgment and fulfilment. This examination underscores the significance of this issue and introduces a few experiences into the advantages of ERP frameworks in advanced education by taking lessons from IS hypotheses by and large. Despite the fact that the investigation factors clarified a vast bit of the difference in UP, there is a piece of the fluctuation that still stays unexplained, giving room to look at user satisfaction within the ERP System of the PHEIs.

Reitsma and Hilletofth (2017) directed research in which there is an assessment of basic achievement factors for the usage of an ERP framework from a client point of view. The study was directed in two progressive advances. Initially, a writing audit was led to determine Basic Achievement Elements (BAEs) for ERP framework execution. Secondly, an overview was led to assess the significance of these BAEs from a client point of view. Information was gathered through a poll that was dispersed inside a German firm and was produced in light of the Basic Achievement Variables (BAVs) found in the writing. Social research was utilised to rank the Basic Achievement Factors (BAFs), arranged by significance from a client point of view.

The discoveries uncovered that users respected eleven of the thirteen BAVs found in the writing as vital for ERP framework usage. Seven of the BAVs were considered to be the most vital from a user point of view, including venture group, specialised conceivable outcomes, vital basic leadership, preparing and training, least customisation, programming testing and execution estimation. Clients respected two of the thirteen BAFs as not vital while executing an ERP framework, including hierarchical change administration and best administration inclusion. This research expressed that discoveries might have been different in context and settings, and along these lines prescribe future research to incorporate more associations, ventures and nations. Furthermore, this gave an ideal chance to apply and explore the gaps in private advanced education ERPs with respect to singular or individual effect that may emerge from ERP instruments administration.

### ***Independent variables:***

Top management support: Bertz (2012) stated that without a careful grounding of a firm's ICT delivery challenges, any framework implementation can be wasteful.

### **3.3.5 Reliability**

The findings of Althonayan (2017:306-342) on reliability stated that business "enterprise resource planning (ERP) systems were complicated and complete software designed to combine commercial enterprise tactics and capabilities. No matter the problems and risks, the adoption of ERP systems was increasing rapidly. Universities made large investments in records systems and assumed fine impacts. However, universities were going through serious challenges in enforcing the new generation. Consequently, this precept aimed to evaluate the impact of ERP structures on better training (HE) from the attitude of stakeholders' overall performance. The ERP system quality factors (flexibility, compatibility, availability of proper records, availability of currency, ease of use and timeliness) were determined to affect overall performance positively, as had been service satisfactory elements (tangibility, reliability, responsiveness and assurance). Alharthis *et al.* (2017) and Althonayan (2017) sought to find that elements from pre-implementation, implementation and post-implementation stages had an instantaneous impact on stakeholders' overall performance".

This research study made a singular contribution by means of attempting to examine the effect of service excellence on stakeholder performance inside the ERP surroundings. The contribution made use of carrier fine as a measurement which includes four elements: reliability, guarantee, tangibility and responsiveness. All four factors had been found to be sizeable on ERP stakeholders' overall performance. The recommendations suggested looking at future studies that might be useful for the duration of the maturity section of the ERPs, which would be applied to include all stakeholders in numerous PHEIs in South Africa. Furthermore, studies could "be beneficial to test the applicability of the impact of the ERP tools management on stakeholders' enterprise" zones.

This concept looks at ERP tools management in PHEIs to discover the effect "on the overall performance of the system's stakeholders".

### **3.3.6 Interoperability**

ERP machine interconnectedness is noticeable in the composition. As stated by Parikh (2018:1), in the surge of sharp degrees of progress in all regions of human movement opens new entryways for the exchange of business endeavour outlines. E-managing a record and propelled money had changed directly into a chunk of ordinary every-day methodologies of ways of life. Furthermore, developing cryptographic sorts of money convey more noteworthy extraordinary limit impacts. Roughly one in all them is blockchain exchange, which endorses clients inside the course of wage-related trades without expense costs. Man is closer to the beginning of association valuable resource masterminding (ERP) automated trade with the coming of blockchain improvement, brilliantly known as an electronic report (appropriated database) at the back of unrivalled money. The fundamental remarkable issue of the improvement is the non-attendance of a lone joined base for estimations storing. Each one of the estimations is despatched amongst interconnected squares that are apparently joined into an arrangement with the utilisation of convoluted figurings. Each rectangle stores its own one-of-a kind piece of certainties. New bits might be passed on to the whole of this chain and they cannot be changed after consolidation. This offers the finest upgraded level of guarantee and hack well-being. The upright of blockchain changes is filtering into learning and commercial firms. There is an enormous commercial centre to perceive what a high take-off in advance of time it is that has advanced toward making an achievable model of blend gadget straightforwardness that backs huge electronic transactions of a framework which has no proprietor. Blockchain trades which have influenced bundled electronic exchange charges that are getting less expensive in worldwide exchanges, with supporting voices now announcing blockchain has changed immediately directly into a key open passage for bookkeeping and distinctive zones. Blockchain could be the loosened headway for accomplices or partners. Blockchain would enable the advancement of key bits of knowledge along the reputation of adapting to business frameworks. Blockchain permits quick, unassuming and frictionless procedures inside associations as well as amongst undertakings and their accessories. For example, by means of near relentless assertion, additional sensible actualities sharing, tried and true after any record or choosen component, minute exams of any piece of an approach happening and widely less peril of stumble and misleading in the blockchain network. The organisations may be able to profit with the advantage of



blockchain change in the areas of technology exchanging money, transportation, city management, electronic exchanges and tourism.

This ERP blockchain concept offers a possibility to PHEIs to deliver into their ERP device all parallel structures into one conceivable gadget within ERP tools management, as shown in the recent blockchain ERP developments below:


### Bitcoin Magazine on blockchain technology

## Cardano Blockchain's First Use Case: Proof of University Diplomas in Greece

January 02, 2018, 04:06:20 PM EDT By Amy Castor, [Bitcoin Magazine](#)



Shutterstock photo



Greek graduates may soon be able to prove their qualifications by way of a blockchain.

GRNET, the national research and education network of Greece, is working on a pilot project with blockchain research and development company IOHK to verify student diplomas on Cardano, a blockchain that [launched in September](#).

The project is notable because it is the first official use case of Cardano, a [proof-of-stake-based](#) cryptocurrency and soon-to-be smart contract platform currently under development by IOHK.

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The GRNET app will be built on Enterprise Cardano, a private or permissioned ledger version of Cardano. Unlike a public blockchain, where anyone can join in and participate, a private blockchain allows only a restricted set of users to validate block transactions.

So far, three Greek universities are participating in the project. While IOHK is providing the decentralized database, GRNET is providing the web front end and support and will bring together other universities participating beyond the pilot.



**Figure 3.3: Bitcoin Magazine picture featuring Enterprise Cardano on Blockchain ERP in Higher Education**

Source: Castor (2018:1)

**News clip on Blockchain ERP developments in Higher Education**

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University College London Fights CV Fraud via Bitcoin Verification

Bitcoin Cash

7 GAMES

HUGE JACKPOTS

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Imagine getting treated by a doctor with a fake diploma, or losing a job to another candidate who faked his resume. Unfortunately, such cases are all too prevalent these days in various parts of the world where proper documentation verification is too cumbersome or too costly. However, bitcoin might provide the answer to making sure this reality is preventable in the future.

Also Read: [Dr. Doom \(Professor Nikolai Roubini\) Calls Stablecoin Tether a Scam](#)

### Bitcoin CV Verification

University College London (UCL) has announced that its Centre for Blockchain Technologies has concluded a pilot program enabling MSc graduates in Financial Risk Management to offer instant verification of their academic qualifications using bitcoin.

All graduates of this course in 2016 and 2017 could register their degree details on a platform developed by London-based startup Gradbase. The school checked the validity of this data and then the system issued a transaction validating the authenticity of these degrees via bitcoin. The participating graduates received a QR code they can place on their CV documents, business cards or professional profiles which anyone can scan to verify their credentials.

The company's co-founder, Cédric Collé, [commented](#): "Academic fraud is a global issue which needs a global solution. The ambition of Gradbase is to become the first platform for easily and trustworthily verifying any qualification around the world."

### University College London's Centre for Blockchain Technologies

Founded in 1826 in the heart of Britain's capital city, UCL is the third largest university in the UK by total enrolment and the largest by postgraduate enrolment. It has about 38,000 students from 150 different countries as well as more than 11,000 staff.

Its Centre for Blockchain Technologies (CBT) serves as an academic interdisciplinary research hub for bitcoin and related innovations, as well as a think tank connecting developers and regulators. It provides consultancy services to industry members, knowledge-transfer activities and in-house solutions.

"We are very excited to have collaborated with Gradbase on a pilot which is a UK first. The UCL CBT is playing a leading role in enabling the use of Blockchain technology in the education sector, and we believe that, in the future, such technology will become mainstream," said Paolo Tasca, Executive Director of UCL CBT.

Would you want to have verification of your ID, CV or academic qualifications stored on the bitcoin blockchain? Tell us what you think in the comments section below.

**Figure 3.4: News clip featuring University College London Fights CV Fraud via Bitcoin Verification**

Source: Mizrahi (2018:1)

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The study by Makori (2017:655-678) explored “factors advancing the utilisation of the internet of things in scholastic and research data associations”. The research utilised a quantitative outline overview of chosen “scholastic and research data associations” in public and private sanctioned establishments. Data experts, computerised content managers, data frameworks and technologists that regularly expend enormous information and innovative assets were engaged with the procedure of information gathering utilising organised poll and resource analysis. Data associations and data professionals were chosen from open and private scholastic research foundations.

“The advancement of the internet of things has progressively changed, changing scholarly and research data Enterprises as the wellspring of learning, notwithstanding growing access to training, information, data and correspondence any place and whenever through Enterprise interconnectedness and systems administration. Internet of things innovations, for example IS, internet of things, advanced data frameworks and individual gadgets are broadly connected by computerised information hubs in scholastic and research data associations. The preparation stage and gadgets are the single greatest supplier of information in scholastic and research enterprises. Present day slants in instruction and learning rehearses in scholastic foundations and data associations rely on the internet of things, advanced archives, electronic books and diaries, online networking interfaces, sight and sound applications, data entryway centers and intelligent sites, despite the fact that difficulties with respect to insufficient technological data innovation frameworks and computing equipment still persist”.

It is this challenge of inadequate ICT infrastructure and computing facilities from this study findings that presented a gap in exploring digital repositories and information portal hubs in developing new knowledge on the internet of things in private higher education ERP tools management. Ahmed, Tezel, Aziz and Sibley (2017) investigated the flow state of the Huge Information idea with its related obstructions, drivers, openings and observations in the design, building and development industry with an accentuation on offices administration. Following a thorough writing survey, the Huge Information idea was researched through two checking workshops with industry specialists and scholastics. The research discoveries expressed that the incentive in information investigation and enormous information was seen by business, yet the business needs direction and initiative.

Additionally, the industry perceived an irregularity between the capturing of information and analytics. Vast ICT merchants creating industry-centred analytical arrangements and better interoperability among various sellers were required. The general worries for enormous information examination for the most part also applied to the design, building and development industry. Furthermore, in any case, the industry experiences a basic fracture for information mix with some little estimated organisations working in its supply chains. This study distinguished various drivers, difficulties and way-advances that call for future activities for Enormous Information in Offices Administration in the design, building and development industry (Ahmed *et al.* 2017).

It is this notion of Facilities Management from the Engineering Industry that presented a gap in PHE ERPs to continuously evolve with the developments in managing the internet of things within ERP solutions management.

### **3.3.7 Network bandwidth**

Ambavane, Pawar, Verma and Marath (2018) encourages managing capabilities over the ERP networks to have a broad network access that promotes ERP access through different mechanisms like workstations, laptops, tablets and mobile phones. In regard to this, network bandwidth calls for the need to manage the ERP tool by having enough connectivity points to the system that meet the number of users of the ERP tools..

### **3.3.8 Management support**

Badewi, Shehab, Zeng and Mohamad (2018) formulated the ERP benefits capability framework: idea mind-set orchestration by utilising 12 businesses in one-of-a-type international locations and validating the consequences with eight professionals that suit Delone and Mclean's idea on management assist in assessing organisations by way of searching the ERP resources and organisational complementary resources required to obtain every group of benefits on the basis of its assets, whilst investing more in ERP resources in order that the potential fee of its ERP is realised.

The ERP benefits reputation functionality framework suggests that every organisation of advantages calls for ERP assets labelled into functions, attached technology and information era, branch competences categorised into practices, attitudes, and manner

of existence, talents and organisational characteristics. Leaping ahead to gain innovation advantages earlier than being mature enough in realising a firm's planning and automation competencies could be a waste of time and effort. The ERP benefits popularity capability framework is a qualitative look. It desired to be sponsored by means of quantitative research to check the outcomes. It is this gap within the management support concept that this study explored.

In the present extreme worldwide rivalry, readiness was pushed as a crucial trademark for business survival and intensity. The reason for this research was to propose a useful strategy to accomplish and improve hierarchical readiness in view of key destinations. In the initial step, an arrangement of key execution pointers (KEPs) of the associations being examined are perceived and grouped under the viewpoints of an adjusted score-card (ASC). Basic achievement factors are then distinguished by positioning the KEPs as indicated by their significance in accomplishing authoritative key goals utilising the Procedure for Request of Inclination by Similitude to Perfect Arrangement (PFRISPA). In the second step, three places of value (POVs) are developed consecutively to recognise and rank the principle lithe properties, agile empowering agents, and change ways. Moreover, with a specific end-goal to interpret etymology judgments of experts into numerical qualities in building POVs, fluffy logical rationale is utilised (Nejatian, Zarei, Nejati and Zanjirchi 2018).

The ability of the proposed strategy was exhibited by applying it to an instance of a multi-national sustenance organisation in Iran. Through the application, the organisation could locate the most appropriate change ways to enhance its authoritative deftness. This paper proposed a novel philosophy for accomplishing hierarchical dexterity. By using and connecting a few instruments, for example, ASC, logical PERISPA, and quality capacity arrangement (QCA), the proposed approach empowered associations to recognise the most fitting deft characteristics, light-footed empowering agents and thus coordinated change ways.

It is from the recommendation above that PHEIs came to learn from other industries to apply the concept of ERP agility. Agility cannot be achieved on its own without Management Support.

Khallaf, Omran and Zakaria (2017) distinguished potential purposes behind conflicting aftereffects of the monetary estimation of data innovation (ICT) speculations. The

investigation planned to create systems and suggestions to investigate future openings and bearings for assessing the profits on ICT speculations. This investigation led a longitudinal research study of the writing survey concerning the effect of ICT ventures on firm execution to distinguish the motivations to the purported ICT efficiency oddity or questions and to investigate future openings and headings for future research. The research gave and talked about the motivations for the conflicting outcomes in the earlier research that analysed ICT speculation results and recommended a system and suggestions for future research. After-effects of earlier studies ought to be translated with regard to inquiring, information utilised, level of research, ICT venture measures, firm execution measures, time skyline and industry attributes. This investigation prescribed that ICT administrators and scientists ought to adjust ICT speculations from the environment the enterprise is in, with the association's business procedures as essential determinants of the arrival on ICT ventures.

The proposal above presented a chance for PHEIs to investigate particular conditions under which firms are probably going to accomplish the upper hand from their ICT ventures. It is hence that the Administration Bolster or management support comes into the overseeing of ERP management tools. Bytheway and Branch ( 2017) state that the beginnings of this exceptional release of the Diary of Big business Data Administration in South Africa can be followed back to an examination attempted in 2010, which found that there was minimal distributed work exploring how data is overseen in training, from vital and operational viewpoints. The work that was then accessible had a tendency to be episodic and in light of particular data advancements, for example, the clicker framework, early learning administration frameworks or canny whiteboards (once simply known as dry marker sheets) in lecture rooms. There was little that was known to remain and consider the ERP master plan.

Badewi *et al.* (2018); Bytheway and Branch (2017) and Khallaf *et al.* (2017) stated that today, it is important to stand well back and think forward. Instruction included various exercises at various levels, including diverse things which were all really or possibly affected by the accessibility of data advancements. Endeavoring to oversee data well in training prompts numerous inquiries, for instance: subjects that were most amiable to the use of new innovation and frameworks, zones of instructive action which were at risk in light of poor data administration and the innovation about the changing way that PHE is filling in as instructors.

It is shown that, to a huge degree, training organisations are endeavoring to make up for lost time with training in business and industry seeing focal points in the ERP frameworks that were currently basic in business. Somewhere else there was worry to build up better approaches for contemplating the data assets that were used in instructing and learning and methods of inquiry and the way these frameworks are overseen. Business Knowledge, action and organisation hypothesis, cell phones, national systems for quality administration, formal thinking, repositories and culture were all to be found in what takes after. The prompt inquiry subsequently was this - by what means may this current research be comprehended?

This research looked at the commitments that followed in two ways. In the first place, what was learnt about the rough excursion from data innovation ventures to authoritative advantages? Secondly, out of all the diverse zones of movement in instruction, it looks at the most intriguing in this new data age.

Additionally, it could be said that this entire venture (this uncommon issue of Diary of Big business Data Administration, the thought for which started in an early research study in South Africa) is extremely coordinated at administration. The time had come to make room at all levels and instill a readiness to grasp change for the advantage of every key partner, particularly in undergraduate studies. Intriguing research was being done, yet a much clearer center around the administration of data in training was required in exploring what is being done in ERP management.

From the recommendations above, there was a gap presented for PHEIs to look at management support activities and how these activities were influencing ERP management solutions.

### 3.3.9 User awareness

As evidenced from Zabukovšek, Simona, Bobek and Samo (2017:1) in the BLED 2017 Conference proceedings clip below, ERP attractiveness by college students within the study areas had not been researched frequently. For lecturers or facilitators, it ought to be vital to know which elements had an effect on student ERP attractiveness. This looked at the reputation of ERP solutions for students, whilst simultaneously uncovering ERP answers on the ERP tools that worry students in ERP real use, based on tracing the influence of outside elements on internal beliefs such as perceived usefulness and perceived ease of use, attitudes, intentions and real use. This presented a gap in assessing ERP user awareness in the use of the technological tools in PHEIs in South Africa.

30<sup>TH</sup> BLED ECONFERENCE: DIGITAL TRANSFORMATION – FROM  
CONNECTING THINGS TO TRANSFORMING OUR LIVES (JUNE 18 – 21,  
2017, BLED, SLOVENIA)  
A. Pucihar, M. Kljajić Borštnar, C. Kittl, P. Ravesteijn, R. Clarke & R.  
Bons



## ERP Solution Acceptance by Students

SIMONA STERNAD ZABUKOVŠEK & SAMO BOBEK

**Abstract** ERP acceptance by its users in companies has been researched by several authors while ERP acceptance by students within study programmes has not been researched so often. For teachers should be important to know which factors have influence on student ERP acceptance. Our study researches student acceptance of ERP solutions while they are exposed to ERP solution and they are involved in ERP actual use. Our research is based on TAM which provides a basis for tracing impact of external factors on internal beliefs (perceived usefulness – PU and perceived ease of use – PEOU), attitudes (AT), intentions (behavioural intention – BI) and actual use. Research model includes additional external factors such as: experience with computer, computer self-efficiency, personal innovativeness toward IT, computer anxiety, user manuals (help), system quality, social influence (environment), training and education etc. Research was conduct within a group of 121 students after short interaction with Microsoft Dynamics NAV ERP solution. Results show that most important external factors for student ERP acceptance are: individual benefits, training and education on ERP system and quality of ERP system.

**Keywords:** • ERP solutions • students • ERP acceptance • TAM •

### Figure 3.5: Clip on Bled Conference proceedings

Source: (Zabukovšek *et al.* 2017:1).



### **3.3.10 Degree of control**

As propagated by Ambavane *et al.* (2018:37-45), in “a cloud primarily based computing infrastructure the resources are usually in someone else's premises or community and accessed remotely through the cloud customers. Processing is finished remotely, implying the fact that the facts and other factors from someone need to be transmitted to the cloud infrastructure or server for processing and the output is again upon completion of the required processing. The diverse techniques to cloud computing, as well as the security problems and issues, should be protected inside the deployment toward a cloud-based infrastructure. Cloud computing can serve a diverse range of capabilities over the net, like garage and virtual servers; applications and authorisation for desktop programs. Through taking gains in resource sharing, cloud computing is able to obtain consistency and economies of scale”. Applying the concept of degree of control in managing the tools, it can be suggested that the ICT staff should not be too rigid in granting user access, considering the users' lifespan or length of the programmes within the tools. This does not mean overriding security protocols but giving enough user access rights to the tools that will last during users' maximum programme contract time within the ERP.

The proceeding section highlighted the concept of CDEES Stream case in tabular format, as derived from Chapter 2.

### **3.3.11 The concept CDEES Stream case and its affiliations**

The CDEES Stream case got its roots from DeLone and McLean's Model as hypotheses supporting the research inside Data Framework general speculations in ERP tools administration, as shown at the start of this section. The following is a feature of the CDEES idea in ERP apparatus administration:

**Table 3.1: The concept CDEES Stream case**

Component	Component Wording	Brief explanation	Linked theory	Reference
C	Complexity theory	Complexity theory deals with decision problem in ERPs e.g time, space, satisfaction problem	TPB- this is the motivation ERP users have to comply with the wishes of the system returns	Bhatiasevi and Naglis (2016), Ali et al. (2018), Badewi et al. (2018), Teo, Zhou and Noyes (2016) and Althonayan (2017). Gavidia (2016), Badewi et al. (2018).
			CONTINGENCY Theory apply management support, to the disposal of System users	Amanollah, Hossein and Rasid (2017), Gupta, Misra, Kock and Rouband (2018) and Warren (2016).
D	Dissemination of Innovation Hypothesis	Innovation dissemination highlights Technological;	TAM, TRA, TPB, DTPB, UTAUT / UTAUT2	Masa'deh, Shannak, Maqableh and Tarhini (2017),

		compatibility, competence and perceived use of IS or ERPs	Awa <i>et al.</i> (2017), Ali <i>et. al.</i> (2018), Chauhan and Jaiswal (2016), Bobek, Rohadia and Sternad (2016), Almajali, Masa'deh and Tarhini (2016), Krechine, Lakhal and Ndjambou (2016), Moryson and Moeser (2016), Kang, Liew, Lim, Jang, Lee and Kang (2018) and Tarhini, Masa'deh, Al-Busaidi, Mohammed and Mahmoud (2017).
E	Equilibrium Punctuated Equilibrium Theory	or E/PET acknowledge rapidly changing	SELF EFFICACY Hatlevik, Throndsen, Loi and Gudmundsdottir

		environments organisations are surrounded with	(2017), Farmer and Tierney (2017) and Downes, Brown, Judge and Darnold (2017).
E	Elaboration Probability Display theory	EPD aims at DYNAMIC training staff or CAPABILITY- system users, it is explains the opposite of competitive TPB which strategies within explains Equity Porters 5 Forces theory amongst that users performing explains tasks that best fit understanding them an organisation's stand point in the context of: suppliers, customers, substitute products, new entrants into the market ; and rivalry	Suchit (2017), Buckley (2018) and He, Huang, Zhao and Wu (2018).

S	<p>Self Efficay Self efficacy FIT VIABILITY- Audrey (2018), Hypothesis theory is ERP chiefs or Sprenger, Mettler concerned with managers and Winter (2016) ERP apparatuses; harnessing of and Peet and devices, computer Technological Pitcovski (2018). performance and tools, ERP ERP performance economic influence, ICT infrastructure, influencing organisational viability interms of ERP management Technological Fit. and Performance.</p>
	<p>ACTOR Mwenya and NETWORK Brown (2017), and theory- Ripamonti and Supports network Galuppo (2016). band width in an ERP system. TAM- appreciate Perceived</p>

		usefulness of the ERPs looking at; ease of use, intention to use and actual system use.
	WORK SYSTEMS	Amani and Fadlalla (2016), Theory-articulates work system and performance of the different elements in ERPs as a whole.
	AGENCY Theory.	Adam, Effah and Boateng (2017), Ramli and Widayat (2017).

Source: Mithi (2018)

### **3.3.11.1 How the CDEES Stream case or Concept Components may apply to the PHEIs' ERPs :**

**3.3.11.1.1 Complexity theory** -This is a challenging ERP circumstance that organisations are faced with due to the dynamic nature of the business environment. Complexity theory calls on ERP organisations to keep exploring ways of how best to describe, analyse and manage their ERP technological tools towards agile and maintainable ERPs.

**3.3.11.1.2 Diffusion of innovation** - apply training to ERP users in a call towards having a maintainable ERP tools, besides focusing on users' perceived usefulness of the system.

**3.3.11.1.3 Equilibrium / Punctuated equilibrium theory** - Environmental rapid changes, End-user perceived usefulness of the system- PHE in South Africa has an opportunity to explore issues that will make institutions have maintainable sound ERP systems, other than entirely focusing on ICT staff as being the source of perceived user satisfaction.

**3.3.11.1.4 Elaboration Likelihood Model** - ELM is an argument of **TPB** as shown in the table above. It presents an opportunity to explore an ERP system's social tools towards work enhancement.

**3.3.11.1.5 Self-efficacy theory** - Support in assisting end-users to accept the technology. The gap presented by the Actor Network theory is for PHEIs to keep on exploring towards having Robust computer networks, acceptable computer performance and hardware. **Fit viability** linked to Self-efficacy in ERPs may cover issues of motivation; design of the ERP tools; how users are interacting with the ERP system; network bandwidth and other appeals. Self-efficacy speaks to outcome expectations. In general, ERP System Reliability is exemplified in the duration of updates of management tools; devices like random access memories; and software amongst others. Furthermore, there is the **Agency theory**, highlighting efficiency attributes; efficiency in the ERP system in general and not just on ERP technological innovation.

**Linked Theories to the CDEES Concept explained:**



### **3.3.12 The Theory of Planned Behaviour (TPB) within the Elaboration Likelihood Model (ELM):**

As researched by Bhatiasevi and Naglis (2016), there is a stretch out of the innovation acknowledgment model to coordinate subjective standard, expected comfort, trust, PC self-viability, and programming usefulness keeping in mind the end-goal to better comprehend the level of impact that instructors had on the selection of the cloud in an instructive setting. The instrument improvement was changed from past research on innovation reception. Information was gathered from two driving colleges in Thailand: Mahidol College Global School and Thammasat College. Auxiliary conditions were connected to the exploration, the after-effects of which represented that apparent usability, expected helpfulness, goal to utilise, expected comfort, trust, and programming usefulness had a factually positive relationship towards the selection of distributed computing. It was discovered that in spite of most investigations, PC self-adequacy and subjective standards did not set a positive relationship. The examination likewise displayed the decisions, which incorporate a dialog of the discoveries, the scholastic and useful ramifications and confinements.

Additionally from the above, there was an investigation conducted to the legitimacy of an expanded hypothesis of arranged conduct or Theory of Planned Behaviour (TPB) to disclose an educators' goal to utilise innovation for instructing and learning. Five hundred and ninety-two members finished a review survey, estimating their reactions to eight builds which frame a broadened TPB. Utilising auxiliary condition displaying, the outcomes demonstrated that the builds in the broadened TPB were critical in disclosing instructors' aim to utilise innovation in their work. Amongst the developments in the exploration show, mentality towards PC utilisation had the biggest positive impact on innovation use expectation, trailed by apparent conduct control. Notwithstanding, the subjective standard negatively affected the aim. The consideration of the forerunner factors likewise reinforced the capacity of the stretched out TPB model to clarify expectation. This investigation adds to the developing discourse in applying mental speculations to clarify social expectation in instructive settings (Teo, Zhou and Noyes 2016).

### **3.3.13 Unified Theory of Acceptance and Use of Technology (UTAUT)**

Chauhan and Jaiswal (2016) reported that Undertaking Asset Arranging (ERP) is asserted to upgrade the employability of undergraduates. Be that as it may, the achievement of preparing or taking into account this objective relies upon their acknowledgment. This exploration examined the determinants of the acknowledgment of ERP programming preparation by undergraduate learners in business colleges in India and part of sex and experience contrasts by taking instances of ERP programming preparing under System Application Product (SAP) College Collusions Program. This exploration expanded the Bound together Hypothesis of Acknowledgment and Utilisation of Innovation by incorporating the ideas of accommodation from online access and ingenuity in data innovation. Study information was gathered from 324 business undergraduate students and multi-assembled research was performed utilising Auxiliary Condition Demonstrating. Results uncover that comfort from online access, creativity in data innovation, execution hope and exertion hope decidedly affect understudies' social expectation to utilise, while encouraging conditions and conduct goals to utilise emphatically affect utilise conduct. Sexual orientation directs the impacts of accommodation from online access and exertion anticipation on social goals to use with more grounded connections for females. Experience directs the impact of exertion hope on social goals to utilise and, startlingly, contrarily directs the impacts of encouraging conditions on utilisation conduct. At last, ramifications for instructive foundations and ERP merchants were examined.

It is highlighted that the bound together hypothesis of acknowledgment and utilisation of innovation (UTAUT) has been broadly used to examine factors affecting the reception and utilisation of data frameworks and advancements (ICT). In any case, the empirical findings about utilising UTAUT are not decisive as far as factual extent of reach, course and size are concerned. Through a meta-analysis of exact examinations on UTAUT from 2003 to 2013, decidedly an exploration was conducted to find out how tight-fisted, precise and powerful UTAUT was at anticipating the acknowledgment and utilisation of innovation. A meta-analysis of 74 distributions uncovered that execution anticipation, exertion hope and social impact clarify ICT appropriation, while conduct aim is the frequently estimated subordinate variable operationalised as an intermediary for framework utilisation, supporting the quality

of UTAUT as a logical model of ICT acknowledgment and utilisation (Krechine, Lakhal and Ndjambou 2016).

The Research conducted by Moryson and Moeser (2016) advocated that distributed computing administrations have been developing quickly lately, with Dropbox, Apple iCloud and Google Drive being amongst the most settled. The motivation behind this examination explored whether there were arbitrator impacts for cloud utilisation. Consequently, Sexual orientation, Age, ICT Experience and Use Setting were incorporated as directing factors. Hypothetical spine was an augmentation of the Brought together Hypothesis of Acknowledgment and Utilisation of Innovation: UTAUT. The UTAUT-determinants were inspected: Execution Hope, Exertion Anticipation, Encouraging Conditions and Social Impact, in addition to fused outside components: Demeanor towards Utilise, Seen Security Dangers and Seen Trust into the exploration show.

Information was led by means of a web review amongst web clients in Germany in October 2014. A sum of 2135 specialists began the poll, with 2040 wrapping up. Information reasons for the investigations were the quantity of distributed computing clients, which was an example of 1047. Operationalisation was tried utilising corroborative factor investigations and causal theories were assessed by methods of basic condition demonstration. Moreover, the basic proportions approach was connected to research directing impacts.

The outcomes demonstrated that broadened UTAUT is a vigorous research show. In detail, Social Impact, Execution Anticipation Exertion Hope, and Seen Security Dangers were appeared to essentially affect Mentality towards Utilised cloud administrations. The blend of all builds utilised represented 67.2% of the changes seen in clients' state of mind and 82.4% in clients' aim to utilise cloud administrations. Furthermore, what was found was that the directing impact for all variables explored, especially sex and ICT encounter, appeared to essentially direct the state of mind and conduct goals to utilise cloud administrations.

Extensionally, an examination led in Korea expected to research the determinants of versatile mobile learning acknowledgment of Korean college understudies in light of the Bound together Hypothesis of Acknowledgment and Utilisation of Innovation (UTAUT2) created by Venkatesh, Thong and Xu. Three hundred and five understudies from four colleges in Seoul, Korea took part in this examination. Stepwise relapse comes about and showed that execution anticipation, social impact, encouraging conditions, hedonic inspiration and propensity fundamentally influenced conduct aim to utilise mobile learning amongst Korean college understudies. The research conducted on mobile learning

determinants from the utilisation of innovation represented around 45 % of the fluctuation of social aim. The discoveries of this examination enhanced the present comprehension of mobile learning reception amongst college understudies (Kang, Liew, Lim, Jang, Lee and Kang 2018).

The examination by Tarhini, Masa'deh, Al-Busaidi, Mohammed and Mahmoud (2017) analysed the components that may obstruct or empower the reception of e-learning frameworks by college learners. It can be arguably be explained that a reasonable system was produced through broadening the bound together hypothesis of acknowledgment and utilisation of innovation amongst the accompanying elements: execution anticipation, exertion hope, hedonic inspiration, propensity, social impact, value esteem and encouraging conditions, by consolidating two extra factors, specifically trust and self-viability. Information was gathered from understudies at two colleges in Britain utilising a cross-sectional poll study from January to March 2015.

The outcomes demonstrated that conduct that was aimed was altogether impacted by execution anticipation, social impact, propensity, hedonic inspiration, self-viability, hope and trust in their request of affecting the quality and clarified 70.6 in a 100 of the fluctuation in conduct expectation. In opposition to desires, encouraging conditions and value esteem did not have an impact on social aim.

The previously mentioned factors are viewed as basic in clarifying innovation reception. Be that as it may, to the best of the creators' learning, there has been no investigation in which every one of these variables were demonstrated together. Along these lines, this examination will add to the writing identified with long range informal communication reception by incorporating every one of these factors and the first to be tried in United Kingdom colleges.

### **3.3.14 Contingency theory**

Bobek, Rohadia and Sternad (2016) conducted a study which highlights that since the start of present day venture administration in the 1960s, scholarly analysts have tried to recognise a complete rundown of Basic Achievement Components (BACs), the key things that undertaking administrators must get right keeping in mind the end-goal to convey a fruitful item. With the appearance of Data Innovation (ICT) activities and, all the more as of late, undertakings to convey ERP frameworks, consideration has swung to recognising the

complete arrangements of Basic Achievement Components for these more particular task compositions. This study investigated the exploration exertion by looking at how contemplating each kind of task had advanced after some time, before creating a merged rundown of BACs or Critical Success Factors for each as a reason for examination. This procedure uncovered a high level of similarity, prompting the conclusion that the objective of distinguishing a non-specific rundown of BACs for ERP administration has been accomplished. Consequently, as opposed to proceeding to portray arrangements of BACs, scientists could expand the estimation of their commitment by stepping forward and concentrating on why, in spite of this clear information on how to guarantee their prosperity, ERP ventures keep on failing.

### **3.3.15 Self-efficacy (learning and accomplishment)**

Hatlevik, Throndsen, Loi and Gudmundsdottir (2017) demonstrate that Self-adequacy is a critical idea for understanding learning and accomplishment. The idea covers learners' self-assurance and their desires for future execution. Learners' learning encounters are vital for the advancement of self-adequacy convictions, which may influence learners' accomplishments. This investigation explored how self-viability can be contextualised with data and correspondence innovation in 15 nations. A hypothetical model was manufactured and tried in every nation in light of information from the Universal PC and Data Proficiency Concentrate 2013. The investigations demonstrated that involvement with innovation, self-governing learning and financial foundation clarified the varieties in Data Correspondences Innovation self-adequacy. Further, sexual orientation, self-adequacy and financial foundation assumed essential parts in understanding learners' PC and data skill levels. This showed that Data Interchanges Innovation self-adequacy is emphatically identified with PC and data education when controlled for other learner attributes and foundation logical factors. The outcomes uncovered an unmistakable refinement between Data Interchanges Innovation self-adequacy and PC and data proficiency.

Farmer and Tierney (2017) express that the self-idea of inventive self-viability: the conviction one can deliver innovative results, has drawn extensive research consideration crosswise over various fields and operational areas amongst an assortment of test writes. There is an arrangement of a review of the exploration to date that has tended towards inventive self-viability in some way, with understanding into the kinds of parts imaginative self-adequacy has played as an associate or result of individual and relevant elements as an indicator of inventiveness-related results, and in addition an arbitrator and middle person within the sight of different elements. Notwithstanding recommending the examples organised in which innovative self-viability is implanted, the outline additionally proposed the utility of inventive self-adequacy in understanding the mind boggling flow around innovativeness. This examination investigated some new research questions and possibly productive lines of future research requests that identify with inventive self-viability.

The reason for an investigation led by Downes, Brown, Judge and Darnold (2017)) was to expand on two components of the self-concordance hypothesis objective, particular viability and anticipated individual association fit, as go between of the connections amongst independent and controlled objective intentions and objective achievement and employment fulfillment.

Information was obtained from two freely gathered examples of authoritative representatives: 37 and 102 and their critical others crosswise over two focuses in time.

Results demonstrated that self-sufficient thought processes were emphatically identified with objective particular viability and anticipated fit and indicated circuitous impacts on objective achievement and other-evaluated work fulfillment. Controlled intentions were adversely identified with similar delegates and results. Objective thought processed embroiled objective particular results and people's general creation of objective intentions over their objectives, shape their objective viability and Individual Association fit discernments. These components identify with the distal results of objective achievement and occupation fulfillment. The exploration offers hypothetical ramifications for the proximal results of objective intentions, yet additionally viable ramifications for manners by which associations can enhance officeholder Individual Association fit recognitions.

Despite the fact that an examination has demonstrated that having self-concordant objectives is decidedly connected with singular results, existing explorations presently cannot seem to comprehend why this is the situation. Moreover, most investigations of self-concordance hypothesis apply contrast scores to contemplate the development at the individual-level as opposed to indicating thought processes independently and thinking about a multilevel viewpoint. This research exploration offers a novel examination of the proximal results of the self-concordance hypothesis and the levels at which these results work.

### **3.3.16 Dynamic capability**

An examination by Suchit (2017) gave establishment to an investigation program in cheap computerised development. Economical Advanced Development is a particular type of cheap advancement computerised innovations assume a critical part in empowering firm-level abilities to beat difficulties of asset compelled business conditions. Economical computerised advancement is fixated on the improvement of items and administrations with a sharp spotlight on moderateness, straightforwardness and supportability. The investigation is established in two settings: with contextual analyses led in both a rising economy (India) and a created economy (Canada). This examination is amongst the first to hypothetically and observationally affirm the nearness of asset imperatives and institutional voids in certain Canadian settings that are likely, ever less serious than those found in developing markets. In addition, the examination featured how firms in the two settings arranged such requirements and voids by creating thrifty ICT advancement ability, based on business,

innovation and social development capacities. An advanced multi-dimensional analysis point of view which concentrated on the combination of firm-level abilities, the difficulties of the biological community that the firm works in and hidden computerised frameworks and advances was utilised to analyse how Thrifty Computerised Development drives firm execution. Utilising the affordance hypothesis, the hypothesis of corporate thriftiness and the dynamic capacities point of view, an exploration structure was produced and the part of computerised stages, ICT advancements and other financial variables was likewise inspected. As the world battles to discover imaginative answers for societal issues (for example, medicinal services, training, neediness and craving) this examination featured advanced systems and capacities that organisations can create to enhance their money related, social and manageability execution. The examination talked about biological system-wide ramifications and added to the headway of both hypothetical and practice-based learning. The examination gave prolific grounds to expand the affordance hypothesis and dynamic abilities point of view by applying it in an economical setting, while at the same time making hypothetical linkages amongst requirements, affordances and dynamic capacities. It likewise gave bits of knowledge to professionals with respect to the improvement of ease and high effect computerised development capacities.

Additionally, Buckley (2018) assessed the ways by which ICT developments could enhance technique instruction and learning by inspecting the how and why, as well as the crosswise of measurements that firms used. Academic methodologies could be planned to test the recommendation that organisations contrast to challenge learners to investigate the purposes behind contrasts amongst firms and the effect of this on procedures and to find efficient contrasts and likenesses in firms across a wide assortment of settings.

In view of enhancing technique instruction in ICT developments above, He, Huang, Zhao and Wu (2018) worry about the noteworthy impacts of information amassing on capacity upgrade, methodical research on the impact of hierarchical learning on unique ability is still short. With poll review, 223 endeavors set up inside the previous 8 years were chosen as the examination subjects for investigating the relationship amongst learning introduction, able to use both hands learning, and dynamic ability and additionally testing the control impact of natural vulnerability. The outcomes uncovered beneficial outcomes of learning introduction on unique capacity; fractional intercession of exploratory learning on learning introduction to dynamic ability; and directed intervention of natural vulnerability on the exploratory figuring out on how to introduce dynamic capacity in learning. The examination



demonstrated the capacity of learning introduction to dynamic ability and gave useful motivation to new firms advancing unique ability.

### **3.3.17 Fit viability theory**

Audrey (2018) expresses that albeit past investigations of administration learning concentrated on evaluating learner development, few examinations tended to how to help learners in applying hypothesis to their administration learning encounters. However, the errand of applying hypothesis is a focal segment of basic reflections inside the sociologies in advanced education and regularly caused nervousness among college learners.

In this examination, an academic model was distinguished that helped learners explore the choice and utilisation of hypothesis to their administration learning encounters. The instructive model depended on a contextual analysis of an upper-division humanities benefit adapting course, which included overview and meeting information to survey the model's adequacy. The discoveries demonstrated that a recognisable confining similarity, joined with a particular arrangement of scaffolded in-class tasks that mulled over a plan of learning, is valuable for conquering any hindrance between understanding the hypothesis and choosing and applying a specific hypothesis to benefit learning ventures. Such an approach diminished learner nervousness and disarray encompassing hypothesis application and administration learning. To develop as researchers, learners must have the capacity to coordinate hypotheses to certifiable circumstances all alone. By joining an encircling similarity with scaffolded tasks, lecturers can enable learners to progress from retaining speculations to applying them to their learning administratively.

According to Sprenger, Mettler and Winter (2016), the progressive incorporation of ICT into different parts of our lives and firms' technological management had brought about a competitive advantage in the market-place. besides adjusting from a business perspective. Supervisors of these technological organisations needed to particularly centre around the plan and development of their business' income instruments to guarantee the practicality of their contributions. The related choices were not unimportant, as administrators needed to know about the pertinent logical factors and to respond rapidly to changes in nature. This research proposed a feasibility hypothesis for advanced organisations portrayed by 17 recommendations that might have controlled directors in the plan of income systems and along these lines bolstered the development and also the suitability of a computerised business.

Furthermore, Peet and Pitcovski (2018) exhibited that learning was distinctively sheltered genuine conviction. Facilitated clarification on safe genuine conviction was that a satisfactory way to deal with epistemic fortunes must not include ordering to strategies for conviction arrangement, yet rather to clarifications for conviction. This move was hazardous for a few conspicuous ways to deal with the hypothesis of information, including restraint / moderation and appropriate functionalism as typically imagined. The view that information typically sheltered genuine conviction was better ready to oblige the move being referred to.

### **3.3.18 Actor network theory**

Mwenya and Brown (2017) clarified that the Actor-network hypothesis had been picking up prominence as a directing hypothetical contraption in data frameworks and it was viewed as collections of individuals, advances, venture records, philosophies and different actors. A key fundamental of Actor-network hypothesis was summed up symmetry, which stated that people and material actors be seen on the same expository plane. A relentless study of the Actor-network hypothesis based Data Frameworks reports that scientists utilising Actor-network hypothesis routinely neglected to maintain the perfect summed up symmetry. Faultfinders regularly call attention to numerous Actor-network hypotheses based Data Frameworks which benefit people as the prevailing actors in actor network systems, while paying lip-administration to summed up symmetry for all actor characters. This research contributed toward understanding the basic issues by surveying the ebb and flow level of consistency to Actor-network hypothesis standard of summed up symmetry in Actor-network hypothesis-based Data Frameworks.

As reported by Ripamonti and Galuppo (2016), a research study that presented the human capital module of the Framework Application Item suite in the Italian branch of a main multinational pharmaceutical organisation. This research can be repeated inside the interpretive custom of data innovation frameworks about concentrating on the endeavor to comprehend and portray how ERP clients in the human capital office translated the undertaking asset arranging (ERP) innovation, how they changed their work ethics and the progressions that happened in the authoritative talks and implications within the ERP system.

The contextual research began with the drive of the Italian human capital division administrator, who was struck by the way that the ERP framework innovation execution was influencing the work-life of the representatives in the office. This exploration utilised

meetings, center gatherings and inward reports as wellsprings of information. The creators led and investigated 20 account meetings and 3 center gatherings with center chiefs and they examined around 120 pages of inside notices.

The execution of ERP frameworks was constantly joined by awesome desires for expanded process defense, proficiency and cost-viability. Upper supervisors' talks made substantial utilisation of what was called process effectiveness talk. In any case, the ERP innovation, in all likelihood, will neither radically change administration nor will it turn into a total count machine that runs a whole work association.

The execution of the ERP framework caused clashes and unsettling influences, exasperating inconsistencies that were not there in the former work systems and presented new sorts of logical inconsistencies. Previous logical inconsistencies progress toward becoming clearer, whereby there was a more grounded interconnection between movement frameworks. The individual operators could test an extension in their exercises if they will just start a development of learning and on the off-chance that they are not kept from such by coercive control. The common development of the subjects' extent of movement and skylines of conceivable outcomes could be supported by the ERP innovation on the off-chance that it is not utilised as a device for mastery at the expense of workers and if the upper administration does not attempt and separate what cannot in reality be isolated: actors' abilities of invented modes of learning that makes the organisation of another method of the action conceivable, and their ability to accept aggregate control of the significance and heading of the change of the action. ERPs were advances that could normally bring changes into the PC network systems where they were presented. However, now and again, they could without much of a stretch and in a non-introspective way, be designed as apparatuses for control by the upper administration.

### **3.3.19 Work systems theory**

The exploration by Amani and Fadlalla (2016) gained bits of knowledge into big business asset arranging (ERPs) reflection by encircling ERP scholarly commitments utilising an information-driven scientific classification that was initially proposed as a sorting out system for grouping reasonable commitments in the field of advertising.

Utilising the DeLone and McLean's (1992) ERP Framework as reported by Nizamani *et al.* (2014), the writers arranged an example of 300 ERP articles distributed amid the period 2000-2014 into a topology of four non-exclusive compositions and eight sub-types.

The discoveries demonstrated that although the elucidating composition got the most consideration by investigations, the debating aspect got the minimum. It additionally appeared that there was incidental measurement on the distinctive kinds of reasonable commitments. Singling out the handiness of the ERP frameworks to business was not tended to as would have been anticipated by the construct-assess focal point of different systems.

The fundamental limitation of this exploration was that it utilised articles from scholastic works, and excluded gathering procedures, books and different outlets. Another restriction was that the search criteria was title-based, which may have missed some pertinent papers. The research gave a view to explore the ERP knowledge base for benefits realisation.

It followed that Shao, Feng and Hu (2016) expressed that Best administration support had been distinguished as an outstanding aspect amongst the most imperative factors in the accomplishment of big business frameworks. Be that as it may, few researches have tended to the issue of what kind of authority is best in the period of the Endeavor Framework life-cycle. Given the distinctive difficulties to authority in the diverse periods of ERPs, utilising a one-style-fits-all approach is unmistakably insufficient. This research investigated the unexpected fit between the perceived initiative styles and the stages in the ERP life-cycle. The confirmation from a multi-contextual research offered help towards suggestions that transformational administration fits best with the appropriation stage; value-based authority fits best with the usage stage; and two varieties of consolidated transformational and value-based initiative styles are best in the digestion and augmentation stages. This research broke new hypothetical ground in IS writing by featuring the possibilities of administration adequacy in the accomplishment of ERPs at various stages. It likewise gave prescriptive bits of knowledge to top administrators regarding whom to put in control and what sort of authoritative style to search for while considering receiving and actualising new ERPs, acclimatising the executed frameworks or thinking about reconciliations with business accomplices.

### **3.3.20 Agency theory**

Adam, Effah and Boateng (2017) articulated how higher HEIs in upcoming countries could move the physical regulatory workplace to a virtual stage to enhance data administration.

The research utilised an interpretive contextual investigation approach and a joined focal point of movement and office speculations to see how an upcoming country's HEI endeavored to enhance its data administration by moving from a physical to a virtual regulatory workplace. The discoveries indicated how logical inconsistencies caused by part clashes, managerial staff's dread of disposal and outside advisors' constrained comprehension of authoritative tenets and techniques could hamper workplace on-line systems. Such difficulties ought to be settled with a specific end-goal to accomplish an effective virtual workplace that backs convenient and exact data administration. The research was constrained by its single case viewpoint in one upcoming country. Be that as it may, future examinations can look at the encounters of HEIs from developed and growing countries in order to represent relevant contrasts.

The research furnished professionals with knowledge on how to address clashes between representatives as potential clients and outside specialists amid virtual framework improvement and usage, especially part strife, dread of disposing of some regulatory staff and advisors' constrained comprehension of authoritative work methodology ought to be settled for fruitful workplace on-line systems.

Concurrently, Ramli and Widayat (2017) analysed the variables that affected the genuine utilisation of ERP data frameworks in the Indonesian organisations. The sample was from the manufacturing sector recorded on the Indonesian Stock Trade in 2015. The essential information was gathered from individuals in these organisations. Moreover, two respondents were chosen from every organisation that had involvement in utilising the ERPs for over a year. From 250 polls sent to the respondents, 120 surveys could be handled (48%). By utilising second request corroborative factor examination, it was discovered that the utilisation of ERP framework would be compelling when it was anticipated then it could apply conduct expectations and demeanors about the comfort of utilisation and the introduction of focused learning. These outcomes would make the top management support team ensure impacting the adequacy of particular self-viability and the apparent straightforwardness being used in the framework. The Apparent simplicity utility impacts the impression of the helpfulness, in this way reassuring conduct by utilising the framework and social goals. Thus the real utilisation of the ERP framework is running successfully. The help of best administrative teams can impact the genuine utilisation of ERP frameworks reliably and successfully. The compelling utilisation of ERP frameworks could create data for making informed choices. The majority of the goals, mentalities and practices are seen to emphatically impact each other and they have huge positive correlations.

Within the theory of theories in ICT and for the purpose of this study on ERP tools management in HEIs, the focus was on the Critical Success Factors Framework within DeLone and McLean's IS Theory.

### **3.4 Conclusion**

The ERP framework ought to constantly be dependable and accessible in the arrangement of pertinent administrations. Disappointments in utilising item equipment brings about a loss of web availability amongst client and supplier's systems, therefore causing intrusions of a shifted nature. Issues of web network and framework get to be of principal significance.

Interoperability guarantees that the Cloud-based Information Technology (IT) arrangements must be inter-operable and perfect between various suppliers, with continuous access to secure, solid systems and the capacity to make, convey and share content grounds widely on any number of gadgets. The next section looks at the Research Methodology employed in the investigation.

## **CHAPTER 4**

### **RESEARCH METHODOLOGY**

#### **4.1 Introduction**

Chapter 4 explains the research methodology employed in the study. This chapter shows the design of the research, illustrating models in the integrated ERP management system and their applicability.

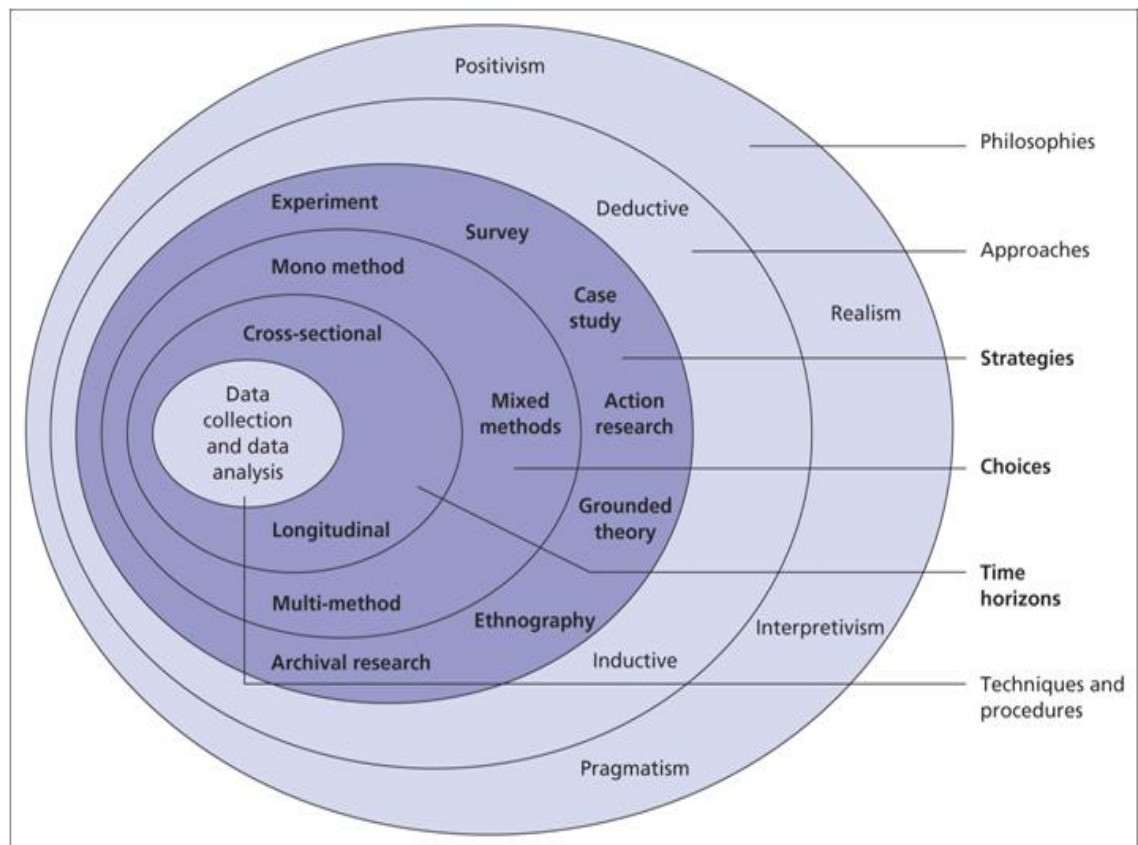
The methodology section also highlights the study design that was used and the choice of research philosophy, research approach and strategy. A depiction of the population, sampling, data collection and synthesis is also provided.

#### **4.2 Research design**

According to Turner, Cardinal and Burton (2015), the research design is a framework that includes the theoretical purpose encompassing: development or testing of theory; methodological purpose; prioritising generalisability; precision in control and measurement; and authenticity of context.

In exploring the critical issues affecting ERP tools management, the researcher used a descriptive design in assessing phenomena and seeking insights into questions. Saunders, Lewis and Thornhill (2012:144) described descriptive research as research with the object of gaining “an accurate profiling of persons, events or situations”.

The Research onion:



**Figure 3.6: Research onion**

Source: Saunders *et al.* (2012)

### 4.3 Philosophy of approach

As further explained by Saunders *et al.* (2012), the research methodology guided the researcher on the design, approaches and strategies that were followed in order to get the valid results based on two research paradigms or philosophies, namely Positivism (quantitative) and Interpretivism (qualitative). Interpretivism guides the researcher to understand differences of the nature of reality between humans in their role as social actors. The nature of reality is seen to be socially constructed, with details of specifics-subjective and value bound.

Interpretivism was shown to have originated from intellectual traditions that were phenomenological and symbolic. Phenomenology pointed to humans and how they make sense of the world around them. Symbolism shows that a human being is in continued interactionism in interpretation of the world around humans. The positivist research design made use of a survey that included “a sample selected from a population under study”, that made “inferences about the population” and address research questions (Saunders *et al.* 2012:144).



#### **4.4 Approach**

An inductive approach was chosen to allow flexibility during focus group interviews. 'In Inductive inference, known premises are used to generate interested conclusions. The Inductive approach generalises from the specific to general' (Saunders *et al.* 2012:144).

Interpretivism integrated social constructs and phenomenological instances in guiding the researcher in the choice of research design, methods, data collection and process analysis. The Interpretivist approach purported use of the inductive approach. It was inductive in the sense that it collected qualitative data from which a theory or model was developed, dependent on the analysis (Saunders *et al.* 2012).

#### **4.5 Strategy of research**

A strategy of research is a general plan within which the study was conducted, reflecting the research objectives clearly. A mixed methods approach (both quantitative and qualitative) was used. The strategy of inquiry was a case study which was used in exploring the research topic. In the qualitative approach, a focus group of 6 to 10 people was used as a sample in interviews and a questionnaire was chosen as part of the quantitative method, as this fitted the case study in the operationalisation of the constructs (Saunders *et al.* 2012).

#### **4.6 Population / target population**

The population referred to all participants within the group or the complete set of cases or group members. (Saunders *et al.* 2012). The actual population for the study was 10500 participants.

#### **4.7 The study (total unit of analysis)**

The population or total unit of analysis in this study was 10500 participants from the three selected PHEIs as follows, RC Pretoria: 2000 participants, RC Braamfontein: 8000 participants, and Damelin Menlyn: 500 participants.

#### 4.8 The sample population

A sample is an enumeration of a subset of a population (Turner *et al.* 2015).

The sample population was used in studies that were cross-sectional in nature. Cross-sectional studies were shown to take place within a short period of time. Within this time horizon, cross-sectional studies made use of the mixed method, questionnaire or survey strategy. They sought to describe the incidence of a phenomenon. There were “qualitative or multiple research strategies. For example, many case studies were based on interviews conducted over a short period of time” (Saunders *et al.* 2012:144).

The targeted sample population for this study was 100 participants. The sample size had been determined using the statistical package;Trignosource (2017), at 95 % level of confidence desired by the researcher, with a margin of error of 3 % indicating that results obtained varied by minus or plus 3, having a standard deviation of 15.4 %. The standard deviation of 15.4 % was calculated from the actual size of the population in the event that 1500 or 1600 subjects was the deviation from the mean value that the researcher was ready to accept. Based on the aforementioned figures, the calculated sample size came to 100 participants.

The sample population was representative in the sense that, the targeted sample of 100 participants consisted of groups of students, lecturers and administrative staff that were selected purposefully out of convenience, and making use of a focus group consisting of 6 to 10 people. The targeted sample size was 100 participants comprising the following number of participants; management: 10, lecturers: 20 and students: 70, from the faculties of Commerce, Information and Communications Technology and Leisure. The study involved the participants, such as the individual users of the ERP tools management system; students, lecturers and management staff at three sites in Gauteng; in Pretoria: Independent Institute of Education (IIE) Rosebank College Pretoria, and Damelin Menlyn (The Education Group), and in Johannesburg: IIE Rosebank College Braamfontein. To be eligible for selection in the study, the research study demanded participants; students, lecturers and management staff of the institutions to:

- Have been in their respective institutions for over two years to ensure that they understand how ERP tools management in private higher education institutions work.
- Have worked or used ERP tools in academic attainment.
- Have undergone ERP tools management sensitisation training.

#### **4.9 Sampling method**

In Sampling, a sample is referred to as a subset of a population (Turner *et al.* 2015). The two main types of sampling are; Probability sampling and non-probability or purposive sampling.

Saunders *et al.* (2012:144) describe probability sampling as the type that works “on the principle of giving all the elements known to have an equal chance of selection”. Non probability sampling chooses participants to the study based on researcher’s judgement.

The study used Non-probability (purposive); judgemental sampling. This sampling method was appropriate in the sense that the researcher as part of the study used opinion or own judgement in selection of respondents for the study, in that the researcher was interested in certain experiences to be shared by the participants.

For the purpose of this study, the extent to which the sample was shown to be representative of the sampling frame was that three institutions had been chosen out of twelve PHEIs (three RCs; and nine Damelin campuses) in Gauteng. The reason for this choice was that they were within the same Province, Gauteng and the distance is within easy reach.

## Tables showing the samples used

Mixed Method: The targeted versus the actual number of participants per category

**Table 4.1: Purposive non-probability: Interviewing of participants**

Sample	Category of participants	Target	Rosebank College Pretoria	Rosebank College Braamfontein	Damelin Menlyn Pretoria
			Participants per institution		
1	Management Staff	10	5	2	3
2	Lecturers	20	13	4	3
3	Students	70	40	15	15

**Table 4.2: Purposive non-probability: Focus group participants**

Sample	Category of participants	Target	Rosebank College Pretoria	Rosebank College Braamfontein	Damelin Menlyn Pretoria
			Participants per institution		
1	Management Staff	20	7	7	6
3	Students	30	12	10	8

**Table 4.3: Purposive non-probability: Survey (Questionnaire) to all participants**

Sample	Category of participants	Target	Rosebank College Pretoria	Rosebank College Braamfontein	Damelin Menlyn Pretoria
			Participants per institution		
1	Management Staff	10	4	3	3
2	Lecturers	20	8	7	5
3	Students	70	30	20	20

The actual number of participants that responded to the survey are shown after the administration of the questionnaire.

#### **4.10 Measuring instrument**

A measuring instrument was anything that became a method of gathering information for a research study (Welman 2012).

A mixed method was used to triangulate the results as “all methods individually are flawed, but these limitations could be mitigated through mixed methods research, which combines methodologies to provide better answers to research questions” (Turner *et al.* 2015:243-267). Furthermore, Cresswell (2018) is in agreement with Sekaran and Bougie (2018:256) by stating that the “Mixed methods techniques is a way to deal with requests, including gathering both quantitative and qualitative information, incorporating the two types of information, and utilising particular plans that may include philosophical presumptions and hypothetical systems. The central presumption of this type of request is that the mix of subjective and quantitative methodologies gives a more total comprehension of an examination issue than one approach” alone. The study utilised multiple sources of data collection in a mixed manner, such as the use of interviews and a focus group (in-depth interviews) in qualitative investigations. In the use of a survey as a quantitative method, the questionnaire was administered to 100 participants as the sample size, comprising students, lecturers and management staff out of a population size of 10500 participants.

“Qualitative research is an approach for investigating and understanding the importance people or gatherings credit to a social or human issue. The procedure of research included rising inquiries and strategies, information regularly gathered in the member's setting, information examination inductively working from particulars to general subjects, and the specialist making elucidations of the importance of the information. The last composed report had an adaptable structure. The individuals who took part in this type of request bolstered a method for taking a look at the distinctions of an inductive style, attention on singular significance and the significance of rendering the multifaceted nature of a circumstance. Quantitative research was a method for testing target hypotheses by inspecting the relationships amongst factors. These factors could be estimated commonly on instruments, with the goal that numbered information could be dissected utilising factual techniques. The last composed report had a set structure comprising of presentation, writing

and hypothesis, strategies, results and talks. Like subjective analysts, the individuals who participated in this type of request had suppositions about testing speculations deductively, working in securities against predisposition; controlling for elective clarifications; and having the capacity to sum up and reproduce the discoveries” (Grbich 2018:257-289).

#### **4.10.1 Thematic analysis**

The themes under investigation are planned so as to address issues brought up in the literature review and in research objectives. The design assisted in arriving at conclusions in Chapter 2.

As indicated by Chisi (2018) the researcher focuses on information investigation systems by arranging stages with connections determined in the study targets or inquiries. As these attestations demonstrate, the information study procedure of the research received topical investigation approach which is an iterative and reflexive process and included classifying, requesting, controlling and condensing information to acquire answers to explore questions. Relating to qualitative information gathering, investigation and understanding as a synchronous procedure, the analyst began the information examination process ideal from information accumulation stage, into translation and composing stages with a specific end goal to abstain from being overpowered by information volume. Additionally on thematic analysis, Sekaran and Bougie (2016:81) attested that topical investigations were a sort of subjective examination which was utilised to break down arrangements and present topics or themes that identify with information created.

A thematic or topical investigation was viewed as the most proper for any examination that looks to finding utilising translations. The information examination process using thematic analysis enabled the analyst to relate an investigation of recurrence of a subject with one of the entire substance. Subjective research required comprehension and gathering assorted viewpoints and information. It likewise gave a chance to comprehend the capability of any issue all the more generally. Topical moves past checking express words or states and spotlights on distinguishing and depicting both verifiable and unequivocal thoughts.

By utilising topical examination, the scientist had the capacity to definitely decide definitely the connection amongst ideas and contrast them and information created through an Identification (ID) of information classes (Sekaran and Bougie 2016:98).

Topical investigation gives the chance to code and classify information into subjects. For instance, how ERP frameworks impact the impression of ERP system users. On account of topical examination, information can be shown and grouped by its likenesses and contrasts. Subjects inside information are distinguished through inductive process. With the inductive approach, subjects recognised are connected to information themselves. Inductive information investigation includes ID of vital classifications in the information, and in addition examples and connections, through a procedure of revelation (Sekaran and Bougie 2016). It is said that through strategies, for example coding, clarifying, marking, determination and outline, the specialist controlled and generously decreased the span of the informational collection, and attracts specific consideration regarding noteworthy bits of information. Re-perusing the information will assist the specialist with identifying codes, classes and topics and thoughts about the association procedure with the members. The information helped the scientist to lessen information into significant subjects, examples, thoughts and ideas (Sekaran and Bougie 2016: 96-98).

This procedure would assist the specialist with clarifying and exploring ideas from the information. As the information examination will unfurl, the researcher in the study simultaneously plotted subjects that were condensed into research discoveries which were incorporated into the study findings. The researcher interacted with the focus group amongst other methods of data collection in the study.

#### **4.10.2 Focus groups**

A focus group is a smaller group of participants interacting with the researcher on case study themes.

For administrative staff and students, the study utilised focus groups. This was proper for two fundamental reasons:

The approach had the upside of getting information in members' own particular words and had the ability to create further bits of knowledge about the issue under investigation. The focus groups enabled members to expand on each other's reaction and concoct thoughts they would not have thought in a one-on-one meeting (Chisi 2018).

Focus group gathering meetings were held with the Management staff and Students of the PHEIs within the study. Each meeting was carefully recorded with the voice recorder for

simplicity of finding data and critical recognitions concerning the ERP tools administration frameworks within these PHEIs. The meeting was directed in English, being the official dialect of correspondence.

#### **4.10.3 Document or record analysis**

Record material could likewise be utilised as wellspring of data. The research likewise gathered information from pertinent printed and recorded materials from the ICT divisions in the PHEIs in the study. Archive analysis for this situation referred to study and survey of authority reports, which were gathered and kept up by associations. Documents incorporated arrangement confirmation rules, money related records, factual reports, yearly reports, strategies, lawful structures and process records (Sekaran and Bougie 2016). Record investigation was a type of subjective research in which reports were translated by the researcher in the study “to give voice and importance around an appraisal point. Dissecting archives fuses coding content into subjects, like how centre gathering or meeting transcripts were broken down. An organisational memo could likewise be utilised to review or score report. There were three essential sorts of reports”, for example,

- “ Open Records being the official, continuous records of an association's exercises. Illustrations that incorporated transcripts within the study, statements of purpose, yearly reports, approach manuals, understudy handbooks, key designs, and syllabi,
- Individual Documents incorporated first individual records of a person's activities, encounters, and convictions. Illustrations incorporate date-books, messages, scrapbooks, sites, Facebook posts, obligation logs, episode reports, reflections or diaries, and daily papers and
- Physical Evidence, for example physical articles found inside the examination setting, regularly called relics. Illustrations included incorporate flyers, notices, plans, handbooks, and preparing materials” (Creative Commons 2016:1).

##### **4.10.3.1 Reason for conducting a document analysis**

Report investigation “is a social research strategy and is an essential research instrument in its own right, and is a significant piece of most plans of triangulation, the blend of philosophies in the investigation of a similar marvel (Creative Commons 2016:1). Keeping in mind the end-goal to look for merging and substantiation, subjective analysts for the most part use no less than two assets through utilising distinctive information sources and



strategies. The reason for triangulating is to give a conversion of confirmation that breeds validity. Validating discoveries across informational collections can lessen the effect of potential predisposition by looking at data gathered through various techniques” by consolidating subjective and quantitative data into record investigation (Sekaran and Bougie 2016).

#### **4.10.3.2 Document analysis process**

Creative Commons (2016:1) articulated that when using document analysis investigation, the “specialist must experience a point by point arranging process so as to guarantee solid outcomes. There is an arranging procedure with eight stages that should occur not simply in record examination but also in all printed investigation”:

- “Create a rundown of writings to investigate, for instance: populace, tests, respondents, members,
- Consider how messages will be gotten to with regard for phonetic or social hindrances,
- Acknowledge and address predispositions,
- Develop fitting abilities for exploration,
- Consider methodologies for guaranteeing believability,
- Know the information one is hunting down,
- Consider moral issues, for example, secret records and
- Have a reinforcement design”.

Creative Commons (2016:1) recommends that “a wide exhibit of reports is better, in spite of the fact that the inquiry ought to be more about nature of the record as opposed to amount. Creative Commons (2016) acquaints two noteworthy issues to consider when starting report investigation. The first is the issue of predisposition, both in the creator or maker of the report, and the specialist also. The analyst must consider the subjectivity of the creator and furthermore the individual predispositions he or she might convey to the exploration. Creative Commons (2016) concludes that the scientist must assess the first reason for the record, for example, the intended interest group. The researcher ought to likewise consider whether the creator was a first-hand witness or utilised used sources. Additionally, what is imperative is deciding if the report was requested, altered, or potentially unknown. The second real issue is the accidental proof, or inactive substance, of the archive. Inert substance alludes to the style, tone, motivation, certainties or feelings that exist in the archive. This is

a key initial step that the scientist must remember” (Creative Commons 2016:1). Archives ought to be surveyed for particular information assessment. Additionally and of principal significance while assessing reports is “not to consider the information as fundamentally exact, precise or finish accounts of occasions that have happened. These issues are summed up in another eight-advanced processes offered as:

- Gather important writings,
- Develop an association and administration frame,
- Make duplicates of the original copies for explanations,
- Assessment of validity of reports,
- Explore archive's motivation, predispositions,
- Explore foundation data, for example tone, style, reason,
- Ask inquiries concerning records, for example, who created it? Why? At the point when? Sort of information?, and
- Explore content”.

Exploring Content refers to the way toward investigating the documents collected in the document analysis process, or the genuine substance of the records. With an example of the meeting method in document analysis, the analyst “treats the report like a respondent or source that furnishes the specialist with important data. The analyst makes inquiries at that point and features the appropriate response inside the content. The specialist figures out the key points extracted from the utilisation of specific words, expressions and ideas. The data is then composed into what is identified with focal inquiries of the examination. Creative Commons (2016) states that a few specialists protest this sort of investigation, saying that it clouds the interpretive procedure on account of meeting interpretations. In any case, Creative Commons (2016:1) advises that reports incorporate a wide assortment of sorts and substance examination can be extremely helpful for painting an expansive, general picture. There is content examination, at that point utilised as a first-pass record survey that can give the scientist methods for recognising important and applicable entries”.

Notwithstanding content examination, topical investigation, can be viewed as a type of example acknowledgment with the record's information. This investigation takes developing subjects and makes them into classifications utilised for advance examination, making it a valuable practice for grounded hypothesis. Document analysis incorporates cautious, centred perusing and re-perusing of information, and additionally coding and classification development. The developing codes and topics may likewise serve to coordinate information

accumulated by various strategies. Creative Commons (2016) totals up the general idea of archive examination as a procedure of assessing records such that exact learning is created and understanding is produced. Document analysis is not only a procedure of arranging a gathering of portions that pass on whatever the specialist wants. The specialist must keep up an abnormal state of objectivity and affectability all together for the report investigation results to be trustworthy and substantial (Creative Commons 2016).

#### **4.10.3.3 The merits of document analysis**

Numerous reasons are narrated why researchers utilise records examination. Right off the bat, records examination “is a proficient and viable method for social event information since archives are reasonable and common sense assets. Archives are typical and arrived in an assortment of structures, making records an extremely available and solid wellspring of information. Acquiring and breaking down reports is frequently much more cost productive and time proficient than leading one’s own particular research or investigations. Additionally, archives are steady, non-responsive information sources, implying that they can be perused and investigated in numerous circumstances and stay unaltered by the scientist's impact or research process” (Creative Commons 2016).

Record examination is frequently utilised as a result of the various “ways it can bolster and fortify research. Report investigations can be utilised as a part of various fields of research, as either an essential strategy for information gathering or as a complement to different techniques. Archives can give supplementary research information, making report investigation helpful in association and administrative frames. Reports can give foundation data and expansive scope of information, and are in this way accommodating in contextualising one's examination inside its subject or field. Archives can likewise contain information that never again can be watched, give points of interest that sources have overlooked, and can track change and advancement. Report examination can likewise point to questions that should be asked or to circumstances that should be watched, making the utilisation of archive investigation an approach to guarantee that exploration is basic and extensive” (Creative Commons 2016:1).

#### **4.10.3.4 Concerns to keep in mind when using record analysis**

“The weaknesses of utilising report examination are less constraints but rather more that there are potential concerns to know about before picking the strategy or when utilising it. An underlying concern to consider is that” records may be organised or put together only

when there is a motivation to look for certain information and in this way require some investigative aptitudes. A few records “may just give a little measure of valuable information or now and again none by any stretch of the imagination. Different archives might be deficient, or their information might be wrong or conflicting. Once in a while there are gaps in the records, prompting more dependence on extra archives. Likewise, a few archives may not be accessible or effectively available. Thus, it is imperative to assess the nature of records and to be set up to experience a few difficulties while utilising archive examination” (Creative Commons 2016:1).

Another possible concern before starting archive examination, and to remember amid, is the potential nearness of inclinations, both in a report and from the specialist. It is critical to altogether assess and examine the subjectivity of reports and comprehension of the information so as to protect the believability of the examination (Creative Commons 2016).

When it comes to encompassing archive investigation or record analysis, concerns and not weaknesses are that they can be effortlessly maintained from a strategic distance by having an unmistakable procedure that joins evaluative advances and measures, as already specified and exemplified by the above mentioned two eight-advance procedures. For whatever length of time that a scientist starts report examination recognising what the technique involves and has an unmistakable procedure arranged, the upsides of record investigation is probably going to far exceed the measure of issues that may emerge.

#### **4.10.4 Interviews**

Summarising interviews within the case study: Data was summarised from the themes or categories by use of coding. Data collection explored a phenomenon, identified themes and patterns and created a conceptual framework. There was theory generalisation and building (Saunders *et al.* 2012). The interviews utilised an in-depth meeting procedure. A recording device was utilised to record interviews that were directed at participants that included administration Staff, Lecturers and Students in the selected PHEIs. The researcher portrayed the reason for the interview to the members, clarifying that they were not constrained to take part in the research.

The choice of the sample in the study utilised a purposive system with ERP tools organisation of the chosen PHEIs.

#### 4.10.5 Design of questionnaire\format\coding\scale used

“A survey was used in the quantitative investigation. The survey as positivist research design included a sample selected from a population under study to make inferences about the population (Saunders *et al.* 2012:144). The questionnaire or survey will be formulated for the purpose of gathering data to address research objectives”.

“A questionnaire was used in which each respondent answered the same set of questions in a predetermined order in the absence of the interviewer”. Statements were designed using a Likert-type rating scale, with a scale of 1 -5, representing: Strongly disagree, Disagree, Neither agree or disagree, Agree and Strongly agree respectively (Saunders et al. 2012). The survey also had Ratio scale questioning techniques, relating to value 0 and Open questions.

**Table 4.4: Interview schedule-type / design**

<b>Rosebank College Pretoria</b>	<b>Rosebank College Braamfontein</b>	<b>Damelin Menlyn Pretoria</b>
Venue: second floor meeting room	Venue: fifth floor, meeting room:	Venue: second floor, meeting room
Month: June 2018	Month: June 2018	Month: July 2018

Regarding interviews, a one-on-one session had a duration of 30 minutes.

Group interviews were scheduled for 45 -60 minutes.

#### 4.10.6 Recruitment process/ data collection

Permission was obtained from participants voluntarily participating in the study by using the letter of consent.

#### 4.10.7 Administering questionnaires\interviews

The questionnaires were administered and delivered to conveniently selected respondents. The targeted sample size was 100 participants, comprising students, lecturers and administrative staff. With interviews, The researcher endeavoured to seek individual permission to take part in the research study including approval to be tape-recorded in assuring “participants of their confidentiality and privacy that their identities are

anonymous, which is an important part of the research activity because it paves the way for participants to cooperate and allow them to freely and genuinely accept to participate in the research exercise” as elaborated in section 4.10.4.

#### **4.10.8 Invitation to participate\informed consent**

Participants were required to give their consent in writing.

#### **4.10.9 Collection of survey instrument**

From the Survey, the collected data was analysed and processed quantitatively with the help of Google analytics and Statistical Package for the Social Sciences (SPSS). Google analytics and SPSS were meaningfully used to contribute to the automatic collection of data as Google analytics and SPSS allowed the organisation and comparison graphically, numerically and in the form of percentages by survey sections.

#### **4.11 Data analysis**

The quantitative type of analysis software was used and made use of google analytics in the administration of the survey. The data was analysed using the IBM (2019) SPSS statistical package (Version 25) and the necessary statistical tests were conducted.

Inferential statistical software packages were used based on the results, e.g. SPSS output.

Qualitative type of analysis were done by content analysis software using nVivo 12 (QSR 2019).

A recording device was used in the interviews. The focus group interviews comprised number of participants; between 6 to 10. After recording, transcribing of data took place from written word to print.

#### **4.12 Pre-testing / Pilot testing**

The purpose of pilot testing was to adjust or rephrase the questionnaire or research instrument in assessing information accuracy.

Pilot testing of the instruments was done by giving the questionnaire to a group of 10 people that was not part of the study. The pilot study was conducted for further inputs. There was scrutiny of instrument by the experts (experts had a look at the questionnaire) as practitioners in the field of study. There were no changes that were made to the instruments.

#### **4.12.1 Delimitations / scope**

The research conducted was based on the critical issues influencing ERP tools management in academic ERP, confined to three PHEIs in Gauteng.

#### **4.12.2 Limitations**

The characteristics that impede or influence interpretation of the study are referred to as limitations (Cresswell 2018). This study would not be generalised to other PHEIs in Gauteng South Africa, as the nature of the topic is dynamic.

### **4.13 Validity and reliability/trustworthiness (qualitative research)**

Validity is the issue of accuracy in research (Yilmaz 2013).

#### **4.13.1 Importance of validity**

##### **4.13.1.1 Quantitative study:**

The importance of validity in research is that, it checks for consistency in measuring what is supposed to be measured. The questionnaire should measure exactly what is to be measured and used and acknowledge an existing instrument that was tested, validated and developed (O'Rourke and Hatcher 2013).

##### **4.13.1.2 Validity in quantitative study**

To ensure that there is validity, face validity took place, for example the instrument was scrutinised by an academic in the field, a practitioner and a statistician. Furthermore, factor analysis was conducted to assess validity (Brown 2014).

##### **4.13.1.3 Reliability pertaining to quantitative study:**

The instrument or questionnaire was checked for consistency. In quantitative analysis, Reliability used split-half measure of similarity using Cronbach's alpha tests (Bonett and Wright 2015).

Reliability in research checks for consistency and generalisation of scores showing that the findings are dependable, credible and have a strong foundation, in that data collection procedures are replicable with the same outcomes (Pandey and Patnaik 2014). Reliability in research checks for consistency and generalisation of scores in different occasions with respondents.

#### **4.13.1.4 Importance of reliability in quantitative study**

Reliability ensures dependability of research (Bonett and Wright 2015). Furthermore reliability ensures internal constancy on items or questions that are correlated with each other and brings forth trustworthiness and credibility in ensuring that research findings were transferable, dependable and generalisable.

#### **4.13.2 Qualitative study:**

##### **4.13.2.1 Trustworthiness in terms of the qualitative data**

This section describes trustworthiness and credibility, as well as honesty and transferability of research findings. Guba and Lincoln (1985 cited in DeVault (2017:1) point out four pillars of trustworthiness in qualitative research as:

***Credibility:*** that accounts in the belief of trustworthiness of data, through prolonged engagement, observations, triangulation, peer debriefing, member checks and referential adequacy. To ensure credibility, the researcher had sufficient commitment in the exploration setting with the goal that intermittent examples in information could be appropriately recognised and confirmed. Triangulation in the study made use of questionnaires, interviews, document analysis and review of literature.

***Transferability:*** refers to generalisation of the research findings to other contexts. To ensure transferability, the researcher has provided a detailed portrayal of the participants' and the research procedure to empower the perusers to survey whether the research discoveries are transferable to their own settings.



**Dependability:** depends on validity, the consistency of research methods in administration of the research instrument uniformly to respondents. Dependability was ensured by having the data collection instruments examined by a practitioner in the field and altogether the study was supervised to affirm the exactness of the discoveries and to guarantee that the discoveries are upheld by the information gathered. Interpretations and outcomes were analysed to decide if they are upheld by the information itself.

**Conformability:** being the researcher's objectivity. The findings and conclusions are based on the process and conditions of the research. To ensure conformability, this study has an audit trail in place and the researcher is liable for giving a total arrangement of notes made during the exploration procedure, study materials used and rise of the outcomes and information regarding data management.

To ensure trustworthiness of the qualitative data, sensitive questions were left until near the end of the interview. This helped the participant to have more time in building trust and confidence in the researcher, allaying any doubts that there would be about the researcher's intentions. If there were potentially sensitive questions, wording of these type of questions was considered with particular attention to avoid negative inferences (Sanders *et al.* 2012).

#### **4.14 Anonymity and confidentiality**

##### **4.14.1 Importance of anonymity**

Participants had the right to privacy (Welman *et al.* 2012).

##### **4.14.2 Ensuring confidentiality and anonymity**

Participants were made aware that their identities would stay anonymous as the interviews did not require participants' names and identities to be known (Vainio 2013).

Participants had the right to privacy. Respondents or participants were given the assurance that they would be indemnified against any physical and emotional harm (Welman *et al.* 2012).

In the study, confidentiality was assured by giving participants letter of information with the assurance that their identities are anonymous (Cooper and McNair 2015).

#### **4.15 Ethical considerations**

In addressing DUT ethical requirements, DUT Ethical issues checklist was applied in the study.

##### **4.15.1 Ensuring that there is voluntary participation**

The letter of informed consent to participants ensured voluntary participation in the study. Through statements of agreement, participants were assured that their identities are anonymous; and the information given to this study will be kept confidential. There were no risks associated with participation of the research. Questionnaires will be stored in a safe storage for five years and thereafter be shredded. Electronic records will be kept for five years and thereafter be deleted.

##### **4.15.2 Ensuring that participants have given informed consent**

The researcher sought permission from the gatekeeper concerning the participants who took part in the study including the approval for participants to be tape recorded through letters of permission to conduct the research.

Permission was obtained from participants voluntarily participating in the study as shown in the letter of consent (Padgett 2016). As suggested by Welman *et al.* (2012), the researcher should obtain permission from the respondents informing them with truthfulness the purpose of the interviews and survey conducted in the study.

##### **4.15.3 Addressing anonymity and confidentiality**

Anonymity and confidentiality was addressed by giving participants the letter of information, with the assurance that their identities are anonymous.

#### **4.16 Conclusion**

Chapter 4 above analysis is on research methodology, with a focus on the research design, philosophy of approach, strategy of research, population / target population, sample population, measuring instruments and ethics.

Within the strategy of research that portrayed the mixed methods approach, the quantitative research technique was esteemed suitable in leading the investigation in accomplishing its targets. The exploration was directed at indigenous habitats where study respondents participated in the study willingly. The poll, the information inquiry about the instrument, was adjusted to the chosen quantitative strategy in the accumulation, gathering and investigation of information in influencing utilisation of Likert-type rating scale. The categories in the survey were planned in such a way that pointed to issues raised in the review of literature. The survey that filled in as strategy instrument for essential information accumulation was conveyed to members through messages. A Google investigation was of important use for a programmed gathering of information by graphical and numerical examination besides SPSS.

The next chapter will deal with the data presentation.

## **CHAPTER 5**

### **DATA PRESENTATION AND FINDINGS OF THE STUDY**

#### **5.1 Introduction**

Chapter 5 presents the findings of the study. This chapter evaluates the findings from the survey (quantitative approach) and the focus group and in-depth interviews (qualitative approach).

#### **5.2 Quantitative analysis**

This section presents the quantitative analysis in the following order:

- The sample that was used
- The study instruments
- Validity
- Reliability statistics
- Factor Analysis
- Cronbach alpha

With SPSS version 25 (2019) Factor analysis results of the study were interpreted by variables which were coded in the variable view window, given short descriptions and matched to full names. In this study, fifty eight participants took part, which had 31 items on the Likert-rating type of scale with the following number of participants per centre: RC PTA: 42, RC Braamfontein: 9 and Damelin Menlyn: 7. All the items that were ordinal by selection were selected to measure the Factor analysis of the scale. The items of the scale were loaded together in the SPSS software with no idea in mind as to how they could form or be divided up. This was an exploratory task that saw how the items came flowing together. The Factor analysis selection in the SPSS software package followed the order as depicted below:

The researcher clicked analyse button: went to dimension reduction, then chose factor where responses with individual variables were chosen or loaded.

On descriptives, the initial solution was selected with the four correlation matrices; coefficients, significance levels, determinant and KMO and Bartlett's test of sphericity.

Continued to the extraction window added scree plot to the default selection which had eigenvalues greater than 1 whereby factors would be selected with eigenvalues that exceeded one.

Proceeding to rotation block; there were two types presented, the orthogonal and direct / oblimin. Orthogonal could be chosen if items were not correlated within these selections; varimax, quatrimax, equanax and promax. For purposes of this study, Direct or oblimin was chosen with the belief that the items were correlated or related.

The next window was the scores which was left by default and the last selection was the options window which was by default , exclude cases list wise; no cases were excluded as all the data was populated.

The factor analysis was run and the following deductions could be made: too high correlations could suggest that the items shared the same thing.

With determinant, it got to be more than .00001. When the determinant output is below .00001, this shows that items were too unrelated showing that there are too low correlations.

KMO above .5 is considered acceptable. The KMO output that is above .5 is considered the better value.

Bartlett's test of sphericity that is .000 suggested that the p value or the probability value is less than .001

Eigenvalues in connection to the scree plot: The values that are above the eigenvalue of 1 are considered very acceptable matched to the cumulative variance that is above 50.

Pattern matrix: The pattern matrix explained how the items loaded together. In this study, by default; SPSS loaded 10 items that converged, while other items were excluded.

The input to the Cronbach alpha and Factor analysis was collected by making use of google analytics with an online survey that is discussed in chapter 6.

The above Sections 5.1 and 5.2 introduce the quantitative analysis per centre and the tables that follow indicate the outcomes in form of tables that were generated through SPSS (SPSS version 25 2019).

The justification, interpretation and analysis per table for RC PTA is found below at the end of the last Table 5.7 from Section 5.2.1.1 to 5.2.1.1.2.5.

### 5.2.1 RC PTA Cronbach alpha and factor analysis

#### Reliability

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**Table 5.1: Reliability Statistics**

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.832	.878	31

**Table 5.2: KMO and Bartlett's Test**

#### KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.475
Bartlett's Test of Sphericity	Approx. Chi-Square	726.272
	Df	465
	Sig.	.000

**Table 5.3: Communalities****Communalities**

	Initial	Extraction
Please tick the category you belong to	1.000	.730
Which department are you in?	1.000	.770
Computer performance (performance outcome expectations)	1.000	.736
Computer Anxiety -Using the ERP system has improved my work performance	1.000	.815
The ERP system has presented me more ways to individual innovativeness in IT	1.000	.778
The ERP system task characteristics and navigation is easy	1.000	.794
Prior performance - In the ERPP system, computer setups are sufficient for online access	1.000	.732
Perceived effort -There is access to dedicated network connection in the ERP system	1.000	.741
The ERP system is fit for new network apps	1.000	.752
Pertaining to viability of ERP system (extent of value add) potential - The ERP system has made the firm adapt to changing business environment	1.000	.824
The ERP system frequently meets low network bandwidth increasing the latency of communication thereby slowing the services in the ERP system	1.000	.724

Regarding space in terms of memory and parallel processing, I am able to take steps in navigation to complete a problem in the ERP System	1.000	.787
In terms of ERP system reliability, there is loss of internet connectivity between customer and provider's network consequently causing interruptions of varied nature	1.000	.800
With computer performance in the ERP System, I have the ability to create, deliver, and share content campus-wide on any number of devices	1.000	.726
Compatibility of Technology in the ERP System -The ERP system integrates or combines data from the different areas of the firm	1.000	.777
Complexity of Technology- Use of the ERP system requires a lot of mental effort	1.000	.876
The perceived need for Technology -My job requires me to use ERP system	1.000	.745
Perceived usefulness -The ERP system is very useful to my job	1.000	.748
Perceived ease of use - The ERP system has an easy to use interface	1.000	.703
Information asymmetry (information flow and for collaboration) - The information and related report in the ERP system are available to me when and where I need them	1.000	.738
Contract: I log in to the ERP system because it is part of my contract in using it	1.000	.752



Risk sharing: I am willing to share the ERP experience or technical know-how with colleagues	1.000	.736
With issues of trust in the ERP system, I have the feeling that system interconnectedness and openness affects my total satisfaction and help me improve my work	1.000	.755
Technology Changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system - I always need technical support to use the ERP system	1.000	.808
Peripheral cues being a process of persuasion (following simple decision rules in ERP system access - When rules and procedures exist to ERP tools management, they are usually in written form	1.000	.754
Attitude (Behavioural intention) or individual perception - I feel it is a necessity to use the ERP system to be competitive in the workplace	1.000	.788
The Management support in managing the ERP tools is efficient and dependable	1.000	.706
Adequate resources -The management team provides me with the necessary support and resources to use the ERP system	1.000	.688
My manager encourages me to use ICT innovativeness in the ERP system	1.000	.776

User involvement -I am able to recognise the ERP system's knowledge value learnt	1.000	.777
Degree of control - I have enough control in acquiring resources in the ERP system	1.000	.779

Extraction Method: Principal Component Analysis.

**Table 5.4: Total Variance Explained (% of Variance)**

**Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings	
	Total	% of Variance	Cumulative %	Total	% of Variance
1	8.371	27.004	27.004	8.371	27.004
2	2.510	8.097	35.101	2.510	8.097
3	2.434	7.851	42.952	2.434	7.851
4	2.075	6.693	49.644	2.075	6.693
5	1.641	5.295	54.939	1.641	5.295
6	1.555	5.017	59.956	1.555	5.017
7	1.482	4.780	64.735	1.482	4.780
8	1.310	4.225	68.961	1.310	4.225
9	1.205	3.886	72.847	1.205	3.886
10	1.031	3.327	76.174	1.031	3.327

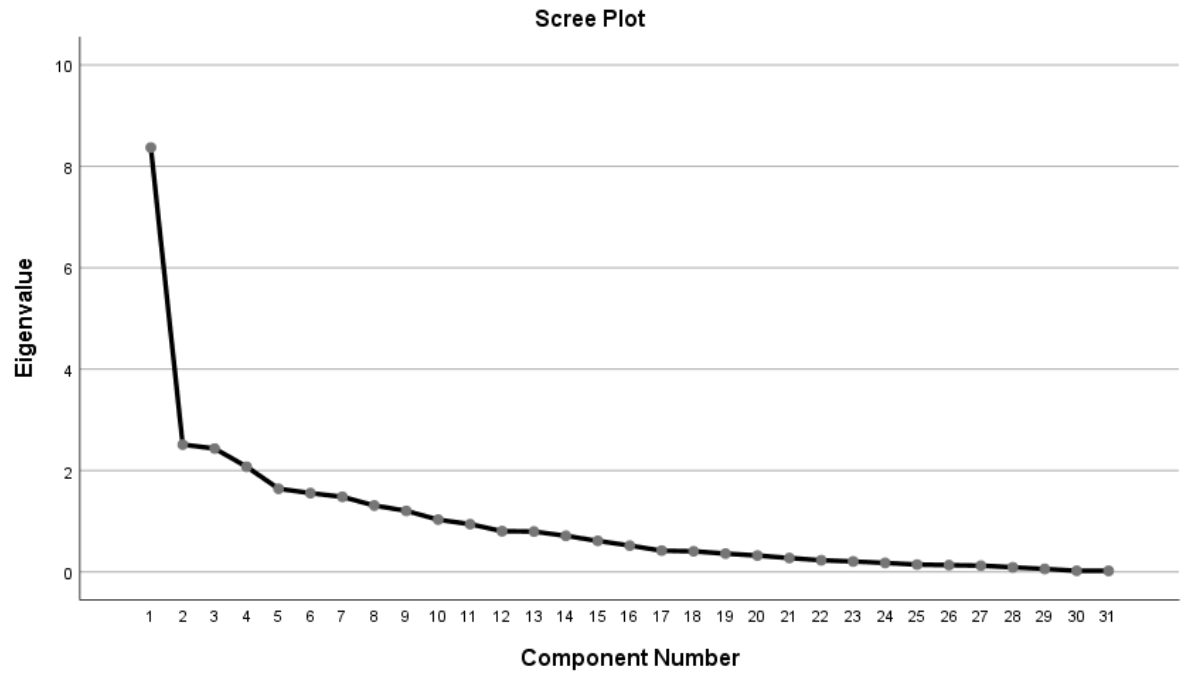
**Table 5.5: Total Variance Explained (Cumulative %)**

**Total Variance Explained**

Component	Extraction Sums of Squared Loadings Cumulative %
1	27.004
2	35.101
3	42.952
4	49.644
5	54.939
6	59.956
7	64.735
8	68.961
9	72.847

Extraction Method: Principal Component Analysis.

**Table 5.6: Scree Plot**



**Table 5.7: Component Matrix**

**Component Matrix<sup>a</sup>**

	Component									
	1	2	3	4	5	6	7	8	9	10
Please tick the category you belong to	.076	.263	.367	.424	.477	-.226	.207	.094	-.076	-.059
Which department are you in?	-.420	-.249	.584	.126	-.103	.202	.111	.120	.200	.238
Computer performance (performance outcome expectations)	.693	-.237	-.025	-.189	.011	.292	-.044	-.033	.072	-.262

Computer Anxiety - Using the ERP system has improved my work performance	.658	.178	.002	-.351	-.214	.326	-.216	.122	-.046	.109
The ERP system has presented me more ways to individual innovativeness in IT	.752	-.048	-.116	-.215	-.074	-.035	-.177	.083	.154	-.285
The ERP system task characteristics and navigation is easy	.415	.096	.380	-.099	.194	-.022	-.540	-.342	.040	.104
Prior performance - In the ERPP system, computer setups are sufficient for online access	.673	-.327	-.002	.248	-.013	-.029	-.076	.051	-.164	.274
Perceived effort - There is access to dedicated network connection in the ERP system	.444	-.278	-.456	.448	-.092	-.050	-.071	.105	.171	-.030
The ERP system is fit for new network apps	.556	-.036	-.450	-.055	-.155	-.238	-.029	.080	.250	.292
Pertaining to viability of ERP system (extent of value add) potential - The ERP system has made the firm adapt to changing business environment	.461	.330	.256	-.191	-.252	-.480	-.067	.183	.258	-.048
The ERP system frequently meets low network bandwidth increasing the latency of communication thereby slowing the services in the ERP system	.193	.390	-.450	-.229	.282	-.285	.282	.163	.100	.052

Regarding space in terms of memory and parallel processing, I am able to take steps in navigation to complete a problem in the ERP System	.326	-.431	.076	-.306	.377	.173	-.238	.032	.393	.105
In terms of ERP system reliability, there is loss of internet connectivity between customer and provider's network consequently causing interruptions of varied nature	.098	-.015	.318	-.518	.449	.148	.386	.047	.140	-.164
With computer performance in the ERP System, I have the ability to create, deliver, and share content campus-wide on any number of devices	.502	.206	.279	-.127	-.271	.152	.359	-.315	.111	-.001
Compatibility of Technology in the ERP System -The ERP system integrates or combines data from the different areas of the firm	.552	.026	.339	.136	-.361	-.335	.007	.002	.056	-.306
Complexity of Technology- Use of the ERP system requires a lot of mental effort	.096	.453	.053	.516	.017	.385	.033	-.105	.453	-.161
The perceived need for Technology -My job requires me to use ERP system	.661	-.043	-.140	-.404	.226	-.141	.055	-.073	.054	.204

Perceived usefulness -The ERP system is very useful to my job	.624	-.142	-.435	-.023	.227	-.013	.139	-.183	-.053	-.205
Perceived ease of use - The ERP system has an easy to use interface	.144	-.578	-.044	.375	.358	-.196	.009	.167	.104	.013
Information asymmetry (information flow and for collaboration) - The information and related report in the ERPsystem are available to me when and where I need them	.653	.378	.144	.028	-.020	-.230	-.072	.281	-.057	-.082
Contract: I log in to the ERP system because it is part of my contract in using it	.611	.182	.078	.163	-.108	-.100	.341	-.221	-.078	.346
Risk sharing: I am willing to share the ERP experience or technical know-how with colleagues	.553	-.450	-.127	.293	-.126	-.063	.117	-.132	.040	-.271
With issues of trust in the ERP system, I have the feeling that system interconnectedness and openness affects my total satisfaction and help me improve my work	.477	.226	-.160	.017	.154	.023	-.299	-.433	-.386	-.032

Technology Changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system - I always need technical support to use the ERP system	.208	.598	-.294	.294	.253	.245	.047	-.145	.294	-.006
Peripheral cues being a process of persuasion (following simple decision rules in ERP system access -When rules and procedures exist to ERP tools management, they are usually in written form	.378	.352	-.088	.064	-.011	.256	-.155	.592	-.079	.172
Attitude (Behavioural intention) or individual perception - I feel it is a necessity to use the ERP system to be competitive in the workplace	.612	-.246	.147	.019	-.161	-.030	.311	-.239	.200	.332
The Management support in managing the ERP tools is efficient and dependable	.744	.079	-.001	.140	-.171	.245	.005	-.028	-.191	.019
Adequate resources -The management team provides me with the necessary support and resources to use the ERP system	.615	-.217	.296	.052	-.102	.277	.003	.271	.001	-.111

My manager encourages me to use ICT innovativeness in the ERP system	.476	.103	.392	.326	.357	-.104	-.346	-.026	.022	.138
User involvement - I am able to recognise the ERP system's knowledge value learnt	.645	-.061	.414	-.042	.182	-.170	.177	.062	-.267	-.126
Degree of control - I have enough control in acquiring resources in the ERP system	.579	-.040	-.102	.086	.134	.368	.320	.217	-.345	.055

Extraction Method: Principal Component Analysis.<sup>a</sup>

a. 10 components extracted.

### 5.2.1.1 Purpose and significance of the above information, RC PTA Cronbach's alpha and factor analysis

In relationship to the investigation being conducted, the significance of the following is explained:

#### 5.2.1.1.1 Cronbach's alpha

Cronbach's alpha is a test of dependability of a scale. RC PTA has 42 cases or participants and 31 items that they responded to on a Likert- rating type of scale. Cronbach's alpha is a famous strategy for deciding dependability when working with Likert- rating scale. Cronbach's alpha does not work to decide reliability of just one item. There should be a series of items on an ordinal scale.

#### *Listwise deletion based on all variables in the procedure*

Listwise deletion shows how reliability of the scale is influenced in the event that a specific item is deleted. For RC PTA, reliability is .832 which is great being over .6. In the event that all items were standardised, Cronbach's alpha is set to be .878 which is utmost great. The probability is high in this regard. Listwise deletion is used to choose which item or items to possibly delete to increase general reliability of an instrument.



For the purpose of the use of Cronbach alpha in this study, the following is cited: all factors being held constant, there is a higher Cronbach alpha if information is regularly distributed than if it is positively or contrarily skewed. In the event that there is a high Cronbach's alpha for instance over .9, that does not show that there is one construct or one dimension. Factor analysis is used to determine the number of constructs in an instrument, Cronbach's alpha is simply a measurement of inward consistency of reliability. It does not indicate number of constructs being measured by a scale (SPSS version 25 2019).

#### **5.2.1.1.2 Factor analysis**

##### **5.2.1.1.2.1 KMO and Bartlett's Test**

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy value is .475. In general, anything over .5 is viewed as satisfactory albeit an estimation of .6 is liked. As far as the Bartlett's test of sphericity is concerned, the p value is considered, and the computed value is .000 which normally is required to be less than .001. In this situation, the outcome is adequate as there is a measurably critical incentive for Bartlett's trial of sphericity to a value below .05 (SPSS version 25 2019).

##### **5.2.1.1.2.2 Communalities**

In the table of communalities initial value of 1 is seen and various values of extraction. The extraction value reveals that the extent of variance of every factor can be clarified by the factors. The next clarification is on the total variance.

##### **5.2.1.1.2.3 Total Variance Explained**

In this study SPSS extracted 10 factors and the cumulative percentage is 76.174 and these 10 factors clarify 76.174 of the variance. The 10 factors are components from 1 up to 10 extracted on Principal Component Analysis within the SPSS as shown in Table 5.5 above. The next highlight is the scree plot.

##### **5.2.1.1.2.4 Scree plot**

With the scree plot, 10 values are above the eigenvalue of 1 and all other potential factors are below. The factors that are below eigenvalue of 1 postulate that they were not extracted. The next highlight is the component matrix.

#### 5.2.1.1.2.5 Component Matrix and rotated component matrix

It is easier to interpret this table and make some adjustments in the factor analysis dialog box. Even if there are no changes, it is seen that factor 1 to factor 10 compared to items in the first column, have very strong figure loadings.

Moving back to SPSS on the tab Analysis, dimension / reduction, factor going to options and sweep by size, suppress small co-efficients, there are a few hypotheses about the acceptable output of a factor loading value. One of the prominent value is .3. With an outright estimation of .3 those factor loadings beneath .3 would not be shown. Relating to the rotated component matrix, the factor loadings are arranged by size. The highest would be arranged by being placed at the top of the table and the weakest placed at the bottom, and by not showing factor loadings that are beneath or viewed as a noteworthy loading value and by arranging them by size, the rotated component matrix is easier to translate (SPSS version 25 2019).

The justification, interpretation and analysis per table for RC Braamfontein in the Section that follows is found below at the end of the last Table 5.13 from Section 5.2.2.1 to 5.2.2.1.2.4.

#### 5.2.2 RC Braamfontein Cronbach alpha and factor analysis

##### Reliability

**Table 5.8: Reliability Statistics**

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.864	.827	29

**Table 5.9: Communalities****Communalities**

	Initial	Extraction
Computer performance (performance outcome expectations)	1.000	.946
Computer Anxiety -Using the ERP system has improved my work performance	1.000	.980
The ERP system has presented me more ways to individual innovativeness in IT	1.000	1.000
The ERP system task characteristics and navigation is easy	1.000	.960
Prior performance - In the ERPP system, computer setups are sufficient for online access	1.000	.964
Perceived effort -There is access to dedicated network connection in the ERP system	1.000	.845
The ERP system is fit for new network apps	1.000	.989
Pertaining to viability of ERP system (extent of value add) potential - The ERP system has made the firm adapt to changing business environment	1.000	.999
The ERP system frequently meets low network bandwidth increasing the latency of communication thereby slowing the services in the ERP system	1.000	1.000
Regarding space in terms of memory and parallel processing, I am able to take steps in navigation to complete a problem in the ERP System	1.000	.959

In terms of ERP system reliability, there is loss of internet connectivity between customer and provider's network consequently causing interruptions of varied nature	1.000	.998
With computer performance in the ERP System, I have the ability to create, deliver, and share content campus-wide on any number of devices	1.000	.975
Compatibility of Technology in the ERP System -The ERP system integrates or combines data from the different areas of the firm	1.000	.970
Complexity of Technology- Use of the ERP system requires a lot of mental effort	1.000	.982
The perceived need for Technology -My job requires me to use ERP system	1.000	.975
Perceived usefulness -The ERP system is very useful to my job	1.000	.999
Perceived ease of use - The ERP system has an easy to use interface	1.000	.978
Information asymmetry (information flow and for collaboration) - The information and related report in the ERPsystem are available to me when and where I need them	1.000	.993
Contract: I log in to the ERP system because it is part of my contract in using it	1.000	.905
Risk sharing: I am willing to share the ERP experience or technical know-how with colleagues	1.000	.972

With issues of trust in the ERP system, I have the feeling that system interconnectedness and openness affects my total satisfaction and help me improve my work	1.000	.990
Technology Changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system - I always need technical support to use the ERP system	1.000	.994
Peripheral cues being a process of persuasion (following simple decision rules in ERP system access - When rules and procedures exist to ERP tools management, they are usually in written form	1.000	.982
Attitude (Behavioural intention) or individual perception - I feel it is a necessity to use the ERP system to be competitive in the workplace	1.000	.955
The Management support in managing the ERP tools is efficient and dependable	1.000	.999
Adequate resources -The management team provides me with the necessary support and resources to use the ERP system	1.000	.939
My manager encourages me to use ICT innovativeness in the ERP system	1.000	.992
User involvement -I am able to recognise the ERP system's knowledge value learnt	1.000	.995

Degree of control - I have enough control in acquiring resources in the ERP system	1.000	.947
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Extraction Method: Principal Component Analysis.

**Table 5.10: Total Variance Explained (% of Variance)**

**Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings	
	Total	% of Variance	Cumulative %	Total	% of Variance
1	9.025	31.120	31.120	9.025	31.120
2	6.248	21.544	52.664	6.248	21.544
3	3.483	12.010	64.674	3.483	12.010
4	3.157	10.887	75.561	3.157	10.887
5	3.005	10.363	85.924	3.005	10.363
6	2.027	6.989	92.913	2.027	6.989
7	1.236	4.261	97.174	1.236	4.261

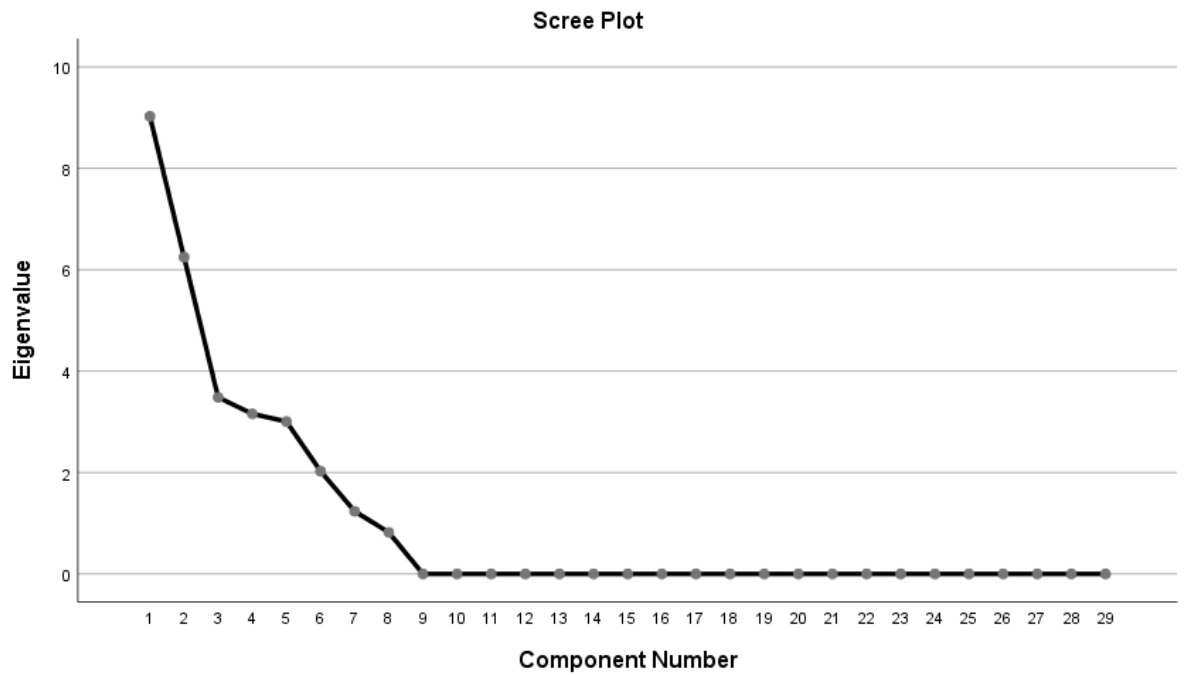
**Table 5.11: Total Variance Explained (Cumulative %)**

**Total Variance Explained**

Component	Extraction Sums of Squared Loadings Cumulative %
1	31.120
2	52.664
3	64.674
4	75.561
5	85.924
6	92.913
7	97.174

Extraction Method: Principal Component Analysis.

**Table 5.12: Scree Plot**



**Table 5.13: Component Matrix**

**Component Matrix<sup>a</sup>**

	Component						
	1	2	3	4	5	6	7
Computer performance (performance outcome expectations)	.319	-.209	.511	-.661	.215	-.229	.064
Computer Anxiety -Using the ERP system has improved my work performance	.424	-.553	-.251	.373	-.181	.500	-.099
The ERP system has presented me more ways to individual innovativeness in IT	.667	-.029	.593	-.004	-.375	.160	-.192
The ERP system task characteristics and navigation is easy	.291	.191	.275	.487	-.681	-.212	-.135

Prior performance - In the ERPP system, computer setups are sufficient for online access	.037	-.864	-.228	-.005	-.356	-.148	.123
Perceived effort -There is access to dedicated network connection in the ERP system	.138	.592	.612	.071	-.128	.255	-.119
The ERP system is fit for new network apps	.507	-.621	-.100	-.486	.131	.243	-.150
Pertaining to viability of ERP system (extent of value add) potential - The ERP system has made the firm adapt to changing business environment	.517	-.726	.177	.239	.337	.050	.007
The ERP system frequently meets low network bandwidth increasing the latency of communication thereby slowing the services in the ERP system	.003	.625	-.004	.452	-.006	.591	.234
Regarding space in terms of memory and parallel processing, I am able to take steps in navigation to complete a problem in the ERP System	.830	.262	-.149	.132	-.161	-.352	.113
In terms of ERP system reliability, there is loss of internet connectivity between customer and provider's network consequently causing interruptions of varied nature	.410	.633	.326	-.320	.097	.381	.259
With computer performance in the ERP System, I have the ability to create, deliver, and share content campus-wide on any number of devices	.359	-.831	.303	.207	.050	.012	.135



Compatibility of Technology in the ERP System -The ERP system integrates or combines data from the different areas of the firm	-.547	-.229	.429	.641	.133	-.061	-.038
Complexity of Technology-Use of the ERP system requires a lot of mental effort	-.515	-.092	.274	.581	.282	-.195	.423
The perceived need for Technology -My job requires me to use ERP system	.833	.030	-.406	.267	.145	.142	.052
Perceived usefulness -The ERP system is very useful to my job	.460	-.326	.635	.289	.407	.156	.069
Perceived ease of use - The ERP system has an easy to use interface	.934	-.017	.056	-.138	.223	.055	.176
Information asymmetry (information flow and for collaboration) - The information and related report in the ERPsystem are available to me when and where I need them	.789	.117	-.499	.082	.205	-.200	.140
Contract: I log in to the ERP system because it is part of my contract in using it	.184	.024	.333	.009	-.780	-.287	.263
Risk sharing: I am willing to share the ERP experience or technical know-how with colleagues	.945	.113	-.228	-.048	-.111	-.001	.022
With issues of trust in the ERP system, I have the feeling that system interconnectedness and openness affects my total satisfaction and help me improve my work	-.189	.581	-.595	.392	.139	.188	-.232

Technology Changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system - I always need technical support to use the ERP system	-.122	.859	.085	-.093	.200	.183	.388
Peripheral cues being a process of persuasion (following simple decision rules in ERP system access -When rules and procedures exist to ERP tools management, they are usually in written form	.739	.152	.137	.558	-.229	-.170	.036
Attitude (Behavioural intention) or individual perception - I feel it is a necessity to use the ERP system to be competitive in the workplace	.425	-.049	.372	.257	.569	.088	-.485
The Management support in managing the ERP tools is efficient and dependable	.709	.215	-.055	.014	.538	-.362	.165
Adequate resources -The management team provides me with the necessary support and resources to use the ERP system	.058	.608	-.106	.282	.243	-.550	-.338
My manager encourages me to use ICT innovativeness in the ERP system	.226	.723	.466	-.319	.051	-.222	-.219
User involvement -I am able to recognise the ERP system's knowledge value learnt	.961	.092	-.204	.071	.032	-.113	.047
Degree of control - I have enough control in acquiring resources in the ERP system	.733	.239	-.102	-.145	-.475	.270	-.147

Extraction Method: Principal Component Analysis.<sup>a</sup>

a. 7 components extracted.

Possible reasons why table KMO was not computed by SPSS in this category:  
It may be due to sample size and that no fixed rotation took place.

#### **5.2.2.1 Purpose and significance of the above information, RC Braamfontein Cronbach's alpha and factor analysis**

In relationship to the investigation being conducted, the significance of the following is explained:

##### **5.2.2.1.1 Cronbach's alpha**

Cronbach's alpha is a test of dependability of a scale. RC Braamfontein has 9 cases or participants and 29 items that they responded to on a likert- rating type of scale. Cronbach's alpha is a famous strategy for deciding dependability when working with likert- rating scale. Cronbach's alpha does not work to decide reliability of just one item. There should be a series of items on an ordinal scale.

##### ***Listwise deletion based on all variables in the procedure***

Listwise deletion shows how reliability of the scale may be influenced in the event that a specific item is deleted. For RC Braamfontein, reliability is .864 which is great being over .6. In the event that all items were standardised, Cronbach's alpha is set to be .827 which is satisfactory. The probability is high in this regard. Listwise deletion is used to choose which item or items to possibly delete to increase general reliability of an instrument (SPSS version 25 2019).

For the purpose of the use of Cronbach alpha in this study, the following is cited: all factors being held constant, there is a higher Cronbach alpha if information is regularly distributed than if it is positively or contrarily skewed. In the event that there is a high Cronbach's alpha for instance over .9, that does not show that there is one construct or one dimension. A factor analysis is used to determine the number of constructs in an instrument, Cronbach's alpha is simply a measurement of inward consistency of reliability. It does not indicate number of constructs being measured by a scale (SPSS version 25 2019).

#### **5.2.2.1.2 Factor analysis**

##### **5.2.2.1.2.1 Communalities**

In the table of communalities the initial value of 1 is seen and various values of extraction. The extraction value reveals that the extent of variance of every factor can be clarified by the factors. The next clarification is on the total variance.

##### **5.2.2.1.2.2 Total Variance Explained**

In this study SPSS extracted 7 factors as shown in Table 5.11 above. The cumulative percentage is 97.174 and these 7 factors clarify 97.174 of the variance. The next highlight is the scree plot.

##### **5.2.2.1.2.3 Scree plot**

With the scree plot, 7 values are above the eigenvalue of 1 and all other potential factors are below. The factors that are below eigenvalue of 1 postulate that they were not extracted. The next section highlight the component matrix.

##### **5.2.2.1.2.4 Component Matrix and rotated component matrix**

This table is easier to interpret and make some adjustments in the factor analysis dialog box. Even if there are no changes, it is seen that factor 1 to factor 7 compared to items in the first column, have very strong figure loadings.

Moving back to SPSS on the tab Analysis, dimension / reduction, factor going to options and sweep by size, suppress small co-efficients, there are a few hypotheses about the acceptable output of a factor loading value. One of the prominent value is .3. With an outright estimation of .3 those factor loadings beneath .3 would not be shown. Relating to rotated component matrix, the factor loadings are arranged by size. The highest would be arranged by being placed at the top of the table and the weakest placed at the bottom, and by not showing factor loadings that are beneath or viewed as a noteworthy loading value and by arranging them by size, rotated component matrix is easier to translate (SPSS version 25 2019).

The justification, interpretation and analysis per table for Damelin Menlyn in the Section that follows is found below at the end of Table 5.14 from Section 5.2.3.1 to 5.2.3.1.1.

### 5.2.3 Damelin Menlyn Cronbach alpha and factor analysis

#### Reliability

**Table 5.14: Reliability Statistics**

<b>Reliability Statistics</b>		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.714	.782	30

Possible reasons why other tables were not computed by SPSS in this category: (KMO, Communalities, Total Variance Explained, Scree Plot and Component Matrix):

It may be due to sample size and that no fixed rotation took place.

#### 5.2.3.1 Purpose and significance of the above information, Damelin Menlyn Cronbach's alpha

In relationship to the investigation being conducted, the significance of the following is explained:

##### 5.2.3.1.1 Cronbach's alpha

Cronbach's alpha is a test of dependability of a scale. Damelin Menlyn has 7 valid cases or participants and 30 items that they responded to on a likert- rating type of scale. Cronbach's alpha is a famous strategy for deciding dependability when working with likert- rating scales. Cronbach's alpha does not work to decide reliability of just one item. There should be a series of items on ordinal scale (SPSS version 25 2019).

*Listwise deletion based on all variables in the procedure*

Listwise deletion shows how reliability of the scale may be influenced in the event that a specific item is deleted. For Damelin Menlyn, reliability is .714 which is great being over .6. In the event that all items were standardised, Cronbach's alpha is computed to be .872 which is good. The probability is high in this regard. Listwise deletion is used to choose which item or items to possibly delete to increase general reliability of an instrument (SPSS version 25 2019).

### **Conclusion on quantitative analysis**

For purpose of the use of Cronbach alpha in this study, the following is cited: all factors being held constant, there is a higher Cronbach alpha if information is regularly distributed than if it is positively or contrarily skewed. In the event that there is a high Cronbach's alpha for instance over .9, that does not show that there is one construct or one dimension. Factor analysis is used to determine the number of constructs in an instrument, Cronbach's alpha is simply a measurement of inward consistency of reliability. It does not indicate number of constructs being measured by a scale (SPSS version 25 2019).

SPSS version 25 (2019) reliability statistics were interpreted by variables which were coded in the variable view window, given short descriptions and matched to full names. In this study, 58 participants took part in the study which had 31 items on the likert-rating type of scale with the following number of participants per centre: RC PTA: 42, RC Braamfontein: 9 and Damelin Menlyn: 7. The test of reliability that measured the validity of the scale was run in the SPSS as follows: clicked analyse tab, selected scale then reliability statistics, items, , alpha selected and proceeded to Statistics tab where the following tabs were chosen; item, scale, scale if item deleted and correlations under Means.

The Cronbach alpha that is above .65 is considered good (SPSS version 25 2019). When the Cronbach alpha is way above .65 close to 1 is considered better. The error in the designed instrument is computed by subtracting Cronbach alpha from 1. The goal is to achieve a 100 percent error free instrument but above .65 is very acceptable.

In this study, the following Cronbach alpha's were output in the SPSS per centre:

RC PTA: .832

RC Braamfontein: .864

Damelin Menlyn: .714

### **5.3 Qualitative analysis**

This section highlights the qualitative analysis that made use of nVivo 12 (2019) software as follows:

- The sample used
- The research instrument
- Interviews

#### **5.3.1 Nvivo software analysis**

With nVivo 12, the data from the qualitative study was coded from the transcripts that were an output of the interviews that were conducted in the three HE centres: A total of 24 transcripts were broken down as follows; RC PTA: 13, RC Braamfontein: 4 and Damelin Menlyn: 7.

The transcripts were loaded into the nVivo software individually per centre as independent new projects by going to the File import button that uploaded the files or transcripts. The next step that was taken was creation of nodes or themes of the study within the study objectives in response to the interviews. The coding in the software was done by highlighting of the main sections of interest to the themes or objectives and dragged to the file's window under the codes section to create the nodes of the first transcript in the same category of the project or centre. The rest of the selections of the themes or nodes were dropped into the same project codes.

Nvivo memo tags were inserted on each file to distinguish files as to the dates and groups that were interviewed per centre for quick referencing.

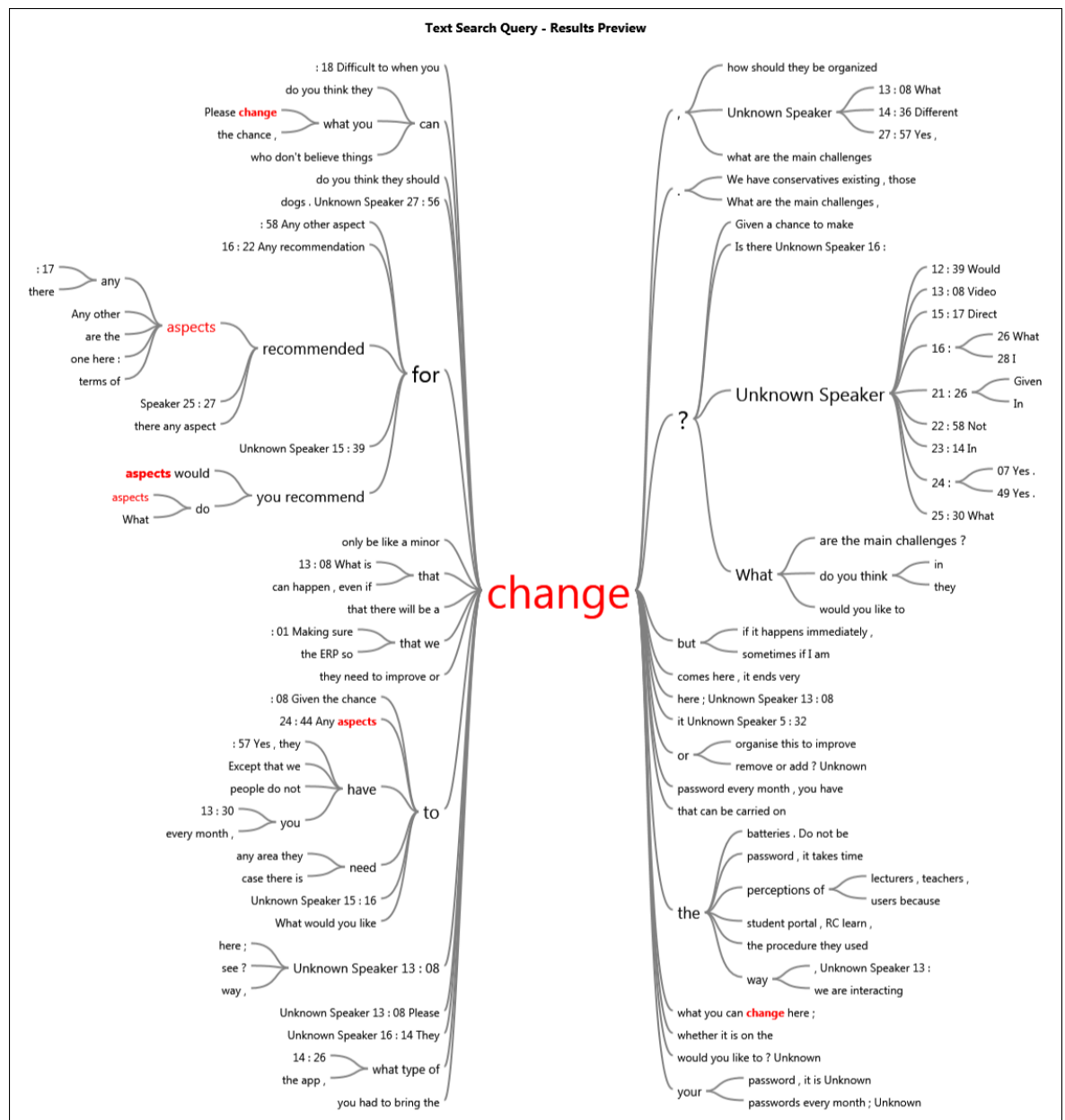
Running of nVivo 12 (2019) reports were completed through the nVivo 12 (2019) Search button that led to the query tab whereby text and frequency searches were done. Text searches that were run as queries were in line with the codes that were created that displayed how different themes flowed together; tree, cluster, map and word cloud analyses that were extracted from nVivo. Frequency selection was limited to the first 50 words with a maximum of 4 searches per coded themes (QSR 2019).

#### **5.3.1.1 RC Pretoria Interviews: selected Nvivo analyses that demonstrated output of the coded interviews**

##### **5.3.1.1.1 Aspects for change**

Nvivo word tree analysis





**Figure 5.1: Aspects for Change**

Source: nVivo12 (2019)

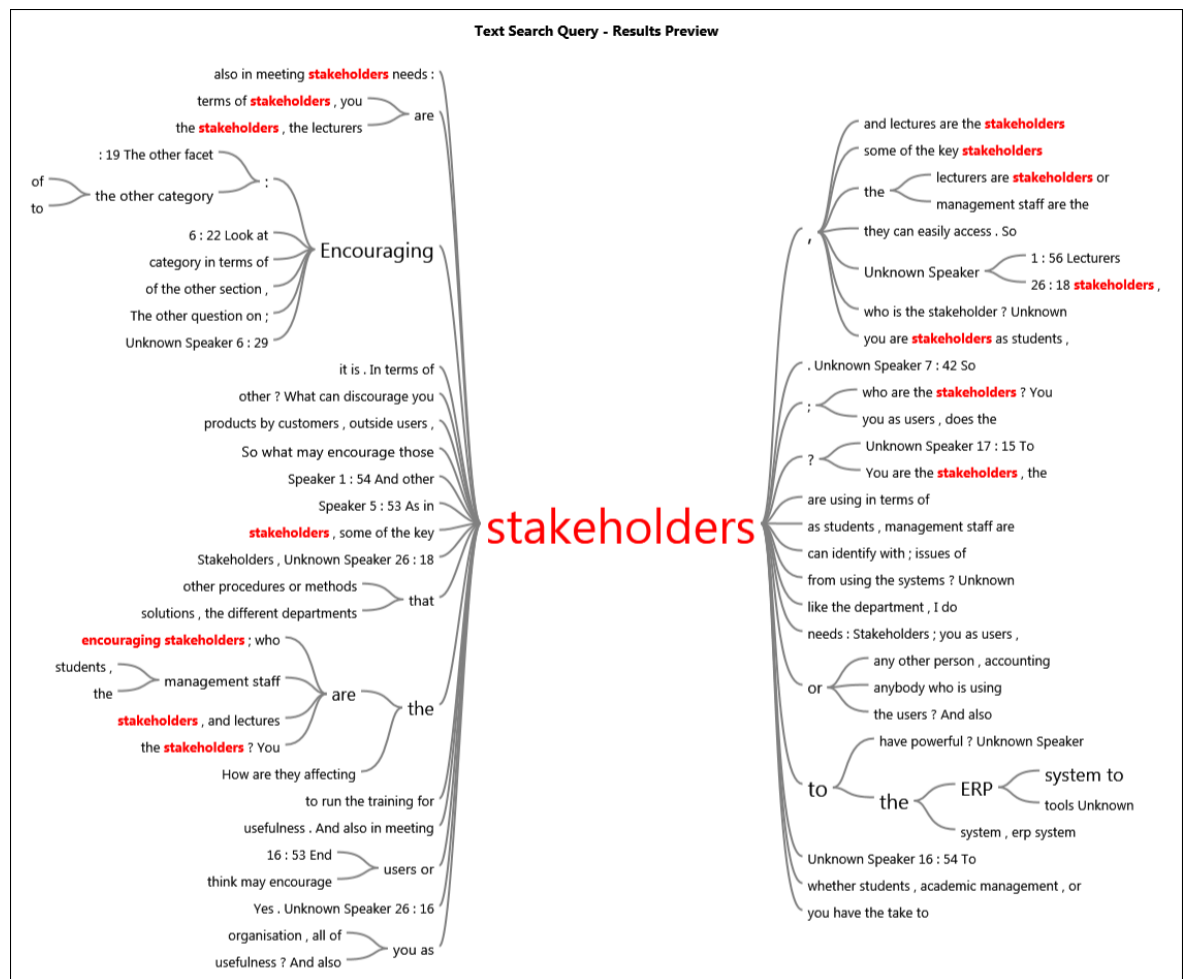
With aspects for change, the key word named change is in the middle of the word tree that links it to other statements with full or extended sentences connected to the key word.

Source: nVivo12 (2019)

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### 5.3.1.1.2 Encouraging Stakeholders

Nvivo word tree analysis

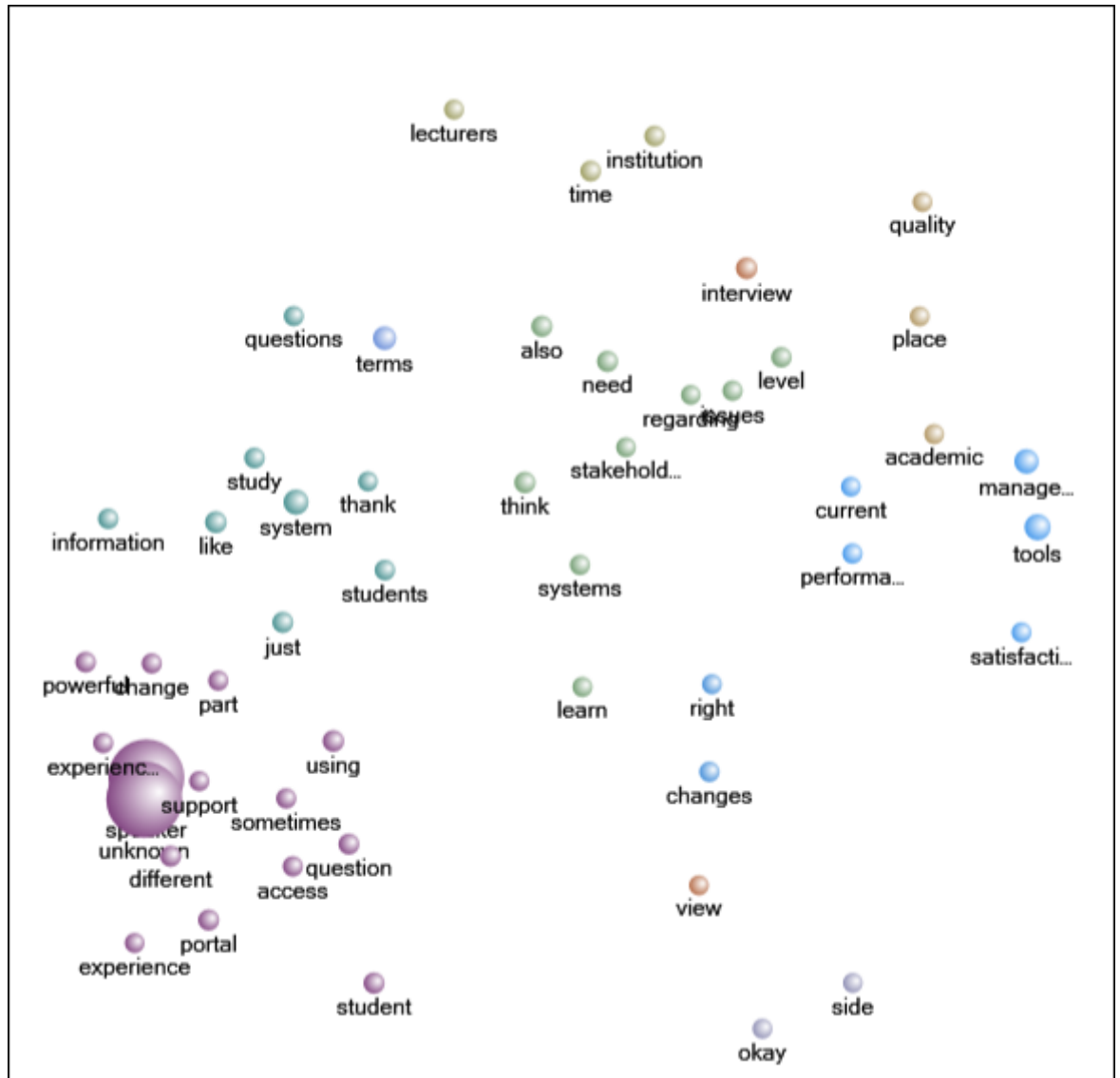


**Figure 5.3: Encouraging Stakeholders**

Source: nVivo12 (2019)

From the above word tree analysis with the key word stakeholders, nVivo12 (2019) could be useful if the key word is used as a main concept in understanding the context in which the interconnected words were used in the interviews (QSR 2019).

### Cluster analysis: encouraging stakeholders



**Figure 5.4: Cluster analysis: encouraging stakeholders**

Source: nVivo12 (2019)

The above figure 5.4 is the three dimensional (3D) map with the key words and shows how the words are connected to each other. The 3D map is another way of putting data into different presentations (QSR 2019).

### 5.3.1.1.3 Issues discouraging users from using ERP

Nvivo word tree analysis



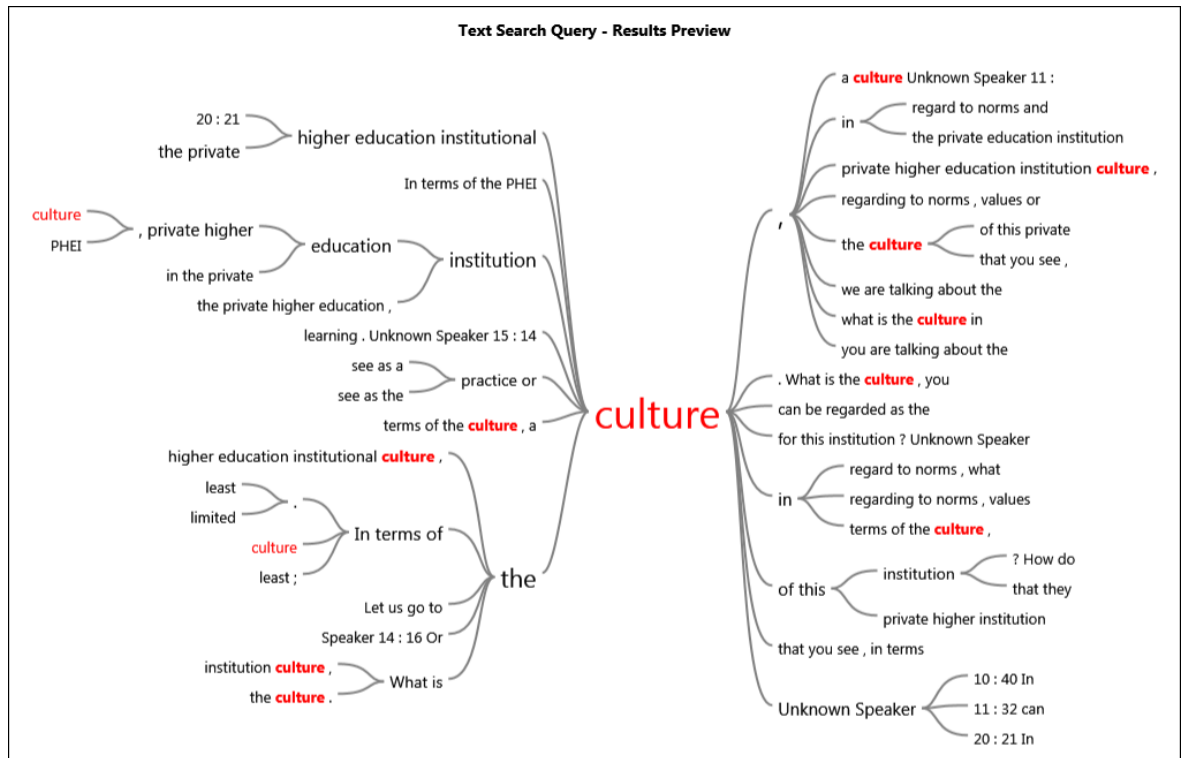
Figure 5.5: Issues discouraging users from using ERP

Source: nVivo12 (2019)

With the word issues from above figure 5.5, when the key word is clicked as the main word in nVivo 12 (2019) word tree, other inter-connected words appear within the wider context (QSR 2019).

#### 5.3.1.1.4 PHEI Culture

Nvivo word tree analysis



**Figure 5.6: PHEI Culture**

Source: nVivo12 (2019)

Nvivo word tree analysis with the key word culture is shown in the wider context in the other sentences connected to the word culture.

## PHEI Culture



Word cloud with PHEI culture is shown in a different layout that may be used in presentations in different ways (QSR 2019).

### 5.3.1.2 RC Braamfontein Interviews, selected Nvivo analyses that demonstrated output of the coded interviews

#### 5.3.1.2.1 Dynamic ERP tools

Nvivo word tree analysis

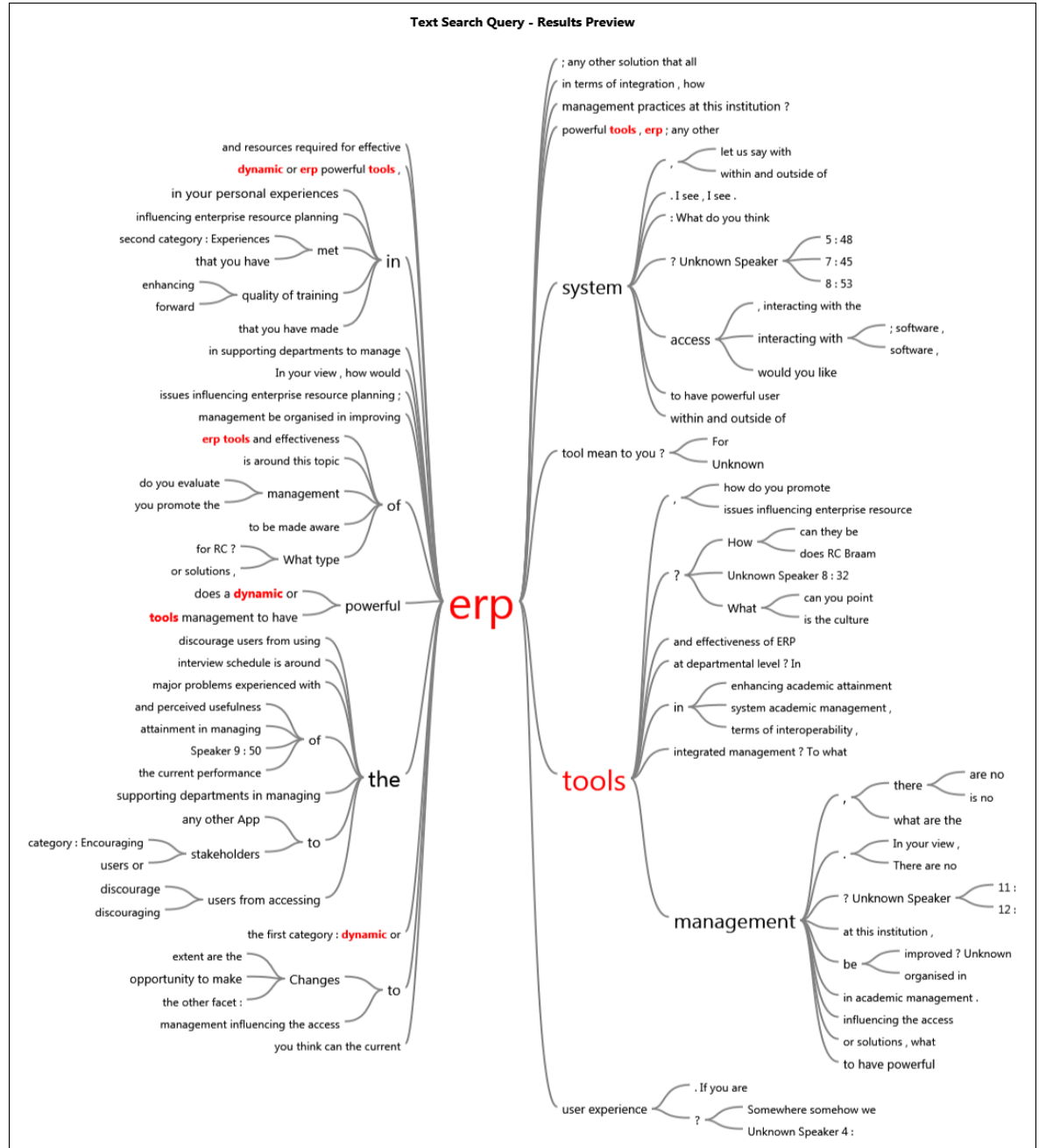


Figure 5.8: Dynamic ERP tools

Source: nVivo12 (2019)

The word erp in the middle of the word tree analysis above in figure 5.8 is presented as the key word that is inter-connected to other words in the context it was used (QSR 2019).



## Word Cloud



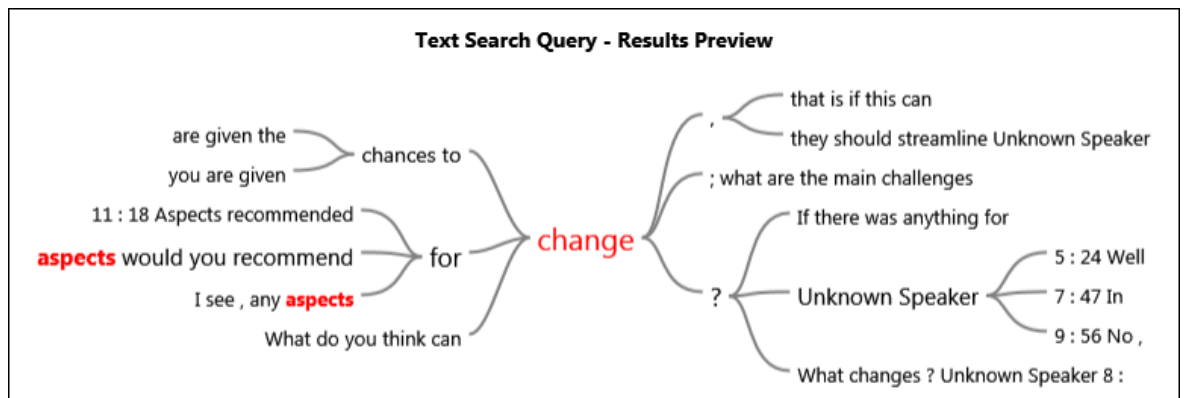
**Figure 5.9: Word Cloud. Dynamic ERP tools**

Source: nVivo12 (2019)

Word cloud with dynamic ERP tools is shown in a different format that may be used in presentations with the related words to ERP tools..

### 5.3.1.2.2 Aspects for change

Nvivo word tree analysis



**Figure 5.10: Dynamic ERP tools**

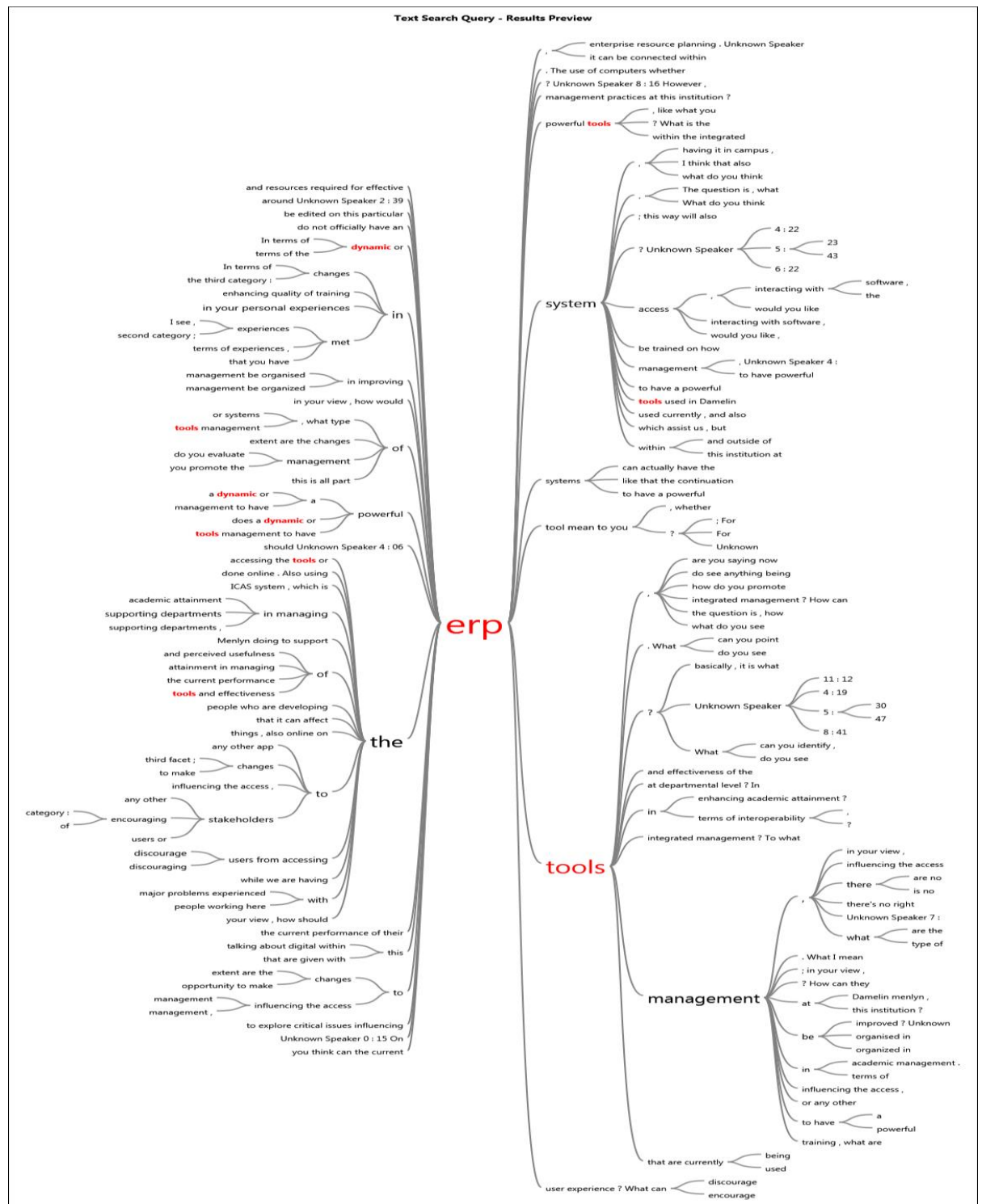
Source: nVivo12 (2019)

The word change in the word tree diagram above is connected to other sentences showing the relationship or how it was used in the wider context.

### 5.3.1.3 Damelin Menlyn Interviews: selected Nvivo analyses that demonstrated output of the coded interviews

#### 5.3.1.3.1 Dynamic ERP tools

##### Nvivo word tree analysis

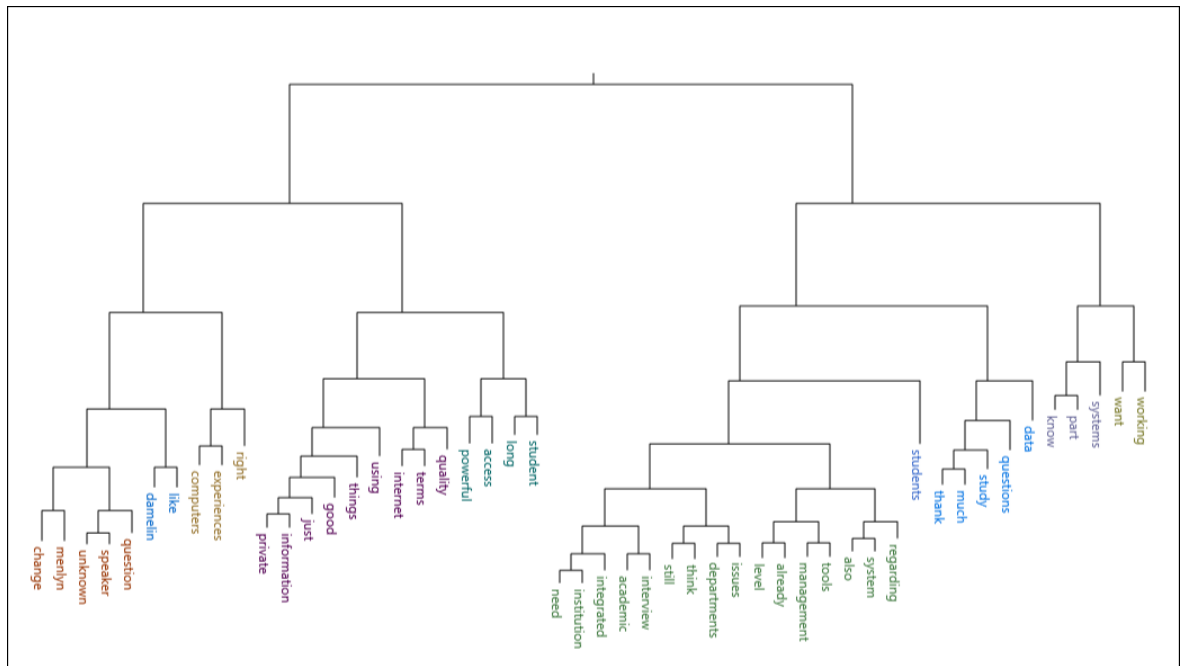


**Figure 5. 11: Dynamic ERP tools**

Source: nVivo12 (2019)

The key words in Dynamic ERP tools in figure 5.11 above are displayed in other full sentences in the greater context in which the words are used.

### Cluster analysis



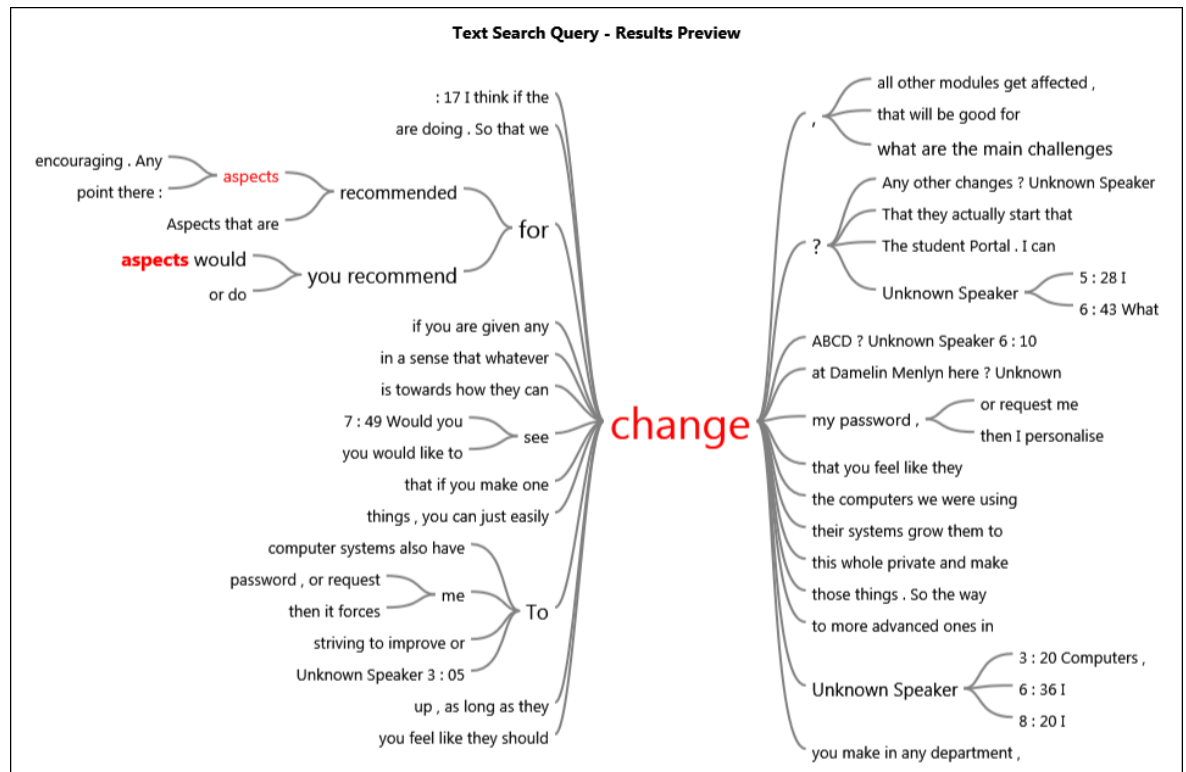
**Figure 5.12: Cluster analysis. Dynamic ERP tools**

Source: nVivo12 (2019)

Cluster analysis, dynamic ERP tools in figure 5.12 above show how the different words come together being in the top words. The words that are displayed with a narrower width highlight the closer relationship in which these words are shown to be, in the cluster analysis database (QSR 2019).

#### 5.3.1.3.2 Aspects for change

### Nvivo word tree analysis



### Figure 5.13: Aspects for change

Source: nVivo12 (2019)

Change as the key word in the middle of the word tree, from figure 5.13 above is shown as peripherals inter-connecting the word change in broader context.

## Word Cloud

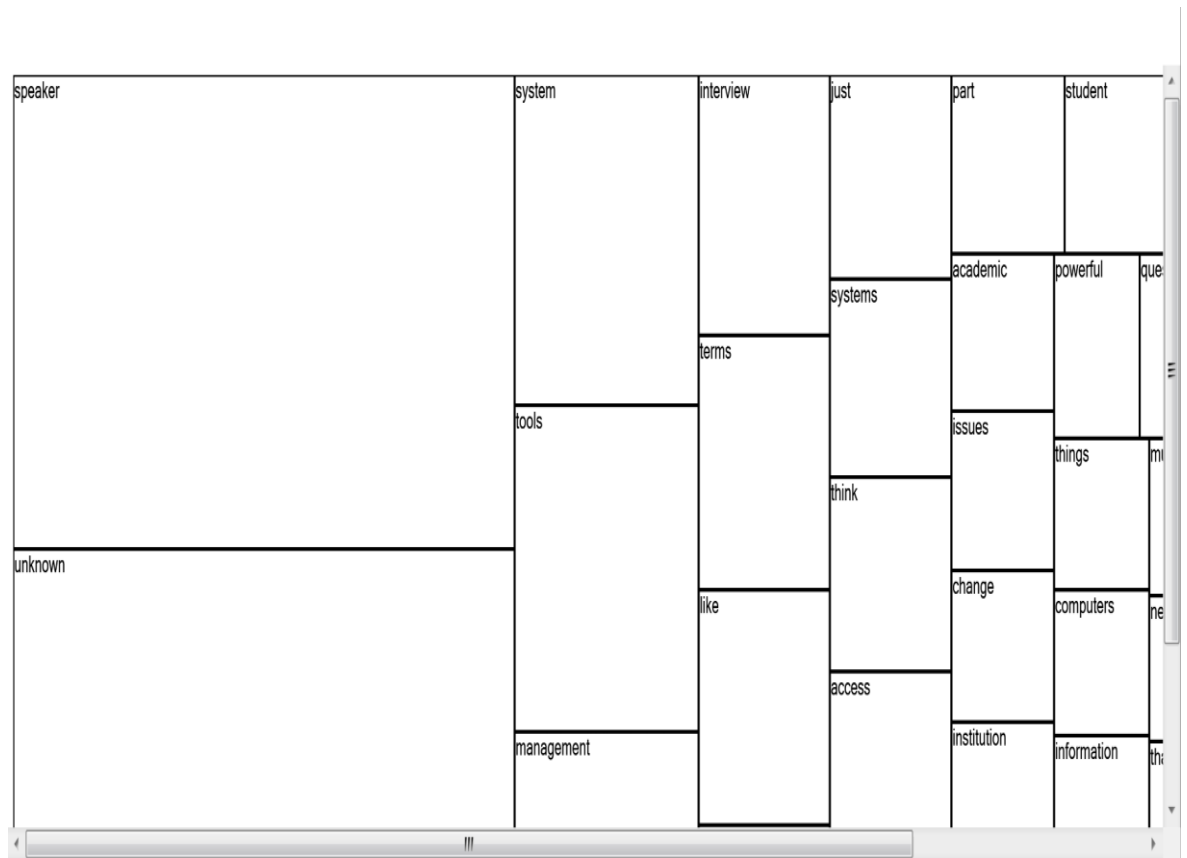


**Figure 5.14: Word Cloud. Aspects for change**

Source: nVivo12 (2019)

Word cloud with aspects for change, from above figure 5.14 illuminate a different outlook that may be used in different presentations around the key words surrounding aspects for change.

## Tree map

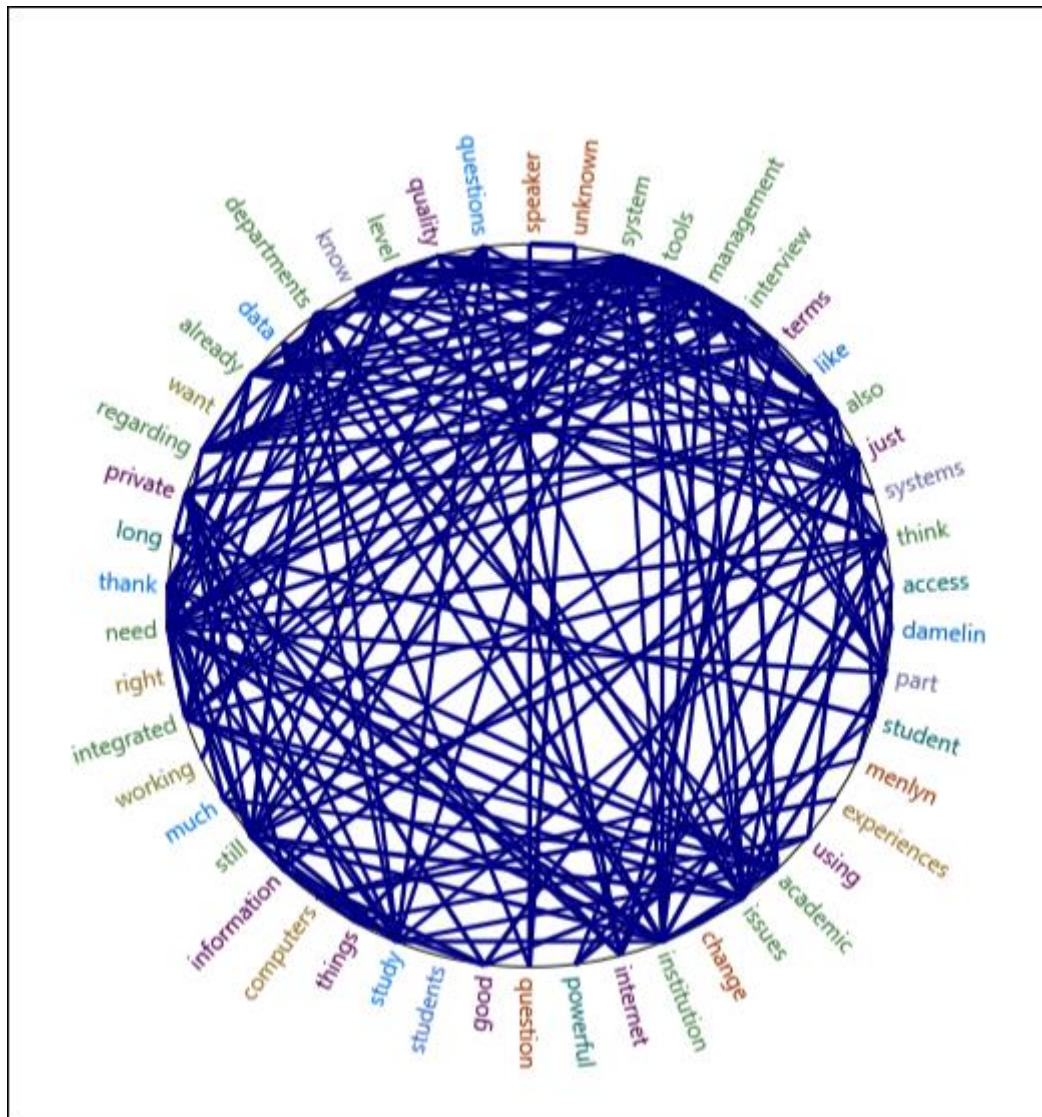


**Figure 5.15: Tree map. Aspects for change**

Source: nVivo12 (2019)

Tree map may be useful to other people in identifying top words quickly.

## Cluster analysis



**Figure 5.16: Cluster analysis. Aspects for Change**

Source: nVivo12 (2019)

Cluster analysis figure 5.16 above might be another way of getting interested in knowing the top words, for example within the top 50 words, how the words form or come together (QSR 2019).



## **Conclusion on qualitative analysis**

The qualitative analysis that made use of nVivo 12 (2019) software in terms of findings of the study is in tandem with section 7.2 with suggested findings from the empirical studies which state that the development of an ERP system's framework requires a holistic approach by looking at issues of cost, quality, reliability and capacity to manage or give the relevant support and adaptability or compatibility of the ERP system to a firm's requirements. Furthermore, nVivo 12 (2019) software analysis concurred with section 7.4, 'aspects for recommendations' on qualitative findings on a section that came after the online survey. The nVivo 12 (2019) qualitative data analysis findings that emanated from the interviews were integrated in section 7.6 with recommendations of the study.

The next chapter looks at the discussion of the study presented graphically and numerically using the quantitative approach.

## CHAPTER 6

### DISCUSSION OF THE RESULTS OF THE STUDY

#### 6.1 Introduction

This chapter used the survey and the results linked to the empirical findings and to Chapter 5 on the reliability statistics that made use of SPSS computations.

##### 6.1.1 Quantitative study:

This section looks at exhibited discoveries in ERPs graphically, numerically in quantitative methodology and there was an interpretation of the discoveries in subjective methodology.

##### 6.1.1.1 Findings, interpretation and discussion of data

Information in various classes of the survey in accordance with research goals was organised by utilising Google analytics. Exhibited figures from the charts were utilised to reach determinations or elucidations on the various factors in the study.

##### 6.1.1.2 Participant summary

The members were clients of the ERP instruments in Gauteng at Rosebank College Pretoria

**Table 6.1: Sample size (RC Pretoria)**

Sample	Category of participants	Target		Rosebank College Pretoria
			<b>Participants</b>	
1	Management Staff	10		4
2	Lecturers	20		8
3	Students	70		30

- **Research instrument**

The themes in the Survey are from Annexure G - Questionnaire : ERP tools management, Integrative Model approach in System academic management on a Likert-type rating scale of 1-5, where: 1. Strongly disagree, 2. Disagree, 3. Neither agree nor disagree, 4. Agree and 5. Strongly agree.

The test of reliability of the instrument (survey) regarding Table 6.1 linked to Chapter 5 on reliability statistics that made use of SPSS, computed the Cronbach's alpha as .832.

### 6.1.1.3 Presentation : RC Pretoria

#### Synopsis of member figures



**Figure 6.1: Outline of member figures in the study**

Discussion and analysis of member figures in figure 6.1 above, 76.2% were student respondents, 19% were lecturers and 4.2% comprised management staff.

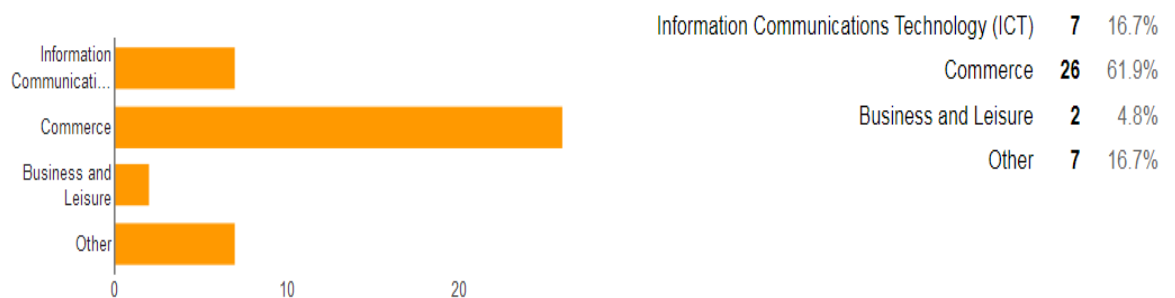
Analysis and discussion of findings on member figures:

A total of 42 participants from RC PTA responded to the online survey that took place from 2<sup>nd</sup> September to 23<sup>rd</sup> October 2018. Participants reached were students, lecturers and management staff as depicted in Figure 6.1. Participants in this section are representing the typical categories of ERP users in HE information exchanges.

Empirical findings related to Figure 6.1 from the literature review point 2.3, paragraph 7:

“Best learning exchange endeavours effectively include both the wellspring of the information and its recipients. Setting up execution desires for the individuals who will utilise the learning further evaluates the estimation of the exchange. Institutions considering or utilising information exchange forms, ought to persistently assess their web based life status. The advantages of information exchange for working environments incorporate the increments in efficiency, speed, readiness, benefits, and development”.

### Departmental statistics



**Figure 6.2: Departmental Statistics**

Analysis and discussion of findings on member figures:

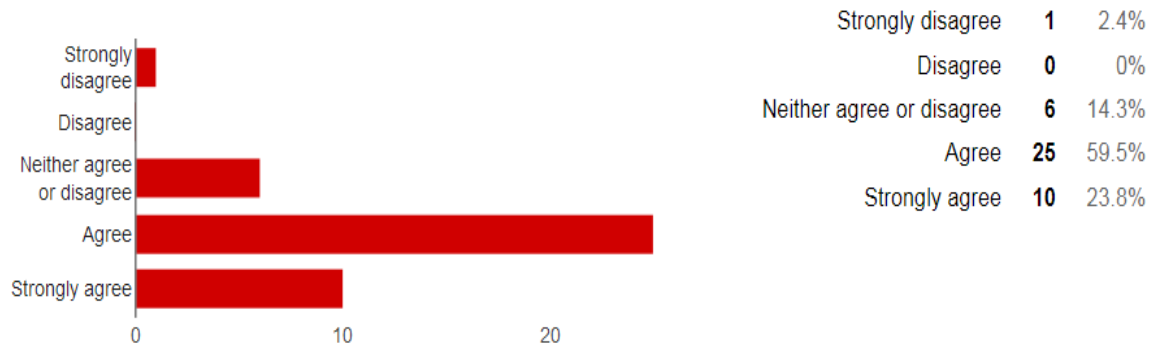
Regarding figure 6.2 above on statistics per department, 16.7% were from the ICT department, 61.9% came from the faculty of commerce, Business and leisure department gave in 4.8% and other constituted 16.7%.

**Section A: Current practices** linked to a general review of literature on perceived effective ERP management and ERP tools utilisation.

The analysis was graphically illustrated by percentages of respondents per item in Section A, shown in the right pane with the participants that; Strongly disagree, Disagree, Neither agree nor disagree, Agree and Strongly agree.

## 1. A dynamic or powerful ERP tool in System academic management

**Computer performance (performance outcome expectations) - The functionalities of The ERP system adequately meets the requirements of my job.**



**Figure 6.3:** Computer performance (performance outcome expectations) - The functionalities of the ERP system adequately meets the requirements of my job.

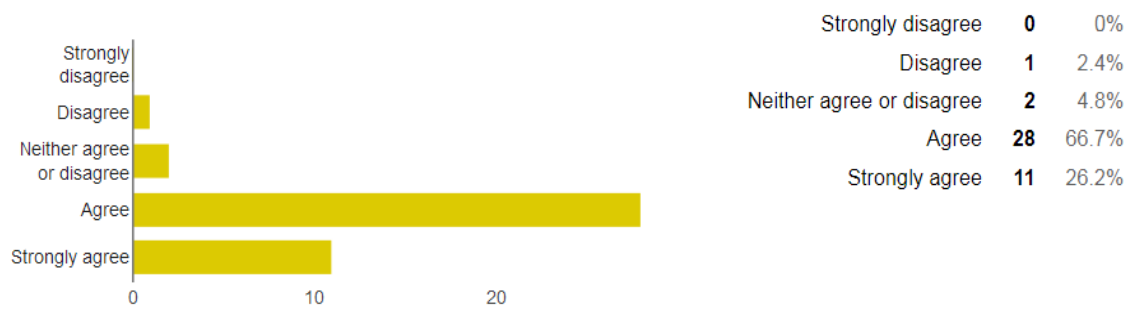
Figure 6.3, item on analysis and discussion of findings on Computer performance (performance outcome expectations):

Those in agreement constitute 83.3% (59.5% just agree and 23.8% strongly agree that the HE ERP at RC PTA is meeting performance outcome expectations and 14.3%, on either agree nor disagree, 0.5% disagree, 2.4% strongly agree.

Linkage to the review of literature:

Empirical findings by Srima and Wannapiroon (2013), Tabbara (2016) and Al-Mashari (2017) relate well to this section in that RC PTA has achieved a balance amongst some key institutional elements. This is seen in 83.3 % of the respondents who are in agreement that the functionalities of the ERP tools adequately meets the requirements of their jobs.

**Computer anxiety – Using the ERP system has improved my work performance.**



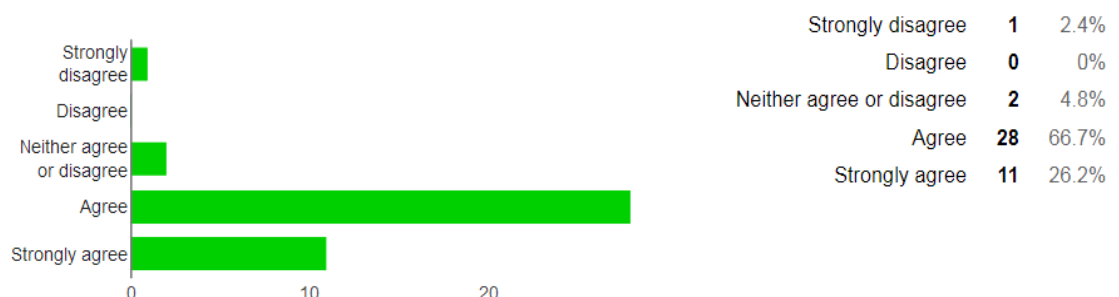
**Figure 6.4: Computer anxiety – Using the ERP system has improved my work performance**

From the above Figure 6.4 on the ERP system influencing work performance, the respondents had the following to say: None strongly agreed, 2.4% Disagreed, 4.8% Neither agreed or disagreed, 66.7% Agreed and 26.2% Strongly agreed.

These findings are linked to the literature review Section 2:

Empirical studies by Khalid *et al.* (2018) are in resonance with computer anxiety in that usage of the ERP system has improved work performance of the respondents, as seen in the 66.7% of the responses from above. “Mate *et al.* (2017) and Argawal (2018) are in tandem with Khalid *et al.* (2018) towards ERP management tools for digital universities. Digitisation has provoked learning, especially having advanced education at a quick pace. Advanced Education Institutions are in basic need to execute current innovations to remain carefully important and separate themselves as computerised pioneers”.

**The ERP system has presented more ways to individual innovativeness in Information Technology (IT).**

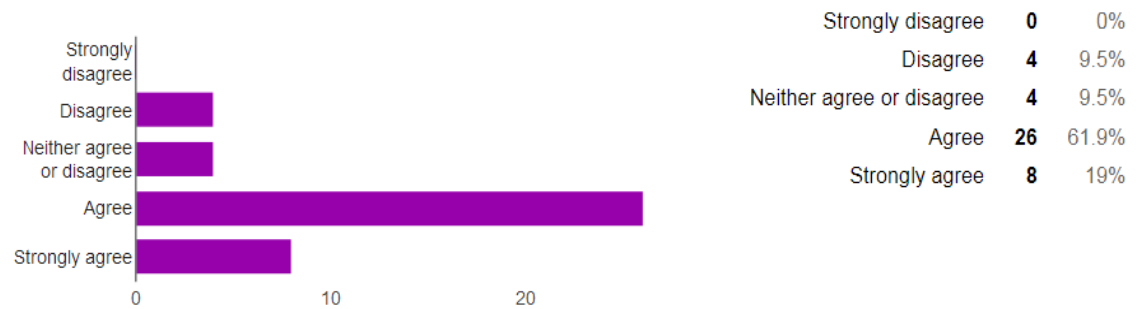


**Figure 6.5: The ERP system has presented me more ways to individual innovativeness in Information Technology (IT)**

The analysis and discussion of findings on how the ERP system has presented more ways to individual innovativeness in IT:

In Figure 6.5 above, 2.4% Strongly disagreed, 0% or none Disagreed, 4.8% Neither agreed nor disagreed, 66.7% Agreed and 26.2% Strongly agreed.

**In the ERP system, task characteristics and navigation is easy.**

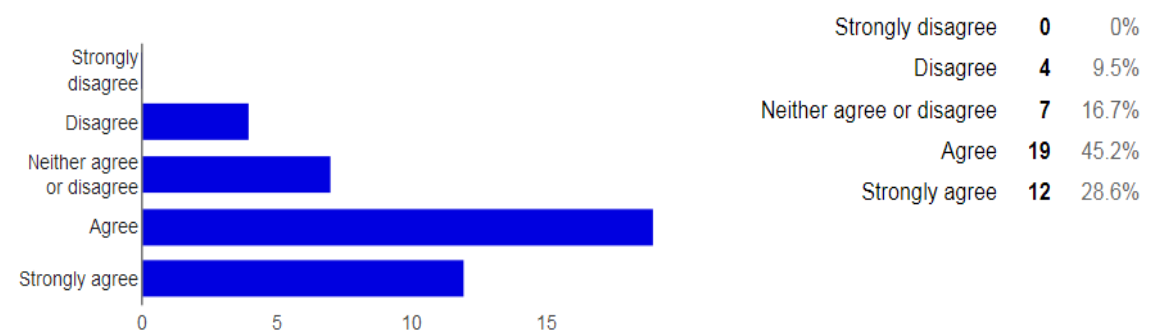


**Figure 6.6: In the ERP system, task characteristics and navigation is easy**

An analysis and discussion of the findings on the ERP system, task characteristics, navigation and use are presented in Figure 6.6:

From the study item above, none or 0% Strongly disagreed, 9.5% Disagreed, 9.5% Neither agreed nor disagreed and 19% Strongly agreed that in the ERP system, navigation is easy.

**Prior performance – In the ERP system, computer set-ups are sufficient for online access.**

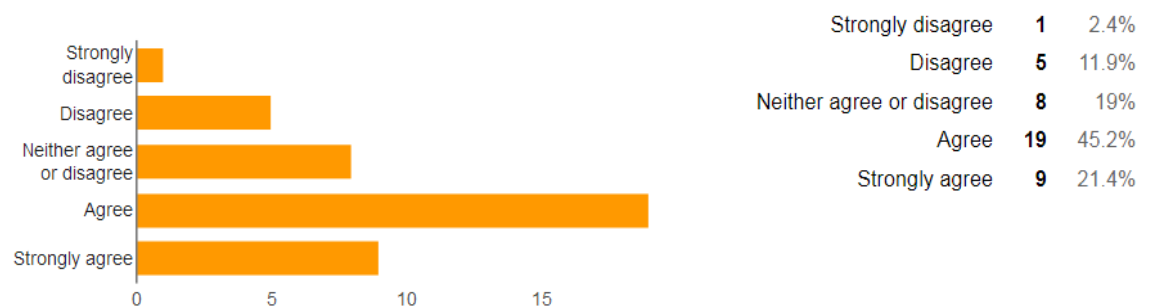


**Figure 6.7: Prior performance – In the ERP system, computer set-ups are sufficient for online access**

An analysis and discussion of findings on Prior Performance are shown in Figure 6.7 – computer set-ups are sufficient for online access in the ERP system:

From the tabulated statistics above, none or 0% Strongly disagreed, 9.5% Disagreed, 10.7% Neither agreed nor disagreed, 45.2% Agreed and 28.6% Strongly agreed that computer set-ups are sufficient for online access.

**Perceived effort –There is access to dedicated network connection, in the ERP system.**

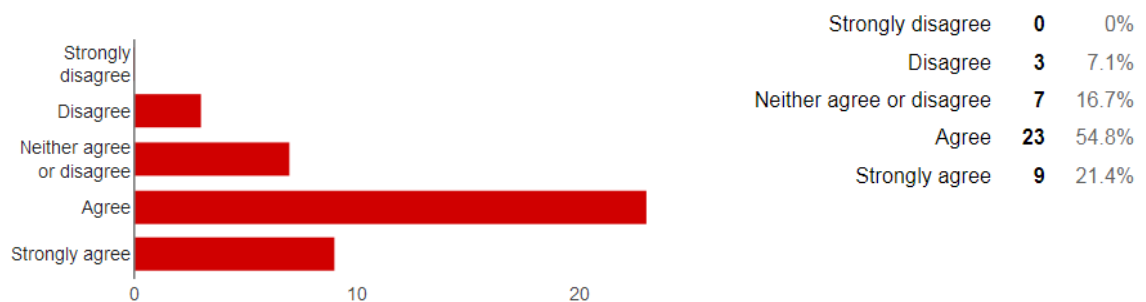


**Figure 6.8: Perceived effort –There is access to dedicated network connection, in the ERP system**

An analysis and discussion of findings on Perceived effort, Figure 6.8, on having access to dedicated network connection in the ERP system reveals that:

The respondents who Strongly disagreed were 2.4%; 11.9% Disagreed; 19% Neither agreed nor disagreed; 45.2% Agreed; and 21.4% Strongly agreed.

**The ERP system is fit for new network apps.**



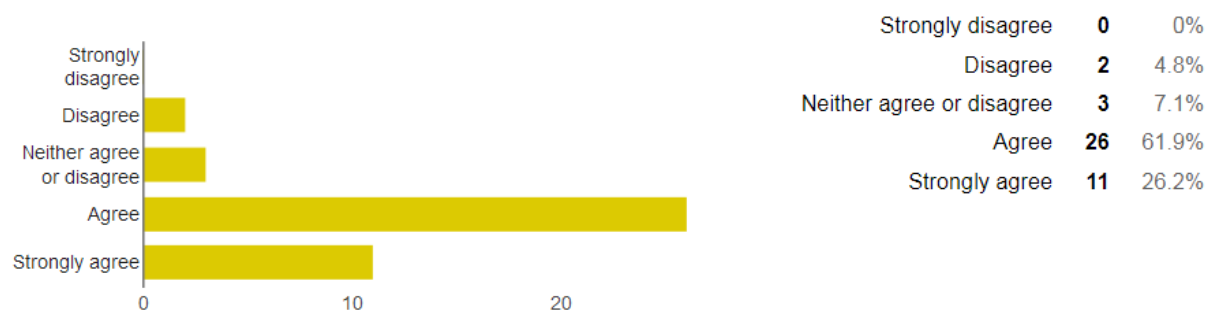


**Figure 6.9: The ERP system is fit for new network apps**

The analysis and discussion of findings on Figure 6.9, that the ERP system is fit for new network apps shows:

In the study, none of the participants Strongly agreed on this matter, 7.1% Disagreed, 16.7% Neither agreed nor disagreed, 54.8% Agreed and furthermore, 21.4% Strongly agreed.

**Pertaining to the viability of the ERP system (extent of value-add) potential - The ERP system has made the firm adapt to a changing business environment:**



**Figure 6.10: The viability of the ERP system (extent of value-add) potential)**

The analysis and discussion of findings on Figure 6.10 on the viability of the ERP system (value-add potential) shows that:

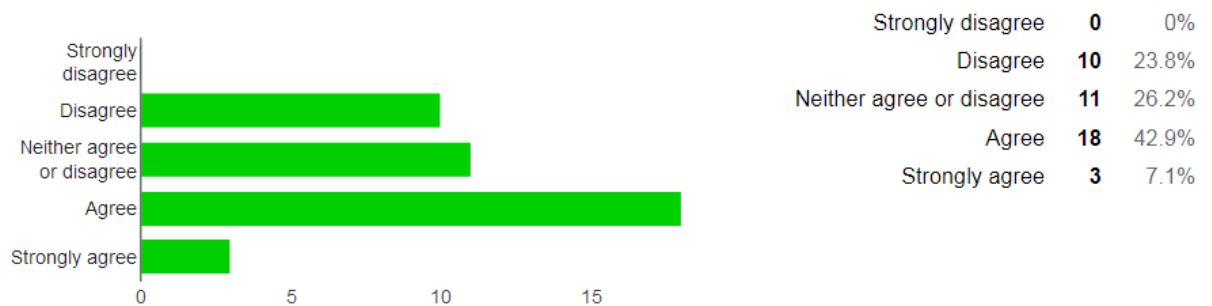
On the above aspect, 0% Strongly agreed; 4.8% Disagreed; 7.1% Neither agreed or disagreed; 61.9% Agreed and 26.2% Strongly agreed.

**Section B: Service quality levels in terms of the perceived usefulness of the ERP System**  
(linked to empirical studies section; 2.4 and 2.9)

The item analytics in Section B were depicted graphically with the percentages of respondents shown in the right pane to each figure below, with participants that Strongly disagreed, Disagreed, Neither agreed nor disagreed, Agreed and Strongly agreed.

## 2. Experiences that you have had in ERP System access; interacting with Software, phones, laptops, computers, internet and any other app

**The ERP system frequently meets low network bandwidth, increasing the latency of communication and thereby slowing the services in the ERP system.**



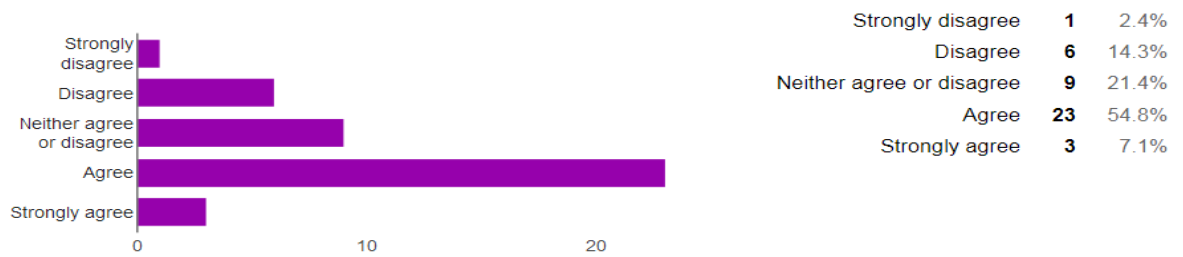
**Figure 6.11: The ERP system frequently meets low network bandwidth, increasing the latency of communication and thereby slowing the services in the ERP system**

The analysis and discussion of findings, as in Figure 6.11, indicate that the ERP system frequently meets low network bandwidth, increasing the latency of communication and thereby slowing the services in the ERP system.

Participants who Strongly agreed were 0%; 23.8% Disagreed; 26.2% Neither agreed nor disagreed; 42.9% Agreed; and 7.1% Strongly agreed.

Empirical findings from the section entitled “TAM and Information Systems in view of the DeLone and McLean’s (1992) data framework for technological innovation incorporates quality elements (data, administration and framework quality) and individual attributes as forerunners to be proceeded with utilisation goal of e-assets” as reported by Nizamani *et al.* (2014), are in agreement with the findings of this section in that respondents were caught in the middle of singling out the important attributes that constitute quality of service. “The ERP system frequently meets low network bandwidth, increasing the latency of communication and thereby slowing services in the ERP system” does not apply to the respondents here, as seen from the figures above. Figures show that they are satisfied with the services in the ERP tools.

**Regarding space in terms of memory and parallel processing, I am able to take steps in navigation to complete a problem in the ERP System.**

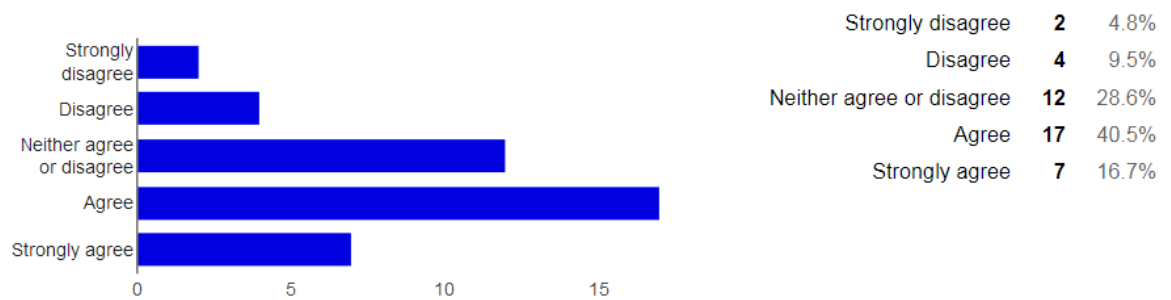


**Figure 6.12: Regarding space in terms of memory and parallel processing, I am able to take steps in navigation to complete a problem in the ERP System**

An analysis and discussion regarding space in terms of memory and parallel processing in taking the steps in navigation to complete a problem in the ERP System is presented in Figure 6.12:

The study respondents show that Strongly disagreed were 2.4%; 14.3% Disagreed; 21.4% Neither agreed nor disagreed; 54.8% Agreed; and 7.1% Strongly agreed.

**In terms of ERP system reliability, there is a loss of internet connectivity between the customer and provider's network, consequently causing interruptions of a varied nature.**

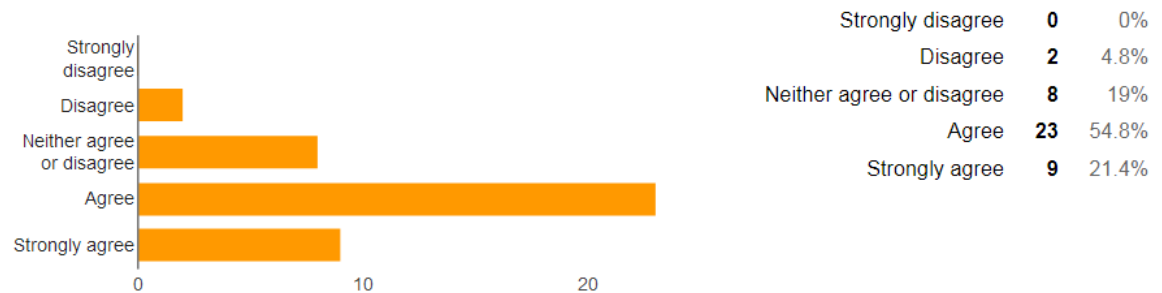


**Figure 6.13: In terms of ERP system reliability, there is a loss of internet connectivity between the customer and provider's network, consequently causing interruptions of a varied nature**

A discussion and analysis of findings in terms of ERP system reliability indicates that there is loss of internet connectivity between the customer and provider's network, consequently causing interruptions of a varied nature as presented in Figure 6.13:

The study respondents indicated that Strongly disagreed were 4.8%; those who Disagreed were 9.5%; participants who Neither agreed nor disagreed were 28.6%; those in Agreement were 40.5% and 16.7% Strongly agreed.

**With computer performance in the ERP System, I have the ability to create, deliver and share content campus-wide on any number of devices.**



**Figure 6.14: With computer performance in the ERP System, I have the ability to create, deliver and share content campus-wide on any number of devices**

An analysis and discussion of the findings in Figure 6.14: having the ability to create, deliver and share content campus-wide on any number of devices pertaining to computer performance in the ERP System shows that:

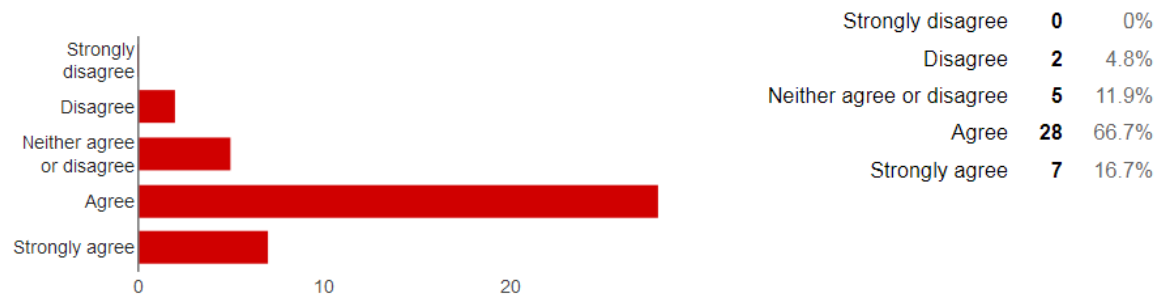
Respondents who Strongly disagreed were 0%. Those who Disagreed were 4.8%; Neither agreed nor disagreed were 19%; Participants who Agreed were found to be 54.8% and those who Strongly agreed were 21.4%.

### **Section C: The extent to which academic Enterprise Resource Planning is responding to stakeholders' needs**

The item percentages per group of participants in Section C were presented on the right hand side of each figure below; with respondents that Strongly disagree, Disagree, Neither agree nor disagree, Agree and Strongly agree.

### **3. Changes to ERP tools management, given the opportunity to work on it**

**Compatibility of Technology in the ERP System – The ERP system integrates or combines data from the different areas of the firm.**



**Figure 6.15: Compatibility of Technology in the ERP System – The ERP system integrates or combines data from the different areas of the firm**

An analysis and discussion of findings as shown in Figure 6.15 on ERP system Compatibility of Technology that the ERP system integrates or combines data from the different areas of the firm shows:

From the statistics above, this is what the respondents had to say: 0% Strongly disagreed; 4.8% Disagreed; 11.9% Neither agreed nor disagreed; 66.7% Agreed and 16.7% Strongly agreed.

Empirical findings from Section 2.10 of review of literature on stakeholders needs relate to this section by stating that “Stakeholders’ needs in this study’s context speak to the perspectives of those at venture activities level comprising ERP system users, clients or customers and different partners as they identify with the opportunities or relate to problems within the system for solutions”. There is a very strong agreement from the respondents’ statistics above: 66.7% agree and 16.7% strongly agree that there is compatibility of technology in the ERP system that allow respondents to integrate or combine data from the different sections of the firm.

Complexity of Technology – Use of the ERP system requires a lot of mental effort.

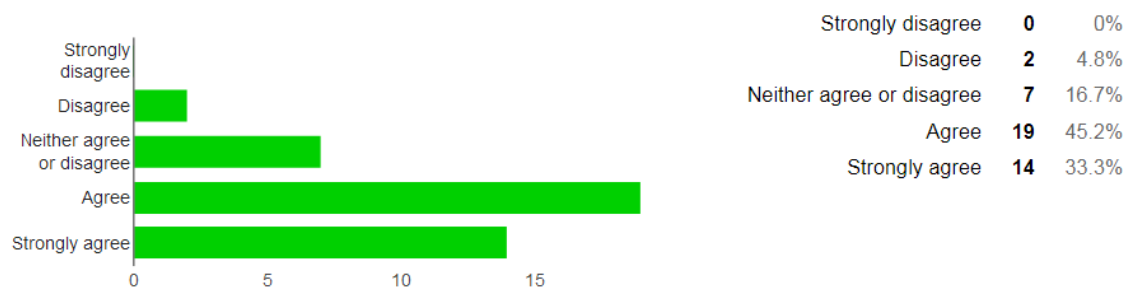


**Figure 6. 16: Complexity of Technology – Use of the ERP system requires a lot of mental effort**

The discussion and analysis of findings on the Complexity of Technology –Use of the ERP system requires a lot of mental effort, as seen in Figure 6.16 indicates that:

The analysed respondent figures in this category were as follows: 0% Strongly disagreed; 21.4% Disagreed; another 21.4% Neither agreed nor disagreed; 47.6% Agreed and 9.5% Strongly agreed.

**The perceived need for Technology – My job requires me to use the ERP system.**

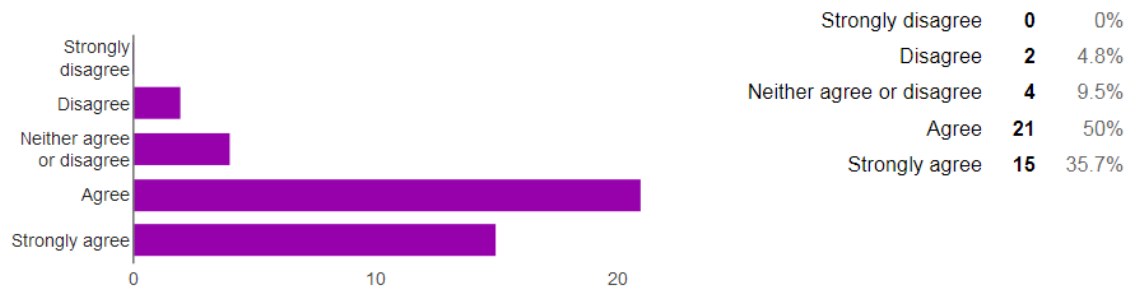


**Figure 6.17: The perceived need for Technology – My job requires me to use the ERP system**

An analysis and discussion of findings on the Perceived need for Technology –My job requires me to use the ERP system, as shown in Figure 6.17 indicates:

Statistics in this section were as follows: 0% Strongly disagreed, 4.8% Disagreed, 16.7% Neither agreed nor disagreed, 45.2% Agreed and 33.3% Strongly agreed.

**Perceived usefulness -The ERP system is very useful to my job.**

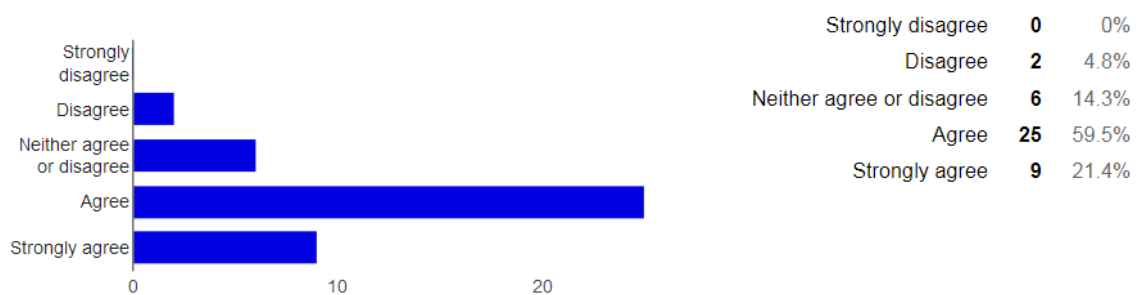


**Figure 6.18: Perceived usefulness -The ERP system is very useful to my job**

The analysis and discussion of findings on the ERP system's Perceived usefulness, the ERP system being very useful to my job is shown in Figure 6.18.

Participants brought forth the following statistics: 0% Strongly disagreed, 4.8% Disagreed, 9.5% Neither agreed nor disagreed, 50% Agreed and 35.7% Strongly agreed.

#### **Perceived ease of use-The ERP system has an easy to use interface.**



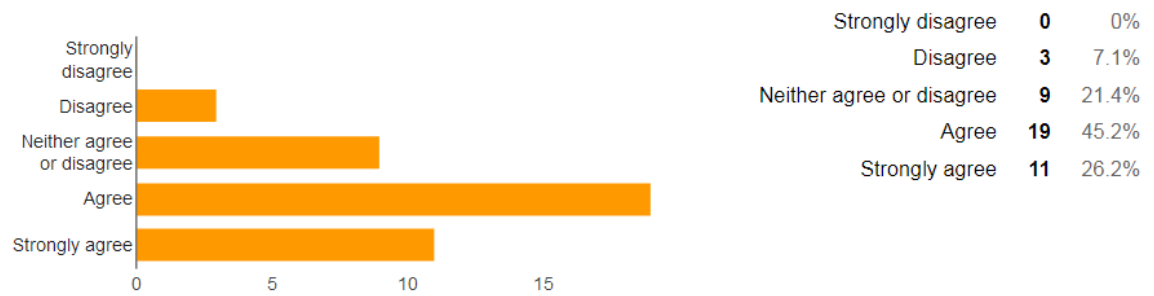
**Figure 6.19: Perceived ease of use-The ERP system has an easy to use interface**

The analysis and discussion of findings on Figure 6.19 that presented on the Perceived ease of use-The ERP system has an easy to use interface showed that:

The respondents had the following to say: 0% Strongly disagreed, 4.8% Disagreed, 14.3% Neither agreed nor disagreed, 59.5% Agreed and 21.4% Strongly agreed.

#### **4. Encouraging end-users or stakeholders to the ERP System to have a powerful ERP user experience**

**Information asymmetry (information flow and for collaboration) – The information and related reports in the ERP system are available to me when and where I need them**

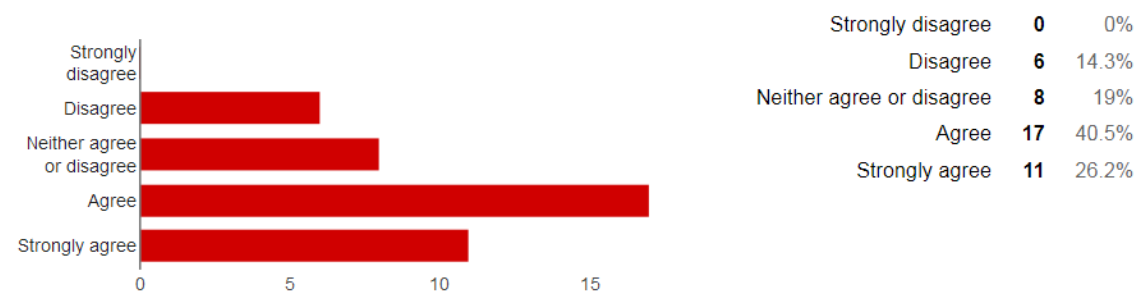


**Figure 6.20: Information asymmetry (information flow and for collaboration) – The information and related reports in the ERP system are available to me when and where I need them**

The analysis and discussion of findings on Figure 6.20: Information asymmetry (information flow and for collaboration) – The information and related reports in the ERP system are available to me when and where I need them shows:

The statistics from this section above were as follows: 0% Strongly disagreed, 7.1% Strongly disagreed, 21.4% Neither agreed nor disagreed, 45.2% Agreed and 26.2% Strongly agreed.

**Contract: I log in to the ERP system because it is part of my contract in using it.**



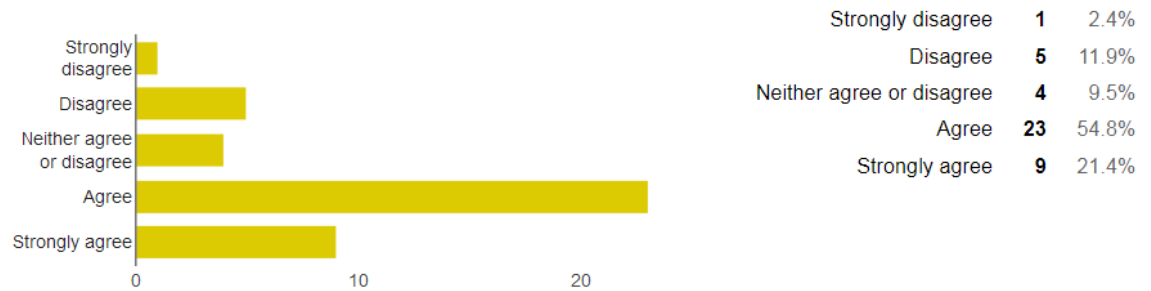
**Figure 6.21: Contract: I log in to the ERP system because it is part of my contract in using it**

The analysis and discussion of findings on : Contract: I log in to the ERP system because it is part of my contract in using it, as shown in Figure 6.21 indicates:

Statistics in this category were as follows: 0% Strongly disagreed, 14.3% Disagreed, 19% Neither agreed nor disagreed, 40.5% agreed and 26.2% Strongly agreed.



**Risk-sharing: I am willing to share the ERP experience or technical know-how with colleagues.**



**Figure 6.22: Risk-sharing: I am willing to share the ERP experience or technical know-how with colleagues**

An analysis and discussion of findings as on Figure 6.22 on Risk sharing: I am willing to share the ERP experience or technical know-how with colleagues shows:

Risk-sharing section had the following figures: 2.4% Strongly disagreed, 11.9% Disagreed, 9.5% Neither agreed nor disagreed, 54.8% Agreed and 21.4% Strongly agreed.

**With issues of trust in the ERP system, I have the feeling that system interconnectedness and openness affects my total satisfaction in the ERP system and helps me improve my work.**

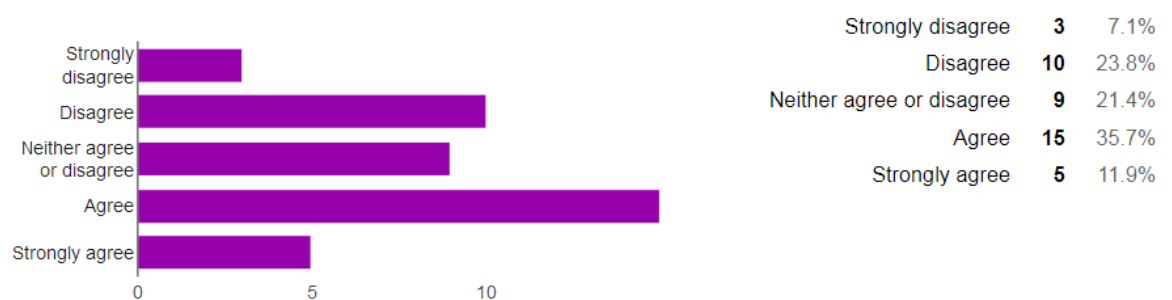


**Figure 6.23: With issues of trust in the ERP system, I have the feeling that system interconnectedness and openness affects my total satisfaction in the ERP system and helps me improve my work**

Analysis and discussion of findings with issues of trust in the ERP system, I have the feeling that system interconnectedness and openness affects my total satisfaction in the ERP system and helps me improve my work as from Figure 6.23 shows:

The respondents presented the following figures: 2.4% Strongly disagreed, 9.5% Disagreed, 23.8% Neither agreed nor disagreed, 47.6% Agreed and 16.7% Strongly agreed.

**Technology changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system – I always need technical support to use the ERP system.**



**Figure 6.24: Technology changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system – I always need technical support to use the ERP system**

The analysis and discussion of findings as from Figure 6.24, Technology changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system

– I always need technical support to use the ERP system:

The tabulated figures from the respondents were as follows: 7.1% Strongly disagreed, 23.8% Disagreed, 21.4% Neither agreed nor disagreed, 35.7% Agreed and 11.9% Strongly agreed.

## **5. Issues discouraging users from accessing the ERP System**

**Peripheral cues being a process of persuasion (following simple decision rules in ERP system access – When rules and procedures exist for ERP tools management, they are usually in written form).**

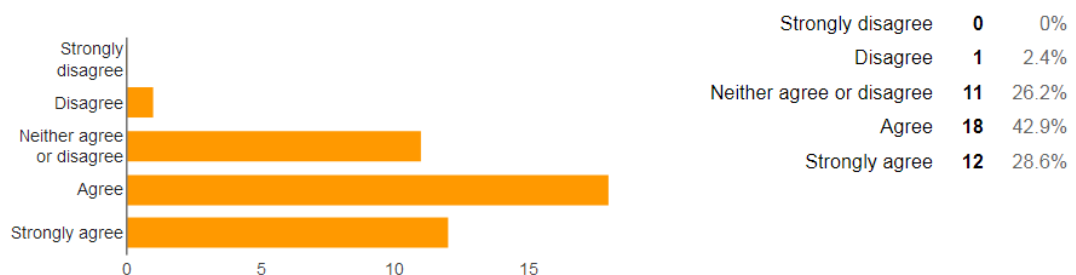


**Figure 6.25: Peripheral cues being a process of persuasion (following simple decision rules in ERP system access – When rules and procedures exist in ERP tools management, they are usually in written form)**

The analysis and discussion of findings in Figure 6.25: Peripheral cues being a process of persuasion (following simple decision rules in ERP system access – When rules and procedures exist for ERP tools management, they are usually in written form):

The participants in this area exhibited the following figures: 2.4% Strongly agreed, 16.7% Disagreed, 47.6% Neither agreed nor disagreed, 31% Agreed and 2.4% Strongly agreed.

**Attitude (Behavioural intention) or individual perception – I feel it is a necessity to use the ERP system to be competitive in the workplace.**



**Figure 6.26: Attitude (Behavioural intention) or individual perception – I feel it is a necessity to use the ERP system to be competitive in the workplace**

An analysis and discussion of findings in Figure 6.26: Attitude (Behavioural intention) or individual perception – I feel it is a necessity to use the ERP system to be competitive in the workplace:

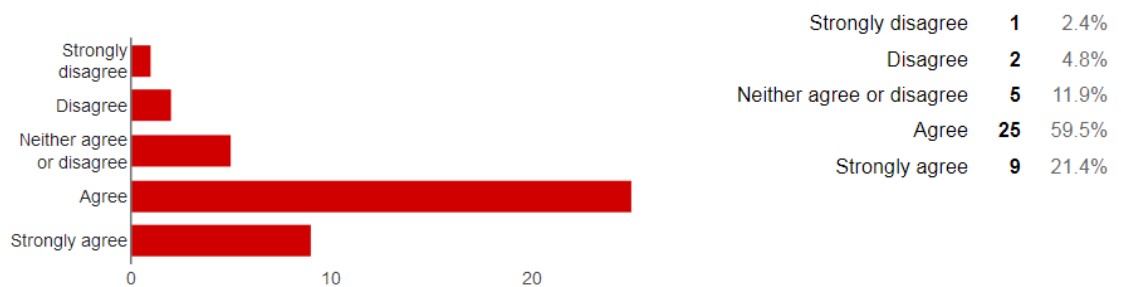
The following figures were presented in this area as from Behavioural intention: 0% Strongly disagreed, 2.4% Disagreed, 26.2% Neither agreed nor disagreed, 42.9% Agreed and 28.6% Strongly agreed.

## **Section D: Internal and external factors that impact the Enterprise Resource Planning system (linked to the review of literature section 2.6)**

Graphical and numerical representation of participants' scores per item in Section D were exhibited as percentages to respondents that Strongly disagree, Disagree, Neither agree nor disagree, Agree and Strongly agree in the figures that follow.

### **6. PHEI culture in regard to norms, values and beliefs in supporting departments in ERP tools management**

**Management support in managing the ERP tools is efficient and dependable.**



**Figure 6.27: Management support in managing the ERP tools is efficient and dependable**

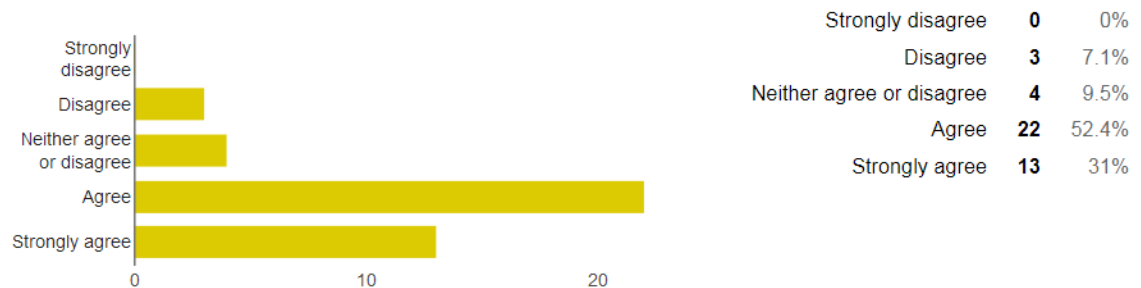
The analysis and discussion of findings in Figure 6.27: Management support in managing the ERP tools is efficient and dependable:

The section above had the following figures from the respondents: 2.4% Strongly disagreed, 4.8% Disagreed, 11.9% Neither agreed nor disagreed, 59.5% Agreed and 21.4% Strongly agreed.

Empirical findings from Section 2.6 of the literature review relate to the findings in this section. “The investigation set up that workaround influences affect the inner controls over budgetary revelations. Workarounds cause repaying controls to be actualised, which were frequently manual in nature, and declined the authoritative proficiency and viability”. Pertaining to this section’s statistical findings, management support is efficient and

dependable in managing the ERP tools as seen from 59.5% and 21.4% of the respondents that are in agreement with this item.

**Adequate resources – The management team provides me with the necessary support and resources to use the ERP system.**

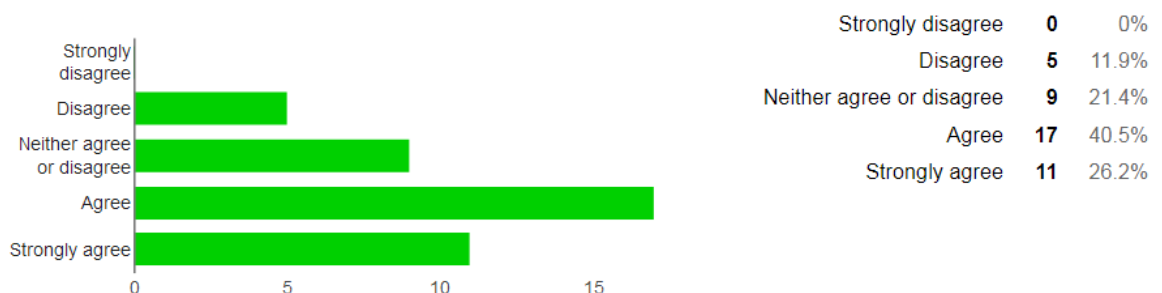


**Figure 6.28: Adequate resources – The management team provides me with the necessary support and resources in the ERP system**

An analysis and discussion of findings in Figure 6.28: Adequate resources – The management team provides me with the necessary support and resources to use the ERP tools:

The figures in this section on Adequate resources were as follows: 0% Strongly disagreed, 7.1% Disagreed, 9.5% Neither agreed nor disagreed, 52.4% Agreed and 31% Strongly agreed.

**My manager encourages me to use ICT innovativeness in the ERP system.**

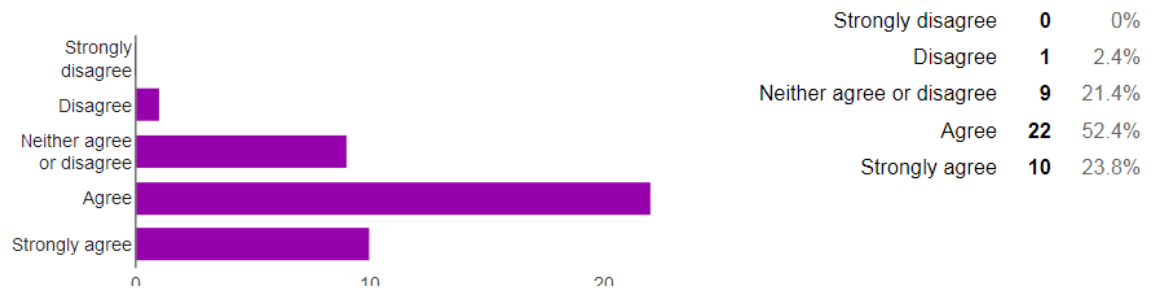


**Figure 6.29: My manager encourages me to use ICT innovativeness in the ERP system**

An analysis and discussion of findings in Figure 6.29: My manager encourages me to use ICT innovativeness in the ERP system:

The numerics in this section on “My manager encouraging ICT usage” were as follows: 0% Strongly disagreed, 11.9% Disagreed, 21.4% Neither agreed nor disagreed, 40.5% Agreed and 26.2% Strongly agreed.

**User involvement – I am able to recognise the ERP system’s knowledge value learnt.**



**Figure 6.30: User involvement – I am able to recognise the ERP system’s knowledge value learnt**

An analysis and discussion of findings in Figure 6.30: User involvement – I am able to recognise the ERP system’s knowledge value learnt:

Participants in this category showed the following statistics: 0% Strongly disagreed, 2.4% Disagreed, 21.4% Neither agreed nor disagreed, 52.4% Agreed and 23.8% Strongly agreed.

**Degree of control – I have enough control in acquiring resources in the ERP system.**



**Figure 6.31: Degree of control – I have enough control in acquiring resources in the ERP system**

The analysis and discussion of findings in Figure 6.31: Degree of control – I have enough control in acquiring resources in the ERP system:

Participants undoubtedly brought the following results: 0% Strongly disagreed, 4.8% Disagreed, 23.8% Neither agreed nor disagreed, 47.6% Agreed and 23.8% Strongly agreed.

**Number of Daily responses: September 2, 2018 – October 23, 2018**

### Number of daily responses



Source: Google analytics (2019)

The above figure showed the number of daily responses between September 2, 2018 – October 23, 2018.

### 6.1.2 Introducing Damelin Menlyn Pretoria

#### *Summation of part figures*

The following table is the sample of Damelin Menlyn in specific categories of participants

**Table 6.2: Sample size (Damelin Menlyn Pretoria)**

Sample	Category of participants	Target		Damelin Menlyn Pretoria
			<b>Participants</b>	
1	Management Staff	10		3
2	Lecturers	20		5
3	Students	70		20

- **Research instrument**

The themes in the Survey were from Annexure G - Questionnaire : ERP tools management, Integrative Model approach in System academic management on a Likert-type rating scale of 1-5 from: 1. Strongly disagree, 2. Disagree, 3. Neither agree nor disagree, 4. Agree and 5. Strongly agree.

The test of the reliability of the research instrument regarding Table 6.2, linked to Chapter 5 on reliability statistics that made use of SPSS, computed the Cronbach's alpha as .714.

#### **6.1.2.1 Synopsis of member figures**

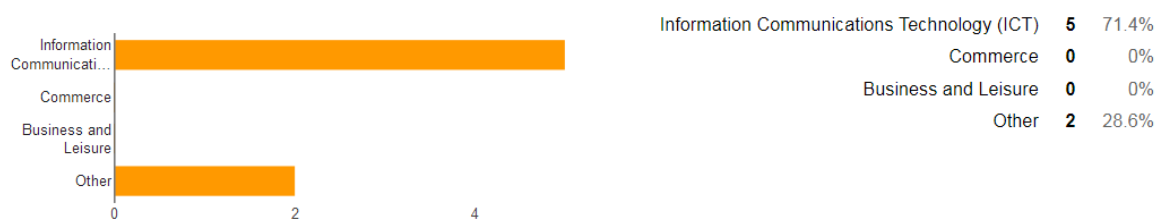




**Figure 6.32: Outline of member figures**

From Figure 6.32 above: 71.4% comprised of student respondents; 28.6% of the respondents were lecturers and 0% from the management staff.

### Departmental statistics



**Figure 6.33: Departmental Statistics**

The analysis and discussion of findings on member figures:

The results of the survey conveyed the figures as shown from Figure 6.33 above, which are as follows: 71.4% of the statistics came from the ICT department; 0% of the figures was from commerce department; another 0% to the total contribution above came from the business Leisure department; and 28.6% of the contribution to the figures emanated from the category named Other.

Empirical findings related to Figure 6.32 and 6.33 from the literature review point 2.3, paragraph 7:

“In respect of the above, it may arguably be seen that PHEIs had a lot of work to re-look into their internal cultures. As explained by Kasemsap (2018) in the study directed, there was a disclosure review of learning exchange; information exchange, work portability and work assorted variety; learning exchange and backup points of view; hindrances to information exchange; information exchange and absorptive limit; learning exchange and information

securing; learning exchange and virtual groups; and the propelled issues of learning move in current associations. The way toward exchanging information was a continuous movement of picking up, modifying and making strides. At the authoritative level, information exchange shows itself through changes in the learning of a unit. Best learning exchange endeavours effectively include both the wellspring of the information and its recipients. Setting up execution desires for the individuals who will utilise the learning further evaluates the estimation of the exchange. Institutions considering or utilising information exchange forms ought to persistently assess their web-based life status. The advantages of information exchange for working environments incorporates the increments in efficiency, speed, readiness, benefits and development”.

## Section A: Current practices

The analysis was graphically illustrated by percentages of respondents per item in Section A, shown in the right pane with the participants that: Strongly disagree, Disagree, Neither agree nor disagree, Agree and Strongly agree.

### 1. A dynamic or powerful ERP tool in System academic management

**Computer performance (performance outcome expectations) - The functionalities of The ERP system adequately meets the requirements of my job.**



**Figure 6.34: Computer performance (performance outcome expectations) - The functionalities of the ERP system adequately meets the requirements of my job**

The analysis and discussion of findings on item: Computer performance (performance outcome expectations) as in Figure 6.34:

The illustrated figures that followed from the functionalities of ERP system in meeting the job requirements were depicted as follows: 0% Strongly disagreed, 0% Disagreed, 14.3% Neither agreed nor disagreed, 71.4% Agreed and 14.3% Strongly agreed.

Empirical findings from the review of literature section 2.3 relate to this section by stating that “In PHEIs, this research exhibited a superior chance to explore routes in how ERPs might be utilised as a social centre point in the production of information that might be regarded to be more profitable towards the grant of research like campus distributions centre points inside and across the broad ERP framework, guided by the ERP tools administration frameworks, other than simply utilising ERPs for ordinary regular learning connections or correspondence”. From the statistical findings above in Figure 6.34, none of the respondents strongly agreed or disagreed to the item “on performance outcome expectations”. A greater number (71.4% and 14.3%) are in agreement on computer performance outcome expectations.

#### **Computer anxiety – Using the ERP system has improved my work performance**



**Figure 6.35: Computer anxiety – Using the ERP system has improved my work performance.**

The analysis and discussion of findings on item: Computer Anxiety in using ERP system to improve performance from Figure 6.35:

The illustrated numerical contributions in terms of the statistics were as follows: 0% Strongly disagreed, 14.3% Disagreed, 28.6% Neither agreed nor disagreed, 57.1% Agreed and 0% Strongly agreed.

**The ERP system has presented me more ways to individual innovativeness in Information Technology (IT).**



**Figure 6.36: The ERP system has presented me more ways to individual innovativeness in Information Technology (IT)**

An analysis and discussion of findings from Figure 6.36 on the ERP for individual innovativeness in Information Technology (IT) shows that:

The summarised figures in the above item were as follows: 0% Strongly disagreed, 0% Disagreed, 42.9% Neither agreed nor disagreed, 57.1% Agreed and 0% Strongly agreed.

**In the ERP system, task characteristics and navigation is easy.**



**Figure 6.37: In the ERP system, task characteristics and navigation is easy**

The analysis and discussions of the findings in the ERP system, task characteristics and navigation is easy from Figure 6.37 indicates:

From the study, 0% Strongly disagreed, 0% Disagreed, 28.6% Neither agreed nor disagreed, 57.1% Agreed and 14.3% Strongly agreed.

**Prior performance – In the ERP system, computer set ups are sufficient for online access.**



**Figure 6.38: Prior performance – In the ERP system, computer set ups are sufficient for online access**

The analysis and discussion of findings: in the ERP system, computer set ups are sufficient for online access reveals:

Graph 6.38 above illustrated the following: 0% Strongly disagreed, 0% Disagreed, 42.9% Neither agreed nor disagreed, 57.1% Agreed and 0% Strongly agreed.

**Perceived effort –There is access to dedicated network connection in the ERP system.**



**Figure 6.39: Perceived effort –There is access to dedicated network connection in the ERP system**

The analysis and discussion of findings on the item that there is access to dedicated network connection in the ERP system:

The illustrated statistics from Graph 6.39 above are as follows: 0% of the respondents Strongly disagreed, 0% Disagreed, 42.9% Neither agreed nor disagreed, 57.1% Agreed and 0% Strongly agreed.

**The ERP system is fit for new network apps.**



**Figure 6. 40: The ERP system is fit for new network apps**

An analysis and discussion of findings on whether the ERP system is fit for new network apps as derived from Figure 6.40 indicates:

The figures are summarised as follows: 0% Strongly disagreed, 0% Disagreed, 42.9% Neither agreed nor disagreed, 57.1% Agreed and 0% Strongly agreed.

**Pertaining to the viability of ERP system (extent of value-add) potential - The ERP system has made the firm adapt to a changing business environment.**



**Figure 6.41: Pertaining to the viability of ERP system (extent of value-add) potential - The ERP system has made the firm adapt to a changing business environment**

The analysis and discussion of findings from Figure 6.41 relating to the viability of ERP system (extent of value-add) potential shows:

The respondents' summary on the above outcome is as follows: 0% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 85.7% Agreed and 14.3% Strongly agreed.

## Section B: Service quality levels in terms of perceived usefulness of the ERP System

The item analytics in Section B were depicted graphically with percentages of respondents shown in the right pane to each figure below: with participants that Strongly disagree, Disagree, Neither agree nor disagree, Agree and Strongly agree.

### 2. Experiences that you have met in ERP System access: interacting with Software, phones, laptops, computers, internet and any other app

**The ERP system frequently meets low network bandwidth increasing the latency of communication, thereby slowing the services in the ERP system.**



**Figure 6.42: The ERP system frequently meets low network bandwidth increasing the latency of communication, thereby slowing the services in the ERP system**

The analysis and discussion of findings in Figure 6.42: The ERP system frequently meets low network bandwidth increasing the latency of communication, thereby slowing the services in the ERP tools:

The respondent figures were as follows: 0% Strongly disagreed, 14.3% Disagreed, 14.3% Neither agreed nor disagreed, 57.1% Agreed and 14.3% Strongly agreed.

Empirical findings from section 2.9 of the literature review relate to statistical findings from Figure 6.42 above which state that “ERP perceived usefulness is how much an individual accepts that utilising ERP tools would upgrade or enhance the activity execution or job performance”. There is a higher number of respondents that agree that they get interrupted in the “ERP system frequently meeting low network bandwidth increasing the latency of communication, thereby slowing the services in the ERP system”; which influences their job performance.

**Regarding space in terms of memory and parallel processing, I am able to take steps in navigation to complete a problem in the ERP System.**



**Figure 6.43: Regarding space in terms of memory and parallel processing, I am able to take steps in navigation to complete a problem in the ERP System**

The analysis and discussion of findings from Figure 6.43: Regarding space in terms of memory and parallel processing, I am able to take steps in navigation to complete a problem in the ERP tools indicate:

The respondents' figures collected are as follows: 0% Strongly disagreed, 0% Disagreed, 28.6% Neither agreed nor disagreed, 71.4% Agreed and 0% Strongly agreed.

**In terms of ERP system reliability, there is a loss of internet connectivity between the customer and provider's network, consequently causing interruptions of a varied nature.**



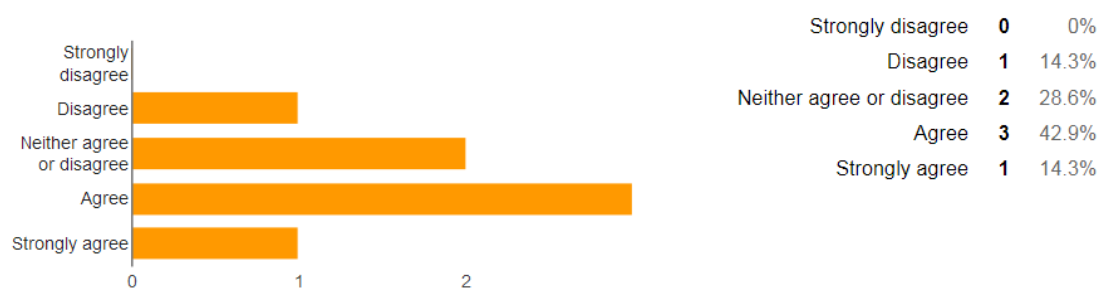
**Figure 6.44: In terms of ERP system reliability, there is loss of internet connectivity between the customer and provider's network, consequently causing interruptions of a varied nature**



The analysis and discussion of findings from Figure 6.44: In terms of ERP system reliability, there is a loss of internet connectivity between the customer and provider's network, consequently causing interruptions:

The statistics illustrated by the participants in this category are as follows: 0% Strongly disagreed, 14.3% Disagreed, 14.3% Neither agreed nor disagreed, 71.4% Agreed and 0% Strongly agreed.

**With computer performance in the ERP System, I have the ability to create, deliver and share content campus-wide on any number of devices.**



**Figure 6.45: With computer performance in the ERP System, I have the ability to create, deliver and share content campus-wide on any number of devices**

The analysis and discussion of findings on computer performance in the ERP System, I have the ability to create, deliver and share content campus-wide on any number of devices, from figure 6.45 shows:

The outcome on the above item is as follows: 0% Strongly disagreed, 14.3% Disagreed, 28.6% Neither agreed nor disagreed, 42.9% agreed and 14.3% Strongly agreed.

### **Section C: The extent to which academic Enterprise Resource Planning is responding to stakeholders' needs**

The item percentages per group of participants in Section C were presented on the right hand side of each figure below, with respondents that Strongly disagree, Disagree, Neither agree nor disagree, Agree and Strongly agree.

### **3. Changes to ERP tools management, given the opportunity to work on it**

**Compatibility of Technology in the ERP System – The ERP system integrates or combines data from the different areas of the firm.**



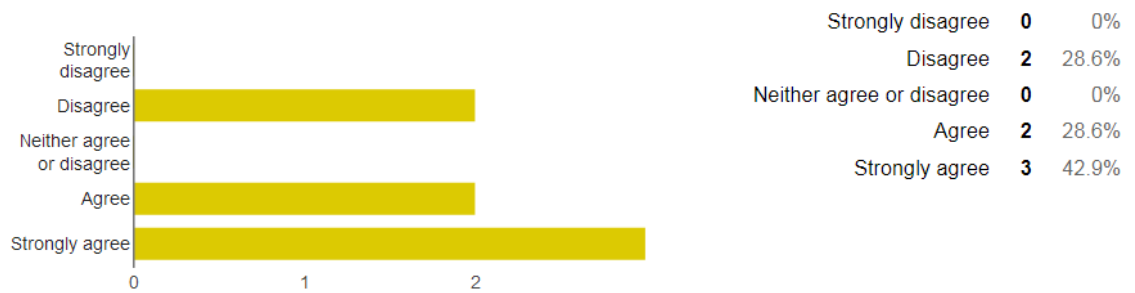
**Figure 6.46: Compatibility of Technology in the ERP System – The ERP system integrates or combines data from the different areas of the firm**

The analysis and discussion of findings in Figure 6.46: Compatibility of Technology in the ERP System – The ERP system integrates or combines data from the different areas of the firm indicates that:

The results were as follows: 0% Strongly disagreed, 0% Disagreed, 28.6% Neither agreed nor disagreed, 57.1 Agreed and 14,3% Strongly agreed.

The empirical findings in section 2.4 of the systematic review of literature uncovers that “information system measurements such as benefit, quality, framework quality and innovation assume a critical part in sharing information among the staff of an association”. This relates to the findings in Figure 6.46 above, where there are strong combined statistical figures of 57.1% and 14.3% of the respondents who agree that there is compatibility of technology in the ERP system to a good extent.

Complexity of Technology – Use of the ERP system requires a lot of mental effort.



**Figure 6.47: Complexity of Technology – Use of the ERP system requires a lot of mental effort**

The analysis and discussion of findings on Complexity of Technology – Use of the ERP system requires a lot of mental effort from Figure 6.47 shows:

The respondents figures were as follows; : 0% Strongly disagreed, 28.6% Disagreed, 0% Neither agreed nor disagreed, 28.6% Agreed and 42.9% Strongly agreed.

**The perceived need for Technology – My job requires me to use the ERP system.**

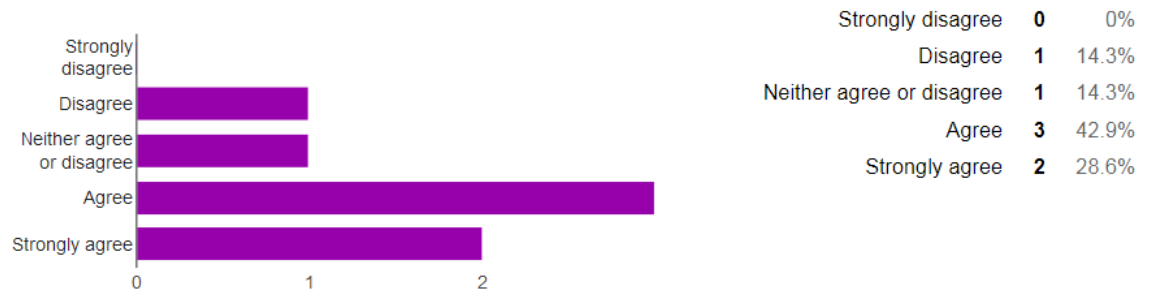


**Figure 6.48: The perceived need for Technology – My job requires me to use the ERP system**

The analysis and discussion of findings from Figure 6.48: The perceived need for Technology – My job requires me to use the ERP system, shows:

Following are the respondents figures: 14.3% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 42.9% Agreed and 42.9% Strongly agreed.

### Perceived usefulness -The ERP system is very useful to my job.



**Figure 6.49: Perceived usefulness -The ERP system is very useful to my job**

The analysis and discussion of findings from Figure 6.49: Perceived usefulness -The ERP system is very useful to my job indicates:

The respondents' statistics from the above item were as follows: 0% Strongly disagreed, 14.3% Disagreed, 14.3% Neither agreed nor disagreed, 42.9% Agreed and 28.6% Strongly agreed.

### Perceived ease of use-The ERP system has an easy-to-use interface.



**Figure 6.50: Perceived ease of use-The ERP system has an easy to use interface**

The analysis and discussion of findings from Figure 6.50: Perceived ease of use-The ERP system has an easy-to-use interface, shows:

The results of the above item were recorded as follows: 0% Strongly disagreed, 0% Disagreed, 28.6% Neither agreed nor disagreed, 57.1% Agreed and 14.3% Strongly agreed.

## 4. Encouraging end-users or stakeholders to the ERP System to have powerful ERP user experiences

**Information asymmetry (information flow and for collaboration) – The information and related reports in the ERP system are available to me when and where I need them.**



**Figure 6.51: Information asymmetry (information flow and for collaboration) – The information and related reports in the ERP system are available to me when and where I need them**

The analysis and discussion of findings on Information asymmetry (information flow and for collaboration) – The information and related reports in the ERP system are available to me when and where I need them, as in Figure 6.51 show that:

The figures were presented as follows: 0% Strongly disagreed, 0% Disagreed, 14.3% Neither agreed nor disagreed, 85.7% Agreed and 0% Strongly agreed.

**Contract: I log in to the ERP system because it is part of my contract in using it.**



**Figure 6.52: Contract: I log in to the ERP system because it is part of my contract in using it**

The analysis and discussion of findings from Figure 6.52: Contract: I log in to the ERP system because it is part of my contract in using it shows:

The above item yielded the following results: 0% Strongly disagreed, 0% Disagreed, 14.3% Neither agreed nor disagreed, 85.7% Agreed and 0% Strongly agreed.

**Risk sharing: I am willing to share ERP experience or technical know-how with colleagues.**

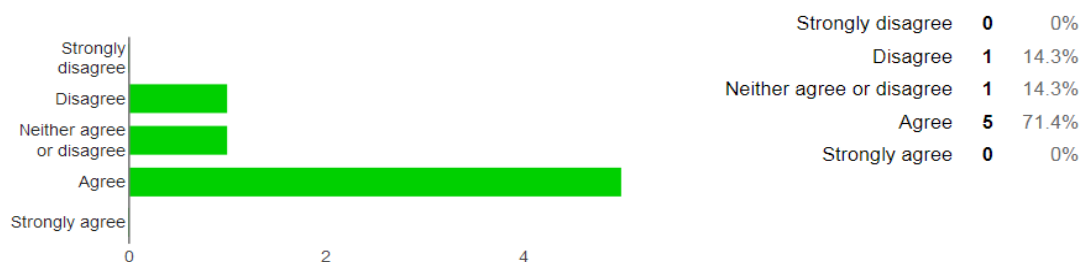


**Figure 6.53: Risk sharing: I am willing to share ERP experience or technical know-how with colleagues**

An analysis and discussion of findings on Risk sharing: I am willing to share ERP experience or technical know-how with colleagues, from Figure 6.53 shows that:

The figures were exhibited as follows: 0% Strongly disagreed, 0% Disagreed, 28.6% Neither agreed nor disagreed, 57.1 Agreed and 14.3% Strongly agreed.

**With issues of trust in the ERP system, I have the feeling that system interconnectedness and openness affects my total satisfaction in the ERP system and helps me improve my work.**

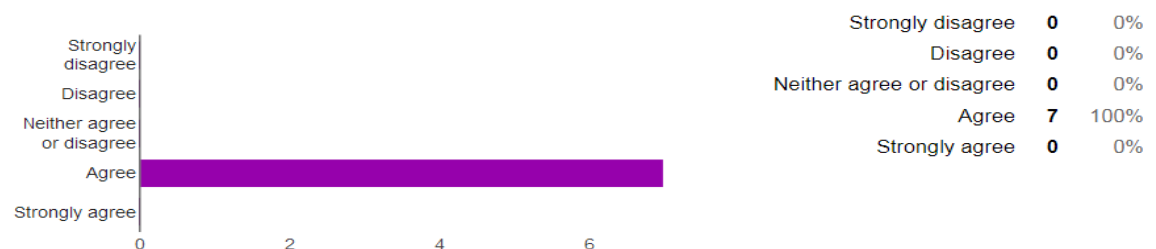


**Figure 6.54: With issues of trust in the ERP system, I have the feeling that system interconnectedness and openness affects my total satisfaction in the ERP system and helps me improve my work**

The analysis and discussion of findings from Figure 6.54: With issues of trust in the ERP system, I have the feeling that system interconnectedness and openness affects my total satisfaction in the ERP system and helps me improve my work indicates:

The figures brought forth by respondents from the above item are as follows: 0% Strongly disagreed, 14.3% Disagreed, 14.3% Neither agreed nor disagreed, 71.4% Agreed and 0% Strongly agreed.

**Technology changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system – I always need technical support to use the ERP system.**



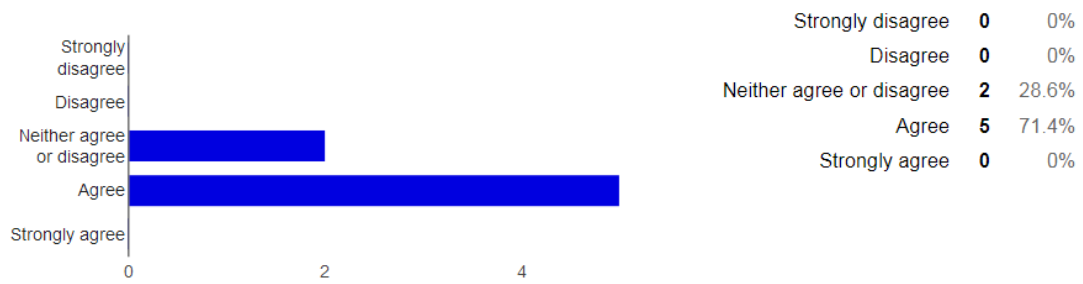
**Figure 6.55: Technology changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system – I always need technical support to use the ERP system**

The analysis and discussion of findings from Figure 6.55: Technology changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system – I always need technical support to use the ERP system shows that:

The statistics from the above category are as follows: 0% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 100% Agreed and 0% Strongly agreed.

## 5. Issues discouraging users from accessing the ERP System

Peripheral cues being a process of persuasion (following simple decision rules in ERP system access – When rules and procedures exist for ERP tools management, they are usually in written form).

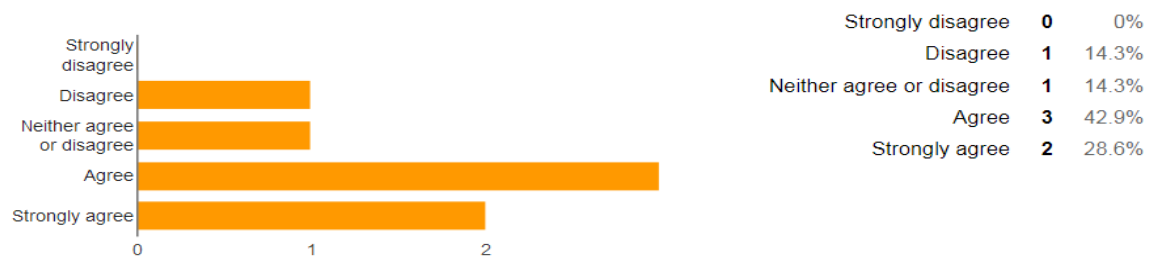


**Figure 6.56: Peripheral cues being a process of persuasion (following simple decision rules in ERP system access – When rules and procedures exist for ERP tools management, they are usually in written form)**

The analysis and discussion of findings from Figure 6.56: Peripheral cues being a process of persuasion (following simple decision rules in ERP system access – When rules and procedures exist for ERP tools management, they are usually in written form) indicates that:

The respondents' figures were as follows: 0% Strongly disagreed, 0% Disagreed, 28.6% Neither agreed nor disagreed, 71.4% Agreed and 0% Strongly agreed.

**Attitude (Behavioural intention) or individual perception – I feel it is a necessity to use the ERP system to be competitive in the workplace.**



**Figure 6.57: Attitude (Behavioural intention) or individual perception – I feel it is a necessity to use the ERP system to be competitive in the workplace**

An analysis and discussion of findings on (Behavioural intention) or individual perception – I feel it is a necessity to use the ERP system to be competitive in the workplace, from Figure 6.57 shows that:

The outcome of the above item is as follows: 0% Strongly disagreed, 14.3% Disagreed, 14.3% Neither agreed nor disagreed, 42.9% Agreed and 28.6% Strongly agreed.



The behavioural intention or individual perception above relates to empirical findings in section 2.10.2 of the review of literature, which states that “the EPD clarifies that adjustments in states of mind are an element of the nature of the data or contention, fringe signs, including heuristics and other boosts that impact influence, and elaboration probability”. From the statistical findings in Figure 6.57, there is a combined number of 42.9% and 28.6% of the respondents, totaling 71.5%, that are in agreement that “it is a necessity to use the ERP system to be competitive in the workplace”.

#### **Section D: Internal and external factors that impact the Enterprise Resource Planning system**

Graphical and numerical representation of participants’ scores per item in Section D were exhibited as percentages of respondents that Strongly disagree, Disagree, Neither agree nor disagree, Agree and Strongly agree in the figures that follow.

#### **6. PHEI culture in regard to norms, values and beliefs in supporting departments in ERP tools management**

**Management support in managing the ERP tools is efficient and dependable.**

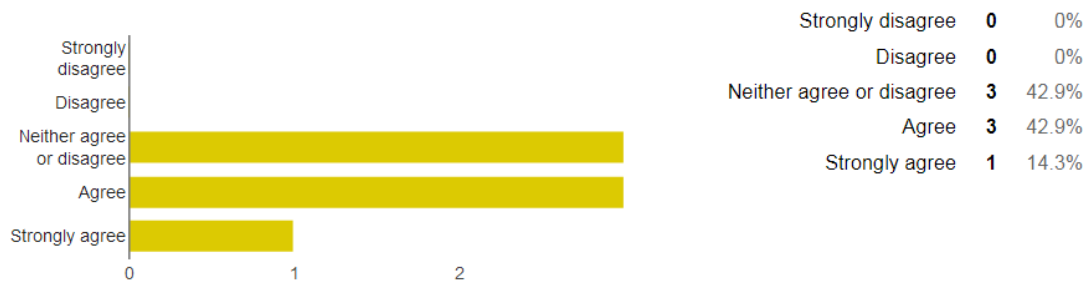


**Figure 6.58: Management support in managing the ERP tools is efficient and dependable**

The analysis and discussion of findings from Figure 6.58: management support in managing the ERP tools is efficient and dependable shows that:

The figures from the above category came out as follows: 0% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 85.7% Agreed and 14.3 Strongly agreed.

**Adequate resources – The management team provides me with the necessary support and resources to use the ERP system.**

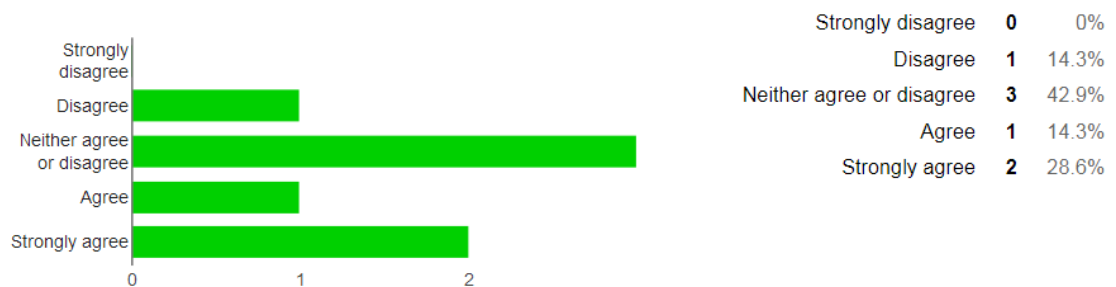


**Figure 6.59: Adequate resources – The management team provides me with the necessary support and resources to use the ERP system**

The analysis and discussion of findings emanating from Figure 6.59 on Adequate resources - The management team provides me with the necessary support and resources to use the ERP system shows:

The outcome from the above item is as follows: 0% Strongly disagreed, 0% Disagreed, 42.9% Neither agreed nor disagreed, 42.9% Agreed and 14.3% Strongly agreed.

**My manager encourages me to use ICT innovativeness in the ERP system.**

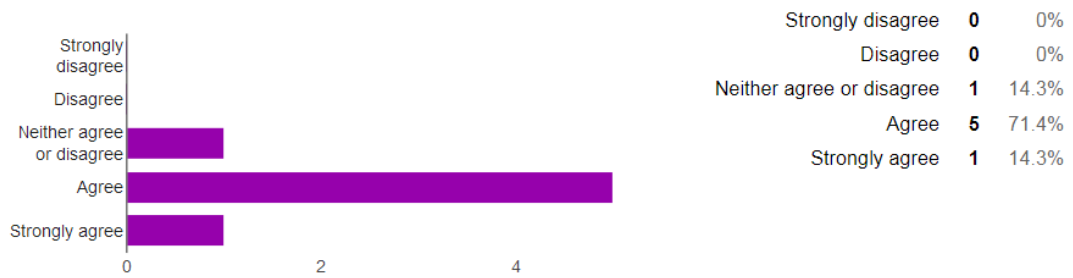


**Figure 6.60: My manager encourages me to use ICT innovativeness in the ERP system**

The analysis and discussion of findings from Figure 6.60: My manager encourages me to use ICT innovativeness in the ERP system shows that:

The results on encouraging ICT innovativeness were as follows: 0% Strongly disagreed, 14.3% Disagreed, 42.9% Neither agreed nor disagreed, 14.3% Agreed and 28.6% Strongly agreed.

### User involvement – I am able to recognise the ERP system’s knowledge value learnt.



**Figure 6.61: User involvement – I am able to recognise the ERP system’s knowledge value learnt**

An analysis and discussion of findings from Figure 6.61: User involvement – I am able to recognise the ERP system’s knowledge value learnt shows:

The user involvement outcome is as follows: 0% Strongly disagreed, 0% Disagreed, 14.3% Neither agreed nor disagreed, 71.4% Agreed and 14.3% Strongly agreed.

Empirical findings from section 2.6 on the audit of writing portray “picking up understanding in the matter of what the key levers to enhance information quality and efficiencies could make ready for a more manageable future in advanced education” and this relates to statistical findings from Figure 6.61 above, where there is a high number of respondents that agree (71.4% agree and 14.3% strongly agree) that they are able to “recognise the ERP system’s knowledge value learnt”.

### Degree of control – I have enough control in acquiring resources in the ERP system.

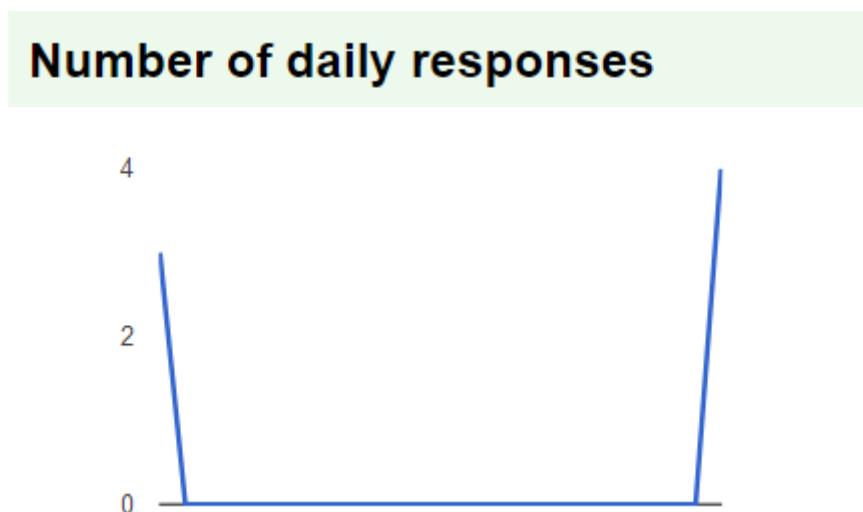


**Figure 6.62: Degree of control – I have enough control in acquiring resources in the ERP system**

An analysis and discussion of findings from Figure 6.62: Degree of control – I have enough control in acquiring resources in the ERP system shows that:

The statistics from the above item are as follows: 0% Strongly disagreed, 28.6% Disagreed, 0% Neither agreed nor disagreed, 57.1% Agreed and 14.3% Strongly agreed.

**Number of Daily responses (November 14, 2018 – December 4, 2018).**



Source: Google analytics (2019)

The above figure entitled number of daily responses showed the period within which the responses were collected (from November 14, 2018 – December 4, 2018).

### 6.1.3 Presentation : RC Braamfontein

The following is the sample size for RC Braamfontein.

**Table 6. 3 : Sample size (RC Braamfontein)**

Sample	Category of participants	Target		Rosebank College Braamfontein
			<b>Participants</b>	
1	Management Staff	10		3
2	Lecturers	20		7
3	Students	70		20

- **Research instrument**

The themes in the Survey were from Annexure G - Questionnaire : ERP tools management, Integrative Model approach in System academic management on a Likert-type rating scale of 1-5 from: 1. Strongly disagree, 2. Disagree, 3. Neither agree nor disagree, 4. Agree, 5. Strongly agree.

The test of the reliability of the research instrument regarding Table 6.3, linked to Chapter 5 on reliability statistics that made use of SPSS, computed the Cronbach's alpha as .864.

#### 6.1.3.1 Synopsis of member figures

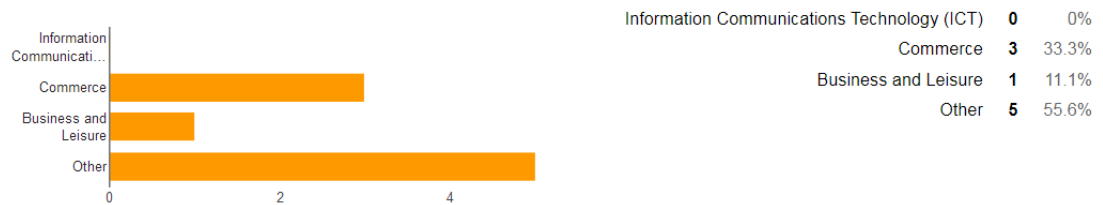


**Figure 6.63: Outline of member figures**

The analysis and discussion of findings on summary of member figures is as follows:

The study comprised the following participants; 44.4% were Students, none came from the lecturing team and a balance came from the management staff and constituted 55.6%.

### Departmental statistics



**Figure 6.64: Departmental Statistics**

The analysis and discussion of findings on member figures is as follows:

The statistics as in Figure 6.64 above were as follows: 0% was from ICT; 33.3% was from the department of commerce; Business and Leisure constituted 11.1%; and 55.6% was from Other groups.

Empirical findings related to Figures 6.63 and 6.64 from literature review point 2.3, paragraph 7 show:

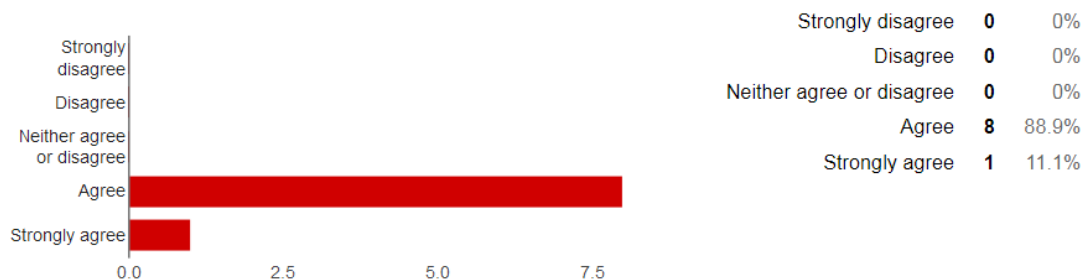
“The way toward exchanging information is a continuous movement of picking up, modifying, and making strides. At the authoritative level, information exchange shows itself through changes in the learning of a unit. Best learning exchange endeavours effectively include both the wellspring of the information and its recipients. Setting up execution desires for the individuals who will utilise the learning further evaluates the estimation of the exchange. Institutions considering or utilising information exchange forms, ought to persistently assess their web based life status. The advantages of information exchange for working environments incorporate the increments in efficiency, speed, readiness, benefits and development” (Kasemsap 2018).

## **Section A: Current practices linked to a general review of literature on the perceived effective ERP management and ERP tools utilisation.**

The analysis was graphically illustrated by percentages of respondents per item in Section A, shown in the right pane with the participants that: Strongly disagree, Disagree, Neither agree nor disagree, Agree and Strongly agree.

### **1. A dynamic or powerful ERP tool in System academic management**

Computer performance (performance outcome expectations) - The functionalities of The ERP system adequately meet the requirements of my job.



**Figure 6.65: Computer performance (performance outcome expectations) - The functionalities of the ERP system adequately meet the requirements of my job**

An analysis and discussion of findings on Computer (performance outcome expectations) as in Figure 6.65 reveal that:

The tabulated figures in this area were as follows: 0% Strongly disagreed and another 0% Disagreed. A further 0% Neither agreed nor disagreed, 88.9% Agreed and 11.1% Strongly agreed.

Empirical findings by Srima and Wannapiroon (2013), Tabbara (2016) and Al-Mashari (2017) relate to this section in that RC Braamfontein has achieved a balance amongst some key institutional elements. The respondents' figures that are in agreement are as follows: 88.9 % agree and 11.1% strongly agree that the functionalities of the ERP tools adequately meet the requirements of their jobs.

### Computer anxiety – Using the ERP system has improved my work performance.



**Figure 6.66: Computer anxiety – Using the ERP system has improved my work performance**

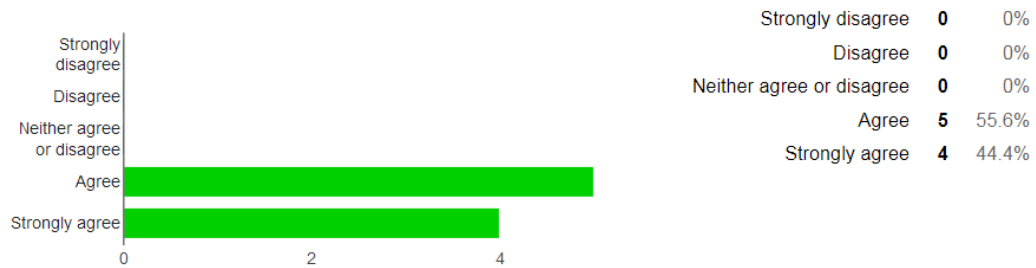
An analysis and discussion of figures in Figure 6.66: Computer anxiety – Using the ERP system has improved my work performance shows that:

The statistics were shown: 0% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 66.7% Agreed and 33.3% Strongly agreed.

Empirical studies by Khalid *et al.* (2018) relate to computer anxiety in that the usage of the ERP system has improved work performance of the respondents as seen in the statistics from Figure 6.66 above, where 66.7% agree and 33.3% strongly agree. “Mate *et al.* (2017) and Argawal (2018) are in tandem with Khalid *et al.* (2018) towards ERP management tools for digital universities. The digitisation has provoked learning, especially advanced education at a quick pace. Advanced Education Institutions are in basic need to execute current innovations to remain carefully important and separate themselves as computerised pioneers”.



**The ERP system has presented me more ways for individual innovativeness in Information Technology (IT).**

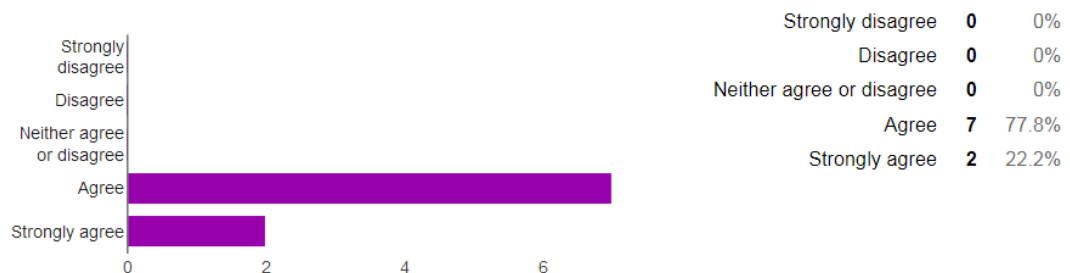


**Figure 6.67: The ERP system has presented me more ways for individual innovativeness in Information Technology (IT)**

An analysis and discussion of findings on Figure 6.67: The ERP system has presented me more ways for individual innovativeness in Information Technology (IT) shows that:

The summarised figures in the above category were as follows: 0% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 55.6% Agreed and 44.4% Strongly agreed.

**In the ERP system, task characteristics and navigation is easy.**

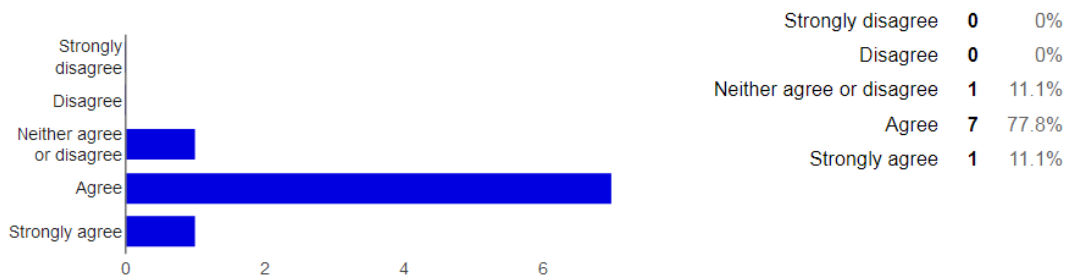


**Figure 6.68: In the ERP system, task characteristics and navigation is easy**

An analysis and discussion of findings on Figure 6.68: In the ERP system, task characteristics and navigation is easy shows that:

The presented figures on the above outcome were as follows: 0% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 77.8% Agreed and 22.2% Strongly agreed.

**Prior performance – In the ERP system, computer set-ups are sufficient for online access.**



**Figure 6.69: Prior performance – In the ERP system, computer set-ups are sufficient for online access**

The analysis and discussion of findings on Figure 6.69: Prior performance – In the ERP system, computer set-ups are sufficient for online access reveals that:

On the above outcome, the figures were portrayed as follows: 0% Strongly disagreed, 0% Disagreed, 11.1% Neither agreed or disagreed, 77.8% Agreed and 11.1% Strongly agreed.

**Perceived effort –There is access to a dedicated network connection in the ERP system.**



**Figure 6.70: Perceived effort –There is access to a dedicated network connection in the ERP system**

The analysis and discussion of findings in Figure 6.70: Perceived effort –There is access to a dedicated network connection in the ERP system reveals that:

The statistics presentation of the above category on dedicated network connection in the ERP system was as follows: 0% Strongly disagreed, 11.1% Disagreed, 0% Neither agreed nor disagreed, 66.7% Agreed and 22.2% Strongly agreed.

### The ERP system is fit for new network apps.

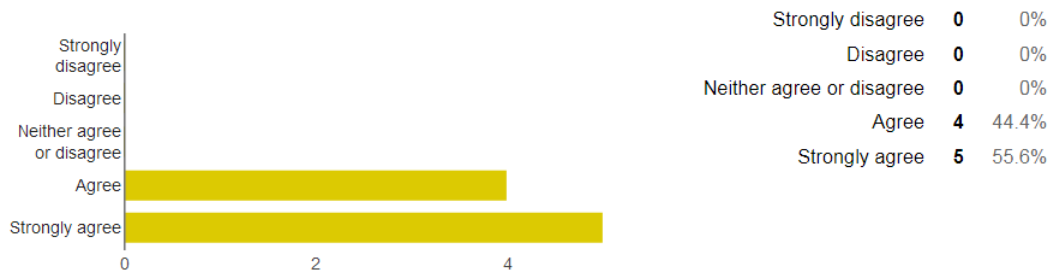


**Figure 6.71: The ERP system is fit for new network apps**

The analysis and discussion of findings on Figure 6.71: The ERP system is fit for new network apps indicates:

The participants' figures on the above outcome are as follows: 0% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 66.7% Agreed and 33.3% Strongly agreed.

Pertaining to the viability of the ERP system's (extent of value-add) potential - The ERP system has made the firm adapt to a changing business environment.



**Figure 6.72: Pertaining to the viability of the ERP system (extent of value-add) potential - The ERP system has made the firm adapt to a changing business environment**

The analysis and discussion of findings on Figure 6.72: Pertaining to the viability of the ERP system (extent of value-add) potential - The ERP system has made the firm adapt to a changing business environment shows that:

Extent of value add figures on the above point were as follows: 0% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 44.4% Agreed and 55.6% Strongly agreed.

## Section B: Service quality levels in terms of the perceived usefulness of the ERP System

The item analytics in Section B were depicted graphically, with percentages of respondents shown in the right pane to each figure below: with participants that Strongly disagree, Disagree, Neither agree nor disagree, Agree and Strongly agree.

### 2. Experiences that you have had in ERP System access: interacting with Software, phones, laptops, computers, internet and any other app

**The ERP system frequently meets low network bandwidth increasing the latency of communication, thereby slowing the services in the ERP system.**



**Figure 6.73: The ERP system frequently meets low network bandwidth increasing the latency of communication, thereby slowing the services in the ERP system**

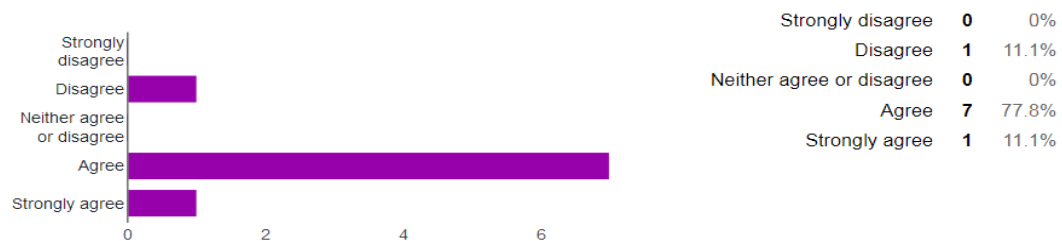
An analysis and discussion of findings on Figure 6.73: The ERP system frequently meets low network bandwidth increasing the latency of communication, thereby slowing the services in the ERP tools shows that:

The summarised statistics on the above outcome are: 0% Strongly disagreed, 22.2% Disagreed, 33.3% Neither agreed nor disagreed, 44.4% Agreed and 0% Strongly agreed.

Empirical findings from section 2.9 entitled TAM and Information Systems “in view of the DeLone and McLean’s (1992) data frameworks achievement show incorporates quality elements (data, administration and framework quality) and individual attributes as forerunners to be proceeded with utilisation goal of e-assets” as reported by Nizamani *et al.* (2014), is in agreement with the findings of this section in that respondents are seen to have mixed feelings in singling out the important attributes that constitute quality of service. “The

ERP system frequently meets low network bandwidth increasing the latency of communication, thereby slowing services in the ERP system”, having the following responses: 0% strongly disagree, 22.2% disagree, 33.3% neither agree nor disagree, 44.4% agree and 0% strongly agree.

**Regarding space in terms of memory and parallel processing, I am able to take steps in navigation to complete a problem in the ERP System.**

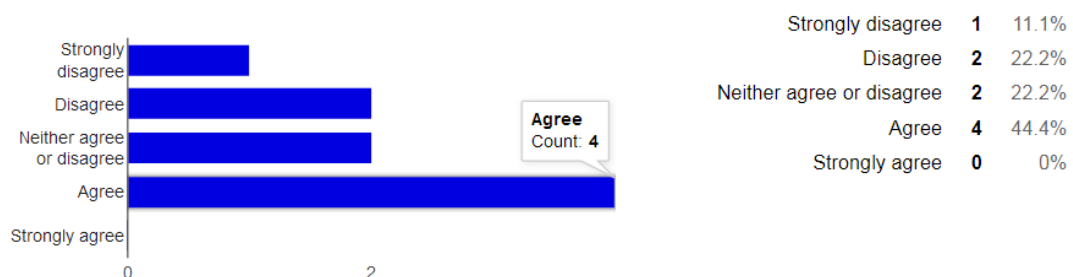


**Figure 6.74: Regarding space in terms of memory and parallel processing, I am able to take steps in navigation to complete a problem in the ERP System**

The analysis and discussion of findings on memory and parallel processing in taking steps to navigate and complete a problem in the ERP System, as from Figure 6.74 show:

The exhibited figures on the above outcome were as follows: 0% Strongly disagreed, 11.1% Disagreed, 0% Neither agreed nor disagreed, 77.8% Agreed and 11.1% Strongly agreed.

**In terms of ERP system reliability, there is a loss of internet connectivity between customer and provider’s network, consequently causing interruptions of a varied nature.**

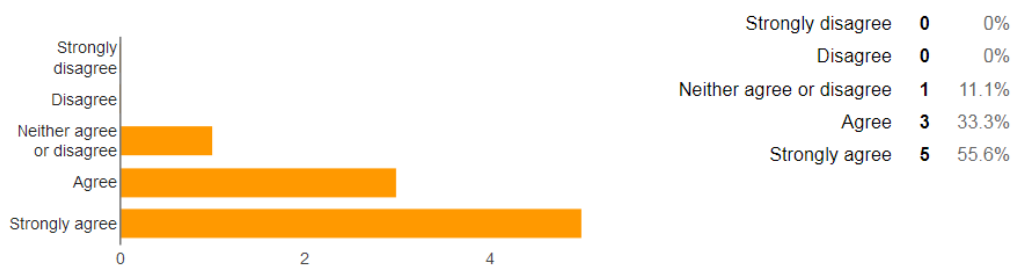


**Figure 6.75: In terms of ERP system reliability, there is a loss of internet connectivity between customer and provider’s network, consequently causing interruptions of a varied nature**

An analysis and discussion of findings on Figure 6.75: In terms of ERP system reliability, there is a loss of internet connectivity between customer and provider's network consequently causing interruptions shows:

Respondents in the above category revealed the following figures: 11.1% Strongly agreed, 22.2% Disagreed, 22.2% Neither agreed nor disagreed, 44.4% agreed and 0% Strongly agreed.

**With computer performance in the ERP System, I have the ability to create, deliver and share content campus-wide on any number of devices.**



**Figure 6.76: With computer performance in the ERP System, I have the ability to create, deliver and share content campus-wide on any number of devices**

The analysis and discussion of findings on Figure 6.76: With computer performance in the ERP System, I have the ability to create, deliver and share content campus-wide on any number of devices indicates:

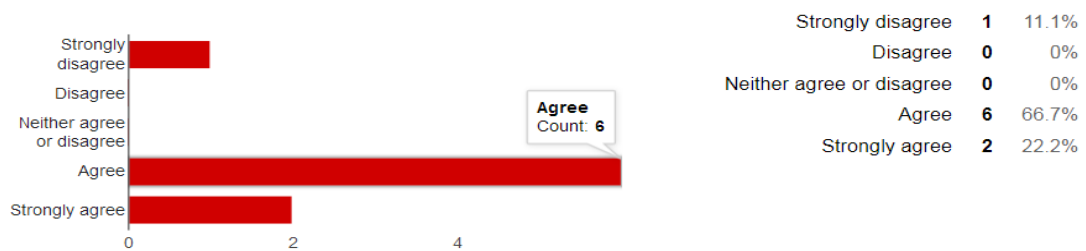
The above category had the following figures: 0% Strongly disagreed, 0% Disagreed, 11.1% Neither agreed nor disagreed, 33.3% Agreed and 55.6% Strongly agreed.

### **Section C: The extent to which academic Enterprise Resource Planning is responding to stakeholders' needs**

The item percentages per group of participants' in Section C were presented on the right hand side of each figure below, with respondents that Strongly disagree, Disagree, Neither agree nor disagree, Agree and Strongly agree.

### 3. Changes to ERP tools management, given the opportunity to work on it

**Compatibility of Technology in the ERP System – The ERP system integrates or combines data from the different areas of the firm.**



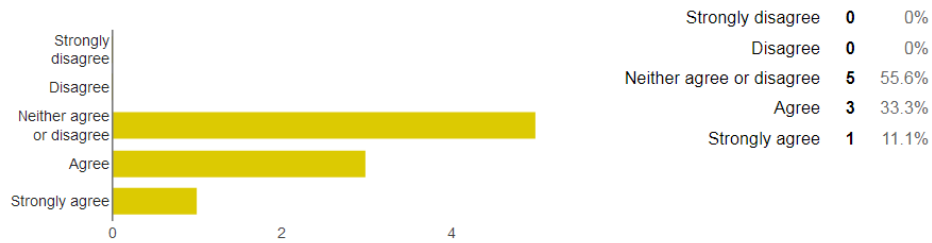
**Figure 6.77: Compatibility of Technology in the ERP System – The ERP system integrates or combines data from the different areas of the firm**

An analysis and discussion of findings on Figure 6.77: Compatibility of Technology in the ERP System – The ERP system integrates or combines data from the different areas of the tools shows:

The following summarised figures were from the outcome, Compatibility of Technology in the ERP System from Figure 42 above: 11.1% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 66.7% Agreed and 22.2% Strongly agreed.

Empirical findings from section 2.10 of review of literature on stakeholders' needs relate to this section by stating that "Stakeholders' needs in this study's context speak to the perspectives of those at venture activities level comprising ERP system users, clients or customers and different partners as they identify with the opportunities or relate to problems within the system for solutions". There is a very strong agreement from the respondents' statistics in figure 6.77 above: 66.7% agree and 22.2% strongly agree that there is compatibility of technology in the ERP system that allows respondents to integrate or combine data from the different sections of the firm.

**Complexity of Technology – Use of the ERP system requires a lot of mental effort.**



**Figure 6.78: Complexity of Technology – Use of the ERP system requires a lot of mental effort**

An analysis and discussion of findings on Figure 6.78: Complexity of Technology – Use of the ERP system requires a lot of mental effort show:

The Complexity of Technology brought forth the following summary: 0% Strongly disagreed, 0% Disagreed, 55.6% Neither agreed nor disagreed, 33.3% Agreed and 11.1% Strongly agreed.

**The perceived need for Technology – My job requires me to use the ERP system.**



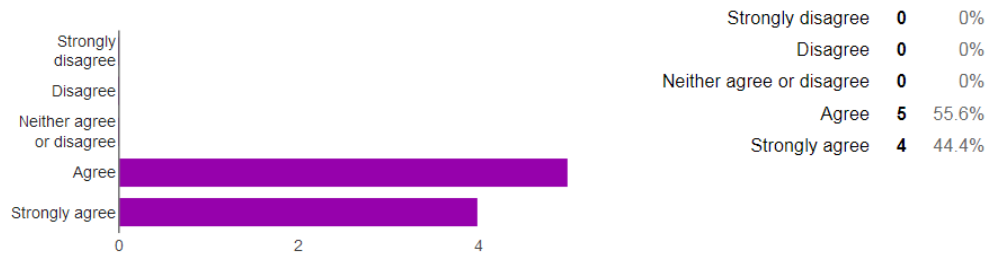
**Figure 6.79: The perceived need for Technology – My job requires me to use the ERP system**

An analysis and discussion of findings on Figure 6.79: The perceived need for Technology – My job requires me to use the ERP system reveals that:



The statistics per category on the above outcome are as follows: 0% Strongly disagreed, 11.1% Disagreed, 0% Neither agreed nor disagreed, 44.4% Agreed and 44.4% Strongly agreed.

**Perceived usefulness -The ERP system is very useful to my job.**



**Figure 6.80: Perceived usefulness -The ERP system is very useful to my job**

An analysis and discussion of findings on Figure 6.80: Perceived usefulness -The ERP system is very useful to my job shows that:

Perceived usefulness tabulated figures as from above outcome are as follows: 0% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 55.6% Agreed and 44.4% Strongly agreed.

**Perceived ease of use-The ERP system has an easy to use interface.**



**Figure 6.81: Perceived ease of use-The ERP system has an easy to use interface**

An analysis and discussion of findings on Figure 6.81: Perceived ease of use-The ERP system has an easy to use interface shows that:

Participants in the category above exhibited the following figures: 0% Strongly disagreed, 11.1% Disagreed, 0% Neither agreed nor disagreed, 66.7% Agreed and 22.2% Strongly agreed.

#### 4. Encouraging end-users or stakeholders to the ERP System to have a powerful ERP user experience

**Information asymmetry (information flow and for collaboration) – The information and related reports in the ERP system are available to me when and where I need them.**



**Figure 6.82: Information asymmetry (information flow and for collaboration) – The information and related reports in the ERP system are available to me when and where I need them**

The analysis and discussion of findings on information flow and for collaboration as from Figure 6.82 reveal:

The figures on Information asymmetry on the above item were as follows: 11.1% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 66.7% Agreed and 22.2% Strongly agreed.

**Contract: I log in to the ERP system because it is part of my contract in using it.**



**Figure 6.83: Contract: I log in to the ERP system because it is part of my contract in using it**

An analysis and discussion of findings on Figure 6.83: Contract: I log in to the ERP system because it is part of my contract in using it shows that:

The tabulation of the item statistics from the above Figure 48 were as follows: 0% Strongly disagreed, 33.3% Disagreed, 22.2% Neither agreed or disagreed, 22.2% Agreed and 22.2% Strongly agreed.

**Risk sharing: I am willing to share ERP experience or technical know-how with colleagues.**

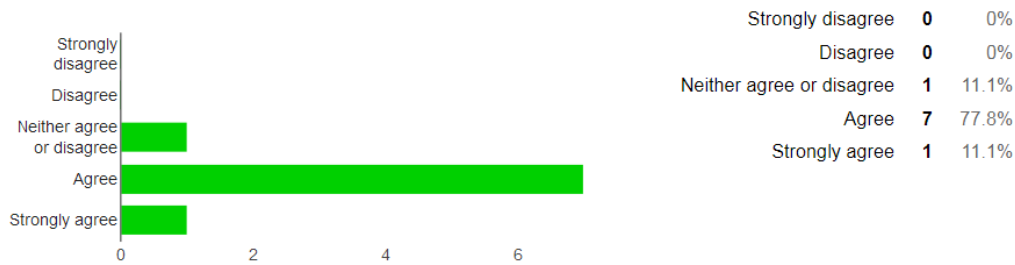


**Figure 6.84: Risk sharing: I am willing to share ERP experience or technical know-how with colleagues**

An analysis and discussion of findings on Figure 6.84: Risk sharing: I am willing to share ERP experience or technical know-how with colleagues shows that:

The presented figures on the above item were as follows: 11.1% Strongly disagreed, 0% Disagreed, 11.1% Neither agreed nor disagreed, 11.1% Agreed and 66.7% Strongly agreed.

**With issues of trust in the ERP system, I have the feeling that system interconnectedness and openness affects my total satisfaction in the ERP system and helps me improve my work.**



**Figure 6.85: With issues of trust in the ERP system, I have the feeling that system interconnectedness and openness affects my total satisfaction in the ERP system and helps me improve my work**

An analysis and discussion of findings on Figure 6.85: With issues of trust in the ERP system shows that:

The respondents' figures were computed as follows: 0% Strongly disagreed, 0% Disagreed, 11.1% Neither agreed nor disagreed, 77.8% Agreed and 11.1% Strongly agreed.

**Technology changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system – I always need technical support to use the ERP system).**



**Figure 6.86: Technology changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system – I always need technical support to use the ERP system)**

An analysis and discussion of findings on Figure 6.86: Technology changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system – I always need technical support to use the ERP system) shows that:

The tabulated figures from Figure 6.86 above were as follows: 0% Strongly agree, 0% Disagree, 11.1% Neither agree nor disagree, 66.7% Agree and 22.2% Strongly agree.

## 5. Issues discouraging users from accessing the ERP System

**Peripheral cues being a process of persuasion (following simple decision rules in ERP system access – When rules and procedures exist in ERP tools management, they are usually in written form).**

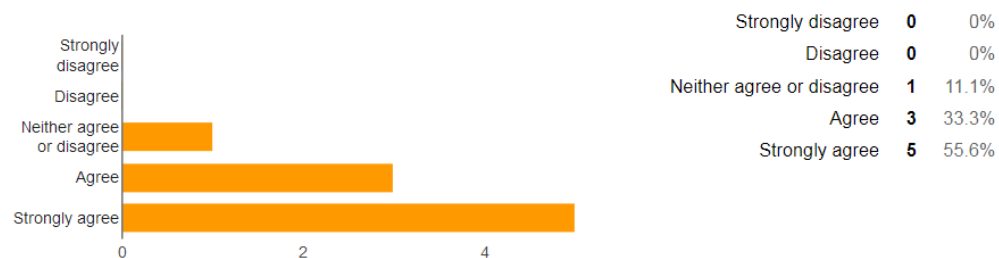


**Figure 6.87: Peripheral cues being a process of persuasion (following simple decision rules in ERP system access) – When rules and procedures exist in ERP tools management, they are usually in written form)**

An analysis and discussion of findings on Figure 6.87: Peripheral cues being a process of persuasion (following simple decision rules in ERP system access) shows that:

From Figure 6.87 above, the summary of figures were as follows: 11.1% Strongly disagree, 0% Disagree, 44.4% Neither agree nor disagree, 22.2% Agree and 22.2% Strongly agree.

**Attitude (Behavioural intention) or individual perception – I feel it is a necessity to use the ERP system to be competitive in the workplace.**



**Figure 6.88: Attitude (Behavioural intention) or individual perception – I feel it is a necessity to use the ERP system to be competitive in the workplace**

An analysis and discussion of findings on Figure 6.88: Attitude (Behavioural intention) or individual perception – I feel it is a necessity to use the ERP system to be competitive in the workplace shows:

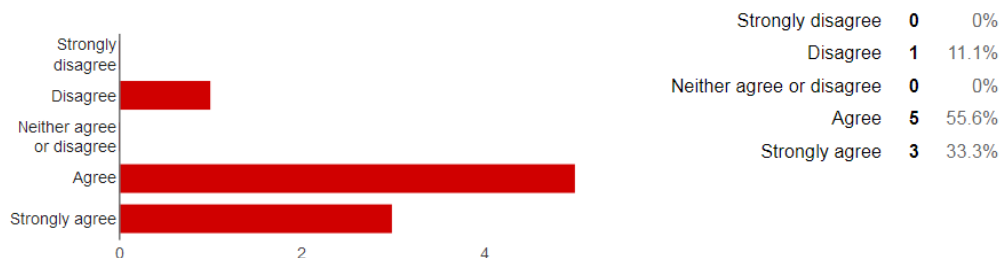
The respondents interaction with the above item, Figure 6.88 were as follows: 0% Strongly disagreed, 0% Disagreed, 11.1% Neither agreed nor disagreed, 33.3% Agreed and 55.6% Strongly agreed.

#### **Section D: Internal and external factors that impact the Enterprise Resource Planning system**

Graphical and numerical representation of participants' scores per item in Section D were exhibited as percentages of respondents that Strongly disagree, Disagree, Neither agree nor disagree, Agree and Strongly agree in the figures that follow.

#### **6. PHEI culture in regard to norms, values and beliefs in supporting departments in ERP tools management**

**Management support in managing ERP tools is efficient and dependable.**



**Figure 6.89: Management support in managing ERP tools is efficient and dependable**

An analysis and discussion of findings on Figure 6.89: management support in managing ERP tools is efficient and dependable indicates that:

The participants articulated the following statistics in the above category, Figure 54: 0% Strongly disagreed, 11.1% Disagreed, 0% Neither agreed nor disagreed, 55.6% Agreed and 33.3% Strongly agreed.

Empirical findings from section 2.6 of the review of literature relate to the findings in this section. “The investigation set up that workarounds influences affect the inner controls over budgetary revelations. Workarounds cause repaying controls to be actualised, which were frequently manual in nature, and declined the authoritative proficiency and viability”. Pertaining to this section’s statistical findings, management support is efficient and dependable in managing the ERP tools, as seen from the respondents statistics as follows: 55.6% agree and 33.3% strongly agree.

**Adequate resources – The management team provides me with the necessary support and resources to use the ERP system.**

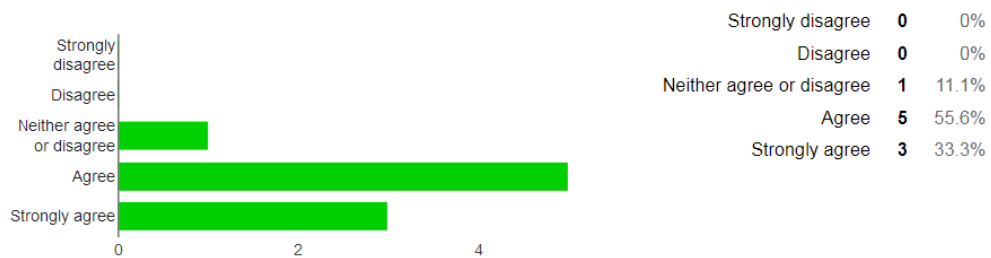


**Figure 6.90: Adequate resources – The management team provides me with the necessary support and resources to use the ERP system**

An analysis and discussion of findings on Figure 6.90: Adequate resources – The management team provides me with the necessary support and resources to use the ERP system reveals that:

The respondents’ summarised figures from above item were as follows: 0% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 66.7% Agreed and 33.3% Strongly agreed.

**My manager encourages me to use ICT innovativeness in the ERP system.**

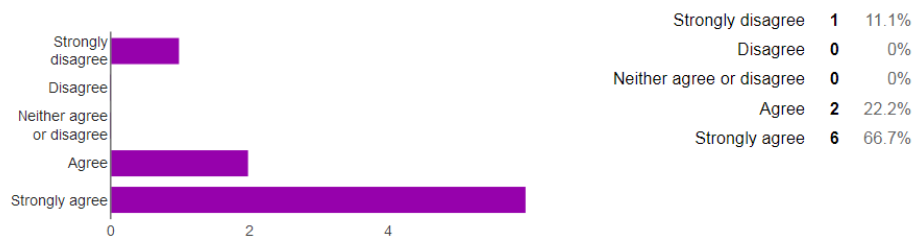


**Figure 6.91: My manager encourages me to use ICT innovativeness in the ERP system**

An analysis and discussion of findings on Figure 6.91: My manager encourages me to use ICT innovativeness in the ERP system shows that:

The tabulated figures on the item: My manager encourages ICT innovativeness are as follows: 0% Strongly disagreed, 0% Disagreed, 11.1% Neither agreed nor disagreed, 55.6% Agreed and 33.3% Strongly agreed.

**User involvement – I am able to recognise the ERP system’s knowledge value learnt.**



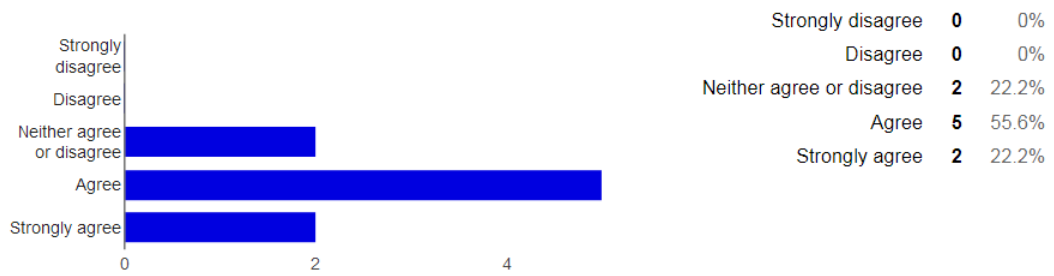
**Figure 6.92: User involvement – I am able to recognise the ERP system’s knowledge value learnt**

An analysis and discussion of findings on Figure 6.92: User involvement – I am able to recognise the ERP system’s knowledge value learnt shows that:

From Figure 6.92 above, the following statistics were presented: 11.1% Strongly disagreed, 0% Disagreed, 0% Neither agreed nor disagreed, 22.2% Agreed and 66.7% Strongly agreed.

**Degree of control – I have enough control in acquiring resources in the ERP system.**





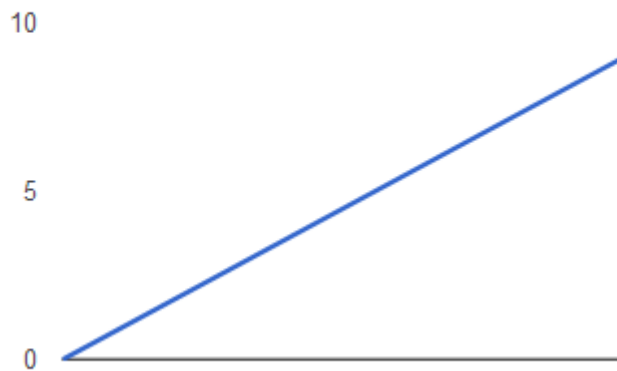
**Figure 6.93: Degree of control – I have enough control in acquiring resources in the ERP system**

The analysis and discussion of findings on Figure 6.93: Degree of control – I have enough control in acquiring resources in the ERP system reveals that:

Pertaining to Figure 6.93, Degree of control presented the following figures: 0% Strongly disagreed, 0% Disagreed, 22.2% Neither agreed nor disagreed, 55.6% Agreed and 22.2% Strongly agreed.

#### Number of Daily responses, December 11; 2018

##### Number of daily responses



Source: Google analytics (2019)

The number of daily responses in the figure above exhibited the number of daily responses on December 11, 2018.

## **Conclusion**

The discussion of the results of the study matched the outcomes per category quantitatively to explanations reflecting SPSS in Chapter 5 that were explained by quantitative data analysis that link to Chapter 4 on Research Methodology. Furthermore, nVivo analysis is linked to the findings that examine records or documents. Document analysis articulates that “archives ought to be surveyed for their fulfilment: as it were, the means by which particular information is assessed. Additionally and of principal significance while assessing reports was not to consider the information as fundamentally exact, precise or finish accounts of occasions that had happened”. The issues were summarised in eight-advanced procedures as:

- Gather significant compositions.
  - Develop an affiliation and organisation outline.
  - Make copies of the first duplicates for clarification.
  - Assessment of validity of reports.
  - Explore chronicle's inspiration, inclinations.
  - Explore established information, for instance, tone, style, reason.
  - Ask inquiries concerning records, for instance, who made it? Why? Right when?
- Kind of data?
- Explore content.

Investigating content implied the route toward examining the written evidence or the authentic substance of the records. One was the gathering technique. For this circumstance, the expert treated the report like a respondent or source that provided the specialist with significant information.

Selected Institutions' document analysis:

### **Document analysis for Damelin Menlyn as part of Educor Group**

“Educor is the biggest private schooling...Educor offers comprehensive support by providing the relevant infrastructures, technology and support systems to accommodate students... at the forefront of higher education...” (Educor 2019).

## **Document analysis for IIE RC PTA and Braamfontein (Johannesburg)**

“The brands under the ADvTECH umbrella operate independently while being fully supported by the group. This enables each brand to focus on its offerings and value propositions such as a unique ethos, products and student learning experience...We own eight distinctive tertiary brands in South Africa and Zambia, including The Independent Institute of Education, which is South Africa’s largest and most accredited private higher education institution/university...” (IIE ADvTECH 2019).

The writings or the reports of the institutions above portray a very important message: that of priding themselves with the art of delivering the PHE attainment with use of technology and its associated benefits. This may be linked to Chapter1, paragraph 9.2 that sought to explore Enterprise Resource Planning tools management in Private Higher Education in South Africa: Critical issues affecting Enterprise Resource Planning tools implementation in academic management.

The next chapter presents the conclusions and recommendations.

## CHAPTER 7

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 7.1 Introduction

Chapter 7 constitutes a summary of the study, conclusions and recommendations to enhance academic attainment. The opportunities for future research are highlighted.

The outputs from the study may be in the form of:

- Presentation at a conference/s
- Journal article/s in accredited journal/s, and
- The study has contributed to the body of knowledge in ERP tools management in PHEIs.

#### 7.2 Findings from the study

##### 7.2.1 Findings on the extent to which models are integrated in the ERP

##### Management system and their applicability

Pertaining to the review of literature from Chapter two, “ERP Agility was clarified as the ERP device territories of cost, quality, reliability, and adaptability that went past the capacity to react quickly to any unforeseen changes in the business condition” (Wijawa *et al.* 2017).

“Furthermore, Babaian, Xu and Wendy (2017) demonstrated that few ongoing investigations of ERP framework interfaces have affirmed that their poor ease of use blocks labourer profitability, in spite of the enormous speculations organisations make in supporting and preparing clients or users. Ease of use challenges emerged from the unpredictability of ERP frameworks, which were planned as a general instrument for plenty of authoritative practices and settings. Determining how to work inside an unreasonably tremendous landscape of ERP assignment pages and parameters was a noteworthy test for most ERP clients”.

“The proposed arrangement in this study that was conducted was dependent on the framework itself to share errand and process data keeping in mind the end-goal to direct clients through learning and playing out their business assignments with the framework. This

point of view emerged from utilising the human– PC joint effort way to deal with the plan of User Interfaces, which were applied as a directing system for the research. This research displayed two interface segments for giving ERP framework clients assignment and process direction: Computerised Playback and Intelligent Process Representation. The oddity of approach originated from utilising the historical backdrop of past cooperations to progressively make enlivened exhibitions out of assignment interfaces and to give an intuitive graphical guide of the present procedure being dealt with by the client”.

The above research presented an opportunity to PHEIs to explore how ERP practices amongst other factors influenced ERP agility within the ERP tools integration.

From the above empirical findings by Babaian *et al.* (2017), the following is related to the study:

The development of an ERP system’s framework requires a holistic approach by looking at issues of cost, quality, reliability, capacity to manage or giving the relevant support and adaptability or compatibility of the ERP system to a firm’s requirements

### **7.2.2 Findings on whether there are current ERP management practices in alignment in the selected HEIs**

In connection to the general review of literature from chapter two of this thesis;

“ERPs have as of late developed in the HE part where they are planned to help the administration of undergraduate information and give vital administration data. Despite the fact that there are numerous studies which have researched imperative parts of the execution of ERPs, one region that seems to have been under-looked into is the means by which these frameworks are embroiled in culture change inside associations. The after-effects of this investigation would empower administrators and additional ly IT masters to increase rich bits of knowledge into tools or solutions management in the HE part and to utilise this learning in the future”.

“In respect of the above, it may arguably be seen that PHEIs had much work relooking into the internal cultures. As explained by Kasemsap (2018) in the study directed; there was a disclosure review of learning exchange; information exchange, work portability, and work assorted variety; learning exchange and backup points of view; hindrances to information

exchange; information exchange and absorptive limit; learning exchange and information securing; learning exchange and virtual groups; and the propelled issues of learning move in current associations. The way toward exchanging information was a continuous movement of picking up, modifying, and making strides. At the authoritative level, information exchange shows itself through changes in the learning of a unit. Best learning exchange endeavours effectively include both the wellspring of the information and its recipient. Setting up execution desires for the individuals who will utilise the learning further evaluates the estimation of the exchange. Institutions considering or utilising information exchange forms, ought to persistently assess their web based life status. The advantages of information exchange for working environments incorporate the increments in efficiency, speed, readiness, benefits, and development”.

Suggestions from literature review:

Empirical findings by Kasemsap (2018) from the review of literature above relate to PHEIs to establish unique ERP frameworks in growing a culture supporting ERP tools management as follows:

- Call or desire for PHEIs to establish robust or dynamic ERP systems as the tool is becoming a vital part in administration of HE establishments.
- PHEIs are urged to grow a culture to support ERP tools management administration within the review of learning and information exchange in meetings users needs.

### **7.2.3 Findings on the service quality levels in terms of perceived usefulness of the Enterprise Resource Planning system**

“Several studies as shown by Moonsamy and Singh (2012), Eid (2017), Spathis (2013), Hitt, Wu and Zhou (2017), Lotfy (2015), Maas, Fenema and Soeters (2016) reported on the formulation of an integrated framework and development of appropriate strategies, as a revolutionary tool besides existing quality models in management systems. As indicated by the above mentioned authors, the study results provided a direction for future research for more effective integration in ERP management. It is this gap that this study intended to exploit as additional elements within integration, such as management of the ERP tool; as the ERP system gets punctuated in meeting the current needs of the firm”.

In reference to the empirical studies findings from above, it is connected to the PHEIs in the following way:

- Organisations need to formulate or develop right strategies that call for ERP system integration in meeting needs of the company's stakeholders or system users.
- As the ERP tool gets expanded in a technological organisation, issues of compatibility of software and applications to the different ERP solutions, ERP departments or tools may not be brought into alignment.

#### **7.2.4 Findings on the extent to which academic Enterprise Resource Planning is responding to stakeholders needs**

The study conducted by Shri Ramwaroop Memorial University (SRMU) is making and spreading information and giving undergraduates an exceptional learning foundation in Science, Technology, Medicine, Management and diverse areas (Agarwal 2018); Chancellor of SRMU and Executive Director, Shri Ramsawroop Memorial Group of Professional Colleges, in a gathering with Elets News Network (ENN). Better propelled instruction realises upgraded business openings. What components should undergraduates recall while picking a specialisation for their graduation and further examinations?

Picking the right course and establishment is champion amongst the most imperative decisions that will impact an undergraduate's entire life. This is simply the reason undergraduates need to first overview, recollecting their destinations. While evaluating an establishment, they should separate whether the techniques for learning will be simply customary or if the association offers current instructing educating strategy. Furthermore, the level of industry focus, nature of the work force and worldwide learning openings should moreover be evaluated. It is also important that the undergraduate pursue studies that have accreditations and affiliations required in the desired course. Having said that, the most basic factor is that the undergraduate should feel that the course and establishment will give the required scope of capacities to achieve the set calling objective.

*How are the Internet of Things (IoT) and Artificial Intelligence (AI) helping propel training systems with getting more understudy support and work-force responsibility?*

Empirical findings by Agarwal (2018) in review of writing audit above relating to enterprise resource planning systems, responding to stakeholders needs:

- PHEIs are requested to have a better propelled instruction within HE ERP s as Educational ERPs are becoming online universities of the moment.
- Propelled training is considered amongst IoT.

#### **7.2.5 Findings on the extent to which internal and external factors impact the Enterprise Resource Planning system at the selected private higher education institutions**

Section 2 of review of literature by Alles *et al.* (2018) state that “workarounds end up coordinated into an association's exercises to meet their business needs. The ebb and flow exploration brings up issues concerning choice of decisions in keeping up hierarchical productivity and control and the need to give client benefit and different business needs”.

This research moved past finding the reasons for workarounds, and extended what was thought about workarounds and their effect on an association. A vital commitment of the present examination is to think about the convergence of workarounds, ERP frameworks, and interior controls.

Findings from the above empirical study relating to PHEIs:

- An establishment is encouraged to explore the flow and nature of work in its ERP to make informed decisions in order to optimize productivity.
- Integration of ERP frameworks and control may influence ERP tools management.



## **7.2.6 Findings on developing a framework to enable effective utilisation of ERP tools to enhance academic attainment**

### **Dissemination of Innovation Theory (DIT)**

Empirical study findings in connection to enabling effective utilisation of ERP tools by Mithi *et al.* (2016):

“Dissemination or Diffusion is clarified as a procedure by which a development is imparted through specific channels after some time amongst individuals from a social framework. The DIT hypothesis ostensibly expresses that the potential clients to the framework may receive or dismiss a development on the preface of convictions that may shape about the advancement”.

Suggestions from literature review section page 53:

“Development Diffusion Theory (DIT) and Technology Acceptance Model (TAM) share regular builds (Mithi *et al.* 2016), that of:

- Relative preferred standpoint: the level to which a development might be thought to Be superior to past thought;
- Compatibility: the advancement seen to be reliable with end clients’ esteems and encounters;
- Complexity: seen as the level of trouble or usability of advancement by end clients;
- Trialability: the degree to which a development might be tried on a constrained scale; and
- Observability: the level or degree to which a development can be seen or might be noticeable to other individuals”.

### **7.3 Findings from the primary research (Statistics)**

#### **7.3.1 Factor analysis**

With SPSS version 25 (2019), the raw data on factor analysis was displayed as annexures within the appendices section of the study. Factor analyses of results were interpreted by variables which were coded in the variable view window, given short descriptions and matched to full names. In this study, 58 participants took part in the study which had 31 items on the likert-rating type of scale with the following number of participants per centre: RC PTA: 42, RC Braamfontein: 9 and Damelin Menlyn: 7.

All the items that were ordinal by selection were selected to measure the Factor analysis of the scale output. The items to the scale were loaded together in the SPSS software with no idea in mind as to how they could form or be divided up. This was an exploratory task that saw how the items came flowing together.

The Factor analysis selection in the SPSS software package followed the order as depicted below:

The researcher clicked analyse button: went to dimension reduction, then chose factor where responses with individual variables were chosen or loaded. On descriptives the initial solution was selected with the four correlation matrices; coefficients, significance levels, determinant and KMO and Bartlett's test of sphericity. The stage that followed was the extraction window, the researcher added scree plot to the default selection which had eigenvalues greater than 1 whereby factors would be selected with eigenvalues that exceeded one.

The rotational block after the extraction window had two types presented, the orthogonal and direct / oblimin. Orthogonal could be chosen if items were not correlated within these selections; varimax, quatrimax, equanax and promax. For purposes of this study, Direct or oblimin was chosen with the belief that the items were correlated or related. The next window was the scores which were left by default and the last selection was the options window which was by default , exclude cases list wise; no cases were excluded as all the data was populated.

The Factor analysis was run and the following deductions could be made: too high correlations could suggest that the items shared the same thing. With determinant, it got to be more than .00001. It is below .00001, shows that items were too unrelated showing that there are too low correlations. KMO above .5 is very acceptable. The higher the value that is above .5 is considered to be better. Bartlett's test of sphericity that was .000 suggested that the p value or the probability value is less than .001. Eigenvalues in connection to the scree plot: The values that are above the eigenvalue of 1 are considered very acceptable matched to the cumulative variance that is above 50. Pattern matrix: The pattern matrix explained how the items loaded together. In this study, by default; SPSS loaded 10 items that converged, other items were excluded.

The input to the Cronbach alpha and Factor analysis was collected by making use of google analytics with an online survey that was discussed in chapter 6.

### **7.3.2 Reliability statistics**

With SPSS version 25 (2019) Reliability statistics were interpreted by variables which were coded in the variable view window, given short descriptions and matched to full names. In this study, 58 participants took part in the study which had 31 items on the likert-rating type of scale with the following number of participants per centre: RC PTA: 42, RC Braamfontein: 9 and Damelin Menlyn: 7. The test of reliability that measured the validity of the scale was run in the SPSS as follows: clicked analyse tab, selected scale then reliability statistics, items, , alpha selected and proceeded to Statistics tab where the following tabs were chosen; item, scale, scale if item deleted and correlations under Means.

The Cronbach alpha that is above .65 is considered good. When the Cronbach alpha is way above .65 close to 1 is considered better. The difference between the Cronbach value found and 1 represents the error in the designed instrument. The goal is to achieve a 100 percent error free instrument but above .65 is very acceptable.

In this study, the following Cronbach alpha's were output in the SPSS per centre as shown from Chapter 5:

RC PTA: .832

RC Braamfontein: .864

Damelin Menlyn: .714

## **7.4 Conclusions (summary of qualitative section after Likert –rating type of survey)**

### **7.4.1 Rosebank College Pretoria**

#### **Section E: Aspects for recommendations**

What aspects were recommended for change?

- The ERP tools managers were requested to stabilise the password for the apps and access codes for computers which changes frequently.
- Constant training and of development of employees on ERP usage and development was called for.
- Accessibility and speed of the WI-FI to be improved periodically.
- More work-based apps and other systems to be brought into the tools.
- To show videos when training new users, written information is not the only way the system users could learn.
- Some respondents found no problems with the ERP tools and that no changes are required at the moment, their version was that it was easy to access ERP.
- Increase performance in the tools in making the ERP faster.
- Other users didnot find the tools to be user friendly.
- Software be updated periodically.
- Improved System Performance with Data Archiving was mentioned.

- Improved interaction with students to be enhanced by streamlining the steps to the ERP tools navigation process. The tools are seen to be congested or having information overload.
- Some respondents requested to institute training for managers as others seemed not always knowledgeable in the entire ERP tools as they should be.

**Table 7.1: Research objectives linked to current and recommended change. RC Pretoria**

	Current practice	Recommended change
<b>Research objective 1</b>  <b>To explore use of models in the integrated ERP management system and their applicability</b>  System reliability and interoperability-accuracy and interactions	<p>The ERP system has been found to be good by most of the respondents in being reliable in providing assessments to students.</p> <p>Few of the respondents articulated that the ERP is minimally linked</p> <p>Interoperability – a call for increased integration across different tools was seen.</p> <p>Some respondents could not see a clear linkage of the ERP to CRM.</p> <p>The strength of network and outside campus accessibility was found to be fair - much improved this year.</p>	<p>The students and lecturers must be updated often whenever there is change, constant communications of changes and interactions benefits all users.</p> <p>The system should be highly accessible and easy to use.</p> <p>There should be increased integration of all the parallel applications that are not yet within one central point of access. The ERP to allow users to access all tools in one place.</p>

		<p>No much change was cited. The current ERP system is still satisfactory to most, in accuracy, interactions and cost effectiveness.</p> <p>Users to be trained in ERP system usage analytics for individual optimum usage over time.</p>
<p><b>Research objective 2</b></p> <p><b>To assess the current ERP management practices in place in the selected HEIs</b></p> <p>Perceived usefulness – format and friendliness</p>	<p>There was a mixed feeling in the category of current practices in the tools. Other participants' found it to be very useful, beneficial, user friendly and helpful whilst others found it not user friendly at all and in actual fact very frustrating.</p> <p>Other users found that the tools graphical user interface is not friendly as some could not find it easy to understand.</p> <p>Users cited that it was hard to access the format on the work that they are doing</p>	<p>New developments to be always communicated to potential users to the ERP when it comes to addition of new tools or apps.</p> <p>Usability to continue: The system should be user friendly so as to encourage every person to make use of it.</p> <p>More visual assistance is needed to simplify the current loaded information. ERP managers to look at interface design.</p>

		<p>No changes had to be made.</p> <p>Tools are still good.</p> <p>The ERP must not be complicated too much. System additions to be something familiar to what the users had been using.</p>
<p><b>Research objective 3</b></p> <p><b>To analyse service quality levels in terms of perceived usefulness of the Enterprise Resource Planning system</b></p> <p>Efficiency and attributes – Network, Band width, Computer speed.</p>	<p>Quality levels were found to be good.</p> <p>Sometimes the computers were slow and the network was experienced to be slow too.</p> <p>The network was good but the speed and the hardware was not enough for everyone to make use of it.</p> <p>Network speed was perceived to be good to many users when logged on in the absence of heavy or many activities calling for most users to be logged on at that time, and these heavy activities slow down the network.</p>	<p>There was need to purchase laptops for all lecturers.</p> <p>Network band width was to be increased for speed and efficiency.</p> <p>There were not enough computers in the cyber center.</p> <p>There was a call for faster network and to allow large numbers of people to access network at once.</p> <p>No changes recommended by some users.</p>

	<p>The tools speed was generally spelled to be good and that it was influenced by high performance computers in the tools.</p> <p>Computer upgrades should be there when needs be for higher information transmission speed.</p> <p>The network band width and computer speed were sometimes very slow.</p>	<p>Accommodate most users; computers speed should be faster and increase the network band width.</p> <p>The network must be fixed by going wireless in most connections.</p> <p>Computers with high performance were requested to be annexed into the tools to increase network speed (efficiency and attributes).</p>
<p><b>Research objective 4</b></p> <p><b>To examine the extent to which academic Enterprise Resource Planning is responding to all stakeholders needs</b></p> <p>Rapidly changing environment</p>	<p>No change was required to the ERP tools though change was good, it would always happen.</p> <p>There were efforts being done to cope with changing environment in the system.</p> <p>Shortage of some applications like those for assignment marking affected the system negatively.</p> <p>The system was changing with time which was very encouraging.</p>	<p>Not applicable.</p> <p>Send the lecturers for training.</p> <p>Constant updates to changes should continue.</p> <p>Some users found that the rate of change to the tools was not quick enough so as to cope with the much needed demand.</p>



	<p>The system was easily adaptable.</p> <p>The tools are up to date.</p> <p>The ERP asset was manageable.</p> <p>Tools are easily adaptable.</p> <p>Tools needed to be Improved.</p> <p>Changing environment, should not be very abrupt to the tools.</p> <p>Users to get updated with new trends by using social media.</p> <p>ERP should be flexible.</p> <p>The software was to be updated as much as possible.</p> <p>Users were coping well with the system.</p> <p>Other users were adapting slowly to the tools.</p>	<p>No change was required.</p> <p>No change had to be made.</p> <p>No much change recommended.</p> <p>ERP tools ought to be simple to use.</p> <p>More improvement to the ERP tools and suited for environment.</p> <p>It was sometimes a problem keeping up with new trends of having system additions every year and business enterprises were affected by those changes, the recommendation was that companies who were busy developing new gadgets should wait at least for a year before releasing the new solutions to the markets because the current tools were not yet optimised.</p>
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		<p>ERP management team should update users of the current changes that they need to make to the tools.</p> <p>The right tools configuration skills ought to be in place</p>
<p><b>Research objective 5</b></p> <p><b>To ascertain the internal and external factors that impact the Enterprise Resource Planning system at the selected private higher education institutions</b></p> <p>Management support - education and training</p>	<p>Essentially there was management support.</p> <p>There was adequate support in education and training in terms of using the ERP systems among the lecturers. Both lecturers and learners should also be supported in ERP usage and development.</p> <p>The management support was not good enough although to some extent they were doing their best to get things going.</p> <p>Management team was doing all they could in their power to support the personnel to master ERP.</p>	<p>More training to enhance the full functionality of the components in the system.</p> <p>The Business Faculty lecturers and other faculties must be informed regularly about the changes.</p> <p>Continual refresher course and developments should be done.</p> <p>The management should provide with the much needed support not only in encouraging the use of ERP but with</p>

	<p>The ERP system was easy to utilise for school purposes as well.</p> <p>Management support was to pay more attention to beginners.</p> <p>There was more support needed in the system.</p> <p>The ERP tools are currently functioning well.</p> <p>Education and training of the ERP tools to be there more often.</p> <p>Educating and training managers was essential for any business. Systems manager should have acquired knowledge of the current system by giving trials to new users of the system.</p> <p>The current ERP education and training was found to be inadequate though the campus offered the training.</p>	<p>the provision of the resources needed.</p> <p>Management should give training on how to use ERP.</p> <p>The tools must be friendly for students.</p> <p>ERP student tasks made the students' jobs easier in that they could be supplied with more material in this area.</p> <p>Businesses must at all times train new staff promoted to management positions for them to be able to cope with the new environment.</p> <p>CRM integration to be visible to users.</p> <p>More educational training should be conducted on how the systems work in the main tools.</p>
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<p><b>Research objective 6</b></p> <p><b>To develop a framework to enable effective utilisation of ERP tools to enhance academic attainment</b></p> <p>Other: (Specify)</p>	<p>The APS system in the tools was one example of an integrated solution that sought to maximise tools effective utilisation within human resource functions.</p> <p>ERP had improved lots of functions as an Institution.</p> <p>Challenges were with availability of data and slow ERP system due to many users and low bandwidth. There had been a lack in the will on the management side to give the much needed framework in the space of ERP.</p> <p>Problems with online support needed to be dealt with.</p> <p>Others saw a development of ERP framework to have applied to big companies. The term big companies could not be defined.</p> <p>Graphic design: The ERP framework was encouraged to contain the training and motivational component for the system</p>	<p>The developed framework was to accommodate all ERP tools users.</p> <p>Network bandwidth to be increased. ERP should match that of developed countries with time to enable the firm to become globally competitive.</p> <p>Management should at all cost demonstrate willingness to transform in the improvement of the ERP.</p> <p>An online support facility improvement is necessary.</p> <p>No change to the tools was recommended by other respondents.</p> <p>Workers must learn to work in a group.</p> <p>Lecturers needed to be motivated and trained properly.</p>
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	users for them to be trained properly.	
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#### 7.4.2 Damelin Menlyn Pretoria

##### Section E: Aspects for recommendations

What aspects were recommended for change?

- To have an electronic access tag when users entered the campus and not filling up campus entry forms.
- The use of recent apps.
- More advanced IT infrastructure to handle the ERP system to work effectively. It had to contain an environment for students to receive results on.

**Table 7. 2: Research objectives linked to current and recommended change. Damelin Menlyn Pretoria**

	Current practice	Recommended change
<b>Research objective 1</b>  <b>To explore use of models in ERP integrated ERP management system and their applicability</b>  Interoperability – reliability accuracy and interactions	The current tools are seen to be reliable for marks capturing but not convenient enough for preparation of lessons.	Practice: there ought to be a change in the system itself for it to be user friendly.

<p><b>Research objective 2</b></p> <p><b>To assess the current ERP management practices in place in the selected HEIs</b></p> <p>Perceived usefulness – format and friendliness</p>	<p>ERP component format was articulated to be friendly in ERP tools.</p>	<p>Damelin to improve their systems if needs be.</p>
<p><b>Research objective 3</b></p> <p><b>To analyse service quality levels in terms of perceived usefulness of the Enterprise Resource Planning system</b></p> <p>Efficiency and attributes – Network, band width, Computer speed.</p>	<p>The network was not always good but the hardware had to be advanced.</p>	<p>Increase the bandwidth, well advanced hardware that use fiber-optic cables so that the internet would be fast.</p>
<p><b>Research objective 4</b></p> <p><b>To examine the extent to which academic Enterprise Resource Planning is responding to all stakeholders needs</b></p> <p>Rapidly changing, dynamic environment</p>	<p>Not applicable.</p>	<p>New apps and new machines or computers were called for.</p>

<b>Research objective 5</b>  <b>To ascertain the internal and external factors that impact the Enterprise Resource Planning system at the selected PHEIs</b>  Management support - education and training	The management team were in support of education and training.	Let the HE management team sit in class and listen to lecturers lecturing, so that they can see the lecturers challenges met in those classes.
<b>Research objective 6</b>  <b>To develop a framework to enable effective utilisation of ERP tools to enhance academic attainment</b>  Other: (Specify)	Not applicable.	Not applicable.

### 7.4.3 RC Braamfontein

#### Section E: Aspects for recommendations

What aspects were recommend for change?

- To encourage students to be active in using ERP systems.
- Manual guide for staff to refer to in case one gets lost with system processes or steps while working to avoid disturbing others.
- There should always be a backup whenever the internet is slow because whenever the internet is slow, interaction between colleagues stops.
- Increase bandwidth.

- Faster internet, and faster PCs.

**Table 7.3: Research objectives linked to current and recommended change. RC Braamfontein**

	Current practice	Recommended change
<b>Research objective 1</b>  <b>To explore use of models in the integrated ERP management system and their applicability</b>  Reliability, interoperability-accuracy and interactions	<p>The system was reliable but there was a problem of internet connectivity at other times.</p> <p>The users experienced issues with internet connection such as failure to submit work that they had applied for.</p> <p>The users were able to work together and exchange information.</p> <p>The system was reliable in terms of the organisation, safety and the information could be kept for future use within the computer memory archives.</p> <p>The ERP enabled the company to exchange information, which was well organised in the tools and managed easily.</p>	<p>The ERP tools should work even if there is no internet.</p> <p>Network should always be connected and in good speed.</p> <p>There is a need to navigate around the ERP system's tools every day for simplicity and understanding in order to maintain quality of work as an alternative to mandatory routine of work.</p> <p>The system should always provide the user guides or user instructions to assist an individual who is having no idea on how to use it.</p> <p>The user's current system's satisfaction is high and that the current ERP format need not to be punctuated highly.</p> <p>ERP system was slow at other times.</p>



	<p>The system was very reliable. The tools produced accurate information when requested.</p> <p>The ERP system was reliable and accurate because it helped to manage the business and automate many back office functions related to technology, services and human resources. It worked very well.</p>	
<p><b>Research objective 2</b></p> <p><b>To assess the current ERP management practices in place in the selected HEIs</b></p> <p>Perceived usefulness – format and friendliness</p>	<p>The system was very useful to the students and staff.</p> <p>The ERP tools should be easy for optimum utilisation from the staff.</p> <p>The ERP was user friendly and manageable, once an individual got the ERP training and knowledge on how to use the system, it became very easy to use and navigate around it.</p> <p>The ERP system was very friendly and useful because students could easily access information sources online rather than searching for</p>	<p>The internet connection should be attended to at all times to address issues of loss of connection.</p> <p>The manual way of doing things could be changed and move to a digital system since users are into fourth and higher industrial revolution of technology, management team ought to carefully test with personas and select the ERP tools that are befitting their HE institutional requirements.</p> <p>More content to assist students can be added on to</p>

	information manually and this made jobs or tasks to be performed.	the system but in a streamlined manner.
<b>Research objective 3</b>  <b>To analyse service quality levels in terms of perceived usefulness of the Enterprise Resource Planning system</b>  Efficiency and attributes- Network, band width, Computer speed.	Service is currently useful and dependable.  Some of the computers were very slow.  There was experience with network problems but not all the time, everything was all excellent.  The internet needed to be strong even if it was Wi-Fi connection for smooth usage and easy flow of work.  Sometimes the network became a problem and made users' work difficult to manage.  When the computer laboratories were empty with no other users, the speed and bandwidth was good but sometimes the network and computers functioned slow.	Slow computers in terms of performance should be fixed with full speed and replaced with quality computers.  Outdated computers need to be simply replaced.  ERP that is controlled by network hardware cabling through electricity is seen to be robust compared to WI-FI with weak connections because at times, the WI-FI becomes slow and makes it difficult for users.  The firm may put fiber optic connections in campus for fast internet speed for work efficiency and effectiveness.  Software could be updated more often so that the computers could speed up and network could be fast.

<p><b>Research objective 4</b></p> <p><b>To examine the extent to which academic Enterprise Resource Planning is responding to all stakeholders needs</b></p> <p>Rapidly changing, dynamic environment</p>	<p>The encounter was good in this area. Users needed to adapt with time.</p> <p>ERP tools users needed to attend workshops in order to familiarise themselves with what was happening around them so that they will be able to cope with the rapid change of the system within the organisation.</p> <p>The ERP tools are considered dynamic by users in the campus.</p>	<p>Tools users should be trained first on how to use the established PHEI systems.</p> <p>ERP specialists to train staff or do practical workshops to enlighten them about the systems.</p> <p>There should be more of improvement in terms of the type of electronic devices that are used such as updated computer machines because such updated PCs sometimes have an influence on the speed of the ERP system.</p>
<p><b>Research objective 5</b></p> <p><b>To ascertain the internal and external factors that impact the Enterprise Resource Planning system at the selected PHEIs</b></p> <p>Management support - education and training</p>	<p>The management support team held seminars to share ERP tools insights with staff.</p> <p>The organisation was able to run the process of education and training in a way that users were in control of keeping relevant information for future references.</p>	<p>ERP system training and increased training programs is required for system users.</p> <p>Practical videos could be created for users to refer to, on how to use the relevant tools, and since there is an approach to the 5th industrial revolution there is a belief that the organisation should be up to date in terms</p>

	<p>The system had a lot of content that could be overwhelming to both students and staff members.</p> <p>Staff and students could be given education and training and were taught on how to access information on their portal and search information sources using the system, and as for the staff they conducted workshops where staff members were taught about the ERPs.</p>	of the new systems developments.
<p><b>Research objective 6</b></p> <p><b>To develop a framework to enable effective utilisation of ERP tools to enhance academic attainment</b></p> <p>Other: (Specify)</p>	<p>Creation of power-point slides and uploading videos on Social media of the campus for easy access and guidance to staff members.</p> <p>There should always be backup of the information kept within the system in the event that the information gets corrupted.</p> <p>Content security seemed to be lacking.</p>	<p>Going for Community outreach so that societies, get to know and understand how technological systems and softwares work.</p> <p>The ERP tools system integration and agility should work hand in hand with other interconnected tools to avoid losing relevant information. This could help in case the company system gets corrupted, and users will be able to access or retrieve a different system which was</p>

		<p>used to save the very same information that was backed up before the loss.</p> <p>There may be an increase in security of content in the system.</p>
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## 7.5 Formulation of study

The objectives of the study were achieved. Significant findings were made as well as relevant recommendations. The study was conducted to determine critical issues influencing Enterprise

Resource Planning (ERP) tools in academic management in Private Higher Education Institutions (PHEIs), in South Africa within the enquiry of a case study, in order to explore and

determine the internal and external factors that were having an influence on ERP tools for integrated management systems.

## 7.6 Recommendations

**Exploring use of models in the integrated ERP management system and their applicability**

### RC PTA

Linked to Nvivo qualitative data analysis, RC PTA should continue with the practice of assessing what is happening within its ERP system through technological surveys in getting insights from users as to what is it that they may do in addressing issues that may be deemed important, emanating from users suggestions.

### RC BRAAM

It is recommended to RC Braamfontein to maintain and go above the current level of ERP tools robustness which at present has been revealed to be easier and efficient to use. In the event that there is an addition to the tools, tools managers should ensure that systems integration does not bring about a downgrade of the present versatility of the tools (linked from interviews, Nvivo qualitative data analysis).

## **DAMELIN MENLYN**

Revelations from Nvivo data analysis from interview schedules has found that the Damelin ERP system is not integrated, and it is recommended that HE managers in a holistic approach, with a representation of their relevant departments, should consult with the people who are developing the ERP systems to use Damelin ERP tools personas, in having one on one interviews and in that way they will be able to know what kind of systems and functions need to be edited on the particular ERP tools that are currently being used in the institution.

Empirical study findings from section 2.2 of review of literature related to the above recommendations:

“Findings from previous studies Peng and Nunes (2017), Schniederjans and Yadav (2013), Alhirz and Sajeev (2015) had reported that it was of paramount importance to establish an evidence based approach in the use of ERP models within the ERP management ever changing area. Regular evaluations on the post -ERP implementation were greatly encouraged to be taking place regularly, for identification of misfits and towards continuous improvement”.

“Generally, Venture Resource Planning (Enterprise Resource Planning) usage had difficulties with a specific end goal to expand the execution” (Wijawa, Kosala, Meyliana and Prabowo 2017).

The motivation behind the examination was to propose an elective approach for ERP framework with a specific end-goal to improve the association execution. The technique for approach was Systematic Literature Review (SLR) for building up a spry (agile) structure for ERP framework that included 54 papers for inquiry. The examination discoveries uncovered a coordinated structure as an instrument for more improved ERP framework. The exploration propelled the data from different analysts and practices to building up a deft structure for ERP framework as an elective arrangement keeping in mind the end goal to

upgrade the execution and expanding upper hand of associations towards business competitive advantage.

“ERP Agility was clarified as the ERP device territories of cost, quality, reliability, and adaptability that went past the capacity to react quickly to any unforeseen changes in the business condition” (Wijawa *et al.* 2017).

### **Assessing the current ERP management practices in place in the selected HEIs**

#### **RC PTA**

The interview schedules that accompanied Nvivo data analysis suggest that there needed to be training programs over and above what is currently being offered in ensuring that there is maximum use of resources.

The study recommends to PHEI, RC PTA to increase stakeholder consultations. The training programs especially at the beginning of the month in the year are not enough. Having orientation on systems once in a semester is an on going effort at RC PTA. Lecturers rarely get surveys about service to bring in suggestions of service. They hardly have training in the system except in something new like in the HR system.

#### **RC BRAAM**

A qualitative data analysis revealed that in the event that the library team is introduced to the different type of systems, it conducts workshops, for instance, turnitin on how students log in, upload the assignment and associated tasks. Workshops are done for students to help them understand how the system works. In as much as Braamfontein campus is concerned, it is striving very hard to ensure that the employees are familiar with the systems that are being used in order to process work and adapt to the ERP tools system culture; it is recommended that the tools should come with some videos, PowerPoint slides, or anything that will make the staff members to be attracted to it, like for example given that sometimes it takes time for employees to understand the new system, in this regard like workshops should be presented to employees. By holding seminars, it will be simple for the staff members to get to be familiar with the system and by doing so, it will make their staff members share their knowledge with others in a simplified manner. Sharing of knowledge will ensure that users get more experienced with the system, which may benefit the organisation.

Furthermore, specifically when it comes to the students; it is suggested to attach guides to assist in how to use the systems; the hub, the student portal amongst others. Pertaining to students, some of them are not familiar with tools. It is going to be easier for students when the guides are attached on how to go about the different areas.

### **DAMELIN MENLYN**

As shown from the data synthesis, HE Damelin Menlyn need to have actually almost all people working there with the ERP system be trained on how to use it, and how to use all the tools that are given with the ERP system; this will also reduce human errors on the system and actually get to know all the functionalities that are there that are not used currently, because there may be a belief that some other functions that are there are not used.

In as much as Damelin Menlyn is putting in other systems like CRM, so that they can integrate it with ICAS, it is recommended to redirect the methods and the procedures that will ensure that the tools are integrated as one solution.

Empirical study findings from section 2.3 of writing audit in connection to recommendations in assessing the current ERP management practices in place in the selected HEIs:

“Generally, findings by Srima and Wannapiroon (2013), Tabbara (2016), and Al-Mashari (2017) postulated that there should be a thorough preparation of Total Quality Management Information System (TQMIS) on current practices in ERP management in terms of principal or fundamental technology, placing a focus on basic equipment for access to the Internet and the network system”.

“Furthermore, the above mentioned authors argue that the perceived effective ERP management, uses an integrative approach aiming to achieve a balance amongst certain key institutional elements”. The findings in this section were pertinent to this research, in that there was a regard of network system and Internet connection at the heart of main technology. This resonated well in giving a compelling reason to exploit the gaps in ERP tool management misfits.



“It is shown that academic associations spend a great deal of cash, time and assets on big business framework (ERP) execution and regularly they do not understand the normal-advantages from these mind boggling frameworks”.

### **Analysing service quality levels in terms of perceived usefulness of the Enterprise Resource Planning system**

#### **RC PTA**

Despite that quality levels have been well appreciated in terms of perceived usefulness, in accessing the school Wi-Fi, access to information and security of the system in terms of updates against malware or viruses, there is lamentation around the account password changes that passwords get configured too often, per user's account in the tool. In this regard, it is recommended to RC PTA to come up with a mechanism that will simplify the issues around password changes, if not in giving out a password change that may last users life time with the institution.

Regarding lecturers it is recommended to the institution to find ways of motivating lecturers, financially, academically and technologically in promoting the ERP usage, for other lecturers are having the view that the management team is saving financially at their expense on other areas to promote the system.

#### **RC BRAAM**

Since most users find the ERP system captivating in this section, with the ability to outsource and exchange information with external stakeholders, it is recommended to RC Braamfontein not to retract their present ERP practices in place but continue finding ways to enhance the quality levels.

#### **DAMELIN MENLYN**

The recommendation in this area is that it should improve on the functionality of the system, which is perceived by its users for not working to its level best. From the data analysis, users are experiencing average internet connections and loss of internet connectivity in the PC laboratories. Generally at the campus, it is revealed that the internet speed is perceived to be very slow, in that a user of the system or tools cannot access some of the needed apps. With the phones, there is better internet connection at the library but there is a setback to the users

in that with the phones, users may not optimise the tools other than just accessing some information.

Password changes to have a clear protocol in the reset and steps in making password changes, for some users are getting lost as to how they get locked out of their users' accounts unknowingly. Empirical study findings from review of literature, section 2.4 related to the recommendations in terms of perceived usefulness of the Enterprise Resource Planning system (analysing service quality levels):

“Several studies as shown by Moonsamy and Singh (2012), Eid (2017), Spathis (2013), Hitt, Wu and Zhou (2017), Lotfy (2015); Maas, Fenema and Soeters (2016) reported on the formulation of an integrated framework and development of appropriate strategies, as revolutionary tools besides existing quality models in management systems. As indicated by the above mentioned authors, the study results provided a direction for future research for more effective integration in ERP management. It is this gap that this study intended to exploit as additional elements within integration, such as management of the ERP tools; as the ERP system gets punctuated in meeting the current needs of the firm”.

### **Examining the extent to which academic Enterprise Resource Planning is responding to all stakeholders needs**

#### **RC PTA**

Recommendations from the study in meeting stakeholders needs is highlighted as follows:

To increase the amount of computer time in the library for student users do not find allocated time, per booking, of one and a half hour not enough. The college should look at the number of students which is above 4000 in coming up with other alternative arrangements for the library computer bookings. Extended computer rooms outside of the library at peak student times is encouraged.

To look into the ERP system agility on the academic side in terms of responsiveness of some loaded or requested tasks or work across. A further analysis in the system is called for as differentiating factor to the tools responsiveness to activities or tasks. A request is seen to

increase the number of computers in the lecturers lounge in matching the number of lecturers though the matching criteria may be subjective.

To look into other alternatives of lecturers marking on RC Learn supported with the marking software to work besides the current upload of students work which takes a very long time in marking. RC PTA to always support the assessment team that captures students' results online, ERP tools to always have enough staff to capture students work on time and support speeding up the work for the other end users to see the results quickly.

Sometimes Wi-Fi is slow or inaccessible, it only allows a certain number of students to connect to it at a certain period of time, allowing for student disconnects, and then another one to connect. Therefore to allow every student to actually have a fair accessibility to Wi-Fi, it is suggested to increase the number of students to certain Wi-Fi group connections.

The ERP tools management team should ensure that there are more functional PCs in the computer rooms to match the growing number of users to the tools.

The ERP tools management team are encouraged to be proactive at all times. In terms of service delivery response times, users perceived it to be fast and to be slow at other times when the tools management team is understaffed.

To relook into the student hub application requests for alternative student arrangements, in the event that students cannot connect to it in good time. From the data analysis, some users were concerned that sometimes they could not connect. Feedback given was the opposite of what they could expect.

#### **RC BRAAMFONTEIN**

As highlighted from the study, Braamfontein's aspect that the ERP tools department should work on was internet which was said to be slow due to certain user activities at campus level. This was assumed that it would also be the case nationally within RC affiliated brands as they were sharing the same ERP platform tool despite brands being named differently like VEGA schools and Varsity colleges.

Tools management of individual account password resets to be relooked at. Frequent changes or changes after every three months is assumed to be problematic by system users.

## **DAMELIN MENLYN**

Based on findings from the qualitative data analysis, it is recommended that the institution fix the system which sometimes crashes with no internet and access to the system, which one may just learn within an hour in getting to understand. The problem was highlighted as internet connectivity.

Additionally, frequent updates to the system are recommended to improve system speed and tools quality besides management of other soft and hardwares, as not all students may have better mobile devices to connect to the internet because computers are found to be slow, sometimes not even working.

To relook into installing apps that are compatible and suitable in the tools for the users.

To train students in accessing the online educational tools using their own mobile devices besides computers and laptops as an alternative login in the event of other system crashes.

Empirical study findings from section 2.5 of literature review, related to the recommendations regarding examining the extent to which academic Enterprise Resource Planning is responding to all stakeholders needs:

“The study by Mate, Bacs and Takacs (2017) in Hungary showed that in the course of the most recent couple of decades, associations as well as Higher Education Institutions ought to be more receptive to the requests of the changed worldwide business condition and enhance HEIs viability. The inspiration in this research was to evaluate the execution of an Enterprise Resource Planning (ERP) framework in advanced education and HEIs related advantages, with an emphasis on undergraduate students' execution while applying a System Application Product arrangement. This paper investigated the precision of college undergraduate students, concentrating essentially on the idea of self-appraisal as ERP users anticipate and assess their own execution with respect to their remotely evaluated accomplishment. In the pre-and post-examination expectations the higher education understudies appear to anticipate and assess their examination more precisely than their lower-accomplishing colleagues”.

“As reported by Khalid, Smash, Soliman, Khaleel and Islam (2018) are in tandem with Mate *et al.* (2017) and Argawal (2018) towards ERP management tools for digital universities. The digitisation has provoked learning, especially advanced education at a quick pace.

Advanced Education Institutions are in basic need to execute current innovations to remain carefully important and separate themselves as computerised pioneers. Despite the fact that numerous colleges have particular advanced plans and systems, yet usage of these up to the most noteworthy models is something numerous foundations are inadequate with. This research accentuated that higher education institutions are in need to ponder the effects of a dynamically advanced world. The developing innovations and their impacts on foundation of an advanced grounds have been studied and illuminated. Besides, the conceivable hindrances and the approaches to outfit digitalisation effectively have likewise been explored. The study, at last, proposed an advanced model for advanced education institutions to execute a computerised technique for the whole foundation to receive the rewards joined to the innovative movement. This study managed to help higher education institutions to comprehend the basic need of computerised vital plans and aid the adaption of the advanced change”.

### **Ascertaining the internal and external factors that impact the Enterprise Resource Planning system at the selected private higher education institutions**

#### **RC PTA**

It is suggested in the qualitative study to encourage staff in regular use of the ERP system besides issues of HR claims that require all staff to use the APS.

Increased ERP training. RC PTA has got an electronic environment that is established in place, like recruiting people who are able to use systems. That is another way of ensuring that tools usage is encouraged.

Lecturers to be able to interact with students on the systems, with competent educational ERP tools knowledge, bringing in a certain way of interacting with students, for most students may not know how to use the software. RC PTA to keep on mobilising new students to attend the training on how to maximise the tools.

It is requested of ERP tools team to provide some school laptops to students to be used at times, away from normal or designated contact points in the event that students are having limited time due to heavy activity on a certain day in the campus whereby almost all college computers are fully booked.

It is recommended from the study that there should be consistency in most of the areas. Consistency does not mean there should be no changes, there should only be like a minor change that can be carried on being notified in time that there would be a change but if it happens immediately, it disrupts everything.

By making lecturers get familiarised to the system which the institution is using despite being at Rosebank or any other institution. Tools configuration managers for lecturers are encouraged to load information that is supposed to be there in ensuring that the tools are user friendly. They should create user friendly documents where lecturers get to access the documents, with simplicity of navigation, and there must be differences again in the website for the students and the lecturers, for other lecturers could not tell the clear differences between the student and lecturer sides.

#### **DAMELIN MENLYN**

The institution is encouraged to rebrand itself of the internet crashes, at times internet does not work at all. This may explain internet connectivity losses because of the hardwares that are not working properly. It is believed from the study that having fiber optic installed in the company will assist in ensuring that the internet is faster with stable connectivity.

The institute is requested to bring in a vibrant student portal besides the Academic Advising Centre, that is not considered robust and not aligned in meeting student academic needs.

Empirical study findings from section 2.6 of review of literature, related to the recommendations regarding ascertaining the internal and external factors that impact the ERP system at the selected PHEIs:

“Findings of Kinuthia (2014), Pishdad and Haider (2013), and Whitcomb (2016) had scantily reported on speed and bandwidth of the cloud ERP management. Despite this reporting, the authors are advocating firms to have a better understanding of ERP institutionalisation drivers of success. Learning Management Systems within the general systems theory are reported to be one component that is independent of other areas within ERP management, interacting with the outside world. The area of speed and band width as stipulated by the authors in this section, presented a gap to be studied within ERP tools management”.

## **Developing a framework to enable effective utilisation of ERP tools to enhance academic attainment**

### **RC PTA**

The study recommends to RC to generally try to be up to date with the services and installations, and exercises in promoting the ERP system by continuously lecturing users to the ERP tools to do the work properly.

To continue loading more module briefs to assessment guidelines in assisting the learners who are unable to have contact learning time with their coaches.

There is a perception from some tools users that a lot of meetings have been held whenever there is difficulty / challenges in loading up information using the internet or with the computer, if these meetings could be held prior to the changes that could happen, it becomes a positive change that does not affect productivity.

Empirical study findings related to the recommendations pertaining to enabling effective utilisation of ERP tools to enhance academic attainment, from section 2.10.1.3 of literature review:

“Eldridge and Gould featured in guides.lib.byu.edu (2018) postulate that the focal suggestion of punctuated balance epitomises three ideas: stasis, accentuation and predominant relative recurrence. Stasis alludes to an extensive stretch of a moderately unaltered frame; accentuation is radical change over a brief length; and predominant relative recurrence is the rate at which these occasions happen in a specific circumstance. Punctuated harmony was produced as a contrasting option to phyletic gradualism, which stresses predictable, aggregate changes to species. Inside the setting of hierarchical conduct, the punctuated balance pertaining to stasis, accentuation and predominant relative recurrence comprises profound structures, balance periods and progressive periods. Profound structure is the arrangement of central decisions a framework has, made of:

- The fundamental parts into which its subsets will be dealt with and
- The basic development outlines that will keep up its existence”.

## **7.7 Scope for future research**

### **RC PTA**

The study recommends that there may be a need for HE departments that are stakeholders or those that assist PHEIs to help in formulation of a standardised HE ERP architectural system that may meet most needs of the PHE ERP tools. ERPs that are found in the market as already configured LSM's, may be expensive to buy and manage by many PHEIs. A standardised system may be easy to manage and supervise within a certain policy. The standardised ERP is not to be enforced upon PHEIs, but should be a matter of choice in adopting it or not.

Private higher education institutions may integrate or have their own parallel ERP systems to the standardised one.

Having an education ERP tools with a vibrant website may be considered a competitive bid by many potential customers or students, a place to enroll with. Vibrant PHEI ERP tools with a dynamic HE website may be perceived as the online university of the moment by numerous potential clients.

### **DAMELIN MENLYN**

For the purposes of future research, looking at the state of ICAS at Damelin Menlyn, the study recommends that there may be need to have additional studies to the ERPs, but within the need for customised dynamic ERP system integration in upcoming PHEIs.

## **7.8 Recommendations from data gathered**

### **RC PTA**

Within the dynamic ERP technological advancements that PHEIs are surrounded with, it may be deemed fit for HE institutions to consider having an offline system access functionality in meeting needs of ERP tool users in a diversified way.

The study suggests having enhanced coach and students personal interactions through online conference tools, the practice that may be backed up and carry the same weight and recognition as physical learning contact hours.

### **DAMELIN MENLYN**



The qualitative data analysis brought in a debate that HE ERPs must or may integrate all those particular factors that coordinate and interact, changes made in one factor should also reflect in another factor or module. ERP tools security features should be instituted at all levels of the main tools.

The ERP tools system has to be such that if there is a change in one module that is in the same hierarchy to other modules that get affected, means that particular action could also be traced in other modules. And those kind of systems are less to be interruptible in a sense that people cannot manipulate the system anyhow, for such actions may be picked up quickly when someone is trying to configure the tool in a manner that is unauthorised.

Issues of integration in selection of any robust, dynamic PHEI tools may call for a firm's financial readiness and companywide consultations with potential users of the system. Bringing in such a discussion in preparation to single out tools that may be selected over time, may be an issue that is seldom shared by top HE executives, as other decisions in the ERP tools selections may seem just to be imposed upon the departments.

Rules and policies of an organisation may hinder progress of the institution. One may find that there is a certain initiative that may enhance a particular department or organisation, but when one looks at the rules, the rules may not actually give any way to suggest changes; and users or potential users to the system are confined to operate in a certain frame-work. Besides this, there may be quite a number of factors that can be of hindrance or constraints in terms of trying to bring something new.

HE ERP that does not have a student portal, without integrated online issues of applications, checking of results, enhancement of teaching and learning but partly integrating one or two departments in isolation to others, may not be considered fit or robust as an educational ERP.

## **7.9 Conclusion**

It may be considered paramount that a PHEI establishes robust, dynamic, agile and versatile ERP tools that may be easily punctuated or added to existing tools within the ERP integration of tools. In this way, it may become simple for the company to adjust in many areas in managing and controlling of security features in the ERP tools. One example may be that of finances, that may not allow students that owe fees to the institution to access their student account with academic information. When private institutions do go that route, of complete HE ERP integration, it might be helpful to sustain an HEI's competitive advantage.

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Available: <https://search.proquest.com/docview/1794656413?accountid=10612> (Accessed 25 April 2017).

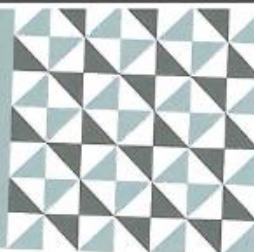
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## **Appendices**

**Annexure A – Ethical clearance from DUT for permission to conduct the study :  
Faculty granting permission Committee**



23 October 2017

Reference: Proposal Approval: Mr. J Mithi

Student number: 21751970

Dear Mr. J Mithi

**PhD IN MANAGEMENT SCIENCES (BUSINESS ADMINISTRATION)**

This serves to confirm the approval of your research proposal by the Faculty Research Committee, at its meeting on 17<sup>th</sup> October 2017, as follows:

1. Research proposal and provisional dissertation title:

**Enterprise Resource Planning Tools Management in Private Higher Education in South Africa**

Supervisor: Dr S. Govender

Co-supervisor: N/A

Please note that any proposed changes in the thesis/dissertation title require the approval of your supervisor/s, the Faculty Research Committee, as well as ratification thereof by the Higher Degrees Committee.

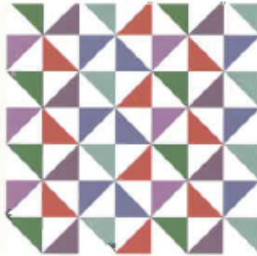
2. Research budget to the amount of **R15 000.00**

Please note that this funding is not a scholarship or bursary and is therefore not paid directly to you, but is controlled by the Faculty. Any proposed changes to the use of this funding allocation requires the approval of your supervisor and the Dean. Please note that funding will be re-imbursed to you after the provision of receipts.

The Institutional Research Committee has stipulated that:

- (a) This University retains the ownership of any Intellectual Property (patent, design, etc.) registered in respect of the results of your Masters/Doctors Degree in Technology studies as a result of the award and the provisions of the above Act;
- (b) Should you find any of the terms above not acceptable then you are given the option to decline the Research budget award to your project in writing.

May we remind you that in terms of Rule G25(2)(b), if you fail to obtain the Masters/Doctors degree within the maximum time period allowed after first registering for the qualification, Senate may refuse to renew your registration or may impose any conditions it deems fit. You may apply to the Faculty Research Committee for an extension.



26 July 2018

Mr J Mithi  
P.O Box 62061  
Karenpark  
Pretoria  
Gauteng  
0118

Dear Mr Mithi

**Enterprise Resource Planning Tools Management in Private Higher Education in South Africa**

I am pleased to inform you that **PROVISIONAL APPROVAL** has been granted to your proposal subject to:

- Piloting of the data collection tools. *Please note that should there be any changes to the data collection tools, in a letter signed by the researcher and supervisor, list the changes to the document and submit to IREC with the final data collection tools. Even when there are no changes to the data collection tools, IREC has to be notified.*
- Obtaining and submitting the necessary gatekeeper permission/s to Institutional Research Ethics Committee (IREC).

PLEASE NOTE THAT THIS IS NOT A FINAL APPROVAL LETTER. KINDLY SUBMIT THE ABOVE MENTIONED DOCUMENTS WITHIN THREE MONTHS TO THE IREC OFFICE. DATA COLLECTION CAN ONLY COMMENCE WHEN IREC ISSUES FULL APPROVAL

The Proposal has been allocated the following Ethical Clearance number **IREC 055/18**. Please use this number in all communication with this office.

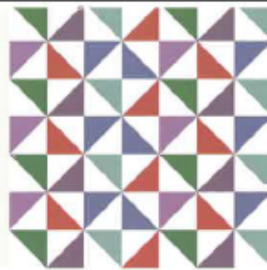
Approval has been granted for a period of two years, before the expiry of which you are required to apply for safety monitoring and annual recertification. Please use the Safety Monitoring and Annual Recertification Report form which can be found in the Standard Operating Procedures [SOP's] of the IREC. This form must be submitted to the IREC at least 3 months before the ethics approval for the study expires.

Yours Sincerely



Professor J K Adam  
Chairperson: IREC





14 September 2018

Mr J Mithi  
P.O Box 62061  
Karenpark  
Pretoria  
Gauteng  
0118

Dear Mr Mithi

**Enterprise Resource Planning Tools Management in Private Higher Education in South Africa**

The Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of your data collection tool.

Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the IREC acknowledges receipt of your gatekeeper permission letters.

Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC SOP's.

Please note that any deviations from the approved proposal require the approval of the IREC as outlined in the IREC SOP's.

Yours Sincerely,



Professor J K Adam  
Chairperson: IREC





## **Annexure B – Letter of information**



### **LETTER OF INFORMATION**

**Title of the Research Study: Enterprise Resource Planning Tools Management in Private Higher Education in South Africa**

**Principal Investigator/s/researcher:** Joseph Mithi (Masters of Business Administration (MBA)).

**Co-Investigator/s/supervisor/s:)** Dr S. Govender.

**Brief Introduction and Purpose of the Study:** The purpose of this research is to determine critical issues affecting managing of Enterprise Resource Planning tools in academic management.

#### **Outline of the Procedures:**

The study will involve you, such as the individual users of the system; students, lecturers and management staff at three sites in Gauteng; in Pretoria: Independent Institute of Education (IIE) Rosebank College Pretoria, and Damelin Menlyn (The Education Group), and in Johannesburg: IIE Rosebank College Braamfontein. Targeted number of participants is 100 comprising 10 lectures, 20 managers and 70 students, from the faculties of Commerce, Information and Communications Technology and Leisure with the following breakdown per institution:

Interviews:

<b>Sample</b>	<b>Category of participants</b>	<b>Target</b>	<b>Rosebank College Pretoria</b>	<b>Rosebank College Braamfontein</b>	<b>Damelin Menlyn Pretoria</b>
			<b>Participants per institution</b>		
1	Management Staff	10	5	2	3
2	Lecturers	20	13	4	3
3	Students	70	40	15	15

Focus group

<b>Sample</b>	<b>Category of participants</b>	<b>Target</b>	<b>Rosebank College Pretoria</b>	<b>Rosebank College Braamfontein</b>	<b>Damelin Menlyn Pretoria</b>
			<b>Participants per institution</b>		
1	Management Staff	20	7	7	6
3	Students	30	12	10	8

Survey (Questionnaire)

<b>Sample</b>	<b>Category of participants</b>	<b>Target</b>	<b>Rosebank College Pretoria</b>	<b>Rosebank College Braamfontein</b>	<b>Damelin Menlyn Pretoria</b>
			<b>Participants per institution</b>		
1	Management Staff	10	4	3	3
2	Lecturers	20	8	7	5
3	Students	70	30	20	20

At this stage in the research, the ERP tools Management in Private Higher Education Institutions in South Africa, is the central phenomenon being studied. It will be generally defined as Critical issues affecting managing of ERP tools in academic management.

To be eligible for selection in the study, the research study will demand you; students, lecturers and management staff of the institutions to:

- Have been in their respective institutions for over two years to ensure that they understand how ERP tools management in private higher education institutions work.
- Have worked or used ERP tools in academic attainment.
- Have undergone ERP tools management sensitisation training.

All of you; students, lecturers and management members of private higher education institutions in the study with less than two years of working or using ERP tools management systems, and those not trained in ERP tools management will be excluded. Again, the study will not consider gender as a criteria but deliberate attempt will be made for consideration. The rationale for exclusion will be largely due to inadequate experience of working in ERP tools management system environment. Purposive sampling will allow the researcher to include you in the study who will meet the set criteria, and further the strategy will allow the researcher to include you; students, lecturers and management staff who are available and willing to take part in the research study.

To respond to the critical issues affecting ERP tools management in Academic Management, the researcher will explore the gaps in management of ERP tools and develop a framework that could enhance academic attainment in private higher education institutions. The reasoning for studying more than one institution lies on the demand to institute whether the research findings from the first institution of study are also prevalent in other similar institution of study, and as a result, the requirement to or not generalise the research findings.

**Risks or Discomforts to you:**

There are no risks involved in this study.

**Benefits:**

The study will develop and recommend a framework within best practices to be used towards continuous improvement.

**The outputs from the study may be inform of Presentation at a conference/s or Journal article/s in accredited journal/s, and it will contribute to the body of knowledge.**

**Reason/s why you May Be Withdrawn from the Study:**

You may withdraw from the study at any time without having to give reason as participation in this research study is voluntary. This information is also contained in the letter of consent that you will sign before commencement of the research study.

**Remuneration:**

There is no remuneration to you involved.

**Costs of the Study:**

You will meet no costs in the study.

**Confidentiality:**

The information provided by you will be kept strictly confidential and will remain completely anonymous.

**Research-related Injury**

There is no risk to you, generally no risks.

**Persons to Contact in the Event of Any Problems or Queries:**

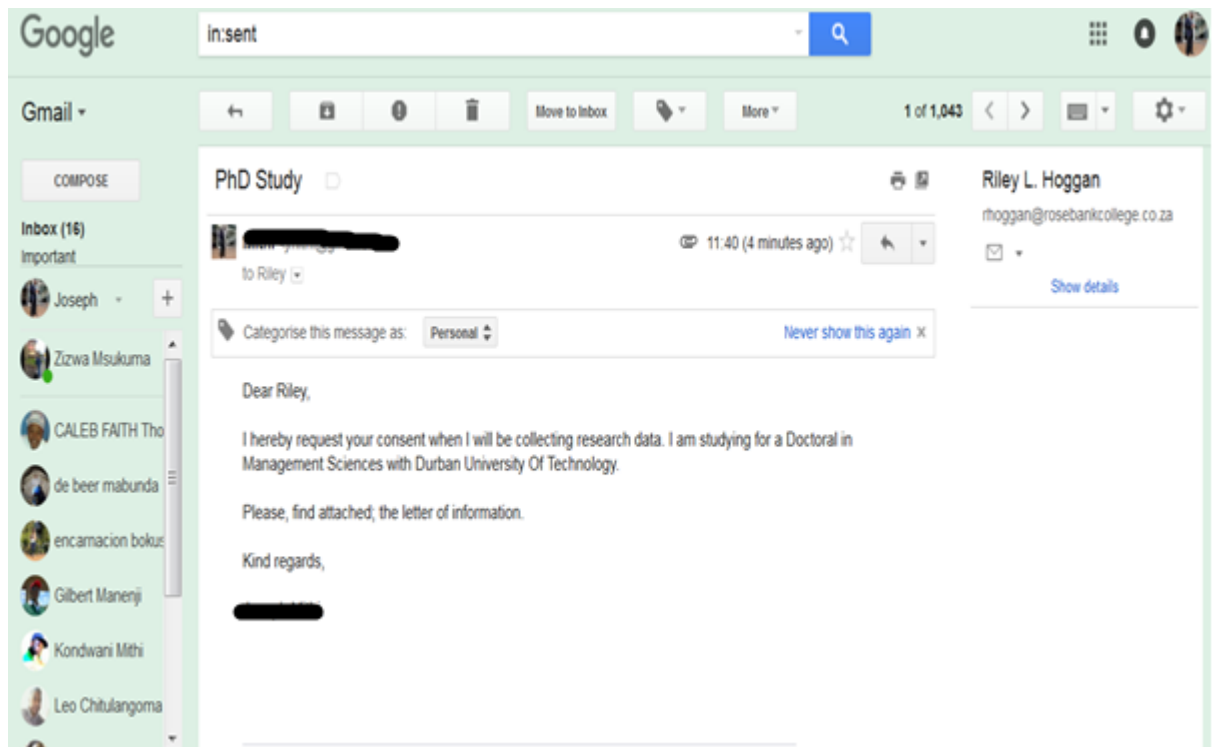
(Supervisor and details) Please contact the researcher (tel no. 012 771 8089), my supervisor (tel no. (031 – 7075912) or the Institutional Research Ethics Administrator on 031 373 2375. Complaints can be reported to the Acting Director: research and Postgraduate Support- Prof C Napier. Contact number 031 373 2577 or [carinn@dut.ac.za](mailto:carinn@dut.ac.za)

If you have any questions, please contact me *via* email: [21751970@dut4life.ac.za](mailto:21751970@dut4life.ac.za), [jmithi@gmail.com](mailto:jmithi@gmail.com), [jmithi@rcconnect.co.za](mailto:jmithi@rcconnect.co.za), or work number 012 771 8089.

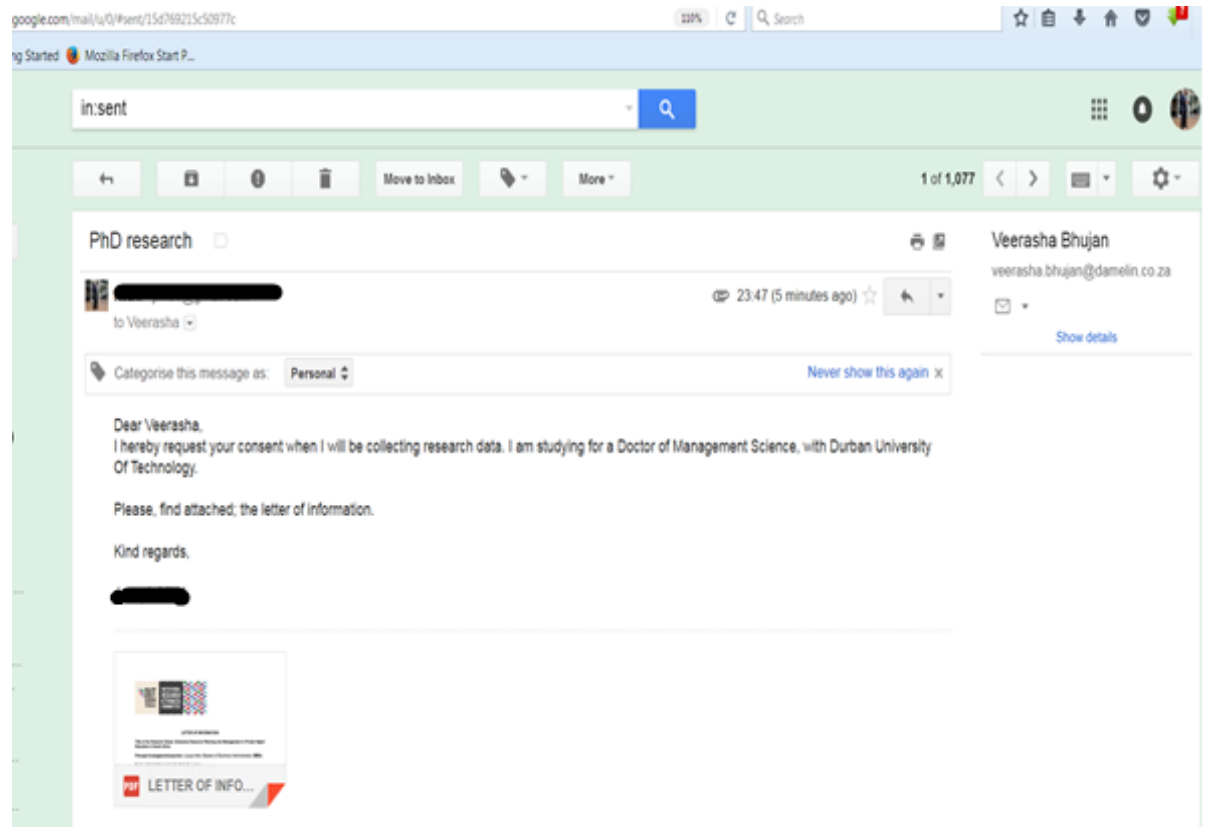
## Annexure C – Letter Requesting Permission to Conduct Research

### GATE KEEPERS LETTERS

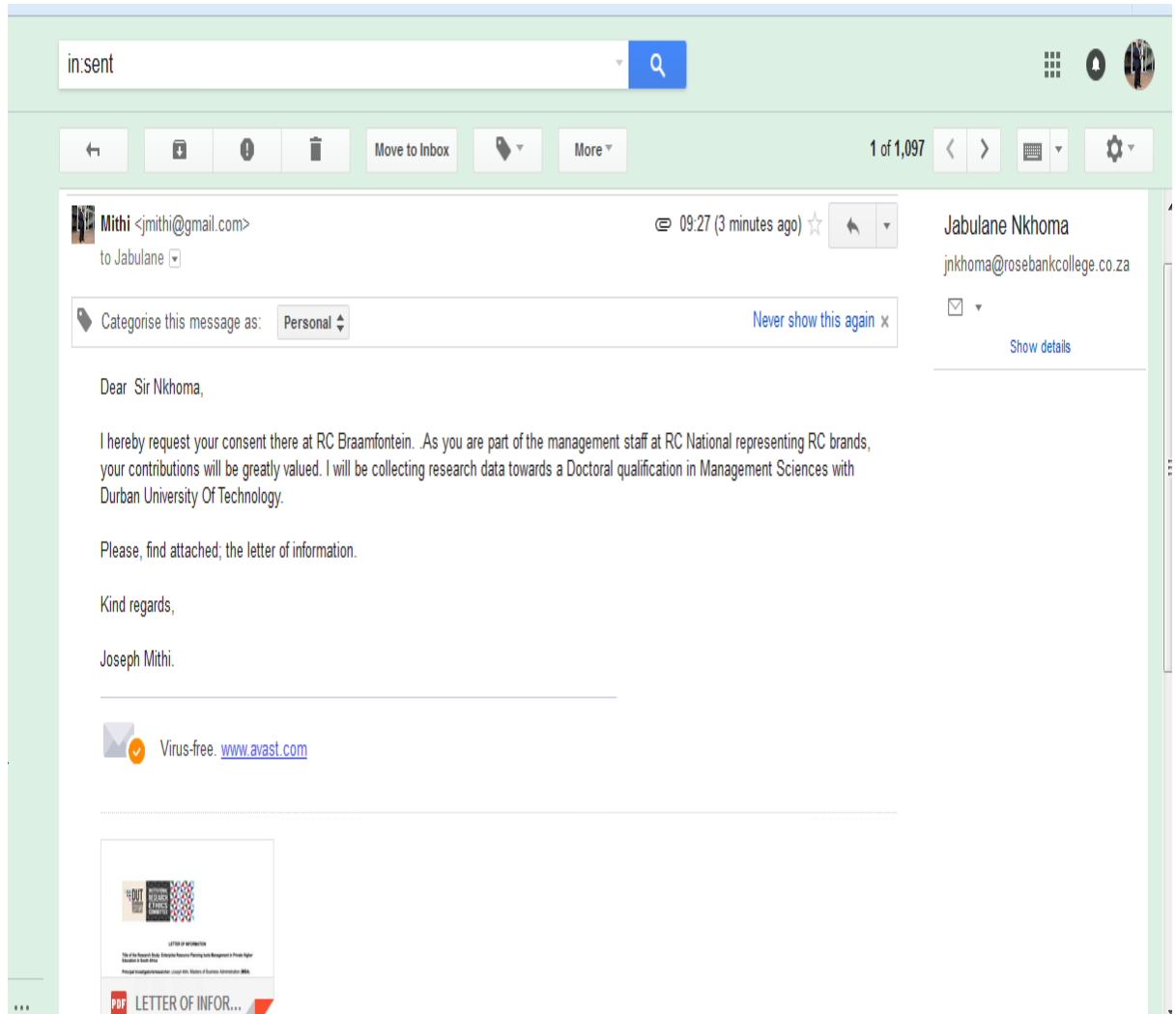
#### IIE Rosebank College Pretoria



## Damelin Menlyn Pretoria



## IIE Rosebank College Braamfontein (Johannesburg)

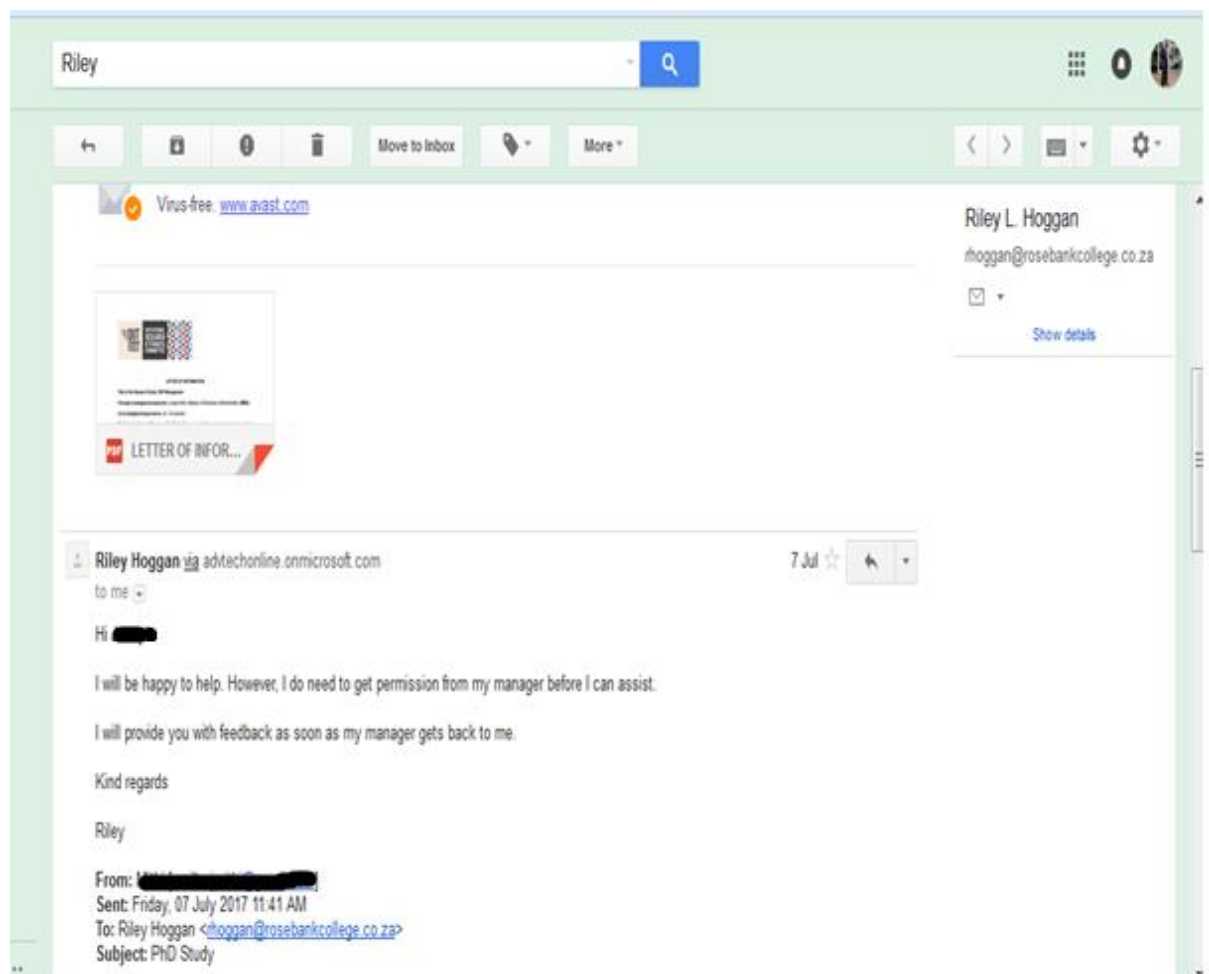




## Annexure D – Gatekeeper’s Letter Granting Permission

The replies are in the process of being finalised as shown in the Gatekeepers letters of permission above.

## RC PRETORIA



Joseph Mithi: IREC 055 / 18

1. Rosebankcollege Pretoria

\*\*\*

----- Forwarded message -----

From: **Sifiso Mndebele** <[smndebele@rosebankcollege.co.za](mailto:smndebele@rosebankcollege.co.za)>

Date: Wed, 15 Aug 2018 at 13:09

Subject: RE: PhD Study

To: Mithi <[jmithi@gmail.com](mailto:jmithi@gmail.com)>

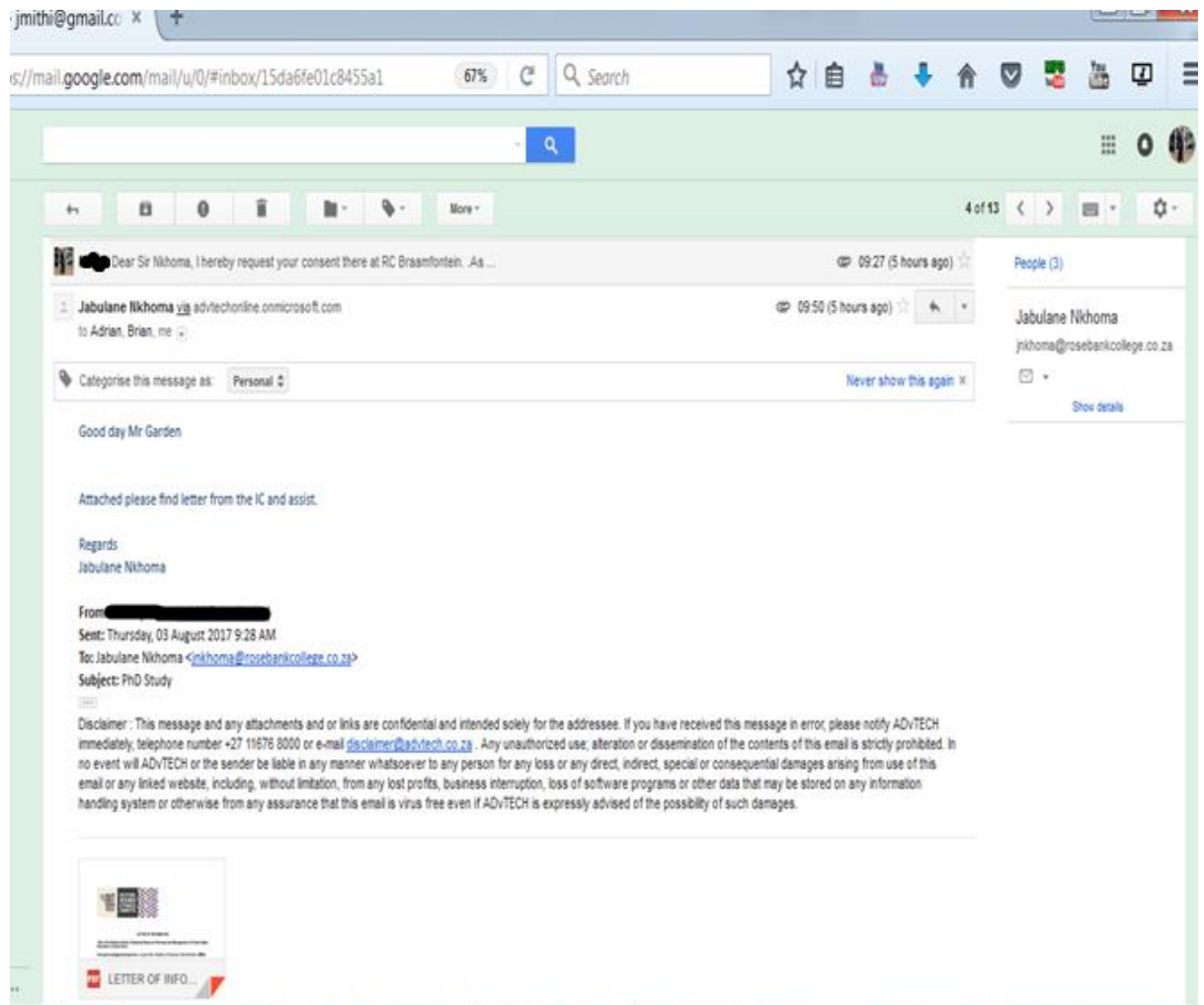
Hellow Joseph,

With your PhD study within the ERP topic , you have my full permission and endorsement as your direct ICT Manager.

Wishing you well in your Pilot studies that you have conducted and in all your data collection hereafter.

Kind regards,

## RC BRAAMFONTEIN



2. Rosebankcollege Braamfontein

\*\*\*

----- Forwarded message -----

From: **Melody Kadzenga** <[mKadzenga@rosebankcollege.co.za](mailto:mKadzenga@rosebankcollege.co.za)>

Date: Tue, 4 Sep 2018 at 16:37

Subject: PhD Study

To: [jmithi@gmail.com](mailto:jmithi@gmail.com) <[jmithi@gmail.com](mailto:jmithi@gmail.com)>

Hi Joseph

I wish you well in your PHD data collection studies you have all my support.

**Regards**

**Melody Kadzenga**  
**Campus Librarian**  
**Rosebank College Braamfontein**  
**Tel: 011 403 2437**  
**Cell: 073 155 9534**  
**Fax 086 293 9704**  
[www.rosebankcollege.co.za](http://www.rosebankcollege.co.za)

A promotional banner for Rosebank College's 2019 application period. The banner features a yellow background with confetti at the bottom. On the left, a woman and a man are standing; the woman is holding a white folder. In the center, the year '2019' is written in large, bold, purple letters. Below it, the text 'FULL-TIME | PART-TIME | DISTANCE' is written in white on a blue background. Below that, 'APPLICATION OPEN' is written in large, bold, white letters. On the right side, there are logos for IIE, Rosebank College, and social media icons for Facebook, Twitter, Instagram, LinkedIn, and YouTube. Below these is the BAC (British Accreditation Council) logo with the text 'THE HE IS INTERNATIONALLY ACCREDITED BY THE BRITISH ACCREDITATION COUNCIL'. At the bottom left, the logo for 'THE INDEPENDENT INSTITUTE OF' is visible. At the bottom right, a line of text states: 'Rosebank College is an educational brand of The Independent Institute of Education (Pty) Ltd which is registered with the Department of Higher Education and Training as'.

## DAMELIN MENLYN PRETORIA

Joseph Mithi: IREC 055 / 18

3. Damelin Menlyn

\*\*\*

----- Forwarded message -----

From: **Paulos Tjiane** <[Paulos.Tjiane@damelin.co.za](mailto:Paulos.Tjiane@damelin.co.za)>

Date: Thu, 6 Sep 2018 at 10:43

Subject: RE: PhD research

To: Mithi <[jmithi@gmail.com](mailto:jmithi@gmail.com)>

Hi Joseph, You are welcome in your PHD data collection studies. I am glad that I have given you the support from the beginning up to this far.

**Kind Regards**

**Paulos Tjiane** | Lan Administrator

Damelin Menlyn

Tel: 012 471 3300 | 012 471 3311

Fax: 086 574 1873 | 012 361 7101

Cell: 072 585 3015

E-mail: [paulos.tjiane@damelin.co.za](mailto:paulos.tjiane@damelin.co.za) | [www.damelin.co.za](http://www.damelin.co.za)



Disclaimer: This correspondence together with any and all appendices are proprietary, private and confidential and for the attention of the addressee only. If you receive this correspondence in error, kindly contact and advise the author, and delete all copies of this correspondence from your system as well as any hard copies which may have been printed. If you are not the intended recipient, any act of dissemination, distribution copying, reproduction or placing of reliance on the contents herein contained is strictly prohibited. We accept no responsibility for any infections or damages that you may suffer as a result of receiving this or any data messages or transmissions. This does not constitute an electronic signature, to vary any contract.

## Annexure E – Letter of Informed Consent to Participants



### CONSENT

#### Statement of Agreement to Participate in the Research Study:

- You hereby confirm that you have been informed by the researcher, \_\_\_\_Joseph\_\_\_\_Mithi\_\_\_\_ (name of researcher), about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: \_\_ IREC 055/18\_\_\_\_,
- You have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- You are aware that the results of the study, including personal details regarding your sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, you agree that the data collected during this study can be processed in a computerised system by the researcher.
- You may, at any stage, without prejudice, withdraw your consent and participation in the study.
- You have had sufficient opportunity to ask questions and (of your own free will) declare yourself prepared to participate in the study.
- You understand that significant new findings developed during the course of this research which may relate to your participation will be made available to you.

\_\_\_\_\_  
\_\_\_\_\_

**Your Full Name**                      **Date**                      **Time**                      **Signature / Right**  
**Thumbprint**

I, \_\_\_\_J Mithi\_\_\_\_ (name of researcher) herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

\_\_\_\_Joseph Mithi\_\_\_\_                      \_\_\_\_23/10/2018\_\_\_\_

\_\_\_\_\_  
**Full Name of Researcher**                      **Date**                      **Signature**

\_\_\_\_\_  
**Full Name of Witness (If applicable)**                      **Date**                      **Signature**

\_\_\_\_\_  
**Full Name of Legal Guardian (If applicable)** **Date**                      **Signature**

## **Annexure F – Letter to Respondent**

### **LETTER TO RESPONDENT**



Faculty of Management Sciences

Department of Management

Date: 07/07/2017

Dear Participant,

I am a student at Durban University Of Technology, collecting data for a Thesis in partial fulfilment of; the requirements for the Doctor of Management Science. The study is on **Enterprise Resource Planning Tools Management in Private Higher Education in South Africa: Critical issues affecting Enterprise Resource Planning tools in academic management**

Find attached; questionnaire, used as data collection instrument for this study.

You may take up to 20 minutes in completing the questionnaire. There is voluntary participation in completing it. In this study, your identity is anonymous; and the information given to this study will be kept confidential. There are no risks associated with participation of the research. Questionnaires will be stored in a safe storage for five years and thereafter be shredded/Electronic records will be kept for five years and thereafter be deleted.

Thanks in advance for your participation in this study.

Yours faithfully



\_\_\_\_\_Joseph Mithi\_\_\_\_\_

Student

Contact Details

Telephone (W)

061 432 5760 / 082 745 9752

E-mail:

[21751970@dut4life.ac.za](mailto:21751970@dut4life.ac.za), [jmithi@gmail.com](mailto:jmithi@gmail.com)

Supervisor / Promoter

Dr. Saths Govender

Contact Details

Telephone (H), Cell, E-mail:.

031 – 7075912, 0823757722, [dr1govender@telkomsa.net](mailto:dr1govender@telkomsa.net),  
[sathsgovender4@gmail.com](mailto:sathsgovender4@gmail.com)

---

Co-Supervisor/Co-Promoter

Contact Details

## **Annexure G – Questionnaire**

### **QUESTIONNAIRE**

**ERP tools management, Integrative Model approach in System academic management**

**Please tick the category that you belong to:**

Student	<input type="checkbox"/>
Lecturer	<input type="checkbox"/>
Management Staff	<input type="checkbox"/>

1. What department are you in?

Information Communications Technology (ICT)	<input type="checkbox"/>
Commerce	<input type="checkbox"/>
Business and Leisure	<input type="checkbox"/>
Other; (Specify):	<input type="checkbox"/>

**Please indicate the extent to which you agree with the following statements by selecting the following scale (Tick where appropriate:**

**1. Strongly disagree, 2.Disagree, 3. Neither agree nor disagree, 4. Agree, 5. Strongly agree.**

**Section A: Current practices**

1.A dynamic or powerful ERP tool in System academic management

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Computer performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(performance outcome expectations) - The functionalities of the ERP system adequately meets the requirements of my job.					
Computer anxiety – Using the ERP system has improved my work performance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The ERP system has presented me more ways to individual innovativeness in Information Technology (IT).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In the ERP system, task characteristics and navigation is easy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prior performance – In the ERP system, computer set ups are	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

sufficient for online access.					
Perceived effort – There is access to dedicated network connection in the ERP system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The ERP system is fit for new network apps.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pertaining to viability of ERP system (extent of value add) potential - The ERP system has made the firm adapt to changing business environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section B: Service quality levels in terms of perceived usefulness of the ERP System**

2.Experiences that you have met in ERP System access; interacting with Software, phones, laptops, computers, internet, and any other app

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
The ERP system frequently meets low network bandwidth increasing the latency of communication thereby slowing the services in the ERP system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regarding space in terms of memory and parallel processing, I am able to take steps in navigation to complete a problem in the ERP System.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In terms of ERP system reliability,	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

there is loss of internet connectivity between customer and provider's network consequently causing interruptions of a varied nature.					
With computer performance in the ERP System, I have the ability to create, deliver, and share content campus-wide on any number of devices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section C: The extent to which academic Enterprise Resource Planning is responding to the stakeholders needs**

3.Changes to ERP tools management, given the opportunity to work on it

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
--	-------------------	----------	---------------------------	-------	----------------

Compatibility of Technology in the ERP System – The ERP system integrates or combines data from the different areas of the firm.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Complexity of Technology – Use of the ERP system requires a lot of mental effort.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The perceived need for Technology – My job requires me to use the ERP system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Perceived usefulness -The ERP system is very useful to my job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Perceived ease of use-The ERP system has an easy to use interface.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.Encouraging end users or stakeholders to the ERP System to have powerful  
ERP user experience

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Information asymmetry (information flow and for collaboration) – The information and related reports in the ERP system are available to me when and where I need them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contract: I log in to the ERP system because it is part of my contract in using it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Risk sharing: I am willing to share the ERP experience or technical know how with colleagues.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
With issues of trust in the ERP system, I have the feeling that system interconnectedness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



and openness affects my total satisfaction in the ERP system and help me improve my work.					
Technology changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system – I always need technical support to use the ERP system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### 5. Issues discouraging users from accessing the ERP System

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Peripheral cues being a process of persuasion (following simple decision rules in ERP system access – When	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

rules and procedures exist to ERP tools management, they are usually in written form.					
Attitude (Behavioural intention) or individual perception – I feel it is a necessity to use the ERP system to be competitive in the workplace.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section D:** Internal and external factors that impact the Enterprise Resource Planning system

6. PHEI culture in regard to norms, values and beliefs in supporting departments in ERP tools management

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
The management support in managing the ERP tools is efficient and dependable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Adequate resources – The management team provides me with the necessary support and resources to use the ERP system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My manager encourages me to use ICT innovativeness in the ERP system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User involvement – I am able to recognise the ERP system's knowledge value learnt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Degree of control – I have enough control in acquiring resources in the ERP system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Section E: Aspects for recommendations

What aspects would you recommend for change?

	Current practice	Recommended change
System reliability and interoperability- accuracy and interactions		
Perceived usefulness – format and friendliness		
Efficiency and attributes – Network band width, Computer speed		
Rapidly changing Environment		
Management support - education and training		
Other: (Specify)		

## **Annexure H – Semi-structured Interview Schedule**

### **INTERVIEW SCHEDULE**

Issues influencing Enterprise Resource Planning (ERP) tools in System Academic Management

**Interview will make use of two audio recorders. There will be spare batteries. Recorders will be turned on and what will be stated before the participant enters the room is: the time, date and interviewee's department /faculty.**

Welcome, putting individuals at ease.

**Introductions (names) and backgrounds.**

**Opening and explaining the interview process**

**(Establish Rapport)** [shake hands] My name is \_\_\_\_\_ collecting data for a Thesis in partial fulfilment of; the requirements for the Doctor of Management Science. I thought it worthwhile to interview you, in seeking a better understanding of your experiences in the topic

**(Purpose)** The purpose of this interview is **to explore Critical** Issues influencing Enterprise Resource Planning (ERP) tools management in Academic Management.

**(Motivation)** The interest is in your personal experiences in ERP tools management – There are no right or wrong answers. Please, feel free, there is no judgement of any kind.

**Openness and honesty is appreciated as this is a confidential interview.**

**(Time line)** The interview will take 45 minutes to talk together

Review and confirm consent: **you have signed the consent form and as agreed we will record the discussion.**

***Check inclusion criteria:*** *Participants in the study, are from PHEIs Gauteng (The research will be conducted based on the critical issues influencing ERP tools management in academic ERP confined to three PHEIs in Gauteng).*

General information; Please choose applicable area

Category:

Student : ☐

Academic Staff : ☐

or Management: ☐

Department : \_\_\_\_\_

Location: \_\_\_\_\_

ERP Years of Experience in using the ERP System : \_\_\_\_\_

Are there any questions before start of this interview?

Source: Adapted from (Federation. Edu 2017).

## **INTERVIEW SCHEDULE**

Before commencing the interview with prospective interviewees, the following needs to be explained regarding ERP system access:

***Integration:***

- Computer performance (performance outcome expectations)
  - Computer anxiety
  - Individual innovativeness in Information Technology (IT)
  - Task characteristics
  - Prior performance
  - Perceived effort
- 
- Fit of new network apps to ERP system
  - Viability of ERP System (extent of value add) potential

***Practices:***

- Time it takes to log into the ERP System
  - Space in terms of memory and parallel processing (steps taken in navigation to complete a problem in the ERP System)
- 
- System reliability (Hardware and Software)
  - Computer performance in the ERP System

***Quality levels in terms of perceived usefulness:***

- Compatibility of Technology in the ERP System
  - Complexity of Technology
  - The perceived need for Technology
- 
- Perceived usefulness
  - Perceived ease of use

***Meeting stakeholders needs:***

- Information asymmetry
- Contract (you log in because it is part of your contract in using it).
- Risk sharing
- Trust

- Technology changes (incremental adjustments or additions in the ERP, issues or challenges met or arising in accessing the system)

***Other Factors:***

- Peripheral cues being a process of persuasion (following simple decision rules in ERP system access)
- Attitude (Behavioural intention) or individual perception

**Interview questions for focus group interviews**

- a. What does a dynamic or powerful ERP tool mean to you?
- b. Explain any experiences that you have met in ERP System access; interacting with Software, phones, laptops, computers, internet, and any other app to the ERP system within and outside of the institution
- c. If given the opportunity to make changes to ERP tools management, what type of ERP System access would you like to use or have?
- d. Describe what you think may encourage end users or stakeholders to the ERP tools management to have powerful ERP user experience?
- e. In your view, what do you think may discourage users from accessing the ERP System?
- f. Describe the PHEI culture in regard to norms, values and beliefs in supporting departments in managing the ERP tools?
- g. What aspects would you recommend for change?

Construct/s Source: Adapted from theories: Self efficacy, Fit Viability test, Complexity, Diffusion of Innovation, Technology Acceptance Model, Agency theory, Punctuated equilibrium, Elaboration Likelihood Model and Theory of Planned Behaviour (Harold 2017).



### **Interview questions for one-on-one interviews**

#### **Dynamic or ERP powerful tools**

- a. What is the level of your satisfaction regarding the current performance of the ERP tools in enhancing academic attainment?

#### **Experiences met in ERP tools management**

- b. What are the major problems experienced with the ERP tools in terms of interoperability (software and internet connectivity)

#### **Changes to ERP tools management**

- c. In your view, how should ERP tools management be organised in improving ERP tools integrated management?

To what extent are the changes to ERP tools management influencing the access to ERP tools?

#### **Encouraging stakeholders to the ERP system to have a powerful user experience**

- d. What methods and procedures are in place to oversee quality of service and perceived usefulness of the ERP tools?

#### **Issues discouraging users from accessing the ERP system**

- e. What do you think are the necessary conditions and resources required for effective ERP tools management at this institution?

What is the level of your satisfaction regarding the current performance of your institution in enhancing academic attainment in managing of the ERP tools?

How do you evaluate management of ERP tools and the effectiveness of the ERP management practices at this institution?

**PHEI culture in regard to norms, values and beliefs in supporting departments in managing the ERP tools**

- f. How do you promote the management of ERP tools at departmental level?  
In what ways do you think can the current ERP tools management be improved?

**Aspects recommended for change**

- g. What are the main challenges and constraints in terms of enhancing quality of training in ERP tools management?

## Annexure I – Editing Letter

**EDITING LETTER**

696 Clare Road

Clare Estate

Durban

26 March 2020

To: Whom it may concern

**Editing of PhD: J Mithi**

***Enterprise Resource Planning Tools Management in Private Higher Education  
in South Africa***

This letter confirms that the aforementioned thesis has been language edited.  
Any queries may be directed to the author of this letter.

Regards

MP Mathews

Lecturer and Language Editor

083 676 4778

Mercillenem@dut.ac.za

## Annexure J – Technical Knowledge Editing Letter

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Tel: 011 670 9592  
Cell: +27743 663 721  
E-mail: [chiyangwa.tawanda@gmail.com](mailto:chiyangwa.tawanda@gmail.com)

**ATTN:** Office of the supervisor/s:  
Dr S. Govender.

**DATE:** 09/01/2020

Dear Sir/ Madam,

**PHD THESIS BY JOSEPH MITHI (DUT STUDENT NUMBER; DPHIL: 21751970)**

**FACULTY:** Management Sciences

**QUALIFICATION:** Degree of Doctor of Philosophy in Management Sciences: Business Administration

This letter serves as a reference for Technical knowledge editing for the PHD thesis entitled  
'Enterprise Resource Planning Tools Management in Private Higher Education in South Africa'.

My assessment upon critical reading of the thesis is that the Technical Knowledge is acceptable and within the area of specialisation.

Yours faithfully,  
Dr. Tawanda Blessing Chiyangwa  
Tel: +27743 663 721  
Email: [chiyangwa.tawanda@gmail.com](mailto:chiyangwa.tawanda@gmail.com)

## Annexure K – Turnitin Report Summary

The screenshot displays the Turnitin interface for a student named Joseph Mithi. The top navigation bar includes links for 'Class Pages', 'My Works', 'Discussion', and 'Calendar'. A welcome message states: 'Welcome to your new class homepage! From the class homepage you can see all your assignments for your class, view additional assignment information, submit your work, and access feedback for your papers. Hover on any item in the class homepage for more information.'

The 'Class Homepage' section provides instructions on how to submit assignments and view feedback. Below this, the 'Assignment Index: Research' table lists the assignment details:

Assignment Title	File	Dates	Similarity	Actions
Research		Start: 07-Feb-2020 11:00AM Due: 29-Mar-2020 11:00PM Post: 29-Mar-2020 12:00AM	9%	<a href="#">Download</a> <a href="#">View</a> <a href="#">Share</a>

The 'feedback studio' section shows the student's name, 'Joseph Mithi', and the assignment title, 'Mithi J\_DPHIL\_MAN SCIENCES\_21751970\_PHD THESIS\_FULL\_29 MARCH\_2020\_FINAL'.

The main content area displays the document title, 'ENTERPRISE RESOURCE PLANNING TOOLS MANAGEMENT IN PRIVATE HIGHER EDUCATION IN SOUTH AFRICA', and the student's name, 'JOSEPH MITHI'.

The 'Match Overview' sidebar on the right shows a total similarity of 9%. It lists the sources contributing to the similarity:

Match	Source	Similarity
1	Submitted to Maroon Research Paper	2%
2	Amelley Timothy, Joel ... Publication	1%
3	PHD in ... Research Paper	1%
4	Submitted to University ... Student Paper	<1%
5	Al-Chamli, Hossain A. ... Publication	<1%
6	Abdulkhman Alkharbi ... Publication	<1%
7	Submitted to University ...	<1%

The 'ORIGINALITY REPORT' section shows the following breakdown:

Category	Percentage
SIMILARITY INDEX	9%
INTERNET SOURCES	4%
PUBLICATIONS	4%
STUDENT PAPERS	7%

The 'PRIMARY SOURCES' section is currently empty.

Supervisor's signature: Dr. Saths Govender  
Date: 27 April 2021