DEVELOPING BUSINESS PROCESS ANALYST COMPETENCIES THROUGH HIGHER EDUCATION INSTITUTION INTERVENTIONS - A KENYAN STUDY

by

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Declaration

This dissertation is the result of my own work and includes nothing which is the outcome of work done in collaboration except where specifically indicated. It has not been previously submitted, in part or whole, to any university or institution for any degree, diploma, or other qualification.

Signature: Signed by candidate Date: 02/05/2019

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Dedication

To Anthony and Catherine. You are both a blessing to me.

To My Wonderful Mother, Mary Wamicha and my Father, the Late Professor Wellington Wamicha for ingraining in me early on the value of a good education and for motivating me to always do my best.

To the love of my life, Boniface for your strength

To the Almighty God who makes all things possible

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All my gratitude to the Almighty God.

Deuteronomy 10:21 "He is the one you praise; He is your God, who performed for you those great and awesome wonders you saw with your own eyes."

Abstract

Title of Thesis: Developing Business Process Analyst competencies through higher education institution interventions - A Kenyan study

Kenya is currently experiencing large-scale economic growth. With this economic growth has come the need for organizations to have well-defined business processes largely through the development of business process management (BPM) initiatives. There is also an increasing move towards the automation of these business processes mainly through the implementation of enterprise resource planning (ERP) systems. This has given rise to the need for business process analyst (BPA) role. BPAs are essential to driving both BPM initiatives and ERP systems implementations. Given this scenario, the first motivation for this study was to investigate the status of BPM in Kenya and the role of the BPA in organizations in Kenya. This study specifically investigated BPA competency-building interventions required to drive BPM maturity and ERP systems implementation projects. Given that no BPM curriculum existed in Higher Education Institutions (HEI) in Kenya at the commencement of this study, the second motivation of the study was to investigate how these BPA competency-building interventions could be adapted into BPM curriculum.

To answer the research questions for this study, the pragmatic research paradigm was used. A hybrid inductive-deductive research approach was deemed most appropriate. This study used a mixed methods approach. This meant that both quantitative and qualitative data was collected. Data for this study was collected iteratively between March 2016 and October 2018 using a cross-sectional or multiple snapshots time horizon. Results from the data analysis explained 12 BPA competency-building interventions. Thereafter, a BPM curriculum was designed using the design science research method (DSRM). The study incorporated the concepts of the 4I framework of organizational learning and the concepts of the activity system.

The scientific contributions of this study comprise three aspects. Firstly, this research identified that certain BPA competencies such as business requirements elicitation, business process improvement, business analysis and holistic overview of business thinking were perceived to have been undervalued in the Kenyan context. Business process orchestration competencies were perceived to be critical for driving BPM in organizations and for successfully managing ERP systems implementations. Secondly, the study established that BPA competency-building interventions such as inter-group collaboration, on-the-job/experiential learning and vendor certifications were among the highly impactful interventions. Thirdly, the study designed a novel BPM curriculum, a first for Kenya. The curriculum incorporated the 4I framework of organizational learning and activity systems in its design and implementation. The results of the evaluation of the BPM curriculum established that students found it useful for building critical BPA competencies such as business analysis, business requirements elicitation and business process improvement.

Data collection for this study was limited to the BPA role within organizations and Business and Information Technology students undertaking a BPM course in HEI within the Kenyan context. Future research can extend data collection to other key staff members such as managers and human resource experts. Further, the BPM curriculum artefact was evaluated in the last 2 weeks of a 4-month semester within which the BPM curriculum was run. Therefore, a comprehensive evaluation could not be carried out due to time constraints. Future studies can extend findings from this study by using a design science approach of artefact evaluation to implement a comprehensive and detailed evaluation of the BPM curriculum. This can provide additional insights into the ways in which the BPM curriculum can be improved. There is also an opportunity

to use action research as a methodology to validate the educational interventions established in this study. Action research would drive in-depth engagement with both BPAs in industry and students undertaking BPM curriculum in HEI with the aim of effecting contributions to both theory and practice.

Publications

In the course of this study, 4 papers were written. These papers presented findings and contributions of this study. These papers were accepted and presented at 3 conferences (4th upcoming in 2019) as outlined below:

Wamicha, E. W., & Seymour, L. F. (2015). A higher education model for developing competencies for critical ERP implementation roles: the case of Kenya. In *Beyond development. Time for a new ICT4D paradigm? Proceedings of the 9th IDIA conference* (pp. 408-416).

Wamicha, E., & Seymour, L. (2016). Towards a Framework for Business Process Management and Enterprise Systems Competency Building in Higher Education Institutions: A Comparative Study of South Africa and Kenya. In *Proceedings of the Mediterranean Conference of Information Systems* (*MCIS)* (p. 12).

Wamicha, E., & Seymour, L. F. (2017). Organizational interventions to build the ERP business process analyst: the 4I framework perspective. In *Proceedings of the South African Institute of Computer Scientists and Information Technologists* (p. 37). ACM.

Accepted paper in 2019

Title: The competencies required for the BPA role: An analysis of the Kenyan Context

Authors: Wamicha, E., & Seymour, L. F. (2019)

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1. Introduction

This chapter sets the groundwork for this research. This chapter elaborates on the background of the research, the problem statement, the research questions, the research context and justification and finally a detailed outline of the structure of the thesis. While much has been done in Information and Communication Technology (ICT) and IS research in developed countries such as North America and Europe, developing countries including those in Africa continue to have issues that are not well analyzed in IS research (Avgerou, 2010). Further, several countries in Sub-Saharan Africa are experiencing major growth in the area of ICT (Mbarika, Payton, Kvasny, & Amadi, 2007). In addition to this, the digital divide in countries such as Kenya continues to reduce at a rapid rate especially in areas such as development and establishment of telecommunications infrastructure (Brännström, 2012). Other critical areas such as electronic governance and improvement of government processes have also been initiated and implemented at a rapid rate in the continent but have not seen equally rapid progress in the area of research (Estevez & Janowski, 2013). In general, the development of information systems research in developing countries has been slow (Avgerou, 2008; Avgerou, 2010). Other studies agree with this perspective, that information systems and ICT have the potential in the continent to enable strategic and transformative development but hardly any research has delved into this rapidly growing area (Thompson & Walsham, 2010).

Studies have also shown that there is a growing need to research issues of information systems and ICT from a context perspective such that we do not assume that what works in one context will automatically work in another (Heeks, 2010). Gaining a clearer evaluation of this context is urgent since substantial funding is being spent on Information Systems in these countries (Hawking, 2011; Heeks, 2010). Education within the IS arena has also been viewed as critical to enhancing educational achievements in developing countries and this is important for using IS optimally (Ngwenyama, Andoh-Baidoo, Bollou, & Olga, 2006). This argument remains as important in the case of competency building for the Business Process Analyst (BPA) role, which is a prominent research area in information systems literature (Klaus, Rosemann & Gable, 2000).

1.1. Problem statement

The research presented in this thesis is titled “Developing Business Process Analyst competencies through higher education institution interventions”. The study places a special focus on the Kenyan context as there is insufficient research on the topic within this context. The research intends to contribute to the literature on competency building of Business Process Analysts

(BPAs) working within complex environments such as within enterprise resource planning system (ERP systems) projects. The focus of the study is building competency of a relatively new role, that of the BPA. This is a relatively new area that requires further investigation, especially within the Kenyan context. Further motivation for this study is that Kenya has developed a long term strategy. This strategy known as the Vision 2030 has outlined a plan for growth in the Business Process Outsourcing under the economic pillar where Kenya hopes to be a global hub for process offshoring (Vision 2030, 2008). However, of note is that high-quality process offshoring is achieved through BPM (Lacity, Solomon, Yan, & Willcocks, 2011; Mahmoodzadeh, Jalalinia, & Nekui Yazdi, 2009) and involves the ability to analyse and redesign business processes in order improve on them (Dumas, La Rosa, Mendling, & Reijers, 2013), a key role of the BPA. In addition, Kenyan studies on process offshoring have indicated that one of the major challenges that Kenya is facing with regards to process offshoring adoption is a lack of relevant competencies (Chumo, 2015).

A closer look at the BPA role indicates that BPAs undertake an analysis of all the activities that are required to complete a critical business operation in an organization, they also consistently work with stakeholders to identify their needs refining their needs and defining it over time. BPAs are involved in the prioritization of these needs and progressive elaboration in order to clarify requirements. Business process analysis also involves balancing between stakeholder needs and end solution requirements (Mathiesen, Bandara, Delavari, Harmon, & Brennan, 2011). Literature addresses the importance of the BPA in their studies (Chakabuda, Seymour, & van der Merwe, 2014; Motwani, Mirchandani, Madan, & Gunasekaran, 2002; Sonteya, Seymour, & Willoughby, 2012). They argued that understanding the business processes of an organization is an important aspect of the success of an ERP systems implementation. Similarly, these studies argue that business process analysis is important and recognize it as a critical success factor in ERP systems implementations. In an effort to develop dynamic curricula a variety of approaches have been used such as the importance of including hands-on approaches in curricula and the usage of ERP systems by academia (Leyh, Winkelmann, & Lu, 2011; Noguera & Watson, 2004; Pridmore, Deng, Prince, & Turner, 2014). Similarly, a multi-course approach that addressed a three-tiered approach and ERP systems integration across multiple business courses have been developed (Peslak, 2005; Springer, Ross, & Humann, 2007). Further, studies on pedagogy in Higher Education Institutions (HEI) have acknowledged that there is a challenge in being able to fully address industry demanded competencies. That universities face a massive task of balancing investments into programs with the need to meet industry demand, which can potentially be offset through appropriate pedagogy. (Eden, Sedera, & Tan, 2014)

Further studies describe the link between competency and pedagogy as *"inextricable"* such that it (the link) forms a basis for the development of a common curriculum (Katz, 2000). This link implies that in order to be able to practically carry out a task, there needs to have been gradual guidance on how to do the task. In this regard, as will be highlighted in the literature review chapter, no study has determined the interventions that can develop BPA competencies required by organizations in Kenya. Further, no BPA curriculum suited to the Kenyan context has been developed.

This PhD thesis focuses on four research questions targeting competency building for BPAs. The study investigates the competencies required for the BPA role to drive BPM initiatives and manage ERP systems implementations in organizations in Kenya. The study then goes on to analyze the educational and organizational interventions that impact these competencies. Finally, the study analyzes the HEI curriculum and pedagogical interventions and interactions that develop these competencies in students. The main aspect of this research reports on these 4 questions or objectives through 4 different research chapters.

1.2. Research questions

The general research question for the study focused on determining the interventions that develop BPA competencies required by organizations. The study focused on describing the competencies of the BPA that are perceived as most important, those organisational interventions that enhance these competencies in BPA's and how these interventions can be adopted in HEIs. In order to investigate the phenomenon of interest, the main research question was formulated and is outlined below:

What interventions develop BPA competencies required by organizations in Kenya?

This research question was empirically investigated using a pragmatic approach that answered the main research question through 4 sub-questions outlined below.

- RQ1: What are the competencies required for the BPA role in organizations in Kenya?
    - This question described the various competencies that organizations view as critical for BPAs to have especially if they are working in ERP systems implementations and ERP systems environments in general.
- RQ 2: What are the organizational interventions that impact these competencies?
    - Here the study described the various interventions that organizations use to build their BPAs
- RQ3: How do these interventions impact BPA competencies?

    - Here emerging patterns were explained between interventions described in RQ2 and the various BPA competencies that they impacted.
- RQ 4: How can the HEI curriculum and pedagogical interventions and interactions develop these competencies in students?
    - Here, the study designed and implemented a BPM curriculum that incorporated those interventions explained in RQ 3 with the aim of preparing students to become BPAs.

1.3. Research philosophy

The researcher takes the position that answering the research question is the most important factor for a study when establishing the most appropriate research philosophy to adopt. This follows the pragmatic research paradigm which advocates for the appreciation of the essence of the research question and then using this as a basis for the selection of the specific method to use (Hanson, Creswell, Clark, Petska, & Creswell, 2005). Pragmatism was ideal for this study given that a major outcome of this study was to determine what would work for a given problem area (Dewey, 2007; Morgan, 2014). Further, pragmatism as a philosophy was best suited to handling mixed methods research which was a focal part of this study. Furthermore, pragmatism was ideal for this study as it involved recognizing a given problematic situation when considering the problem and developing a line of action and likely consequences and thereafter presenting action points required to address the problematic situation.

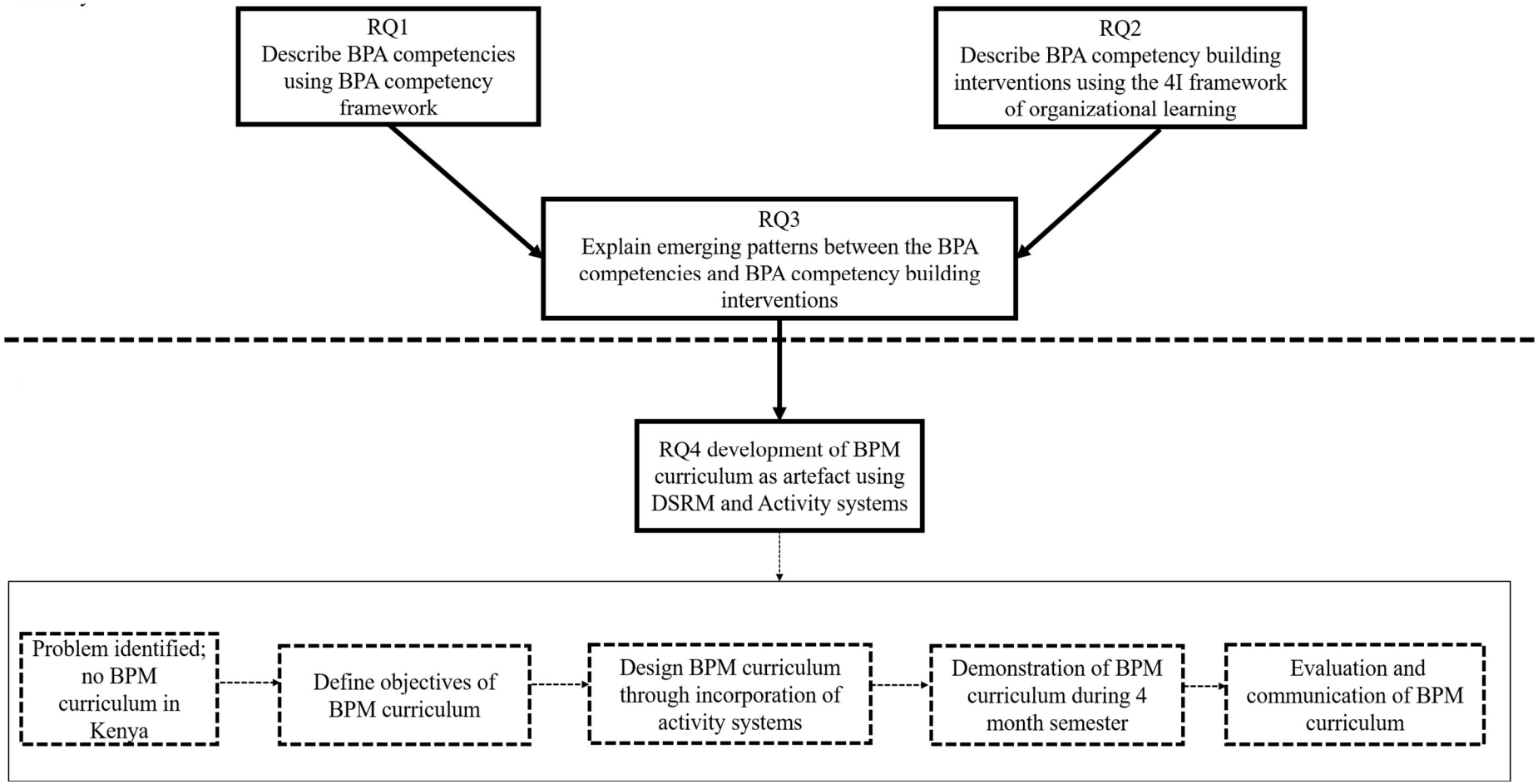

Figure 1-1: The research context

1.4. Research context

This research focused on BPM and BPA within the Kenyan context. The main motivation was that no previous studies on either BPM or BPA in Kenya had been carried out. In order to deeply investigate the phenomenon of interest, two cases were carefully selected and were found to be most appropriate for answering the four research questions of this study. The study addressed BPAs working in Industry and thereafter investigated BPM curriculum implementation within HEI. Figure 1-1 below further outlines the context of this study.

1.5. Justification of the research

This research will positively impact both industry practitioners. Similarly, given the complexity of ERP systems implementations and operations, it is necessary to have practitioners who appreciate the importance of BPM within these complex environments. In this regard, this study is relevant not only within the Kenyan context but also within the region where companies continue to adapt and operationalize ERP systems. ERP systems implementations and their subsequent operations require well-streamlined business processes and therefore skills in BPM will become critical as the number of ERP systems implementations increase.

The study intends to contribute to the existing body of knowledge by describing the competencies that are required by BPAs as well as the curriculum adaptations that HEI can incorporate into their courses to facilitate competency developed in BPAs. The study is therefore relevant for HEI that are constantly trying to implement industry relevant curriculum. From a practical perspective, the findings of this study can be generalized to both large and small-sized companies from varying sectors in Industry. These companies include those intending to optimize their BPM initiatives and those implementing an ERP system. These companies are required to fully synthesize their business processes as well as those that have already fully implemented ERP systems and have clear intentions to constantly manage and re-design their business processes.

1.6. Structure of the thesis

The structure of the thesis is outlined as follows:

Chapter 1: Introduction - The chapter provides an outline of the aim of the research, the statement of the problem, the research questions and the main research objectives.

Chapter 2: Literature Review- This chapter provides an extensive and systematic synthesis of the state of the art in the thematic areas of ERP systems education, Competency building and the Kenyan context. The study also addresses the theoretical viewpoints relevant to the study as well as an analysis of other works using similar research paradigms

Chapter 3: The Research Methodology - This chapter focuses on how the study applied Pragmatic philosophy within the study. The chapter also provides a detailed overview of the site selection for data collection and the data collection methods that were used for each of the research questions.

Chapter 4: The competencies required for business process analyst roles in organizations in Kenya – The chapter identifies and discusses the main competencies that are required for critical ERP systems roles in organizations running ERP systems solutions in Kenya. The chapter presents the results of the surveys conducted. These results are comprehensively discussed and then compared with the available literature.

Chapter 5: What are the organizational interventions that impact these competencies? – This chapter analyses the organizational interventions in two parts. The first part contextualizes these themes through comprehensive thematic analysis. The results of the study are discussed using the 4I Framework of Organizational Learning.

Chapter 6: How do these interventions impact BPA competencies? This chapter explains emerging relationships between these organizational interventions and the BPA competencies that they impact. This discussion is presented in the form of correlation matrices between organizational intervention and BPA competency.

Chapter 7: What HEI curriculum and pedagogical interventions and interactions can develop these competencies in students? This chapter discusses Activity Theory as the theoretical framework used to answer the research question. The chapter examines the research context and method used as well as curriculum development recommendations that can be incorporated into BPA related courses in HEI.

Chapter 8: Conclusions, recommendations and ideas for future research – The chapter presents the key contributions of the study with references to the main aim of the research and its constituent research questions. The chapter also discusses the implications of the research on both theory and practice. The chapter concludes by outlining the limitations of the research and opportunities for future work.

2. The Literature review – A Hermeneutic approach

During the course of preparing for the literature review chapter, the researcher studied various approaches to carrying out a literature review in order to establish which approach would be most appropriate for this study. Given the structured nature of the systematic review that requires a distinct planning phase, execution phase and reporting phase (Budgen & Brereton, 2006; Inayat, Salim, Marczak, Daneva, & Shamshirband, 2015), it was found to be limiting for purposes of this study. Further, the researcher identified that highly structured approaches often undermine dialogical interaction between literature and findings the develop as the study matures (Boell & Cecez-Kecmanovic, 2010, 2014). This study took into account that, while systematic reviews provide ideal guidelines for high-quality literature reviews, it was important not to disregard the personal and intellectual engagement between literature and the findings of this research (Boell & Cecez-Kecmanovic, 2015). This study opted to follow the hermeneutic approach to carrying out a literature review which involved a search and acquisition cycle and an analysis and interpretation cycle that happened iteratively through the course of this study. The hermeneutic approach was also deemed most appropriate given that it allowed the researcher to use relevant literature from a variety of journals, conference proceedings and books. Among the relevant journals accessed included the Business and Economics Review, the Business Process Management Journal, The European Journal of Information Systems, The Journal of Information Systems Education, International Journal of Economics, Commerce and Management. Among the conference proceedings that were accessed included proceedings from the International Conference on Software Engineering, IST-Africa conference proceedings and the Academy of Management conference proceedings. Books that were used in this study included the Handbook of qualitative research, the handbook of BPM and the handbook of educational research. A Figure 2-1 below outlines the steps of the hermeneutic approach to the literature review.

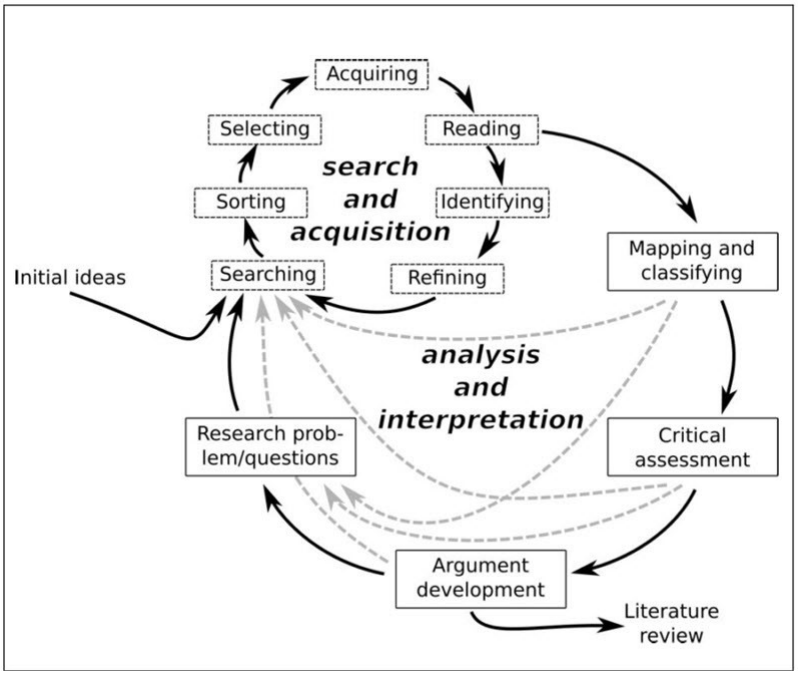

Figure 2-1: A hermeneutic framework for the literature review (Boell & Cecez-Kecmanovic, 2010, 2014)

While using the hermeneutic literature review approach, this study opted to follow an outcome perspective where the intention was to frame and study the research background (vom Brocke, Simons, et al., 2015). The background review was selected as it enabled the researcher to inform how the research questions and hypothesis for this study were developed (Boell & Cecez-Kecmanovic, 2010; vom Brocke, Simons, et al., 2015). Similarly, given that this study also developed a design science artefact, the background review enabled the researcher to justify the novelty of the artefact that was designed (Boell & Cecez-Kecmanovic, 2010; vom Brocke, Simons, et al., 2015; von Alan, March, Park, & Ram, 2004). Further, the findings chapters of this thesis were written following an iterative dialogical interaction between literature and the research findings. This approach, therefore, allowed for an interactive synthesis of literature from a broad set of relevant sources. The main concepts of interest were derived from the four research questions. These are presented in Table 2-1. The literature review addresses three research focuses. 1) BPM, the BPA role and competency requirements. 2) Organizational learning theories, interventions and frameworks 3) BPM curriculum, pedagogy and teaching strategy and activity Systems analysis.

Table 2-1:Concepts derived from sub-questions

Sub-questions	Keywords/Concepts	Research focus
What are the competencies required for the BPA role in organizations in Kenya?	BPA BPA competencies Kenyan Context BPM Maturity BPM in ERP systems implementations	1
What are the organizational interventions that impact these competencies?	Organizational Learning interventions Competency building frameworks	2
How do these interventions impact BPA competencies?		
How can the HEI curriculum and pedagogical interventions and interactions develop these competencies in students?	BPM curriculum Pedagogy and teaching strategy Activity Systems	3

The following sections of the literature review synthesize in greater detail, the main themes of the study.

2.1. Research focus 1: BPM, the BPA role and competency requirements.

The first research focus addresses literature on BPM in section 2.2.1 this is then followed by a synthesis of literature on the evolution of BPM in general in section 2.2.2 this is followed by a review of literature on the integration of the BPM and ERP systems fields in section 2.2.3 with consensus that BPM facilitates effective implementation of ERP systems in organizations. The literature review then addresses studies on competency building in the IS field in section 2.2.4 and thereafter synthesizes studies on the BPA role, the specific role that drives BPM initiatives and therefore plays a significant role in ensuring that BPM matures throughout the organization. In order to better understand the competency requirements of the BPA role, this study synthesizes the literature on BPA competency requirements in section 2.2.5 as well as an assessment of studies on BPM, ERP systems and the BPA role within the Kenyan context in section 2.2.6.

2.1.1. Business Process Management (BPM)

BPM has been defined as an area that attempts to merge the areas of Information Technology and Management Science. BPM is defined as a critical management practice that is focused on ensuring that there is a good understanding of business processes of an organization in order to enable organizational effectiveness and efficiency (Xu, 2011; Sonteya et al., 2012) . BPM has also been regarded as an active field of research in the IS arena, authors suggest that it is an interdisciplinary methodology that addresses how organizations can analyze, design, implement and improve their organizational work processes and the IT systems that support them (Müller, Schmiedel, Gorbacheva, & vom Brocke, 2016). Business Process Management (BPM) is also viewed as a holistic management discipline (Rosemann & vom Brocke, 2015) that attempts to find common ground between computer science and business administration (Weske, 2012). BPM can be represented within BPM software that is driven by specific process designs used to automate and operationalize business processes (Van Der Aalst, 2013). BPM impacts efficiency by providing integration between managing the performance of the organization through the management of end-to-end business processes of the organization (Vom Brocke & Rosemann, 2010). Similarly, it has been viewed as a major prerequisite for taking full advantage of the ERP systems software that is to be implemented (Al-Mudimigh, Zairi, & Al-Mashari, 2001; Rosemann & vom Brocke, 2015). There has also been an increase in interest in the way business process re-design works within ERP systems implementation plans (Bradford & Gerard, 2015). Within the area of strategic management, BPM has been described as a critical management practice that is focused on ensuring that there is a good understanding of business processes of an organization in order to enable organizational effectiveness and efficiency (Xu, 2011; Sonteya et al., 2012).

2.1.2. Evolution of BPM

Business Process Management (BPM) trends span a period of more than thirty years (the 1980s –2000s) and have been defined as focusing on continuous process improvement and business process redesign (Scheer & Nüttgens, 2000; Vom Brocke et al., 2011). In this regard, A study investigated BPM maturity frameworks (De Bruin & Rosemann, 2006; Harmon, 2015; Röglinger, Pöppelbuß, & Becker, 2012). Studies have also investigated the evolution of business process management (Harmon, 2015; Smith & Fingar, 2003). These studies have suggested that by having an understanding of business processes, organizations are better able to keep up with the demands of the current global market (Smith & Fingar, 2003; Weske, 2007, 2012). This is because business process management aims to understand what the organization does and from this, it attempts to

manage the process improvement and optimization lifecycle (Smith & Fingar, 2003). The business process lifecycle is defined as a set of phases that are dependent on each other and that aim to improve or optimize existing business processes or add new business processes that are critical to the organization (Weske, 2007).

Literature around BPM maturity frameworks has been developed over the years (Röglinger et al., 2012; Tarhan, Turetken, & Reijers, 2016). Largely findings from literature indicate that organizations can be placed into four distinct stages of BPM maturity. These are; the Initial Stage where there are uncoordinated attempts towards BPM but a strong desire to learn (de Bruin & Doebeli, 2009; De Bruin & Rosemann, 2006; Rosemann, 2006; Rosemann & vom Brocke, 2015; G Rummler & Brache, 1998; GA Rummler & Brache, 2004); the Repeatable stage where organizations begin to document their processes. However, processes are manual, and organizations tend to be reactive towards process improvement (de Bruin & Doebeli, 2009; De Bruin & Rosemann, 2006; Hammer, 2015; Rosemann, 2006; Rosemann & vom Brocke, 2015); the Managed stage where organizations understand and coordinate end-to-end activities. Process improvement takes on a more proactive approach because organizations invest more in understanding and analyzing their processes (de Bruin & Doebeli, 2009; De Bruin & Rosemann, 2006; McCormack, 2007; McCormack et al., 2009; Rosemann, 2006; G Rummler & Brache, 1998; GA Rummler & Brache, 2004); the Optimized stage where BPM becomes engrained in the strategy and operations of the organization (de Bruin & Doebeli, 2009). Further, organizations take the time to measure and manage their processes and BPM is handled by well-organized teams (de Bruin & Doebeli, 2009; De Bruin & Rosemann, 2006; Harmon, 2015; Rosemann, 2006). Literature also suggests that the more mature an organization is in terms of BPM the higher the competency requirements for BPAs handling these BPM initiatives (de Bruin & Doebeli, 2009; De Bruin & Rosemann, 2006; Rosemann, 2006). However, upon further scrutiny of literature on BPM maturity, there was no clear indication of the specific BPA competencies required to drive BPM maturity in organizations. To describe these competencies, the current study develops the following hypothesis that is further analyzed in chapter 4 of the study.

Table 2-2 outlines this relevant literature with respect to literature reviews carried out on BPM maturity (Röglinger et al., 2012; Tarhan et al., 2016).

Table 2-2: BPM maturity Frameworks, Source:(Röglinger et al., 2012; Tarhan et al., 2016)

BPM Model	Source	Maturity stages
BPMMM	(de Bruin & Doebeli, 2009; De Bruin & Rosemann, 2006; Rosemann, 2006)	Initial: Un-coordinated/Unstructured attempts towards BPM
		Optimized: Strategic and operational management a core part of BPM
Process performance index	(G Rummler & Brache, 1998; GA Rummler & Brache, 2004)	Initiation: organizations are new to BPM but have a strong desire to learn
		Process management mastery: BPM is a way of life for organizations. Process owners are rewarded on process performance. Every employee understands the processes
BPR maturity model	(Maull, Tranfield, & Maull, 2003)	Group 1: Organizations engage in business process reengineering (BPR) project planning
		Group 5: Organizations use experience from BPR projects and apply it to the whole business
Business process maturity model	(Fisher, 2004)	BPM Siloed: Siloed information from individual groups working to optimize their own processes
		Intelligent operating network: employees achieve optimal efficiency throughout the end-to-end value chain cutting across different functions of the organization
Process management maturity assessment	(Rohloff, 2009)	BPM&P Initial: processes are not defined. Elements such as schedule, budget are not predictable
		Optimizing: market requirements are taken into consideration when adjusting processes
Business process management BPM maturity model	(McCormack, 2007; McCormack et al., 2009)	BPM&P Ad hoc: processes are unstructured and not well defined. The organization concentrates on its functional arms
		Integrated: the organization is based on end-to-end processes
	(Hammer, 2015)	P-1/E-1 (examples): Processes are based on fragmented IT legacy systems

Process and enterprise maturity model		P-4/E-4 (examples): design of processes aligns with customer and supplier processes
Process maturity ladder	(Harmon, 2015)	Initial: processes are not defined
		Optimizing: processes are measured and managed. Processes are handled by well-organized teams
Business process maturity model	(Schonenberg, Weber, Van Dongen, & Van der Aalst, 2008)	Initial: focus is on firefighting and success of process management is based on the competence and heroics of individuals and not on the proper design of processes
		Innovating: focus is on change management with clear directions to defect and problem prevention, as well as continuous and innovative improvements, are in place. Processes are continually improved
Business process maturity model	(Lee & Dale, 1998)	Initial: processes are managed in an ad hoc manner
		Optimizing: proactive mechanisms for monitoring and controlling processes

2.1.3. Process outsourcing, BPM and ERP systems integration

A study suggests that the areas of process outsourcing, BPM and ERP systems integration are among the core areas of research in business process related studies. ERP systems have been used to facilitate the automation of processes in Business process outsourcing (Sidorova & Isik, 2010). Process outsourcing is viewed as an inter-organizational approach to process design, where certain processes that are not core to the business can be handled outside organizational boundaries. Enhanced by advancements in ICT such as ERP systems and globalization, process outsourcing "is among the most pervasive business trends of the 2000s. Processes being outsourced range from payroll and HR management, to cash management and IT management." (Sidorova & Isik, 2010 p. 577). On the other hand, BPM has been defined as an approach to process performance that provides integration between managing performance of the organization through the management of end-to-end business processes of the organization (Makokha, Musiega, & Juma, 2013) as well as the management of processes that add value to the organization (Makokha et al., 2013). BPM has been viewed as a major prerequisite for taking full advantage of the ERP systems software that is to be implemented and as a means of automation

of an enterprise's business processes and functions (Mutongwa & Rabah, 2013; Otieno, 2010). There has also been an increase in interest in the way business process re-design works within ERP systems implementation plans (Apiyo & Mburu, 2014). These studies argue that for ERP systems to be used efficiently in organizations, the business processes being executed by the system need to be well understood and analyzed and then mapped onto the ERP systems (Apiyo & Mburu, 2014).

Given that ERP systems are central to BPM and process outsourcing, it is important to define them. ERP systems are regarded as enterprise-wide systems that are used by organizations to integrate and optimize their business processes (Amondi, 2014). ERP systems make it possible for organizations to automate large portions of their business processes as described in the following statement:

"An enterprise system stores its data in one centralized database, and a set of application modules provides the desired functionality, including human resources, financials, and manufacturing. Enterprise resource planning systems have effectively replaced numerous heterogeneous enterprise applications, thereby solving the problem of integrating them" (Al-Mudimigh et al., 2001 p. 30).

With this definition in mind, research has shown that in order for ERP systems to be implemented optimally, it is critical for the implementers to fully appreciate the business processes of the organization (Otieno, 2010). There is also an indication that those organizations that achieve optimal benefit from an ERP systems implementation have a clear understanding of their end-to-end business processes. (Moon, 2007):

"BPM is not limited to ERP systems to leverage benefits, BPM has to acknowledge the technical possibilities which ERP systems can provide. Consequently, when considering enterprise systems, it is difficult to conceive of ERP systems without also considering BPM. ERP systems and BPM are integrated." (Moon, 2007 p. 10).

There is, therefore, an increase in demand for individuals who understand BPM within ERP systems environments. Many organizations have seen the need to invest in professionals who can take on the role of the BPA (Garbutt & Seymour, 2015; Weske, 2012). This professional should support a holistic approach to business processes and is often required to have a high number of different competencies to effectively manage business process practices (Antonucci & Goeke,

2009; Chakabuda et al., 2014; Garbutt & Seymour, 2015; Sonteya et al., 2012). This is more so in ERP systems implementations where a high level of process thinking is required (Otieno, 2010). Further to this**,** when it comes to BPM in ERP systems implementations, studies suggest that even though a new ERP systems will help in the automation of business processes, the actual improvement of business processes can be done independently of an ERP systems (Kimberling, 2016). In addition, experts of BPM and ERP systems integration believe, when companies fail to define and improve their business processes, they end up implementing their ERP systems over existing faulty processes (Hongjun & Nan, 2011; Kimberling, 2016). Therefore, to effectively implement an ERP system, project members involved in these implementations, such as BPAs, need the requisite competencies to be able to define the existing processes and improving on them prior to the ERP systems implementation (Harmon & Trends, 2010; Hongjun & Nan, 2011; Kimberling, 2016). In order to uncover these requisite competencies, Chapter 4 of the study analyzes the need to revamp competencies around the BPA role within ERP systems environments.

2.1.4. The BPA role

In this regard, the Business Process Analyst (BPA) is defined as: "mid-level person who deals with tactical, more day-to-day aspects of discovering, validating, documenting and communicating business process knowledge'' (Antonucci & Goeke, 2011). Several studies address the importance of BPAs in their research and also address a scarcity of skills in business process analysis (Chakabuda et al., 2014; Jarrar, Al-Mudimigh, & Zairi, 2000; Motwani et al., 2002; Sonteya et al., 2012). Currently, this role of Business Process Analysis (BPA) has been passed on to the Business Analysts (BA) of the organization. This often leads to a situation where the business analyst requires additional training in order to fit into the BPA role. Some studies have carried out a comparative analysis of the BPA and BA roles (Mathiesen et al., 2011). The results of the study indicated that while there were certain BPA skills that aligned with BA skills, there were still additional capabilities that the BPA was required to have such as Process Architecture competencies (Harmon, 2015; Mathiesen et al., 2011), Process management competencies (Harmon, 2015; Mathiesen et al., 2011), Process-oriented thinking (Moormann & Bandara, 2012), Social BPM (Caporale, Citak, Lehner, Schoknecht, & Ullrich, 2013) and Process Management and Social Networks (Mathiesen et al., 2011; Rosemann & vom Brocke, 2015). The next section elaborates further on competency building in IS and then specifically for the BPA role.

2.1.5. Competency building for the BPA

While analyzing literature around competency building for the Business Process Analyst, a number of studies were identified. These studies analyzed the various competencies required for a Business Process Analyst (Sonteya et al., 2012). The study did not focus specifically on BPA roles in ERP systems implementations but rather provided a more generic overview of the competencies required for the BPA. A study focused on ranking important BPA competencies (Chakabuda et al., 2014). This study provided an indication of those competencies that are deemed important for the BPA role but was provided within a more generic context. In order to proceed with the study, it was important to provide a clear definition of competency within the context of this research. For the study, a broad definition of competency was utilized. One study described competency as the 'knowledge, skill, ability or characteristics associated with high-performance On-the-Job' (Mirabile, 1997). Other studies provide similar definitions (Ravesteyn, Betenburg, & Waal, 2008; Rudman, Garbutt, & Seymour, 2016). This study also aims to adopt the same definition. Competency has also been regarded as the skill that is often associated with performing optimally within a particular job, including the attitudes of the project members (Aydinli, Brinkkemper, & Ravesteyn, 2009). A study developed competence constructs specifically tailored toward ERP systems implementations (Stratman & Roth, 2002). In the area of information systems, understanding and building competency requirements have been viewed as critical to organizations who want to carry out their operations efficiently and who want to prevent underutilization of information systems (Khairi & Baridwan, 2015; King, 2015). There is also an emphasis on the need to build competencies integration mechanisms between technical areas such as information systems and business areas such as accounting (Sledgianowski, Gomaa, & Tan, 2017). There is also a strong argument that information systems professionals such as project managers who are involved in Information systems development project implementations require personnel that have a variety of skills ranging from technical competencies to business-related competencies. Several studies have defined BPA competency requirements as going beyond those of a business analyst (Sonteya et al., 2012). Since BPM is a discipline that covers a wide variety of tasks, from the planning stage where specific process objectives are developed to the actual execution of the process, the professional tasked with having to carry out these tasks also need to have a wide range of competency requirements (Lohmann & Zur Muehlen, 2015). Research suggests that the BPA ought to have strong technical, business and mathematical competencies (left brain thinking) as well as strong interpersonal skills involving aspects of emotional intelligence and being able to communicate effectively with stakeholders (right brain thinking) (Kalpič & Bernus, 2006; Rosemann, 2006; Sonteya et al., 2012). Several studies have

gone ahead to develop competency frameworks for information systems practitioners and specifically BPAs (Chakabuda et al., 2014; Lohmann & Zur Muehlen, 2015; Müller et al., 2016; Sonteya et al., 2012). The framework comprises 16 different competencies that industry said BPAs needed to have. The 16 competencies as developed by Sonteya and Seymour are outlined in the following Table 2-3 and Figure 2-2:

Table 2-3: List of BPA competencies (Sonteya et al., 2012)

Competency category	Constituent competencies
BIC (Business Interpersonal competency)	BIC1 (Facilitation and Leadership) BIC3 (Business Communication) BIC4 (Trustworthiness) BIC2 (Business Requirements Elicitation)
OK (Organizational Knowledge)	OK (Organizational knowledge)
BPA (Business process Analyst Fundamental Competency)	BPA1 (Business Analysis) BPA2 (Holistic Overview of business thinking) BPA3 (Client Experience Thinking) BPA4 (Mathematical and Statistical competency)
BPO (Business Process Orchestration)	BPO1 (Business process and Value chain modelling) BPO2 (Business Process Improvement) BPO3 (Business Process Risk and Compliance Assessment) BPO4 (BPA drive and promotion)
TC (Technical Competency)	TC1 (Software Oriented Architecture) TC2 (ERP systems Knowledge) TC3 (User Interface design)

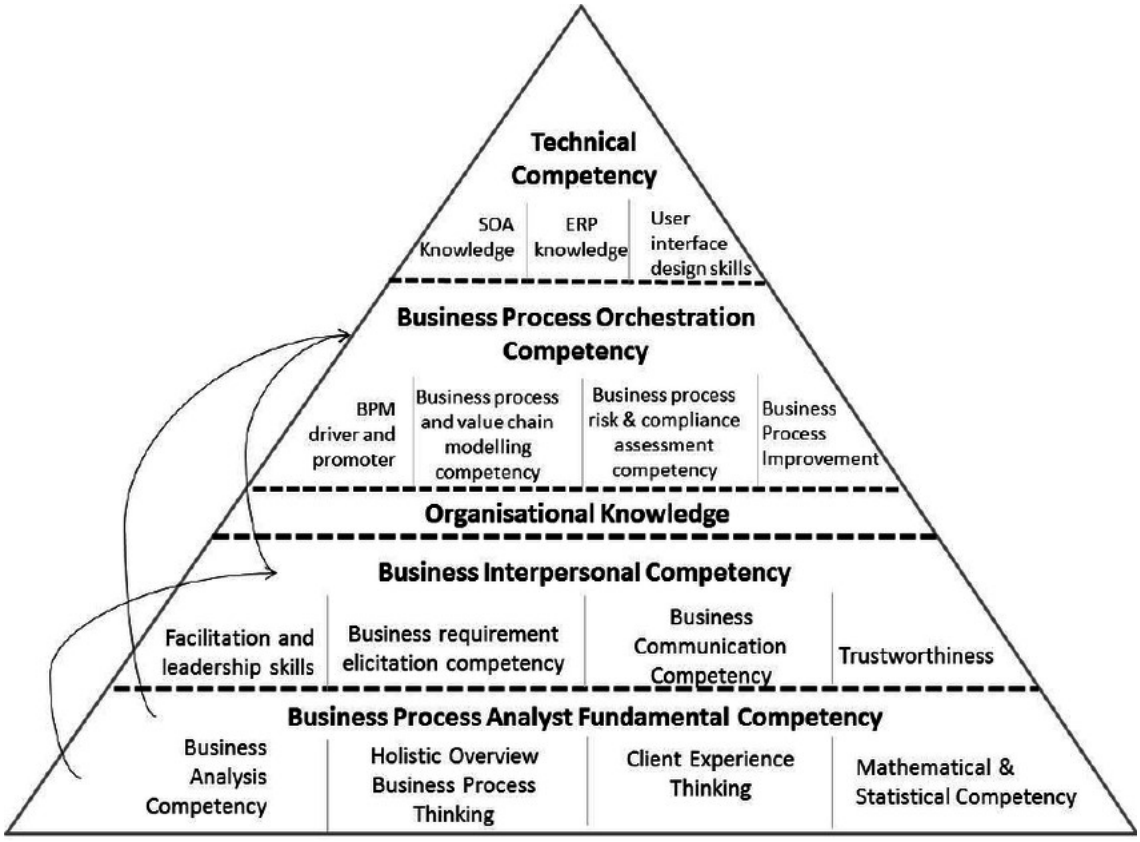

Figure 2-2: The BPA competency framework (Sonteya et al., 2012)

2.1.6. The Kenyan context

Several countries in Sub-Saharan Africa are experiencing major growth in the area of ICT (Mbarika, Payton, Kvasny, & Amadi, 2007). In addition to this, the digital divide in countries such as Kenya continues to reduce at a rapid rate especially in areas such as development and establishment of telecommunications infrastructure (Brännström, 2012). Other critical areas such as electronic governance and improvement of government processes have also been initiated and implemented at a rapid rate in the continent but have not seen equally rapid progress in the area of research (Estevez & Janowski, 2013). In general, the development of information systems research in developing countries has been slow (Avgerou, 2008, 2010). Other studies agree with this perspective, that information systems and ICT have potential in the continent to enable strategic and transformative development but hardly any research has delved into this rapidly growing area (M. Thompson & Walsham, 2010). There is an emphasis on the idea that the current trend of Information systems in developing countries is that of growth and dynamic change (Otieno, 2010). With specific respect to Kenya, the Kenyan government has developed a national strategy termed the Kenya vision 2030. This long term strategy is based on three pillars that

include the economic pillar, the social pillar and the political pillar. Under the economic pillar, the vision 2030 strategy intends to implement process outsourcing as a major economic sector. Process outsourcing involves contracting specific business processes to a third party service provider (Vision 2030, 2008). Research suggests that to achieve this, a high level of BPM know-how is be required (Mahmoodzadeh et al., 2009). In fact, among the intended outcomes of this sector is skills development for related activities to enhance the quality of products and services (Vision 2030, 2008). Furthermore, Kenya intends to market itself as a process outsourcing destination and establish a process offshoring park as part of the expansion of its ICT infrastructure (Vision 2030, 2008). Figure 2-3 illustrates the sectors of the Economic Pillar of Kenya's vision 2030. In this case, process outsourcing is represented as Business Process Offshoring.

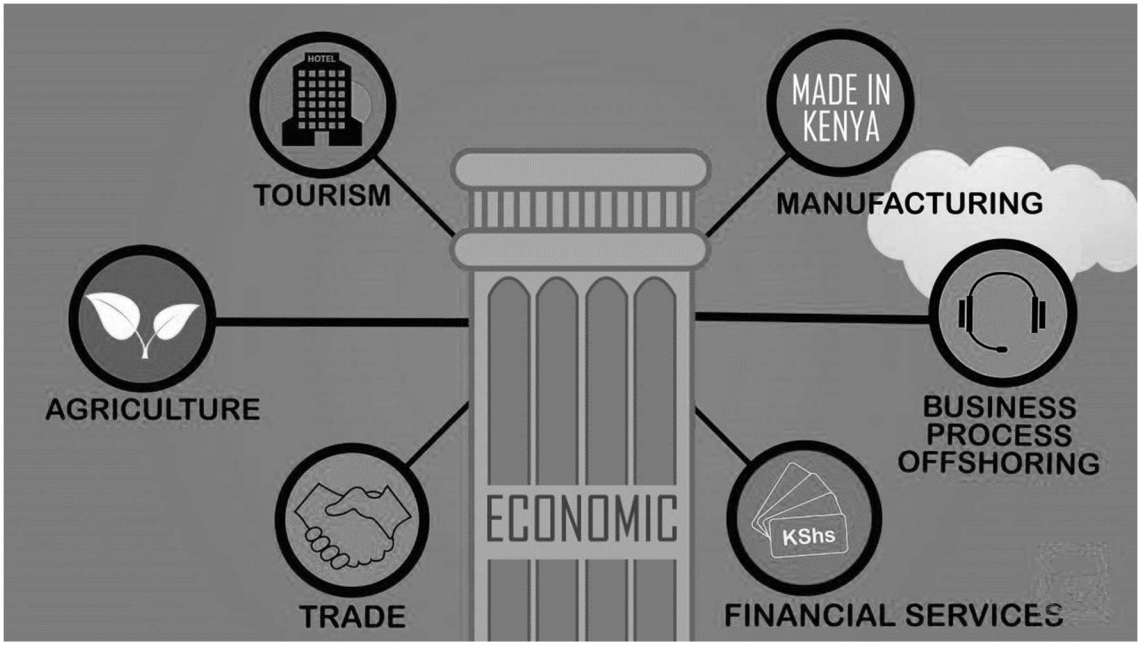

Figure 2-3: Sectors of the Economic Pillar (Vision 2030, 2008)

Given that high-quality process outsourcing requires a high-level competence in BPM (Lacity et al., 2011; Mahmoodzadeh et al., 2009) it was interesting to note that while much has been done with respect to process offshoring in Kenya (Jane, Aosa, Awino, & Njihia, 2018; Mann & Graham, 2016; Mann, Graham, & Friederici, 2015), hardly any research in BPM or BPM competency building had been carried out on the Kenyan context with one study suggesting that one of the main pitfalls of adoption of process outsourcing projects in Kenya was a lack of relevant competencies in the country (Chumo, 2015). Similarly, hardly any studies have been carried out regarding BPM education and BPM competency requirements in Kenya. In the

analysis of literature relevant to Kenya, several studies have covered the success factors required for successful ERP systems implementations (Mose, Njihia, & Magutu, 2013). Studies based on ERP systems in Kenya suggest that certain factors such as financial resource availability, complexity of the organization, regulation, top management support and employee perceptions are critical for effective ERP implementation (Kimani, 2013; Njihia & Mwirigi, 2014). Further, a Kenyan based studies on ERP implementations have addressed ERP system implementation experiences and established that ERP systems are critical for service delivery (Ndung'u & Kyalo, 2015; Nzuki, 2015). However, there are some key challenges. Key among these challenges is a lack of required skill sets (Ndung'u & Kyalo, 2015). Similarly, a Kenyan study that examined ERP implementations in Kenya found that inability to manage and re-engineer business processes was a major factor for failure of most ERP implementations in the country (Bett, 2018). No articles in the area of BPM, BPM curriculum and ERP systems curriculum were found but several acknowledge the need for further analysis of competency requirements in the use of BPM and ERP systems (Abdullabhai & Acosta, 2012; Makokha et al., 2013; Otieno, 2010; Waweru & Ngugi, 2015).

2.1.7. The South African (SA) context

This study took on a keen interest in synthesising literature on the South African context especially in order to answer research question 1 of the study. Generally speaking, studies on ICT competency development based on the SA context indicate that the country has made steps to develop BPM competency building initiatives with the aim of reducing the skills gap in the current ICT graduates (Ansen, 2014; A. P. Calitz, Greyling, & Cullen, 2014). A study developed frameworks for graduate development focusing on improving both the quality and the number of ICT graduates and students (Breytenbach, De Villiers, & Jordaan, 2013). Research from SA has also addressed the challenges facing the country from the perspective of e-skills within the value chain (A. Calitz, Greyling, & Cullen, 2010). These studies indicate clear concern that there is a significant skills shortage both within SA and also at an international level. This is especially so because current business practices require a skilled workforce conversant with new technology (A. Calitz et al., 2010). From the perspective of teaching ICT skills, SA studies have attempted to identify key challenges or tensions facing HEI focusing on aspects such as policy coherence, balancing finances with intellectual research imperatives, promoting strategic balance in partnerships with flexible regulations in HEI (Krauss & Turpin, 2010). Several studies focusing on BPM curriculum and BPM competency building have also been carried out. Such studies have

developed a competency framework for the BPA (Sonteya and Seymour, 2012), an analysis of the challenges facing teaching business process related courses in SA HEIs (Flugel, Seymour and van der Merwe, 2014) and a further explanation of the competency gap found in the emerging Business Process Analyst role (Chakabuda and Seymour, 2014). As regards studies covering ES, most studies have covered aspects such as adoption and usage of ES architecture and the idea that these processes are largely complex and ES implementations are often focused on the organizational need to make complex decisions (Scholtz, Calitz, & Connolley, 2013).

2.2. Research focus 2: Organizational learning theories, interventions and frameworks

The second research focus was concerned with the literature on organizational learning theories. Section 2.3.1 addressed literature on the organizational learning theory, experiential learning theory and action science and organizational learning. Additionally, this section addresses literature on organizational learning interventions while 2.3.2 focuses on the 4I framework of organizational learning and its areas of application.

2.2.1. Organizational learning theories, frameworks and approaches

Organizational learning is a rapidly growing area of research that has been heavily influenced by rapid changes in technology, corporate competition and globalization (Easterby-Smith, Snell, & Gherardi, 1998). It is also an area of interest not only for the corporate world but also in academia (Easterby-Smith et al., 1998). Studies have also distinguished literature focusing on learning within the organization (Leitch, Harrison, Burgoyne, & Blantern, 1996). The two main divergences that come up are the organizational learning, which focuses on mainstream research that attempts to observe and understand how organizations learn and the learning organization which delves into what organizations have done to enhance learning, they are often written as success stories presented and communicated as case studies (De Geus, 1988). This study opts for the organizational learning approach which is descriptive in nature as it attempts to describe "What factors drive learning in organizations" (Tsang, 1997). More specifically, this study attempts to understand those organizational learning interventions that can enable competency building for BPAs. The following sections outline the literature that was analyzed. The literature covers studies on organizational learning and organizational learning interventions such as training and development. The themes derived from this literature were used to further guide the study. The following sections synthesize further the literature on organizational learning theories.

a) Organizational Learning theory

The authors address the learning process of organizations that were constantly evolving to survive; they develop learning processes in teams; they also develop four constructs of organizational learning (knowledge acquisition, information distribution, information interpretation, and organizational memory (Argyris, 1967, 1976; Argyris & Schon, 1978; Cangelosi & Dill, 1965; Huber, 1991). Further, the organizational learning theory has been described as a means to conceptualize the process of organizational learning as a member-based process that is either independent of IT or can also be supported by IT (Schlagwein & Bjørn-Andersen, 2014). Within the domain of management information systems, the organizational learning theory has been used to describe the extent to which an organization is able to identify and correct errors in its operations (Argyris, 1977). Further, an organization is said to learn through its individuals who act as agents for their respective organizations and can involve elements of exploitation and exploration (Argyris, 1977; Schlagwein & Bjørn-Andersen, 2014; Schulz, 2001; Skarmeas, Lisboa, & Saridakis, 2016). This is also known as an organizational learning system and can be used in the process of knowledge transfer from an expert to a novice (Argyris, 1977; Bontis, Crossan, & Hulland, 2002; Wang, Lin, Jiang, & Klein, 2007). Further studies have argued that a learning organization is able to maintain a competitive advantage by being able to learn faster than the competition and effectively use and safeguard organizational resources (Crossan, Lane, White, & Djurfeldt, 1995; Stein & Vandenbosch, 1996; Weishäupl, Yasasin, & Schryen, 2015)

b) Experiential learning theory

Experiential learning is based on learning models developed by Lewin, Dewey and Piaget (D Kolb, 2014). It encompasses a number of models such as the Lewinian model which incorporates concrete experiences, observations and reflections, the formation of concepts and generalizations and testing these generalizations (D Kolb, 2014). Figure 2-4 below outlines the phases of the experiential learning theory.

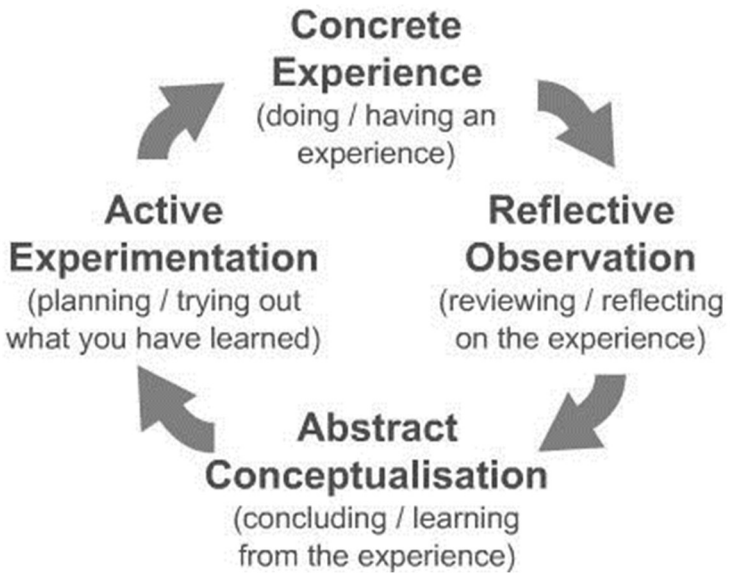

Figure 2-4: The phases of experiential learning (D Kolb, 2014)

Experiential learning is often described as a process and not necessarily as an outcome (D Kolb, 2014) and that learning is a continuous process where knowledge is acquired continuously through derived and tested experiences (D Kolb, 2014). Learning is instead a continuous process that is clearly based on experience from the past and is said to have been achieved when the learner is able to resolve conflict arising from opposing ways of doing things (Fenwick, 2001; Jewer & Evermann, 2014; Kirkham & Seymour, 2005; A. Y. Kolb & Kolb, 2005; D Kolb, 2014; David Kolb, Boyatzis, & Mainemelis, 2001; Schenck & Cruickshank, 2015; Scholtz, Cilliers, & Calitz, 2010; Veres III, Sims, & Locklear, 1991; Watson & Schneider, 1999). Within the management education domain, experiential learning has been used as part of problem solving techniques by emphasising on the need to reflect and then act in order to improve learning outcomes in both industry and HEI (Antonacopoulou, 2017; Cantor, 1997; Easterby-Smith & Cunliffe, 2017; Gilardi & Lozza, 2009; Miller & Maellaro, 2016; Paton, Chia, & Burt, 2014; Shen, Nicholson, & Nicholson, 2015). Studies have emphasized that within HEI experiential learning has provided an opportunity for students to have a more hands-on learning experience with evidence showing that students who learnt experientially were more likely to retain concepts over time (Specht & Sandlin, 1991) (Farooki, 2014).

c) Organizational learning and Strategy

The articles provide an analysis of the intersection between organizational learning and strategy. Research involves the development of antecedents categorized into 3, Knowledge Characteristics, Learning Process and Social Dimension (Argote, 2015; Hotho, Lyles, & Easterby-Smith, 2015).

Research also suggests that there is a mutual exchange of ideas between strategy and organizational learning (Hotho et al., 2015). Furthermore, in order to remain competitive, it is necessary for an organization to incorporate learning processes within its overall strategy (Argote, 2015)

d) The divergence between Organizational learning and the learning organization

Research in this domain addresses three perspectives in order to better analyze divergences between organizational learning and the learning organization. These are Teleology (Why do organizations learn), Ontologies (What is organizational learning) technologies (How to implement measures for organizational learning) and Epistemologies (Methods of enquiry into organizational learning). (Easterby-Smith et al., 1998; Ege, Esen, & Aşık Dizdar, 2017; Örtenblad, 2018; Reese, 2018; Sun & Scott, 2003; Tsang, 1997). Research into these two aspects has provided a distinction between the learning organization and organizational learning. Findings indicate that organizational learning is descriptive in nature. It exists naturally and is based on processes. Organizational learning literature is often found within the academic field (Örtenblad, 2018). On the other hand, the learning organization is based on normative aspects which require some form of activity and literature defines this term from the perspective of a practitioner or consultant (Örtenblad, 2018). Furthermore, studies in this area also suggest that learning can occur across three levels namely the individual, the collective and the organization as an individual (Örtenblad, 2018).

e) Action Science and Organizational Learning

The studies focus on learning at an individual, group, inter-group and organizational level (Argyris, 1995; Yih-Tong Sun & Scott, 2005). Studies in this area suggest that learning occurs any time errors are identified and corrected. Similarly, learning can be said to have occurred anytime there is a match between the intentions of an action and the final outcome of an action (Argyris, 1995; Golembiewski, 2018). The study elaborates on two theories of action which are Model I (actionable knowledge) and Model II (productive reasoning) (Argyris, 1995; Evans & Kivell, 2015; Sun & Scott, 2003). The action strategies that develop from Model I include advocating for a particular position, evaluating both an individual's thoughts and actions and the thoughts and actions of others and finally Model I enforces that individuals should be able to articulate their position, understand the position of others and attribute causes of aspects that the individual is required to understand (Argyris, 1995). Model II focuses on acquiring valid

information, making an informed choice and monitoring the implemented choice in order to detect and correct errors (Argyris, 1995).

f) Organizational learning Interventions

This area encompasses developing interpersonal competency in the workplace where a study discusses the Information, Demonstration, Practice and Feedback – IDPF approach. This is an approach that is critical to developing interpersonal competencies (Bedwell, Flore and Salas, 2014). Studies investigating reflection and critical reflection in the workplace acknowledge that formal training in the organization is very important but that employees should also cultivate their ability to reflect by including learner participation, problem-solving and experiential learning in specific training programs (Marsick, 1998). Similarly, studies on training approaches for Individuals and teams provide a holistic overview of some of the approaches that organizations can use to train their employees (Aguinis and Kraiger, 2009; Goldstein, 1993). A necessary component of the Design and Evaluation of training can be found in establishing the relationship between training design, evaluation approaches and effectiveness of the training program (Arthur, Bennett, Edens & Bell, 2003).

This analysis of literature helped in achieving a better understanding of the context of the research in terms of some of the organizational learning theories that are in use as well as the interventions that organizations use to enable learning. This literature review was especially important because no literature was found that described the way in which organizations intervene to develop critical competencies in Business Process Analysts.

2.2.2. Organizational learning as a process

Research within this domain presents learning as a process that occurs across the individual, group and organizational levels through 4 distinct processes. This processes make up the 4I framework of organizational learning and they include intuiting, interpreting, integrating and institutionalizing (Balarezo & Nielsen, 2016b; Crossan & Berdrow, 2003; Crossan, Lane, & White, 1999; Jones & Macpherson, 2006; Lawrence, Mauws, Dyck, & Kleysen, 2005; Prats López et al., 2015; Vera & Crossan, 2004; Webb, Ahmad, Maynard, Baskerville, & Shanks, 2017).

Some of the popular organizational learning frameworks that were identified included the 4I framework of organizational learning that reveals an existing tension between exploration and exploitation that occur across three levels, the individual, group and organizational level. These levels, as well as the 4 learning processes, are linked together through feedback and feedforward

mechanisms (Balarezo & Nielsen, 2016b; Crossan & Berdrow, 2003; Crossan et al., 1999; Jones & Macpherson, 2006; Lawrence et al., 2005; Prats López et al., 2015; Vera & Crossan, 2004; Webb et al., 2017).

2.2.3. The 4I Framework of organizational learning

This study uses the 4I Framework of Organizational Learning (Crossan & Berdrow, 2003; Crossan et al., 1999). This framework provides an approach that can be used to better understand the process of organizational learning. The framework was deemed appropriate for this study as it encompassed key elements of organizational learning that were identified throughout the literature review process. These included the exploration and exploitation characteristics of organizational learning that involve the assimilation of knowledge and the use of the knowledge that has been learnt (Argyris, 1995); The concept that learning takes place across three levels within the organization (individual, group and organizational) (Örtenblad, 2018); and the acknowledgement of the importance of intuitive and experiential learning processes. The model has four main processes and these processes are intuiting, interpreting, integrating and institutionalizing. These four processes are linked to the three levels of organizational learning (Crossan & Berdrow, 2003; Crossan et al., 1999).

a) Premise and concepts of the 4I framework

The 4I Framework is underpinned by four premises which collectively support a central proposition. These premises are:

1. Organizational learning often moves between assimilation of new learning and applying what has already been learnt. In the framework, assimilation of new learning is termed as exploration while the application and usage of what has been learned is termed as exploitation.
2. Organizational learning is to be found in three main levels. These levels are individual, group and organizational levels.
3. The three levels of organizational learning that are mentioned above are linked to the processes of learning which are intuiting, interpreting, integrating and institutionalizing (4I). These processes are of a social and psychological nature.
4. In organizational learning, cognition, the process by which we acquire knowledge and understanding through experience, will influence how we act and vice versa.

The central proposition of the 4I framework suggests that these 4I processes are linked together through both feed-forward and feedback processes. This linkage occurs across the three different levels (Crossan & Berdrow, 2003). Figure 2-5 illustrates the 4I framework of organizational learning.

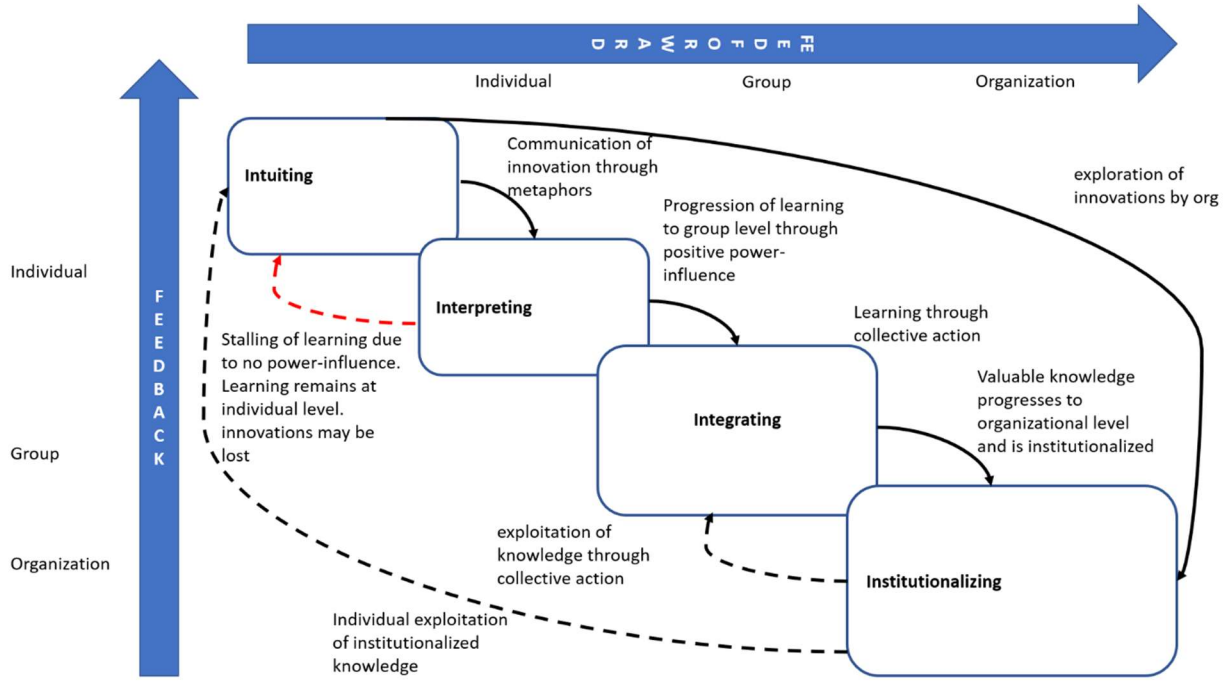

Figure 2-5: The 4I framework of organizational learning (Crossan et al., 1995; Lawrence et al., 2005)

The 4I Framework of Organizational learning also describes a central proposition of the framework which suggests that there are feedforward and feedback actions that cut across the three levels.

b) Feed Forward Process

The Feed Forward process describes a move of knowledge or innovation from the individual level to the group level and finally the organizational level. This transfer of knowledge is facilitated through the interpreting and integrating processes (Balarezo & Nielsen, 2016a; Jones & Macpherson, 2006; Lawrence et al., 2005). This feedforward to the organization happens through the development of new ways of doing tasks. Feedforward learning can stall at this point if there is no mechanism in place to influence a move this knowledge from simple interpretation to collective integration and finally to institutionalization (Lawrence et al., 2005). Therefore,

feedforward can be achieved successfully if there are influential or powerful players in the organization that support this integration and institutionalization of new knowledge (Lawrence et al., 2005). Researchers have argued that in cases where there are no influential players then the knowledge that is potentially useful to the organization may be lost (Lawrence et al., 2005).

c) Feed Back Process

The Feedback Process describes the transfer of knowledge, ideas and innovations from the organization to the individual through the institutionalization process. The Feedback process involves the exploitation of new ideas and how these new ideas are institutionalized (Balarezo & Nielsen, 2016a; Crossan et al., 1999; Jones & Macpherson, 2006; Lawrence et al., 2005). The Feedback process describes how the institutionalization of ideas affects individuals and groups in the organization (Crossan et al., 1999). In other words, through the Feed Back process, an organization is able to exploit or use what has already been learnt (Crossan et al., 1999).

d) Areas of application of the 4I framework

The 4I framework of organizational learning has been used to investigate the politics of organizational learning through the integration of power and leadership (Berson, Da'as, & Waldman, 2015; Lawrence et al., 2005). Similarly, this framework has been used to analyse entrepreneurial opportunities as a phenomenon of interest (Dutta & Crossan, 2005). Furthermore, this framework has also been used to investigate strategic renewal (Crossan & Berdrow, 2003; Jansen, Vera, & Crossan, 2009; Jones & Macpherson, 2006) and innovation (Crossan & Apaydin, 2010). The framework has been used to investigate learning beyond organizational boundaries (Prats López et al., 2015) and competency building for the ERP systems business process analyst (Wamicha & Seymour, 2017).

2.3. Research focus 3: BPM and ERP systems curriculum, the Activity Theory and activity systems analysis

This research focus addressed literature on BPM and ERP systems curriculum in section 2.15. This involved scrutiny of literature on HEI education models and student learning. Further in section 2.16, this research analysed the Activity Theory as a potentially ideal theory for describing BPM curriculum.

2.3.1. BPM and ERP systems curriculum

Within the larger domain of information systems curriculum, BPM curriculum has been seen as a major component that continues to gain relevance. This is more so given that the BPA role is now being recognized as a major career track within the information systems curriculum (Mathiesen, Bandara, Marjanovic, & Delavari, 2013; Topi, Valacich, Wright, Kaiser, Nunamaker, Sipior, & Vreede, 2010). Studies acknowledge that BPM education is growing with curriculum ranging from an integrative BPM curriculum, a business integration and an IT integrated curriculum (Antonucci & Goeke, 2011; vom Brocke, Seidel, & Tumbas, 2015). This is further exemplified by various studies that address topics on improving BPM competency building initiatives (Chakabuda et al., 2014; Sonteya et al., 2012). Furthermore, studies argue that BPM is considered a core competency for the business analyst field and has been characterized as key for building skills that allow for better interaction with stakeholders and as a competency required to bridge between business and information technology (Flügel, Seymour, & van der Merwe, 2014; IIBA, 2009).

2.3.2. HEI Education models for BPM and ERP systems curriculum

Given the broad area of IS and specifically BPM and ERP systems education, several studies show that Universities at a global level are at different levels of maturity regarding how they deliver ERP systems curriculum and how they organize their course offerings (Antonucci, Corbitt, Stewart, & Harris, 2004; Antonucci & Goeke, 2009; Blount, Abedin, Vatanasakdakul, & Erfani, 2016; Boyle & Strong, 2006; Holland & Light, 2001; Hustad & Olsen, 2014; Jensen, Fink, Moller, Rikhardsson, & Kraemmergaard, 2005). In line with this, authors on IS curricula specify the rising need to continuously evolve pedagogy (Katz, 2000) with the aim of developing students that are ready to work effectively with current industry requirements (Ask, Magnusson, Enquist, & Juell-Skiels, 2009; Hawking, McCarthy, & Stein, 2004; Mahanga & Seymour, 2015; Zschieck, Weiss, & Wirz, 2016). In an effort to develop dynamic curricula a variety of approaches have been used such as the importance of including hands-on approaches in curricula (Leyh et al., 2011; Noguera & Watson, 2004; Pridmore et al., 2014). Studies have also developed holistic frameworks that provide a comprehensive and appropriate for linking required BPA competencies with ERP systems adoption in any given IS university curriculum (Scholtz, Cilliers, & Calitz, 2012). Other approaches have included a multi-course approach that addressed a three-tiered approach and ERP systems integration across multiple business courses (Bradford, Vijayaraman, & Chandra, 2003; Peslak, 2005; Springer et al., 2007). Other studies have focused on pedagogical change and pedagogical innovation to stimulate reflective learning of enterprise systems (Ask et

al., 2009; Hustad & Olsen, 2014; Hawking et al., 2004). Another recurring concept in IS and BPM Education literature is the extent of collaboration with industry. Most of the literature encountered supports strong industry collaboration when developing IS systems curriculum such as embedding industrial knowledge into the curriculum and the use of industry-based projects to facilitate learning (Hawking et al., 2004; Stewart & Rosemann, 2001).

2.3.3. Student learning

Critical concepts within this theme focus on the idea that it is not enough to understand competencies required for BPM roles or even how IS based curriculum should be structured. It is also critical to establish evaluation criteria to assess if students are actually learning what they have been taught. A popular tool for student learning evaluation is The Blooms taxonomy (Bloom, Hastings, & Madaus, 1971). Bloom's taxonomy has been used widely in providing an evaluation in education with the aim of enabling students to become reflective learners who are able to apply theoretical concepts taught at the classroom level. Some research has used the tool in the development of IS and BPM based curriculum (Atif et al., 2011; Chakabuda et al., 2014). In addition to this, when addressing BPM curriculum it is important to go beyond the process of curriculum development to actually understand the process by which students move from superficial learning to deeper and more reflexive and reflective learning (Ryan & Ryan, 2013). The tool also provides a popular taxonomy used in evaluating the process of student learning including learning concepts in BPM and ERP systems (Atif et al., 2011; Fürbringer, Freund, Glardon, Nienhaus, & Stammbach, 2002; Rashid et al., 2011). Research covering student learning has also looked into a simulation of learning processes using cognitive learning tools (Cronan, Léger, Robert, Babin, & Charland, 2012). Among the student learning theories that have been applied in the area of student learning include the Organizational Learning Theory (Argyris, 1967, 1976, 1977, 1995; Argyris & Schon, 1978; Cangelosi & Dill, 1965; Huber, 1991). The authors addressed the learning process of organizations that were constantly evolving to survive, learning processes in teams and development of four constructs of organizational learning. Another theory of interest is the experiential learning theory (Fenwick, 2001; Jewer & Evermann, 2014; Kirkham & Seymour, 2005; Kolb & Kolb, 2005; D Kolb, 2014; David Kolb et al., 2001; Scholtz et al., 2012; Watson & Schneider, 1999). These studies address the best ways to facilitate learning and competency attainment for students undertaking IT based courses.

2.3.4. Activity Theory

The Activity Theory was derived as a human science perspective by Vygotsky and as a classical German philosophy by Kant and Hegel. It is seen as a multidisciplinary theory that is based on the idea that a closed system does not work well because human activity is dynamic and multifaceted. Seminal studies on the Activity Theory developed three generations of research around the theory (Engeström, 1999, 2001). The first generation Activity Theory addressed Vygotsky's idea of mediation and formalized it into a model of instrumental action (Vygotsky, 1978). The second generation included developing a relationship between mediation and other aspects of an activity. The third generation Activity Theory was more wholesome and included an understanding of the importance of dialogues and joint activity (Engestrom, 2000; Engeström, 2001). In general, the theory focuses on the idea that human activities are driven to achieve specific outcomes. It also focuses on the interaction of human activity within a pre-determined context and attempts to move away from following a specific process of action that often neglects societal or cultural nature of the activity (Engestrom, 2000; Engeström, 1999, 2001; Engeström, Miettinen, & Punamäki, 1999). Further, similar research argues that the Activity Theory provides a theoretical framework that can be used to analyze human and communal action (Kaptelinin, Kuutti, & Bannon, 1995). The theory has been used widely in many different areas including HEI learning and course design (Yamagata-Lynch, 2003, 2007). It has been used in the development of constructivist learning environments and in student learning processes (Jonassen, 2000; Jonassen & Rohrer-Murphy, 1999). It has been used in the area of mobile learning (Sharples, Taylor, & Vavoula, 2010; Uden, Damiani, Gianini, & Ceravolo, 2007); it has been used in combination with other learning theories like experiential learning (Holman, Pavlica, & Thorpe, 1997; David Kolb et al., 2001). It has also been widely used in expansive learning and work re-designing (Engestrom, 2000; Engeström, 1999; Engeström et al., 1999) in Personal Learning Environments (Buchem, Attwell, & Torres, 2011)and in studies on Human-Computer Interaction (Kaptelinin et al., 1995; Kaptelinin & Nardi, 2006). Activity Theory has been applied in the context of critical realism research paradigm (Mukute & Lotz-Sisitka, 2012; Nunez, 2013; Spasser, 2002).

Activity Theory is based on a set of principles or concepts namely: a) unity of consciousness and activity where the human mind is said to develop within a meaningful goal-oriented context (Kaptelinin et al., 1997) b) object orientedness where human beings are said to live in an objective reality that includes social and cultural properties (Kaptelinin et al., 1997; Nardi, 1995) c) Activity as the basic unit of analysis where an activity is seen as being directed towards an object and the subject is able to do several activities at once (Kaptelinin et al., 1997) d) Mediation where there

is an emphasis that all human activities are mediated by tools (artefacts or instruments) tools depend on the cultural know-how and social experience (Kaptelinin et al., 1997) e) History and Development where there is a need to understand an activity based on the way in which it has developed over time. In order to understand an activity's current state, it is important to analyze its history (Kaptelinin et al., 1997) f) internalization and externalization where there needs to be a clear difference between external and internal activities. Internalization signifies the process from external to internal, actions among subjects to actions within a subject, and externalization signifies external actions that manifest mental thoughts/actions (Kaptelinin et al., 1997; Kaptelinin, 1996) g) Hierarchical Structure where Kuutti (1995) interpreted three levels of activity as motive for activity, goal or action (goals and motives may overlap and differentiating them may be difficult) and conditions or operations (conscious acts that become routine over time). Figure 2-6 outlines the basic concepts of the Activity Theory while Appendix 4 and Appendix 5 goes into further detail on the definitions of the Activity Theory concepts:

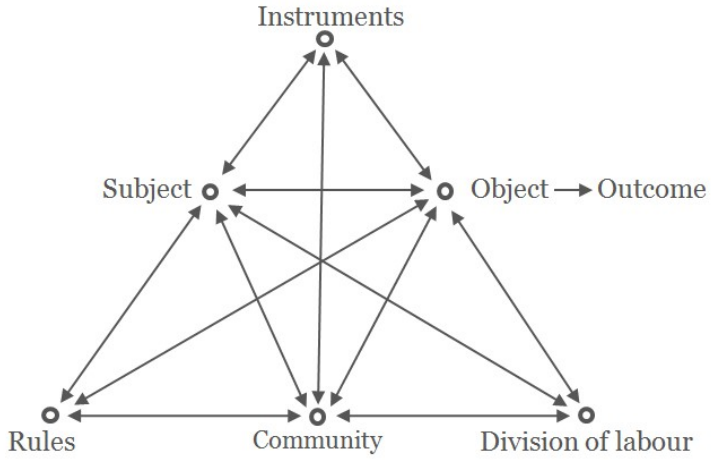

Figure 2-6: The Second Generation Activity System (Engeström, 1999)

2.3.5. Activity systems analysis

Activity systems analysis is an approach developed by Engestrom (Engeström, 1999). It is a method for presenting complex qualitative data (Yamagata-Lynch, 2003). Activity systems analysis has been used in design-based research especially because design-based research often leads to data collection and analysis that involves complex processes (Fraser, Honeyfield, Breen, Protheroe, & Fester, 2017; Hoadley, 2004; Yamagata-Lynch, 2007). Activity systems are also viewed as a means of understanding human activity within a collective context often represented in the form of triangle diagrams (Choi & Kang, 2010; Engeström, 1999; Kaptelinin, 2005; Sundberg et al., 2016; Yamagata-Lynch, 2007). Practically, activity systems have been used to

understand the interactions between teacher activities within a professional development program (Yamagata-Lynch, 2003). In addition, activity systems analysis has also been used as a descriptive tool that has been used to capture and describe steps required for organizational change (Barab, Schatz, & Scheckler, 2004; Roth & Tobin, 2002; Yamagata-Lynch & Haudenschild, 2009). Further research on activity systems requires that the researcher engages in reflection with iterative drafting and redrafting of the activity system triangle models (Yamagata-Lynch, 2007). While research does acknowledge that real-world contexts are more complicated than what can be represented in triangle diagrams, activity systems are still useful in representing participants worldview of a given context (Yamagata-Lynch, 2007). Research also suggests that activity systems can occur over a plane of analysis that includes the individual, inter-individual and institutional plane (Yamagata-Lynch, 2007). This is similar to the 4I framework of organizational learning that also describes learning processes across the individual, group and organizational levels (Crossan et al., 1999). Moreover, activity systems analysis has been described as beneficial to design-based research by enabling the identification of meaningful activity units and identification of existing tensions in the activity systems (Yamagata-Lynch, 2007). However, activity systems analysis does come with several dilemmas such as defining activity settings contained within a rich data set, modelling complex human activities through the use of a series of distinct activity systems, identifying tensions within activity units and maintaining trustworthiness in activity analysis (Yamagata-Lynch, 2007, 2010).

2.4. Summary of literature

Following an extensive literature review, this research established that much has been done in the area of BPM, the BPA role, BPM maturity, BPM competency building. However, from a contextual perspective, Kenya intends to position itself as a leading hub for process offshoring (Vision 2030, 2008). Given that high-quality process offshoring requires a high-level competence in BPM (Mahmoodzadeh et al., 2009) it was interesting to note that while much has been done with respect to process offshoring in Kenya (Jane et al., 2018; Mann & Graham, 2016; Mann et al., 2015), hardly any research in BPM or BPM competency building had been carried out on the Kenyan context with one study suggesting that one of the main pitfalls of process offshoring adoption in Kenya was a lack of relevant competencies in the country (Chumo, 2015). Related studies on the Kenyan context did suggest that more BPM and ERP systems related literature was required. Furthermore, studies have also delved into ERP systems curriculum and competency building. This interest in the ERP systems domain arose given that ERP systems are information

systems that enable the automation of business processes. Therefore, in order to implement these information systems effectively, it is important to be competent in the area of BPM.

This study took the position that, in order to uncover the BPM competency building for the BPA role, it was necessary to analyze the way in which organizations learn. The study investigated existing literature on the various organizational learning theories, approaches and frameworks used in the information systems domain. Some of the most common approaches included organizational learning, experiential learning and action science in organizational learning. A common theme that arose was that learning occurs across three levels that include the individual level, the group level and the organizational level. These approaches have been incorporated into a wide variety of topics such as strategic management and analyzing entrepreneurial opportunities. Similarly, approaches such as experiential learning have been used to investigate the curriculum and the use of HEI educational models in BPM and ERP systems-related courses. Similarly, extensive research has been carried out with regards to HEI models for BPM and ERP systems curricula including several theories discussing pedagogy and student learning. This includes the use of activity systems analysis that uses the concepts found in the Activity Theory.

2.5. Research Gaps

Findings from the literature review suggest that the more mature an organization is in terms of BPM the higher the competency requirements for BPAs handling these BPM initiatives (de Bruin & Doebeli, 2009; De Bruin & Rosemann, 2006; Rosemann, 2006). However, upon further scrutiny of literature on BPM maturity, there was no clear indication of the specific BPA competencies required to drive BPM maturity in organizations. Furthermore, no studies addressed the Kenya context with regards to BPM and the BPA role. Similarly, studies focusing on BPM within ERP systems implementations are scarce especially within the African context much less the Kenyan context despite Kenya aiming to position itself as a leader in process offshoring as part of its long-term strategy (Vision 2030, 2008). This has proven to be a significant gap in literature given that experts of BPM and ERP systems integration believe when companies do not correct faulty business processes, this can lead to failure when implementing their ERP systems. In this regard, further research is required that outlines how improving BPA competencies can improve success rates of ERP system implementation projects. Similarly, research on the BPA role requires further diversification to determine their requisite competencies. The competencies are aimed at enabling the BPA to improve business processes, drive BPM initiatives in their respective organizations and enhance the quality of ERP systems implementation. Studies

discussing the extent to which the Kenyan context perceived BPM and BPA competencies in comparison to other African contexts would be valuable given that there is a move towards viewing phenomenon of interest from a contextual perspective.

An analysis of literature indicated that very few studies on BPA competencies had been done in Africa and none in Kenya. Throughout the literature review, no studies on the specific interventions required to build these competencies in BPAs had been identified and much of the literature scrutinised either addressed the BPA role or organizational learning and organizational learning interventions separately. It was critical to note that there were gaps in knowledge concerning pedagogy for BPM education, presentation of teaching strategies most suitable for teaching BPM concepts, the maturity of both BPM and ERP systems curriculum and employability of students for the BPA role. Furthermore, no studies identified specifically focused on the unique needs of the Kenyan context where the BPA job role is very new. Of note was that at the time of this study Kenya had no BPM curriculum embedded in any HEI course.

3. Research Method

In this particular chapter, the intention is to demonstrate the appropriateness of the selected method and how it was used to answer the three research questions for this study. The chapter includes an analysis of the research questions and the empirical situation of the study; the paradigmatic assumptions of the study; the research strategy and the intended theoretical contribution. The theoretical foundations of the framework to be used in the study were also elaborated. In order to provide a holistic overview of the methodology used, the study utilizes the components of the research onion (Saunders, 2011). These components include research philosophy, scientific contribution, research approach, research strategy, time horizons and research choices. This study focused on describing the competencies of the BPA role that were perceived as most important, those organizational interventions that enhanced these competencies in BPAs and how these interventions could be adopted in HEIs. The main research question for this study was as follows:

What interventions develop BPA competencies required by organizations in Kenya?

This research question was empirically investigated and the approach used is further explained in this chapter. This study answers this primary research question by addressing four sub-questions discussed further in section 3.2.

3.1. An Analysis of the intended objectives for the study

This study first sets out to describe which competencies are perceived as necessary for the BPA role for organizations in Kenya. These findings are compared to a similar study done in SA in order to establish any contextual differences. Further, this study investigates the interventions that are used by BPAs in organizations in Kenya and then explains how these interventions enhance the required BPA competencies. Finally, the study explains how these interventions can be applied through the HEI curriculum in order to prepare students to become BPAs. These three questions are further outlined in Table 3-1:

Table 3-1: Intended research objectives per research question

Research question	Research objectives
RQ 1: What are the competencies required for the BPA role in organizations in Kenya?	- This question provided a description of the various competencies that organizations view as critical for BPAs based on BPM maturity, the status of ERP systems implementation and geographical context - Another objective was to focus on contextual perspectives by analyzing findings in the Kenyan context and then differentiating these findings with those of a similar study done in the SA context. - This study developed propositions outlining the contextual findings.
RQ 2: What are the organizational interventions that impact these competencies?	- In this question, the aim was to identify and describe the interventions that organizations use to build BPA competencies in Kenyan based companies
RQ3: How do these interventions impact BPA competencies	- A node matrix was developed that outlined cross-tabulation of which interventions impacted which BPA competencies in Kenyan based companies and allowed explanation of patterns between these two aspects.
RQ 4: How can the HEI curriculum and pedagogical interventions and interactions develop these competencies in students?	- This question prescribed a BPM curriculum developed with the aim of preparing students to become BPAs within the Kenyan context.

3.2. Research philosophy

Research philosophy is defined as the important assumptions that are made that underpin the research strategy (Saunders, 2011). The research philosophy is mainly influenced by a particular view of the relationship between knowledge and the way in which this view is developed (Saunders, 2011). Research philosophy is made up of the ontology, epistemology, axiology, methodology, and, methods. Each concept is defined below:

a) Ontology: Ontology focuses on the various assumptions made by researchers on the way aspects of the world operate. It focuses on what constitutes knowledge (Walsham, 1995).

b) Epistemology: Epistemology is concerned with the nature of knowledge, how it is created, acquired and communicated (Walsham, 1995). It is regarded as what constitutes acceptable knowledge in a given field of study (Gregor, 2006; Saunders, 2011).
c) Methodology: Methodology is described as the plan of action prepared by the researcher to carry out particular research (Saunders, 2011) and is often constrained by the Ontological and Epistemological position already taken by the researcher (Guba & Lincoln, 1994).
d) Methods: Methods include the specific techniques and approaches that are used to collect and analyze data (Crotty, 1998). The data collected can either be quantitative and qualitative. A mix of qualitative and quantitative data can be used within a study (Saunders, 2011).

This section analyses the philosophies of interest to this study namely Pragmatism and Interpretivism.

3.2.1. Positivism

Positivist research follows the basic ontological assumption related to an existing objective such as social or physical reality. This social or physical reality can be apprehended, characterised or measured (Orlikowski & Baroudi, 1991). In information systems, positivist research applies in cases where there is evidence of formal propositions as well as variables with quantifiable relationships that are identified by testing hypothesis and making inferences (Orlikowski & Baroudi, 1991).

Positivism makes the assumption that reality exists independently and overlooks the human element. Positivist research assumes therefore that individuals do not influence their social reality and that a researcheris not influenced by the research context (Orlikowski & Baroudi, 1991).

3.2.2. Interpretivism

The Interpretivist research philosophy takes the position that researchers need to understand the differences and interactions of humans given their important role as social actors. The nature of interpretivism is described as the process of gaining knowledge of the reality of the world through social constructions (Saunders, 2011). Within the area of information systems, interpretivism has been used to better understand the context within which information systems are utilized (Klein & Myers, 1999; Walsham, 1993). In this regard, Interpretivism focuses on a holistic viewpoint and social structures of the different participants of a given information system (Walsham, 1993). Interpretive philosophy, therefore, argues that “reality is socially constructed” (Orlikowski &

Baroudi, 1991 p.16.). In interpretive studies, there is a focus on the context within which the study is carried out (Walsham, 1993). The epistemological basis of interpretivism suggests that social aspects cannot be fully measured through the use of hypothesis and development of quantifiable relationships within variables (Orlikowski & Baroudi, 1991). Rather Interpretivism offers the option that enables researchers to analyze qualitative data to enable them to understand human aspects such as cognitive behaviour and human actions within their specific environments and contexts (Klein & Myers, 1999). From an ontological perspective, interpretivism emphasizes the use of subjective meaning (Orlikowski & Baroudi, 1991). Hence, interpretivism attempts:

> *"to understand the intersubjective meanings embedded in social life…to explain why people act the way they do" (Gibbons, 1987 p.3).*

In this regard, information systems research that uses the interpretivist philosophy assumes that the social world is created and reinforced by human beings through their behaviour and interactions (Orlikowski & Baroudi, 1991).

3.2.3. Pragmatism and mixed methods research

Studies around Pragmatism are derived from work carried out by James, Dewey and Pierce (Creswell & Clark, 2017), as well as other researchers (Cherryholmes, 1992; Patton, 1990; Porra, Hirschheim, & Parks, 2014; Rahi, 2017). According to the Pragmatic research philosophy, answering the research question is the most important factor within a given study when determining the research philosophy to be used. The pragmatic research philosophy can integrate more than one research strategy and research approach. It is also possible to integrate multiple research methods focusing on qualitative and quantitative data and even action research methods. The pragmatic philosophy takes the view that one approach may be more appropriate for answering a particular research question. The pragmatist argues that it is possible to adopt both the positivist and interpretivist philosophies depending on the nature of the research question to be studied (Johnson, Onwuegbuzie, de Waal, Stefurak, & Hildebrand, 2016). Hence, instead of the methods used in a research problem being important, it is the problem to be solved that is important (Creswell & Creswell, 2017; Rossman & Wilson, 1985). The following is a direct quote from a study that addressed the nature of the pragmatic philosophy with regards to its strength in answering a particular research question:

> *"The great strength… of this approach (pragmatism) is its emphasis on the connection between philosophical concerns about the nature of knowledge and the technical*

concerns about the methods that we use to generate that knowledge." (Tashakkori & Creswell, 2007 p.5)

Substantial research has also argued that pragmatism forms an attractive philosophical underpinning for mixed methods research studies (Greene, 2008; Johnson & Onwuegbuzie, 2004; Johnson et al., 2016; Johnson, Onwuegbuzie, & Turner, 2007; Tashakkori & Teddlie, 1998). With this in mind, therefore, mixed methods research intentionally utilizes "competing paradigms" while at the same time appreciating that each paradigm used in a study can give valuable insights (Creswell & Creswell, 2017; Hanson et al., 2005). In order to situate mixed methods within a given research philosophy, researchers have argued that the pragmatism philosophy would be the best option to support a mixed methods study given that it focuses on understanding and appreciating the research question first and then adopting the most appropriate approach to answer the research questions (Johnson & Onwuegbuzie, 2004).

3.2.4. The position of this study: Research philosophy

While this study has a strong leaning towards the interpretivist philosophy, the researcher takes the position that answering the research question is the most important factor for a study when establishing the most appropriate research philosophy to adopt. This follows the pragmatic research paradigm which advocates for the appreciation of the essence of the research question and then using this as a basis for the selection of the specific method to use (Hanson et al., 2005). This study proposes that pragmatism forms a good basis for the use of mixed methods which forms an important component of this study. The researcher individually addressed each of the three research questions and provided the epistemological, ontological and methodological positions taken for each of the research questions. The methodological positions will be more elaborately discussed later on in this chapter. These positions are outlined in Table 3-2:

Table 3-2: Epistemological, ontological and methodological positions of this study by the research question

Research question	Epistemological stance	Ontological stance	Methodological stance
RQ 1: What are the competencies required for the BPA role in organizations in Kenya?	Facts or knowledge gained through scientific method however in order to understand the context better any	Initially, an objective view of the phenomenon of interest is taken followed by a focus on the subjective meaning	This research question follows a concurrent approach to mixed methods research where quantitative data is more dominant than qualitative. This approach is useful for carrying out corroboration of data (QUAN + qual)

	existing social constructs are analysed further	of the phenomenon of interest	Quantitative data: - Development of dependent and independent variables - Hypothesis are developed and tested - Quantifiable relationships are developed - Propositions were developed that presented findings on those competencies that BPAs found important. - The propositions were developed with respect to the results obtained after hypotheses were tested. Qualitative data: - This provides supporting data for the research question; promotes triangulation - Provides confirmation of the results obtained from quantitative data - Addresses issues specific to the Kenyan context which quantitative data is unable to achieve satisfactorily.
RQ 2: What are the organizational interventions that build BPA competencies?	Knowledge was gained through analysis and understanding of social constructs	The focus was on the subjective meaning of the phenomenon of interest	Qualitative data: - Was aimed at gaining a holistic understanding of what organizational interventions BPAs used to build their competency levels. - The data collected and analysed had a strong focus on the context of the BPA role.
RQ 3: How do these interventions impact BPA competencies	Knowledge was gained through analysis and understanding of social constructs	The focus was on the subjective meaning of the phenomenon of interest	Qualitative data: - The data collected sought to explain patterns between the interventions used to build BPA competencies and the specific competencies that they impact

			- Cross-tabulation between BPA competencies and Organizational interventions through a node matrix
RQ 4: How can the HEI curriculum and pedagogical interventions and interactions develop these competencies in students?	Knowledge was gained through analysis and understanding of social constructs	The focus was on the subjective meaning of the phenomenon of interest	Qualitative data: - Was aimed at making discovery of shared meanings and artefacts that are used in the development of BPM curriculum in HEI. - The outcome was a designed artefact to be used in the classroom as part of HEI BPM curriculum Ex-post artefact evaluation - Use of a naturalistic approach - Quantitative survey applied to students after running the designed artefact

3.3. Scientific contribution

Within the domain of information systems, studies have classified theories (Gregor, 2006; McKelvey, 1982). Research suggests that it is beneficial for the user to classify theories in order to determine the most appropriate contribution to the research question at hand (Gregor, 2006). A study focusing on the classification of theories suggests that they can have a number of components (Gregor, 2006). These are further elaborated in Table 3-3.

Table 3-3: Structural Components of Theory (Gregor, 2006 p. 620)

	Theory Components	Definition
Components common to all 5 theory classifications	Means of representation	The theory must be represented physically in some way: in words, mathematical terms, symbolic logic, diagrams, tables or graphically. Additional aids for representation could include pictures, models, or prototype systems.
	Constructs	These refer to the phenomena of interest in the theory. All of the primary constructs in the theory should be well defined. Many different types of constructs are possible: for example, observational (real) terms, theoretical (nominal) terms.
	Statements of relationship	These show relationships among the constructs. Again, these may be of many types: associative, compositional, unidirectional, bidirectional, conditional, or causal. The nature of the relationship

		specified depends on the purpose of the theory. Very simple relationships can be specified: for example, "x is a member of the class".
	Scope	The scope is specified by the degree of generality of the statements of relationships and statements of boundaries showing the limits of generalizations.
Components dependant on the type of theory	Causal Explanations	The theory gives statements of relationships among phenomena that show causal reasoning
	Testable propositions	Statements of relationships between constructs are stated in such a form that they can be tested empirically.
	Prescriptive statements	Statements in the theory specify how people can accomplish something in practice (e.g., construct an artefact or develop a strategy).

The five primary goals of theory (Gregor, 2006) are theories for analyzing, explaining, predicting, explaining and predicting and finally design and action. The next section further discusses the scientific contribution relevant to this study. Further, the last section provides a justification of the relevant theories for this study.

3.3.1. Theory for analyzing (Type I)

The analyzing theories form the most basic type of theory. These type of theories attempt to answer the "what is" (Gregor, 2006). They are descriptive in nature and are often used when there is nothing or very limited knowledge of the phenomenon of interest. Variants of analyzing theories include "classification schema, frameworks, and taxonomies" (Gregor, 2006 p. 625). Theory of analyzing should provide evidence that is credible and should as much as possible correspond to "what is" questions (Miles, Huberman, Huberman, & Huberman, 1994).

3.3.2. Theory for explaining (Type II)

The explaining theories focus on why and how certain phenomena of interest take place (Gregor, 2006). This theory presents possible reasons as to why, when, and where certain events occur (Gregor, 2006). Theories of explanation can be high level such as those which focus on providing a high-level view of the world (Klein & Myers, 1999) or lower level explanations that provide reasons as to how or why specific things occur within a particular situation (Gregor, 2006). These explaining theories will often analyse causal factors that contribute to the occurrence of the phenomenon of interest (Gregor, 2006).

3.3.3. Theory for design and action (Type V)

The design and action theories are prescriptive in nature and attempt to establish how to do something (Gregor, 2006). *"It is about the principles of form and function, methods, and justificatory"* (Gregor, 2006 p. 628). These theories are often categorized under software engineering (Morrison & George, 1995) because of their focus on developing functional outputs. Research has shown that these group of theories are critical in IS research with researchers stating that these theories are grouped under design science-based research (Gregor & Hevner, 2013; Hevner, 2007; von Alan et al., 2004).

3.3.4. The position of this study: Scientific contribution

a) **Research question 1 and Research question 2**

RQ1 and RQ2 aim to develop descriptive and analytical knowledge of the phenomenon of interest. Theories for analyzing are beneficial as they provide an initial glimpse into the phenomenon of interest where hardly any information was previously available (Gregor, 2006). This study intends to analyze and describe BPA competency development within the Kenyan context. Hardly any information was available in this area and this is clearly indicated in the gap analysis of the literature review chapter. The findings of RQ1 and RQ2, therefore, provide a good starting point towards a further investigation of BPA competency development.

b) Research question 3

The 3rd research question for this study addresses how organizational interventions impact BPA competencies. The main scientific contribution is a theory for explaining that addressed the existing patterns between interventions and competencies with regards to which interventions described in RQ2 had the highest impact on given BPA competencies. Additionally, RQ3 provided a high-level view of the phenomenon of interest and the relationships that exist within the phenomenon of interest (Gregor, 2006). In this case, the phenomenon of interest with regards to the relationships that exist between the Organizational interventions developed in research question 2 and the BPA competencies that they impact the most.

c) Research Question 4

Research question 4 aimed to prescribe components in the development of BPM curriculum in HEI. The outcome was a designed artefact to be used in the classroom and would form part of HEI BPM curriculum. In this regard, research question 4 dealt with "how to" develop the most appropriate HEI curriculum for BPA competency building. Further, the theoretical contribution

for this research question was a theory for design. This research question intends to provide a constructive output or artefact for development of appropriate BPM curriculum. This developed artefact is further elaborated in Chapter 7 and has been tested for simplicity, ease of use, evaluation for completeness and quality of results. The artefact development follows the steps specified by Peffers (2007). In order to build the artefact, research question 4 relies heavily on the use of activity systems derived from Activity Theory as discussed in chapter 2. Table 3-4 provides an overview of the scientific contribution for each research question of the study. Table 3-4 outlines how the concepts described in Gregor (2006) have been adapted for this study. In addition to stating the position of this study with regards to scientific contribution, it is also important to emphasise on the position of this study with regards to the interrelationships of the different types of theories (Gregor, 2006). Studies suggest that the most basic types of theories are analytical in nature and are critical for the development of other types of theories (Gregor, 2006). RQ1 and RQ2 provide this initial look into BPA competency building and interventions and form a basis for the development of other theories.

Table 3-4: Scientific Contribution of the study by research question

Theory Overview: Provides a description and analysis of the BPA competencies that are important within the Kenyan context. Further, interventions are used in organizations to develop BPAs are analyzed. Emerging patterns between BPA competencies and organizational interventions are explained and finally, an artefact is designed that can provide prescriptions for the development of a BPA focused curriculum				
Theory components	**Instantiation**			
	RQ1	**RQ2**	**RQ3**	**RQ4**
Methods of representation	Words Diagrams and tables			Words, diagrams, tables and photos
Constructs	BPA Competency analyses	Classification of BPA competency building interventions	Relationships between Interventions and BPA competencies	BPM curriculum, artefact built from activity systems

Statements of relationship	Provides a description of relationships between competency requirements using the BPM competency framework. These descriptions focus on factors such as BPM maturity, ERP systems implementation and geographical context	Description of BPA competency development interventions and classifying them using the 4I Framework of organizational learning.	Matrix node showing patterns between interventions and BPA competencies. High-level statements of the emerging patterns between interventions and BPA	Interaction of students with artefact with the aim of building BPA competencies
Scope	Limited to the BPA role largely within the Kenyan Context			
Causal Explanations	None			
Testable propositions	Yes. 4 propositions are developed and are further elaborated in chapter 4	None		
Prescriptive statements	None			Prescribe Curriculum Requirements for BPA competency building courses. these are represented as activity systems

Theories for explaining build on theories of analyzing by providing both a high level and detailed explanation as is described in Research question 3 (Gregor, 2006). Finally, theories for design are informed by both theories for analyzing and explaining. With respect to this study, research question 4 designs and evaluates an artefact for curriculum development that is built from contributions made from the previous research questions. Figure 3-1 illustrates the flow of theory developed for this study. This flow is based on work by Gregor (2006).

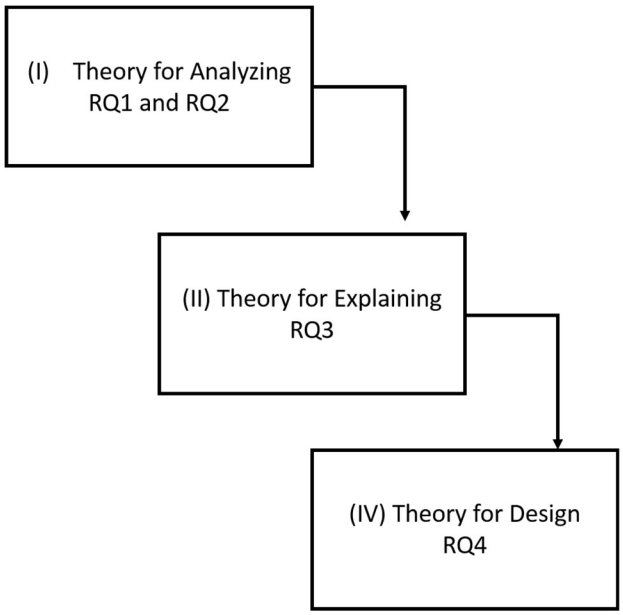

Figure 3-1 Scientific contribution for this study (Gregor, 2006 p. 630)

3.4. Research approach

In this section, the research approach is discussed. The research approach of a study is described as critical to making appropriate research design decisions (Blaikie, 2009). Research approaches also provide a way to answer the research questions of a given study (Blaikie, 2009; Lyytinen & Ngwenyama, 1992; Ngwenyama, 2014). The four main approaches are induction, deduction, retroduction and abduction (Blaikie, 2009; Ngwenyama, 2014). The next sections discuss the deductive and inductive approach and the final section analyzes how these two approaches were used with respect to this study.

3.4.1. Deduction

Studies suggest that deductive reasoning is based on the development of a hypothesis before testing in order to develop a theory (Blaikie, 2009). Deductive reasoning allows for the development of descriptive statements for a given phenomenon of interest. Propositions

developed through deductive reasoning can give way to opportunities for explanation and prediction for a given area of interest (Blaikie, 2009). In this regard, the deductive approach can aid in the development of both descriptive and explanatory contributions. In this case, the research questions aid in the definition of the problem, a theory or set of concepts are selected that can best be used to solve the problem (Lyytinen & Ngwenyama, 1992; Ngwenyama, 2014). These theories or concepts can be derived from other disciplines so long as they are deemed beneficial to describe the phenomenon of interest. Finally, relationships are identified between the different concepts that can describe the given phenomenon of interest (Lyytinen & Ngwenyama, 1992; Ngwenyama, 2014). Studies have also argued that deductive reasoning can play a significant role in theorizing in design science-related research (Gregory & Muntermann, 2011).

3.4.2. Induction

Induction has been described as providing a "commonsense view" of a given area of interest (Blaikie, 2009). With regards to induction, facts are observed and recorded regardless of presumed importance; these facts are then analyzed and generalizations are drawn from them. These generalizations are then further tested and refined (Blaikie, 2009). In the case of the inductive strategy, all facts of a given study are observed and recorded. These facts are then analyzed and classified without the use of hypotheses (Blaikie, 2009). Inductive reasoning also involves recognizing, matching and explaining patterns in complicated problems (Arthur, 1994).

3.4.3. The position of the study: Research approach

a) <u>Deduction: Research question 1, 2 and 4</u>

RQ1, RQ2 and RQ4 follow the deductive approach to research design. As discussed in section 3.5.1, deductive approaches follow the development of descriptive statements for a given study. This is done through the development of hypotheses that are tested and from which propositions are developed and outlined. RQ1 follows this approach, where four hypotheses are developed using the BPA competency framework (Sonteya et al., 2012) and tested. The findings of RQ1 are presented in the form of seven propositions. These 7 propositions offered an opportunity for further explanation and understanding of the Kenyan context given that there was no prior literature on BPM or BPA within this context.

Further, deductive reasoning is said to use theory or a set of concepts for solving a given problem. Deductive reasoning can aid in the identification of relationships between different concepts with the aim of further understanding the phenomenon of interest. In this regard, research question 2

uses the concepts derived from the 4I framework of organizational learning developed in the field of psychology to identify and describe organizational interventions and how they are classified within the four learning processes of the 4I framework of organizational learning (Crossan et al., 1999).

Deduction is also useful in the area of design based studies since they intend to build prescriptive solutions to theories or frameworks that already exist (Gregory & Muntermann, 2011). Research question 4 uses a top-down deductive approach where Activity systems models are derived from the concepts of the Activity Theory and the BPA competency-intervention framework. These activity systems form a basis for the new design artefact to be used in BPM curriculum development for HEI.

b) Research Question 3

At the heart of this study was research question 3. This research question intended to explain patterns between BPA competencies and organizational interventions used to develop these competencies. Inductive reasoning was an ideal approach to use for this question as it provided an opportunity for establishing universal generalization and explaining patterns emerging from data (Blaikie, 2009). The inductive approach was therefore found to be appealing with respect to explaining competency – intervention patterns. Since inductive reasoning was deemed the most appropriate approach to answering this research question, it was necessary to achieve data saturation in order to ensure that the analysis outcome was as accurate as possible. Section 3.10.4 of this chapter further discusses how data saturation was achieved.

Table 3-5 below summarizes the research approach used for each of the 4 research questions and the theory of framework used or developed. To answer, research questions 1,2 and 4 follow a deductive approach and therefore the study used existing theories and frameworks. On the other hand research question 3 aimed to develop a theory that explained existing patterns between BPA competencies and organizational interventions.

Table 3-5: Research approach and theory/framework used or developed

Research Question	Deductive	Inductive	Theory/Framework used or developed
RQ1	X		BPA competency Framework used
RQ2	X		4I Framework of Organizational Learning used
RQ3		X	New Framework developed (BPA competency – Organizational intervention)
RQ4	X		New framework and Activity Theory used

3.5. Research strategy

Studies define research strategy as the steps required by the researcher to answer a given research question (Saunders, 2011). The research strategy adopted by the researcher is dependent on aspects such as time allocated, available resources and philosophical underpinnings (Saunders, 2011). Studies also suggest that research strategies are not necessarily mutually exclusive and that it is possible to embed a strategy within another. There are several research strategies available to the researcher. These include experiments, surveys, case studies, action research, grounded theories, archival research and ethnographies (Saunders, 2011). The next section discusses the research strategy adopted.

3.5.1. The position of the study: Research strategy

This study adopted a mixed method strategy. RQ1, RQ2 and RQ3 focused on BPAs working in organizations in Kenya. While RQ4 focused on students and lecturers participating in BPM courses in HEI. A study argues that the mixed methods strategy has come of age (Creswell, Hanson, Clark Plano, & Morales, 2007; Tashakkori & Creswell, 2007). Proponents of this strategy argue that quantitative and qualitative methods used on their own fall short of the approaches in use today in the domain of social and human sciences such as the information systems field (Creswell et al., 2007). Furthermore, the mixed methods strategy was appealing to this study as it allowed for the focus to be placed on the research question. Pragmatism which was adopted in this study supports this philosophical underpinning (Creswell & Clark, 2017; Creswell et al., 2007). Given that this study wanted to have a deeper understanding of the BPA competency field in Kenya, a relatively new area of research, a mixed methods approach was ideal as it would enable the use of both quantitative and qualitative data thereby giving a better understanding of the phenomenon of interest (Creswell & Clark, 2017).

3.5.2. Context description

The study followed a mixed methods approach. This meant that both quantitative and qualitative data was used (Keutel, Michalik, & Richter, 2014). In the case of RQ1 BPAs working in organizations in Kenya were asked to fill out a survey instrument indicating which competencies they felt were important. In RQ2 and RQ3 semi-structured interviews were used with a focus on BPAs working in organizations in Kenya. In RQ4 semi-structured interviews were used to collect requirements from lecturers and students participating in BPM courses in HEI. Further, in RQ4,

a survey was used to evaluate the effectiveness of the designed artefact. Table 3-6 provides a summary of the research strategy adopted for this study.

a) BPAs working in industry: involved running a survey with BPAs working in different types of industry such as manufacturing, retail, banking and power generation. The respondents of the survey had to be working directly with the documentation, analysis, re-design and implementation of business processes. Here, this study sought BPAs who had experience handling ERP implementations. Most of the BPAs identified in this setting had studied in Kenya but had not received any formal education on BPM. Most of their competencies had been attained while already working in Industry. Furthermore, this research expected valuable feedback on the Kenyan context from the respondents given that they worked in organizations based in Kenya.
b) BPM curriculum implementation within HEI: from the previous setting, this research established that BPA practitioners in Kenya had received no formal education on BPM. Most BPAs had been faced with a steep learning curve once they began working in their roles in industry. The study collected requirements from undergraduate students who were currently in the 4th year of study. All the students involved attended a Kenyan based HEI. The aim was to develop a BPM course that would be used within the selected HEI for a period of 1 semester. Each semester lasted for a period of four months. The BPM curriculum would be implemented in the form of 10 sessions. Each session took 3 hours and lasted for 10 weeks of the 4 month semester. The remaining 2 weeks were designated as the exam period. Section 3.11 provides additional details of the BPM course. It was for these students that the final artefact was tailored. As part of the data collection process, the researcher found it necessary to collect requirements from lecturers who had experience teaching a BPM course. It was, therefore, necessary to collect data from lecturers who taught BPM courses in South African HEI. The researcher approached 4 lecturers based in South Africa who provided valuable insights that were incorporated into the artefact development.

Table 3-6: Summary of research strategy

Context	Method/Instrument	Research Question
BPAs working in industry	Survey	1
	Semi-structured interviews	2, 3
BPM curriculum implementation within HEI.	Semi-structured interviews for requirements specification Artefact evaluation survey	4

3.6. Time Horizon

Another important research design factor that this study considered was whether the study would be a "snapshot" taken during a particular point in time (a cross-sectional study); or whether it would seek to make a representation of events over a long period of time, otherwise known as a longitudinal study (Saunders, 2011). Longitudinal studies evolve over a continuous period of time that remains uninterrupted (Saunders, 2011). These types of studies focus on the process through which the research evolves (Chen & Hirschheim, 2004) Similarly studies also suggest that when it comes to research evolving over time, there can be research that follows a "repeated measure design". This approach focuses on understanding how a particular phenomenon changes over time (Chen & Hirschheim, 2004). On the other hand, a cross-sectional or "multiple snapshots" research occurs over specific points or periods in time and can involve single data collection points involving a different set of experiments or data collection subjects (Chen & Hirschheim, 2004).

This study used a cross-sectional approach with multiple snapshots. This meant that at different points throughout the four-year period of the study, the researcher carried out data collection at multiple time periods. These data collection periods included distribution of a survey to Kenyan BPAs, interviews with Kenyan based BPAs, interviews with lecturers and students participating in BPM-related courses and surveys with students to evaluate the designed artefact.

The study carried out a total of 6 snapshots or 6 data collection points during the course of the study. The Table 3-7 further outlines the snapshots details of this study. The next section further elaborates on the research choice for this study. The next section also discusses the target sample, how data was collected and analysed for each research question.

Table 3-7: Time horizon summary for the study

Snapshot	Target Sample	Research strategy	Research Question	Time-period
1	BPAs in Kenyan based organizations	Survey	1	March – June 2016
2	BPAs in Kenyan based organizations	Interviews	2, 3	May-August 2016
3	Lecturers and Students	Interviews	4	January – March 2017
4	BPAs in Kenyan based organizations	Interviews	2, 3	June – August 2018
5	Students	Survey (Pilot)	4	June 2018
6	Students	Survey	4	October 2018

3.7. Data Sources

The research choice of a study is defined as the way in which a researcher decides to use either qualitative or quantitative data techniques and procedures in the process of answering a particular research question (Saunders, 2011). Researchers in business, management and information systems provide support for the use of a mixed methods research choice where a single study uses a combination of both quantitative and qualitative techniques and procedures (Tashakkori & Creswell, 2007; Tashakkori & Teddlie, 1998, 2010; Venkatesh, Brown, & Bala, 2013). While using the mixed methods research choice, the researcher can opt to use qualitative and quantitative data in parallel or one after the other (Saunders, 2011). In addition in most mixed methods choices, the qualitative techniques and procedures may dominate the quantitative techniques and procedures and vice versa (Johnson & Onwuegbuzie, 2004). As mentioned in section 3.3 of this chapter, this study opted for the mixed methods research choice. Further, as described in section 3.6.3, the mixed methods approach was appealing as it offered an opportunity for confirmation data findings where the use of qualitative data was used to corroborate the findings of the quantitive data (Patton, 1999) and where quantitative data in the form of a survey was used to evaluate a design artefact (Venable, Pries-Heje, & Baskerville, 2012).

3.8. BPA competencies data collection and data analysis

This study aimed to describe the competencies required for the BPA by answering the following research question: *What are the competencies required for the BPA role in organizations in Kenya?* To answer this research question, the study set out to establish those competencies that

are most important for industry in Kenya and then which of the competencies the industry is most satisfied with. The study used the framework developed by Sonteya et al. (2012).

An important aspect that the researcher considered when determining the defensibility of the results was the aspect of legitimation in a mixed methods study (Onwuegbuzie & Johnson, 2006). As a legitimation measure for the study, the researcher addressed the convergence construct validity of the research by using an instrument that had been previously used to answer a similar research question in a South African study (Chakabuda et al., 2014). Additionally, following the premises put in place by a replication study (Asamoah, Andoh-Baidoo, & Agyei-Owusu, 2015), the researcher established that the South African study was appealing as it analysed similar constructs as the current study.

3.8.1. Mixed methods sampling technique

As discussed, mixed methods sampling strategies enable the researcher to employ all the research probability and purposive techniques. The researcher can creatively combine these techniques with the primary aim of answering a study's questions. The research method used a purposive sampling approach and specifically an informal sampling frame of 150 BPAs working in different organizations in Kenya (Teddlie & Yu, 2007). In order to qualify for the sampling frame, an individual had to be directly involved in executing process management initiatives such as process documentation, analysis, re-design and implementation. The researcher targeted any individual who performed process management activities within functional departments such as operations and strategy. No incentives were provided to the respondents. From the sampling frame, a total of 65 respondents completed the questionnaire. The researcher then carried out a follow-up interview with 5 BPAs to clarify findings from the survey. The survey (Appendix 6) was sent out to Kenyan based BPAs between March and June 2016. Out of the 150 surveys, 65 were completed and recorded in the Qualtrics data collection software. In this case the response rate was 43%. These respondents came from a variety of backgrounds and worked in companies that had different levels of BPM maturity and either had an ERP systems implementation, partial ERP systems implementation or no ERP systems implementation at all. The table 3-8 and table 3-9 provides a summary of the demographics of the interviewed BPAs. These 5 BPAs had participated in the survey and had shown interest in participating further in the study. They were therefore called upon to participate in a short interview that aimed at a deep investigation of the survey results:

Table 3-8: Summary of BPAs who filled in the survey

Industry ID	Industry	%	Count
1	Finance or insurance	7.94%	5
2	Real estate or rental and leasing	0.00%	0
3	Professional, scientific or technical services	4.76%	3
4	Management of companies or enterprises	3.17%	2
5	Admin, support, waste management or remediation services	4.76%	3
6	Educational services	7.94%	5
7	Health care or social assistance	3.17%	2
8	Arts, entertainment or recreation	0.00%	0
9	Accommodation or food services	1.59%	1
10	Other services (except public administration)	7.94%	5
11	Mining	0.00%	0
12	Unclassified establishments	0.00%	0
13	Utilities	4.76%	3
14	Construction	3.17%	2
15	Manufacturing	9.52%	6
16	Wholesale trade	0.00%	0
17	Retail trade	0.00%	2
18	Transportation or warehousing	1.59%	1
19	Information Technology, Hardware or Software Development	39.68%	25
	Total	**100%**	**65**

Table 3-9: Summary of BPAs interviewed during confirmation of quantitative data results

Interview sequence	Respondent ID	Industry	Process management area of expertise
1	BPA1	Engineering	Operations
2	BPA2	Food and Beverage	Finance/credit
3	BPA3	Insurance	Business development
9	BPA9	Software development	Operations
10	BPA10	Education	Project management

3.8.2. Data collection and analysis techniques for RQ1

For the survey tool (refer to Appendix 6), the respondents were required to rank each of the 16 competencies. This ranking was based on a 5 point Likert scale that ranged from “Not at all important” to “Extremely important”. In order to effectively analyse the quantitative data collected, four hypotheses were developed. These Hypotheses were:

H1: *Business Process competencies are more important in organizations with managed or repeatable BPM than in those with initial or repeatable BPM*. The survey also sought to establish the stage of maturity of the Kenyan organizations with respect to their BPM initiatives. The Kenyan based BPAs were asked to select the stage at which their organization was in terms of BPM maturity. Four options were applied in the survey. These options were, beginning from the highest to the lowest stage of maturity, "optimized", "managed", "repeatable" and "initial". The data analysis procedure for this hypothesis followed the Kruskal Wallis test.

H2: *Business Process competencies are more important in organizations with implemented ERP systems than in those that have either not implemented ERP systems or have partial ERP systems implementations*. As part of the data collection technique, the BPAs working in Kenyan based organizations were also required to indicate the level of ERP systems implementation for their respective organizations. There were three options for this question which included "Full ERP systems Implementation", "Partial ERP systems Implementation" and "No ERP systems Implementation". The data analysis procedure for this hypothesis followed the Kruskal Wallis test.

H3: *The importance of the high-level BPA competencies in the Kenyan Context will be different than the importance in other African contexts.* Further, this study verified if there were any differences between BPAs high-level competency requirements in the Kenyan context and other African contexts. After synthesis of literature, a study carried out on South African BPAs was found viable for a contextual comparison because it also focused on BPA competency requirements and which competencies South African BPAs found most important (Chakabuda et al., 2014). After requesting the authors the raw data was used in the study was provided. H3 sought to compare the Kenyan context with the South African Context with respect to the high-level competencies. The raw data received from the South African study for the high-level competencies was compared with high-level competencies data from the Kenyan study using the Student t-test.

H4: *The importance of constituent BPA competencies in the Kenyan Context will be different than the importance in other African contexts.* Similar to the 3rd hypothesis described above, H4 sought to compare the Kenyan context with the South African Context with respect to the constituent competencies. The raw data received from the South African study for the constituent competencies was compared with constituent competencies data from the Kenyan study using the Student t-test.

To answer H1 and H2, The Kruskal-Wallis non-parametric test was used. This test can be used when the ANOVA one-way assumptions are not met. The test provided insights into the significant differences between two or more groups. The Kruskal-Wallis H test, as used in this study, is appropriate when determining whether three independent groups or more are significantly similar or different in terms of a given variable of interest for the study (Chan & Walmsley, 1997). The test is performed on ranked data and differs from the Mann-Whitney U-test which is limited to only two values for nominal variables used in a given study (McDonald, 2014). In the Kruskal-Wallis test, if the P-value <0.05 then medians are statistically significant on the other hand if the P-value > 0.05 then the differences between the medians are not statistically significant. The Kruskal-Wallis test is ideal for studies that have 1 nominal variable against 1 measurement variable. Nominal Variables are used to classify observations made during the study into discrete groups or categories while a measurement variable describes an observation that can be measured (McDonald, 2014). In this case, the nominal variables were BPM maturity having 4 different groupings and ERP systems implementation having 3 different groupings Table 3-10 outlines the Nominal and Measurement variables that were used for H1 and H2:

Table 3-10: Nominal and Measurement variables for the study.

H	Nominal Variable	Measurement Variable
H1	BPM Maturity *Initial* *Repeatable* *Managed* *Optimized*	BPA Competency Category
H2	ERP systems Implementation *ERP systems* *Partial Implementation* *No ERP systems*	BPA Competency Category

To answer H3 and H4, the Student t-test was used. The t-test is also used to compare any two averages. With respect to this study, the averages calculated for the Kenyan and South African contexts were compared. The main output of the test is to determine if the two averages from two samples (the Kenyan sample and the South African sample) were different from each other (the t-value). The test also shows how significant these differences are (p-value). Further, the t-value represented a ratio between the 2 groups. The higher the value the more the difference between the groups and vice versa. On the other hand, the p-value represents the significance of difference

between the averages of the Kenyan and South African sample. Ideally, a p-value that is 0.05 (5%) or less means the differences are significant (Zimmerman, 1987).

3.9. Organizational interventions data collection and data analysis

To answer this research question, the thematic network analysis steps developed by Fereday were used. RQ2 and RQ3 were simultaneously answered throughout the study. The thematic analysis approach described by Fereday was ideal for analyzing qualitative studies while at the same time ensuring rigour of the study (Fereday & Muir-Cochrane, 2006).

3.9.1. Data sample for RQ 2 and RQ 3

The Interview strategy was used to collect qualitative data for research question 2 (refer to Appendix 7 for the interview schedule). Interviews were carried out with BPAs working in Kenyan based organizations with different levels of BPM maturity and different stages of ERP systems implementations. These interviews were conducted using the purposive sampling approach. The purposive sampling approach is a common method of qualitative data collection (Huberman & Miles, 2002; Patton, 2002). This technique was found to be the most appropriate because the study focused mainly on a very specific job role and the organizational interventions that can be used to develop competencies for this role. As such it was necessary to find people who fit as closely as possible to this role in order to get accurate data. The participants of the study were involved directly with BPM initiatives within their respective organizations. The participants were working on analyzing multiple business processes with the aim of providing value to their organizations. In addition, the participants were working within the African context at the time of their interview. As data collection progressed the researcher used the snowball sampling approach where participants who had already been interviewed introduced the researcher to potential participants who fit the description of the homogeneous sample (Huberman & Miles, 2002; Onwuegbuzie & Leech, 2007). In terms of sample size, studies suggest that homogenous sample sizes of approximately 8-12 participants are appropriate (Boddy, 2016; Guest, Bunce, & Johnson, 2006; Sandelowski, 1995). In addition, studies argue that research with more than 30 in-depth interviews may be too large for an in-depth qualitative analysis and may require additional justification (Boddy, 2016). The study considered these but also focused considerably on using saturation as a measure for eventual sample size (Sandelowski, 1995). The test for saturation is further discussed in section 3.10.4. The study took the position that samples collected for RQ2 and RQ3 were homogenous in nature. All the respondents had to be working as BPAs. These respondents came from different industries namely Food and Beverage, Energy and Natural resources, Printing and

Publishing and Insurance. The BPAs ranged from entry level to senior level. 4 participants were recent graduates while 11 participants had been working for several years. It was found necessary to include entry-level participants in the study in order to establish the range of interventions that the organizations in building competency in their BPAs. In addition to this, one of the respondents while working as a BPA had also worked within the training and development arm of the organization with a special focus on training in Enterprise Systems implementation projects.

3.9.2. Data collection techniques for research question 2 and 3

The researcher developed an initial set of interview questions (Appendix 7) that were semi-structured in nature. These questions acted as a critical guide for the researcher while carrying forward dialogue with the interviewee (Myers & Newman, 2007). These questions were refined with each data collection iteration. To illustrate how questions were refined with each interview, participants were asked to explain the reasons why they felt a certain organizational intervention built specific BPA competencies. The researcher, therefore, had to ask probing questions to get a better explanation of the organizational intervention – BPA competency relationship. This aspect of the interviews was critical to collecting data necessary for answering research question 3. Face to face interviews were used to collect data for the study. However, in two cases a telephone interview was found to be suitable and was used due to logistical limitations. The duration of the interviews ranged between 30 minutes and 90 minutes. The researcher also took down notes during each interview in order to note down important information provided by the interviewee. Each interview was transcribed and coded before the next interview was scheduled. This enabled the researcher use the insights of the previous interview to refine the interview instrument. The interview guide comprised 3 sections. The first section I was to welcome the interviewee to the session and provide them with the ethics and confidentiality requirements of the study. The interviewees were assured that all the information they provided would remain confidential and they were also asked to confirm that they had not been coerced to attending the interview. The next section II was the centre of the guide. Here the interviewee was provided with a description of each competency as described in Appendix 1 and they were asked to describe what intervention they or their organization had used to build each BPA competency. This was then followed with the interviewee having to explain how each intervention had enabled them to build the BPA competency. In the last section III, the interviewee was thanked for participating in the interview. Similarly, the interviewee was asked if they were willing to recommend a participant who was a

BPA and who would be willing to do an interview for purposes of the study. Table 3-11 provides a summary of the participants interviewed.

Table 3-11: Summary of participants interviewed

Interview sequence	Respondent ID	Industry	Process management area of expertise
1	BPA1	Engineering	Operations
2	BPA2	Food and Beverage	Finance/credit
3	BPA3	Insurance	Business development
4	BPA4	Engineering	Intern
5	BPA5	Engineering	Intern
6	BPA6	Engineering	Intern
7	BPA7	Engineering	Intern
8	BPA8	Software development	Enterprise systems implementation
9	BPA9	Printing and publishing	Enterprise systems implementation
10	BPA10	Education	Project management
11	BPA11	BPM consulting	Risk management
12	BPA12	Premium rate service providers	Finance and credit
13	BPA13	Airline services	Business development
14	BPA14	BPM consulting	Health care processes
15	BPA15	Premium rate service providers	Finance and credit
16	BPA16	BPM consulting	BPA training programs
17	BPA17	BPM consulting	Business development

3.9.3. Non-probability sampling technique for the qualitative data

Given that this study followed a mixed methods sampling approach, the researcher was free to creatively use the non-probability sampling technique for RQ2 and RQ3. It was deemed most appropriate given that it allowed the researcher to select the sample based on subjective judgment (Saunders, 2011). This technique was also appropriate as the study intended to focus on in-depth data collection for a small focused group. Non-probability sampling was also appealing and provided an opportunity to thoroughly explore the phenomenon of interest (Saunders, 2011). After making the decision to use the non-probability sampling technique, the study adopted a purposive or judgmental sampling approach. Studies have argued that purposive sampling allows the researcher to select participants who would be most informative to answering the research

questions (Saunders, 2011). Further, while using a purposive sample, the researcher decided on homogenous sampling. Homogenous sampling brings to focus a particular sub-group where all participants have similar characteristics. In conjunction with purposive sampling, the researcher also used a snowball approach due to the fact that the researcher experienced difficulty in getting appropriate and willing participants for data collection. The snowball approach is often used where there is some difficulty in identifying willing participants of a sample (Saunders, 2011).

The following sections elaborate further on the data collection and data analysis techniques and procedures that were used for each research question.

3.9.4. Data analysis procedures for research question 2 and 3

This section provides a detailed description of the data analysis and reporting for the research questions 2 of the study. The study used Fereday's approach to thematic analysis. This approach provided guidelines for a deductive-inductive hybrid approach that was ideal for this study given that RQ2 followed a deductive approach while RQ3 followed an inductive approach.

Step 1: This step involved the development of a codebook for organizational interventions through the 4I framework of organizational learning and the BPA competency framework.

Step 2: This step focused on testing the reliability of the codes. This was done by analyzing interviews carried out and categorizing them into the predefined codes of the 4I framework and the BPA competency framework. It was also necessary to develop a codebook for the BPA competencies framework in order to match the organizational intervention that impacted a given BPA competency. This step is further outlined in the codebooks generated. These codebooks are presented in the Appendices section specifically in Appendix 1 and Appendix.2.

Step 3: The next step involved the coding of all interviews carried out with fifteen BPAs using codebook defined. The data was summarized and the initial codes were identified.

Step 4: From the coded text, abstract themes were derived. The NVivo software was used throughout the coding process. In some cases, the coded text was placed in more than one theme/node. The themes were refined and a description provided for each theme. From the basic themes, a total number of 22 themes or nodes were developed in the first iteration of the data analysis. Later these were refined into 18 basic themes a further iteration produced 12 basic themes. A detailed description of these basic themes is presented in Appendix 3 for further perusal.

Step 5: Following the development of 12 basic themes, the study used the 4I framework (Crossan et al., 1999) to categorize the 12 basic themes into the organizing themes. Essentially this meant that the 12 basic themes were categorized into the 4I framework processes of intuition, interpretation, integration and institutionalization respectively and further to this, the interventions

were matched to the BPA competency that they had the highest impact on through the use of a node matrix. The node matrix is defined as a means to cross-tabulate coded content (Bazeley & Jackson, 2013). It is defined as a method used by researchers to query existing data (Bazeley & Jackson, 2013). The matrix was automatically generated by Nvivo. For this study, a node matrix was used to cross-tabulate the 12 organizational interventions, derived during step 4, with the 16 BPA competencies. This was aimed at identifying which organizational interventions impacted highly on a given BPA competency.

Step 6: This step involved the legitimation of coded themes. At this stage, all the themes and codes were re-checked against the codebooks generated in step 1 and 2 to ensure that evidence was interpreted correctly and that any patterns identified had been defined accurately.

Steps 2 to 6 happened in an iterative manner and themes and patterns were refined with each interview that was analysed.

3.9.5 Tests for saturation for RQ2 and RQ3

The data collection and analysis process used saturation as a major measure for rigour. Saturation has been defined as a state within a study where no additional data can be found to develop additional properties or themes by the researcher (Glaser & Strauss, 2017). Similarly, saturation is viewed as the process by which a researcher gains a full understanding of the participants' perspective (Legard, Keegan, & Ward, 2003). Further, saturation in qualitative studies has been termed as a golden standard for determining purposive sample sizes as well as a critical measure of rigour in qualitative research (Guest et al., 2006; Morse, 2015). This section looks at the approach the researcher used in order to achieve saturation for research question 2 which used a deductive approach and research question 3 which was inductive in nature.

a) Research question 2: Given that a deductive approach was used to answer RQ2, it was necessary to identify the most appropriate way to achieve saturation within deductive reasoning. Studies suggest that for deductive approaches, the research relies wholly on pre-determined codes of a theory or framework in use, in this case, the 4I framework (Saunders et al., 2018)

> "Saturation may refer to the extent to which predetermined codes or themes are adequately represented in the data—rather like the idea of the categories being sufficiently replete with instances, or 'examples', of data" (Saunders et al., 2018 p.6).

Therefore, it was necessary for the researcher to understand the predetermined codes, as presented in the codebook. After evaluating the predetermined codes and generating a codebook the next

step was to find "examples of data" from the transcribed interviews that fit within these predetermined codes. After 3 iterations of data collection and data analysis, a total of 17 interview transcripts were generated and analysed.

In order to determine saturation for RQ2, measures such as code definition, which was dependent on the codebook (Appendix 2) and code prevalence were used. This followed findings generated by a recent study on the topic of saturation in qualitative research (Hennink, Kaiser, & Marconi, 2017). The 1st iteration of data collection and analysis produced 22 codes or examples of data (interview 1-9). The initial 22 codes are summarised in Appendix 3. These codes were defined and recategorized into 12 codes/themes after the 2nd iteration of data collection and analysis (interview 10-12). A final set of 12 themes were defined and were find to have stabilised with respect to the codebook by the 3rd iteration of data collection and analysis (interview 13-17). In terms of code prevalence, the researcher focused on how many times certain codes were identified and defined across the 17 interviews. After the 3rd iteration of data collection and analysis, the researcher found that 9 out of the 12 themes had been identified within the 1st interview (67%) while 100% of the 12 themes were identified by the 12th interview. Further 7 of the 12 themes were found to be highly prevalent and were identified by at least 9 out of the 17 participants (52%). 100% of the highly prevalent themes had been identified by the 1st interview. The 5 themes with low prevalence were identified from the 2nd interview with the least prevalent being identified after the 11th interview. The researcher found that themes appearing after the 3rd interview were mainly low prevalent codes (appearing in 6 participants or less). It was determined that code saturation was achieved by the 12th interview based on code identification (100% of codes were identified), code prevalence (100% of highly prevalent codes). Further, codebook stability was achieved with no further code definitions being made after the 12th interview. Table 3-12 and Figure 3-2 further summarizes the code prevalence and timing of code development categorised by code type.

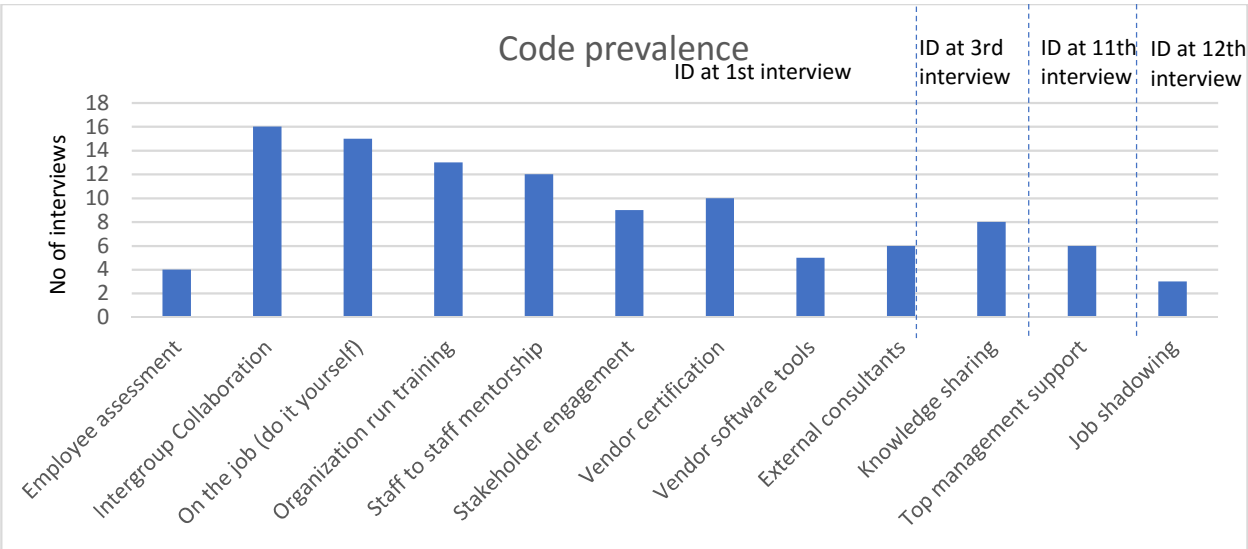

Figure 3-2: Summary of code prevalence and timing of code development

Table 3-12: Summary of code prevalence and timing of code development

Code	Code timing	Code prevalence	Highly/lowly Prevalent Codes
Employee assessment	1st interview	4 interviews	Low
Intergroup Collaboration	1st interview	16 interviews	High
On-the-Job (do it yourself)	1st interview	15 interviews	High
Organization run training	1st interview	13 interviews	High
Staff to staff mentorship	1st interview	12 interviews	High
Stakeholder engagement	1st interview	9 interviews	High
Vendor certification	1st interview	10 interviews	High
Vendor software tools	1st interview	5 interviews	Low
External consultants	1st interview	6 interviews	Low
Knowledge sharing	3rd interview	8 interviews	High
Top management support	11th interview	6 interviews	Low
Job shadowing	12th interview	3 interviews	Low

b) Research question 3: Since RQ3 was inductive in nature it was necessary to investigate measures for saturation related to inductive studies. Literature suggests that for inductive studies, theoretical saturation is the most appropriate measure (Saunders et al., 2018). In this case, saturation is achieved when no additional data is found by a researcher for a particular category (Glazer & Strauss, 1967). Further, it is achieved where similar patterns are repeated

over and over again during data analysis and no new patterns emerge in the data (Saunders et al., 2018). A decision to continue with data collection is based on the extent to which patterns analyzed from data can be generalized (Saunders et al., 2018). This meant that it was critical for the researcher to combine sampling for study participants with the actual data collection and analysis in a non-linear fashion in order to ensure that all possible patterns for the phenomenon of interest have been identified and explained (Bryman, 2012; Dey, 1999; Saunders et al., 2018). This was the stance adopted by the researcher in answering RQ3. The researcher was concerned with identifying and explaining patterns existing between the 12 organizational interventions and the 16 BPA competencies. The interview instrument used can be found in Appendix 7. Similar to RQ2, the interviews were carried out in three iterations. After each interview, data were analyzed and the node matrix was run. From this, patterns emerging were recorded and explanations of the patterns were derived before the next interview was scheduled. For each iteration, the number of new emerging patterns were recorded. This process continued iteratively until all relevant patterns had been sufficiently identified and explained. With each iteration, the number of new patterns explaining BPA Competency-Organizational Intervention reduced. By the 3rd iteration wich covered interviews 13-17, new patterns emerging were between 0% and 5%. Most highly prevalent interventions had emerging patterns of less than 4% by the 17th interview. After analyzing the data results for any repeated patterns the researcher resorted to stopping at the 17th interview primarily because most BPA Competency-Organizational Intervention relationships had been sufficiently explained, especially for prevalent interventions (see table 3-12 for prevalence by intervention).

Table 3-13: Emerging patterns explaining BPA Competency-Organizational Intervention relationships by iteration (represented as %)

Intervention	BPA Competency-Organizational Intervention New patterns emerging by iteration – represented as %		
	1st Iteration (Interview 1-9)	2nd Iteration (Interview 10-12)	3rd Iteration (Interview 13-17)
Employee Assessment	100	0	0
External consultants	98	2	0
Inter-group collaboration	72	26	3
Knowledge sharing	5	85	10

On-the-Job (do it yourself)	68	29	4
Organization run training	76	24	0
Shadowing	0	78	22
Staff to Staff Mentorship	89	11	1
Stakeholder engagement	72	28	0
Top management support	0	55	45
Vendor Certifications	96	4	0
Vendor software tools	98	2	0

In addition, resource constraints such as time and cost of data collection and analysis contributed to the researcher's decision to stop data collection and analysis at the 17th interview. This motivation to consider finalizing qualitative data collection and analysis due to time and cost constraints has been taken by several studies discussing saturation. These studies argue that more often than not factors such as time and resources may, in reality, prove to be practical constraints on the researcher and that participant recruitment may be driven by these constraints rather than the adequacy of the sample size (Green & Thorogood, 2004; O'reilly & Parker, 2013). Table 3-13 summarizes the new patterns emerging by iteration for RQ3 which focused on explaining BPA Competency-Organizational Intervention relationships.

3.10. HEI artefact

The study used the Design Science Research Methodology (DSRM) (Peffers, Tuunanen, Rothenberger, & Chatterjee, 2007). This is a common methodology used in the presentation of design science research. In order to answer RQ4 which provides a theory for design contribution, it was critical to outline the steps followed in developing the artefact. This study found the DSRM methodology particularly appealing as it provided a robust way of producing and presenting consolidated findings (Peffers et al., 2007) of the previous three research questions and how these findings could be applied in a more practical way. Similarly, DSRM provided guidelines towards the development of an artefact for HEI that would be used to build requisite BPA competencies in students. The next sections address how DSRM was implemented for this study. The process involved identifying the problem, defining the objectives for the solution, designing and developing the artefact, demonstration of the artefact, evaluation of the artefact and finally communication on the utility and novelty of the artefact.

3.11. Design Science research

Currently, design science research (DSR) has taken its rightful place as a legitimate and important IS research paradigm (Baskerville, Baiyere, Gregor, Hevner, & Rossi, 2018; Gregor & Hevner, 2013; von Alan et al., 2004). Studies investigating DSR continue to lay out procedures to be followed by researchers in order to improve the overall quality of DSR output (Gregor & Hevner, 2013). This includes appropriate approaches to design, implementation, evaluation and communication of DSR (Gregor & Hevner, 2013; Peffers et al., 2007). Research also argues that design science artefacts are supposed to be useful for solving specific problem domains (Gill & Hevner, 2013). Furthermore, the design science research methodology (DSRM) arose from the need to appropriately conduct design science research within the information systems field. This was mainly because, in the past, there was no commonly accepted framework for DSR (Peffers et al., 2007). DSRM was developed with the aim of incorporating principles, practices and procedures required to carry out DSR research (Peffers et al., 2007). Since its conceptualization, DSRM has been used to develop artefacts in the accounting information systems domain (Geerts, 2011), within enterprise architecture and IT service management (Gama, Sousa, & da Silva, 2013). To develop a maturity model for E-collaboration and as an approach to aligning IT infrastructure capacity with business requirements (Hain & Back, 2011; vom Brocke, Braccini, Sonnenberg, & Spagnoletti, 2014). Similarly, studies on DSRM have argued considerably on the evaluation of DSR artefacts in order to determine their effectiveness in solving a particular problem domain (Venable, Pries-Heje, & Baskerville, 2016). In addition, this study focused on developing an artefact for a specific context from which prescriptive knowledge was then distilled (strategy 2 of the design science research strategies) (Iivari, 2015). Figure 3-3 illustrates the DSRM process model by Peffers et al., 2007.

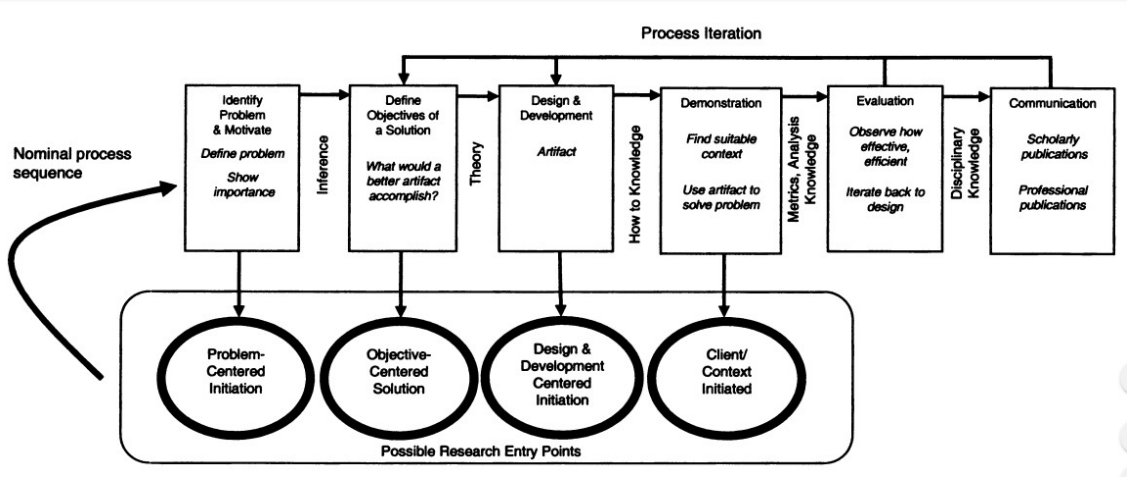

Figure 3-3: The DSRM process model (Peffers et al., 2007)

The DSRM methodology comprises a problem identification phase which involves defining the research problem and then justifying the value of the situation. The objectives of the solution are then defined. These objectives should be both possible and feasible. The artefact is then created and its use is demonstrated. The artefact is then evaluated in order to determine its effectiveness for solving the specified research problem. The artefact can be communicated through the use of media such as scholarly articles. These phases progress iteratively and the researcher is able to refine each phase in order to improve the overall quality of the final artefact (Peffers et al., 2007).

3.11.1. Identifying the problem

To answer RQ 4, the part of the study focused on delivering a design contribution, it was important to first establish the specific problem at hand (Peffers et al., 2007). The main problem was that there were no pre-existing curriculum Kenya HEI curricula for building competencies in students taking BPM courses to prepare them to become BPAs in industry. Throughout the study, data collected and analysed indicated that BPA practitioners in Kenya had received no formal education in HEI. Most BPAs had been faced with a steep learning curve once they began working in their roles in industry. This study used the findings from previous research questions of this study to develop the artefact. The study also collected requirements from 1 focus group discussion involving 10 students doing business and information technology related courses, within the Kenyan context. The students were the main subjects for whom the artefact would be tailored. This was in order to better understand the setting within which the artefact would be implemented. Further, since at the time of this research there were a limited number of lecturers teaching BPM\A curriculum in HEI within the Kenyan context, the researcher interviewed 4 lecturers with

experience teaching BPM courses within the South African context. The data sources used for this study are outlined in table 3-14 below

Table 3-14: Summary of respondents for RQ4

Interviewee ID	Area of study
Student1	Information technology
Student2	Information technology
Student3	Information technology
Student4	Information technology
Student5	Information technology
Student6	Information technology
Student7	Finance
Student8	Marketing
Student9	Accounting
Student10	Accounting
Lecturer 1	BPM
Lecturer 2	BPM and ERP
Lecturer 3	ERP
Lecturer 4	BPM

The lecturers provided valuable insights into how they taught BPM within their respective HEI. The requirements specification Interview used for both the students and the lecturers can be found in Appendix 8. The instrument was based on the concepts derived from the Activity Theory. A definition of the concepts can be found in Appendix 3 and 4.

3.11.2. Defining the objectives of the solution

Studies suggest that outputs in design science can be quantitative in nature where the researcher measures the extent to which a proposed solution will be better than an existing one (Peffers et al., 2007). The solution can also be qualitative in nature where the objective is to describe how the artefact will solve a problem that has not been solved before (Peffers et al., 2007). It was also necessary to assess and infer from the findings made from the requirements collection process that was done during the problem identification stage. The concepts of the Activity Theory were used as a lens for the requirements collection process. Hence, the desirable solution for RQ4 was qualitative in nature and the main objective was to develop 4 activity systems using the concepts of the Activity Theory and based on the 4 processes of the 4I framework. These concepts were defined and description was provided on how they would be adapted to designing the final artefact (Appendix 4 and 5).

3.11.3. Designing and developing the artefact

At this stage, the researcher also addressed the resources required to achieve the objectives outlined in stage 2 of the DSRM. The study used the set of definitions for all concepts making up the activity systems also outlined in stage 2. These set of definitions acted as a data management tool for reference during development of the artefact. It also acted as a trail of evidence to support the credibility of the study.

As part of the design stage, it was necessary to expound on the Activity Theory and to determine the applicability of each of the concepts of the theory. This was done through raw information captured during data collection and analysis of two BPM curriculum documents. An interview schedule (refer to Appendix 8) was developed and used to collect data requirements from lecturers and students participating in BPM-related courses. These curriculum documents were the AIS/AIC curriculum guidelines for undergraduate (Topi et al., 2010) and postgraduate programs (Gorgone, Gray, Stohr, Valacich, & Wigand, 2006; Wynne, Olson, & Challa, 2016) Appendix 4 and Appendix 5 provides some examples of the Activity Theory was applied to carry out the document analysis of two BPM curriculum documents.

3.11.4. Demonstrating the artefact

The 4th stage of the artefact development was implemented in the classroom specifically for a BPM course that was run for undergraduate students who were undertaking a Bachelors' in Business Informations Systems at an HEI in Kenya. Here the aim was to describe how the artefact was implemented in the course of 2 semesters with 2 separate cohorts. Each semester ran for 12 weeks. The first cohort attended the course during the April-July 2018 semester while the second cohort attended the course during the August-November 2018 semester. Using the designed activity systems as a guide, the researcher also developed material for the course during this period using relevant textbooks to compile lecture notes; group assignments were also developed as well as practical lab work. These resources were developed in conjunction with industry collaborators and lecturers working within the HEI. The artefact was demonstrated during the first 10 weeks of the semester while the artefact evaluation had to be completed within the remaining 2 weeks of the semester.

3.11.5. Evaluating the artefact

At the end of the semester, as part of the artefact evaluation, the students were required to fill in a survey outlining what competencies they perceived that they had built with respect to the BPM

course that they had just completed. The data collection instrument comprised of a survey with a Likert scale that asked the student to grade to what extent the course materials and delivery had helped them build on each of the 16 BPA competencies. This evaluation survey can be found in Appendix 9. The course material and delivery were strongly hinged on the 4 activity systems making up the artefact. The study followed the Framework for Evaluation of Design Science research (FEDS) approach to artefact evaluation (Venable et al., 2016). The FEDS approach focuses on two dimensions namely 1) the functional purpose of the evaluation, whether formative or summative and 2) the specific evaluation paradigm, whether artificial or naturalistic (Venable et al., 2016). The functional purpose of the artefact evaluation was summative in nature given that this study focused on establishing the extent to which the artefact developed built the requisite BPA competencies in the student subjects. This was in line with the definition provided by Venable et al., (2016). The paradigm of the evaluation was naturalistic. Naturalistic evaluations explore how the artefact develops within its actual environment. In this study, the artefact was evaluated within a real-life classroom environment with actual 4th year Bachelor of Business Information Technology (BBIT) students undertaking the BPM course. This evaluation paradigm was seen as most relevant for this study. Admittedly, however, the naturalistic approach was difficult to use. Some specific areas of difficulty that the researcher faced included establishing any confounding variables, outside the artefact's domain that could affect the accuracy of the utility evaluation of the artefact. A similar position is taken by Venable et al., (2016) on the use of a naturalistic approach. In relation to this, due to cost and time constraints faced by the researcher (artefact evaluation had to be completed within the last 2 weeks of the semester), the quick and simple evaluation strategy described by Venable et al., (2016) was adopted. The researcher mainly used a summative and naturalistic approach through the use of a survey that contained very specific questions targeting students' experiences on the exercises they completed during the semester. The survey required students to state which BPA competencies they perceived they had to use to complete all the tasks of the semester project. A copy of the evaluation survey can be found in Appendix 9.

3.11.6. Communicating the artefact

At the communication phase, it was the intention of the researcher to communicate the problem and its relevance to the Kenyan context. The researcher elaborated on the utility and novelty of the BPM course and the extent to which the course had facilitated the learning of BPM concepts to the BBIT undergraduate students.

Throughout the semester when the course was run, the researcher documented the process of artefact implementation, the interactions with students and final outputs presented by the students. The researcher presented a part of these findings at a BPM/ERP systems teaching and learning workshop that took place in the Information Systems department at the University of Cape Town in the month of June 2018. In the future, the researcher intends to target design science related journals and conferences.

3.12. Application of DSRM, Activity systems analysis and the 4I framework of organizational learning in BPA competency building

While applying the Activity Theory, outcomes are an essential concept of the theory as they define the desired end-result of an activity. In the case of this study, the main outcome is to attain competencies that can help students work optimally within the BPM domain as BPAs. In order to get a clearer definition of the general competencies required, the BPA competency framework was used. The model was developed by integrating elements from various competency models to generate clusters of competencies specifically BPA competencies. The 4I framework of organizational learning provided an ideal framework for analyzing organizational learning interventions that could be used to develop BPA skills. Further, the use of activity systems analysis provided an appropriate means of describing and modelling organizational learning interventions as activities that could be incorporated into BPA curriculum within HEI. This BPA curriculum was developed using DSRM.

3.13. Ethics and confidentiality approach for this study

Prior to commencing data collection for this study and after approval of the research proposal, the researcher sought ethical approval from the ethics committee from the Faculty of Commerce at the University of Cape Town. The researcher developed all the documentation and instruments required (Appendix 10, 11 and 12). These included all surveys and interview schedules, a cover letter and participant consent form, an approval letter from the HEI and the ethical approval form. These documents were compiled and sent to the Ethics committee. Once ethical approval was received, the researcher commenced data collection. During the interview phase of this study, each participant was provided with a consent form during the briefing part of the interview (refer to Appendix 11 for the cover letter and consent form). All participants were made aware that they had the right to withdraw from the interview at any point. Participants of the data collection process were assured that they would receive a copy of the results of this study upon request. All survey and interview responses were kept confidential and the participants remained anonymous.

To achieve this, the researcher ensured that the names and unique details of the participants and their respective organizations were withheld during the compilation of the final report.

3.14. A summary of the research method

This study sought to investigate the interventions that develop BPA competencies in organizations in Kenya. This artefact will be used in HEI with the intention of building BPA competencies in students through BPM curriculum. The study followed a pragmatic research philosophy where the most important factor for the study was using the most appropriate approaches to answer this study's research questions.

Table 3-15: A summary of the Research method

Methodology	The position of this study
Research aim	To investigate the interventions that develop BPA competencies in organizations in Kenya and design and implement an artefact to be used in HEI to build BPA competencies in students.
Scientific contribution	RQ1 and RQ2: Theory of analyzing RQ3: Theory of explaining RQ4: Theory of designing
Research approach	RQ1, RQ2 and RQ4: Deductive RQ3: Inductive
Research strategy	Mixed methods
Time horizon	Cross-sectional with multiple snapshots
Research sampling	A homogenous sampling of participants with specific attributes and purposive snowballing
Data collection instruments	Semi-structured Interviews and surveys with a 5 point Likert scale
Data analysis tools	Nvivo for analyzing qualitative data, Statistica for analyzing quantitative data
Data analysis approaches	RQ1: Normal average ranking, Kruskal-Wallis and Student t-test RQ2: Thematic analysis RQ3: Thematic analysis, cross-tabulation of themes through a node matrix RQ4: Artefact development through DRSM

The study followed a mixed methods approach where both qualitative and quantitative data were collected and analyzed. The results of this study uncovered the most important BPA competencies for BPAs working in the Kenyan context, described 12 organizational interventions used to develop BPA competencies in Kenya, explained the emerging patterns between the 12 organizational interventions and how they build BPA competencies and finally designed and implemented an artefact comprising of 4 activity systems, incorporating the 12 educational

interventions, that could be used in HEI to build required BPA competencies in students undertaking BPM courses. Table 3-15 provides a summary of the research method used in this study.

4. Uncovering the competency requirements for the BPA role in organizations in Kenya

This chapter aims to answer the first research question of the study. This research question titled *What are the competencies required for the BPA role in organizations with ERP systems in Kenya*, aimed to describe the various BPA related competencies. These were described in relation to certain characteristics such as a company's level of BPM maturity and stage of ERP systems implementation. In addition, the research question aimed to establish if there were any contextual differences between the Kenyan and South African context.

4.1. Approach to answering the research question

With regards to the first hypothesis (H1) focusing on BPM maturity, a framework covering the maturity levels of different companies was used. This framework describes the different levels within which companies can find themselves in terms of the level of the advancement of their BPA activities. H1 analyses the BPA competencies that companies at different levels of maturity value. The results of the data analysis indicated that the more mature the BPM of the company the more they value or require a high level of BPM expertise.

The second hypothesis (H2) focuses on establishing the perceptions that companies with, without and with partial ERP systems implementations have when it comes to BPA competencies that they find important. H2 establishes that companies with ERP systems value a high level of BPM expertise thereby indicating that there is a link between ERP systems implementations and ERP systems expertise.

The last hypothesis (H3) aims to establish if there are any contextual differences between the Kenyan context and the African context at large. To test this hypothesis, it was essential to identify similar work done on BPA competencies. After synthesis of literature, a study based on the South African context was identified and the authors of the study were willing to provide raw data that could be used to compare with the Kenyan context. The results of the study indicated that mainly, differences between the two contexts were minimal except for four BPA competencies. The likely reasons for these differences are further analyzed.

4.2. Findings

The discussion section presents the results of the data collected with respect to the 4 Hypotheses as well as an in-depth analysis of the results. In addition to the survey, a set of 5 interviews were done with BPAs for purposes of confirmation of data that aimed to corroborate and clarify the findings from the survey. Based on the 65 responses received from the survey, a calculation of

means was carried out on all the competencies. The Likert scale spanned 5 (Extremely Important) to 1 (Not important at all). From the results of the means calculated, each of the competencies was ranked from the highest to the lowest mean. High means indicated those competencies that BPAs found important while low means indicated those that they perceived as not important. The results indicated that Trustworthiness (BIC4) tended to be most important to the BPAs with a mean of 4.33. Similarly, the Business Interpersonal Competency (BIC) grouping was perceived as most important with a mean of 4.00.

Also important to note was that for BPM maturity, out of the 65 respondents, 12 respondents stated that their BPM maturity level was at the initial stage while 23 respondents were at the repeatable stage, 17 at the managed stage and 13 at the optimized stage.

For ERP implementation stage, out of the 65 respondents, 36 respondents stated that they had an ERP system while 3 respondents had partial ERP implementation and 26 respondents had no ERP implementation. In addition to the survey, a set of 5 interviews were done with BPAs in order to supplement findings from the survey.

Table 4-1: **Competency Mean and Ranking**

Organizations in Kenya	Mean	Importance Ranking
BIC4 (Trustworthiness)	4.33	1
BIC3 (Business Communication)	4.29	2
BPA3 (Client Experience Thinking)	4.18	3
BFC1 (Business Analysis)	3.93	4
BFC2 (Holistic Overview of business thinking)	3.90	5
BPO3 (Business Process Risk and Compliance Assessment)	3.87	6
BPO2 (Business Process Improvement)	3.86	7
BIC1 (Facilitation and Leadership)	3.8	8
OK-Imp (Organizational Knowledge)	3.76	9
BPO1 (Business process and Value chain modelling)	3.70	10
BIC2 (Business Requirements Elicitation)	3.6	11
BPO4 (BPA drive and promotion)	3.41	12
TC2 (ERP systems Knowledge)	3.23	13
TC3 (User Interface design)	3.18	14
TC1 (Software Oriented Architecture)	3.04	15
BFC4 (Mathematical and Statistical competency)	3	16
BIC (Business Interpersonal competency)	***4.00***	***1***
OK (Organizational Knowledge)	***3.76***	***2***

BPA (Business process Analyst Fundamental Competency)	***3.75***	***3***
BPO Business Process Orchestration	***3.71***	***4***
TC Technical Competency	***3.15***	***5***

The Mathematical and statistical competencies had a tendency to be least important for the BPA with a mean of 3 while the Technical Competency grouping was viewed as the least important grouping with a mean of 3.1. Table 4-1 further outlines these findings. This is in line with findings from literature that strongly supports that BPAs need to have strong interpersonal skills. In fact, they have been viewed as the most important BPA competencies (Chakabuda et al., 2014). On the other hand, technical competencies were not strongly required for the role (Chakabuda et al., 2014; Sonteya et al., 2012). This section presents the findings of each of the hypotheses and the results of the data collected with respect to the 4 hypotheses**.**

4.2.1. H1 Findings

Business Process competencies are more important in organizations with managed or optimized BPM than in those with initial or repeatable BPM.

H1 sets out to investigate if Business Process competency requirements vary with more mature BPM than with those with low BPM maturity. This study used the BPM maturity framework developed by (de Bruin & Doebeli, 2009; De Bruin & Rosemann, 2006; Rosemann, 2006). This framework developed four distinct stages in BPM maturity. These four stages are defined in Table 4-2.

Table 4-2: BPMM phases and their characteristics (Source: (de Bruin & Doebeli, 2009; De Bruin & Rosemann, 2006; Rosemann, 2006))

Maturity phase	Characteristics of the phase
Initial: Undefined processes	- Low BPM competency requirements - Reactive to process defects
Repeatable: Processes are documented and re-used	- Processes are manual
Managed: Processes are monitored and controlled	- BPM activities are coordinated - Proactive to process issues

Optimized: processes are constantly improved, measured and re-designed	- High BPM expertise requirements

Further, in order to answer H1, the Kruskal-Wallis test was used. The independent variable for H1 was "BPM maturity" and the groups were "optimized", "managed", "repeatable" and "initial". For BPM maturity, out of the 65 respondents, 12 respondents stated that their BPM maturity level was at the initial stage while 23 respondents were at the repeatable stage, 17 at the managed stage and 13 at the optimized stage. The results of H1 indicated that Organizations in Kenya with Optimized BPM found that BPO was a critical competency this differed significantly with those organizations that had repeatable or initial BPM. Table 4-3 further outlines the P-test for the various competency groupings.

Table 4-3: Competency categories with their respective Kruskal-Wallis P-test results (Independent variable – BPM Maturity)

BPA Competency Category	Kruskal Wallis P-test results
BPO Business Process Orchestration	P = .0263 Most significant
BIC Business Interpersonal competencies	p =.9161
BFC Business Process Fundamental Competencies	p =.0564
OK Organizational Knowledge	p =.0869
TC Technical Competencies	p =.6022

In this case, only one, BPO, is significant at the 0.05 level. Therefore, the BPO competency was perceived as more important by BPAs working in organizations that had a higher level of BPM maturity (Optimized = 44.1 and Managed = 36.8) than those working in organizations with a lower BPM maturity (Initial = 29.8 and Repeatable = 25.6). Likewise, The BPA Fundamental competency or BFC was perceived as more important by BPAs working in organizations that had a higher level of BPM maturity (Optimized = 38 and Managed = 40) than those working in organizations with a lower BPM maturity (Initial = 26 and Repeatable = 27). Table 4-4 illustrates the mean differences between the 4 groups with respect to the BPO and BFC competencies.

Table 4-4: BPO and BFC Fundamental Competencies differences per group (Independent/Nominal variable – BPM Maturity)

BPM Maturity Phases	BPO p =.0263	BFC p=.0564
	Average number of respondents per phase	Average number of respondents per phase
Initial	29.8	26.5
Repeatable	25.6	27.4
Managed	36.7	40.7
Optimized	44.0	38.6

The results of the data analysis showed that the BPO orchestration competencies and the BFC competencies are deemed important to organizations with managed and optimized BPM. These organizations already have well-coordinated BPM activities requiring personnel who could effectively manage and optimize these BPM activities. This table shows that there is a significant difference in BPO capabilities perceptions among perceived BPM maturity levels. Specifically, there were more participants who perceived their organization to have an optimized BPM maturity than those who perceive their organizations at other levels of BPM Maturity reporting the importance of BPO. It also shows that the least number of participants reporting BPO indicate they are from a repeatable BPM mature organization.

a) BPO competencies

The results of the study indicated that the higher the BPM maturity the more the organization valued BPO competencies. These competencies involve the ability to understand process and value chain modelling, the ability to promote and drive the business processes of the organization, an understanding of the risk and compliance assessment activities within the organization and an appreciation of business process improvement. This coincides with findings from literature that organizations with high BPM maturity also require personnel with high BPM expertise (Rosemann and de Bruin (2005). Further input from BPAs who were interviewed after the data analysis was complete to clarify this feedback on BPO competencies was analyzed. Two BPAs were targeted with one working in a company with optimized BPM (BPA8) and another in a company with initial BPM (BPA10). The input from the BPA working in a BPM optimized company (BPA8) stated that for them process orchestration was so critical to the organization that without it their company would be at a standstill. Below is a specific quote from the interview:

"Process Orchestration is probably the most important in my view, why? Because they hit straight into your core areas, so if you improve your process orchestration, you'll improve your business processes, you'll improve on your core objective, those are the most important things" –BPA8.

On the other hand, the BPA who worked in a company with less mature BPM understood the importance of process orchestration and the positive impact that process orchestration would have on the company. However, process orchestration wasn't really something that they had put special focus on:

"We do need to improve our processes, because they've become dated, and we need to keep up with the tools of business in the industry. We have to keep growing and finessing our trade" – BPA10

It was interesting to note that those organizations with Initial BPM maturity had a higher number of average participants (30) than organizations with Repeatable BPA maturity (26). This could indicate that even though organizations had a low BPM maturity they still felt the importance of having BPO related competencies. This is related to a study that emphasized that even though organizations at the initial stage of BPM maturity had minimum knowledge of BPM they still had a significant willingness to learn (G Rummler & Brache, 1998; GA Rummler & Brache, 2004) and that a proper grasp of the business process orchestration competency would help streamline organizational systems and help them remain competitive.

b) BFC competencies

Highly mature companies with managed or optimized BPM appreciated the BFC competency group more than those with initial or repeatable BPM. The BFC competencies encompass the ability to carry out business analysis, to have a holistic overview of business thinking, the ability to be client focused, an understanding of mathematical and statistical modelling and fundamental business process competencies. Those companies that had managed BPM had the highest importance mean, this is because these companies continue to invest in personnel with expertise in BPM so that this personnel are able to help eventually optimize their business processes. Similarly, BPA8 and BPA10 were asked about their perceptions of BFC competencies. BPA8 who works in a company with a high level of BPM maturity suggested that business analysis was

important to the organization on any level but that it was important to go over and above just basic business analysis to the point where a BPA is able to drive a complete redefinition of a business:

> *"So, it's important to know but I prefer being the guy who is going to define what we do next, you become more relevant than the guy who has crammed how the business works now, yeah that's my view. I'll give you an example of company X, where does company X want to be in 10 years time?" – BPA8*

These statements by BPA8 provided a glimpse into how much companies with optimized BPM value BPM activities so much so that they consider BFC competencies such as Business Analysis core to redefining and re-inventing the business. BPA10, who works in a less BPM mature company, admitted that in the past systems were much less closed and the environment much less structured. This made it difficult for them to maximize on the potential business analysis activities that they could carry out for their company.

> *"I've been here for about 4 years, so this has evolved over time. There's a relatively new workforce, so now the processes are more open and seamless. Processes and systems are now more structured. Before, people were not very open, but now the environment is more open and inclusive." - BPA10*

The feedback received indicates that for BFC competencies to be fully achieved and appreciated, it is necessary for processes to be clear, for the organization's environment to be much better structured and for departments within the organization to be more open to scrutiny by other departments within the organization. Therefore, based on the findings from the study a proposition for H1 was developed as follows:

- ***Proposition 1: The BPO orchestration competencies (BPO) and the fundamental BPA competencies (BFC) are perceived to be more important to organizations with managed and optimized BPM than they are to organizations with initial or repeatable BPM.***

After establishing that BPO and BFC competencies are perceived as more important in an organization with higher BPM maturity, the study went to examine if any significant differences,

in the importance of BP competencies, existed with respect to ERP systems implementation level. The next section addresses this.

4.2.2. H2 Findings

Business Process competencies are more important in organizations with implemented ERP systems than in those that have either not implemented ERP systems or have partial ERP systems implementations.

The results of H2 indicated that there was a significant difference between what BPA competencies requirements in organizations in Kenya with ERP systems versus without ERP systems for the BPO process competency grouping. Table 5 below further illustrates the mean differences between the 3 groups. The following tables outline the Kruskal-Wallis findings for the 5 different competency groupings. In this case, the Independent (grouping) variable was "ERP systems Implementation" where respondents were grouped into three groups. These were ERP systems implementation, a partial implementation or no implementation. Table 4-5 below further outlines the P-test for the various competency groupings.

Table 4-5: Competency categories with their respective Kruskal-Wallis P test results (Independent variable – ERP systems Implementation)

BPA Competency Category	Kruskal-Wallis P test results
BPO Business process orchestration totals	p =.0212 Most significant
BIC Business Interpersonal Competencies Totals	p =.3267
OK Organizational Knowledge	p =.2458
TC Technical Competencies totals	p =.8707
BFC Business Process Fundamental Competencies	p =.1329

For ERP systems implementation stage, out of the 65 respondents, 36 respondents stated that they had an ERP system while 3 respondents had partial ERP systems implementation and 26 respondents had no ERP systems implementation of the 5 competency categorizations, a significant difference was detected for the Business Process Orchestration (BPO) competency grouping which had a p-value of 0.0212. The highest mean ranking was found in those BPA respondents who had ERP systems implementations (Mean = 38.6) while the lowest mean ranking was found in BPA respondents who had no ERP systems implementations (Mean = 25.2). This indicated that more BPAs who perceived themselves to be working in organizations with ERP systems appreciated BPO competencies much more than those perceiving themselves to be

working in organizations without any ERP systems implementations. The BPO competency has been defined as the process of coordinating and managing process events by compiling these events into a new solution or into a holistic process (Stuart, 2017). In terms of competency, the BPO competency has been defined as one that allows the BPA to perform a process analysis and manage process change by initiating a BPM cycle whenever it is required within the organization, modelling business process value chains and managing BPM risk and compliance assessment functions. The results indicate that the existence of ERP systems in organizations could contribute to BPAs working in these organizations to value the BPO competency category much more than those BPAs working in organizations without ERP systems. Table 8 further illustrates the BPO median differences per group where the Independent or Nominal variable is ERP systems Implementation. Table 4-6 outlines the BPO mean differences per group (Independent/Nominal variable – ERP systems Implementation).

Table 4-6: ERP systems implementation stages

ERP systems Implementation Stages	BPO p =.0212
	Mean
1 – ERP systems	38.5
2 - Partial Implementation	33.8
3 - No ERP systems	25.2

The results of this hypothesis clearly coincide with these findings from literature. The competency group that had the most significant difference was the BPO competency which involves Value chain modelling (BPO1); Process improvement (BPO2); Risk and compliance assessment (BPO3) and promotion and drive of business processes (BPO4). All these constituent competencies are geared towards business process management and optimization. The results indicated that those BPAs in companies that had implemented ERP systems valued these competencies much more than BPAs in companies without an ERP system. This is further outlined in Table 9 above.

4.4.5 The link between BP competencies and ERP systems Implementations.

Based on the results described above, the BPO competency seems to be a critical competency for those organizations with implemented ERP systems, it also happens to be a critical competency for organizations with mature BPM as described in H1. This implies that for ERP systems to be

implemented and managed well, BPM related competencies, especially those related to business process orchestration, must be built. This is in line with literature on BPM within ERP systems implementations. Studies related to BPM in ERP systems implementations suggest that even though a new ERP system will help in the automation of business processes, the actual improvement of business processes can be done independently of an ERP system (Kimberling, 2016). In addition, experts of BPM and ERP systems integration believe, when companies fail to define and improve their business processes, they end up implementing their ERP systems over existing faulty processes. Therefore, to effectively implement an ERP system, project members involved in these implementations, such as BPAs, need the requisite competencies to be able to define the existing processes and improving on them prior to the ERP systems implementation. Ideally, if a BPA involved in an ERP systems implementation has the competencies required to have a realistic understanding of process definition and process improvement, then, it is more likely that the ERP systems implementation project will succeed (Kimberling, 2016). Therefore, based on the findings from the study a proposition for H2 was developed as follows:

Proposition 2: The BPO orchestration competencies are perceived to be more important to organizations with ERP systems than they are to organizations without or with partial ERP systems implementations.

4.2.3. H3 Findings

The importance of the high-level BPA competencies in the Kenyan Context will be different than the importance in other African contexts.

Studies agree with the perspective, that information systems and ICT have potential in the continent to enable strategic and transformative development but hardly any research has delved into this rapidly growing area (M. Thompson & Walsham, 2010). This study takes the position that research on a context should be selected not on convenience but through a thorough analysis of the strengths and opportunities available to the researcher (Davison & Martinsons, 2016). In addition, the study aims to exhibit through its findings that the Kenya context perceives BPA competencies differently from other African contexts and that it is, therefore, valuable to view studies from a contextual perspective. A thorough analysis of literature indicated that very few studies had been done on BPA competencies in Africa. The two studies found covering BPA competencies in Africa (Chakabuda et al., 2014; Sonteya et al., 2012) were done in the South African (SA) context. Additionally, the SA studies were appealing as a means of comparison with the Kenyan study as SA is perceived to have progressed quite rapidly in terms of development of

BPM in different industries, BPM competency building models and BPM research as a whole (Chakabuda et al., 2014; Grisdale & Seymour, 2011; Kruger & Johnson, 2010; Sonteya et al., 2012; G. Thompson, Seymour, & O'Donovan, 2009). The BPA competency framework that was used in the SA studies comprises 16 different competencies deemed necessary for the BPA (Sonteya et al., 2012). These two studies focused on BPAs working in South African companies. The latter study was a better match for comparison of contexts because it used a similar survey tool as the current study. The authors of the paper were requested for the raw data obtained from their survey and these were compared with the results of the Kenyan study using the Student t-test on the two samples. The findings for this study indicated that for four of the five high-level codes, there were no significant differences between the two contexts. The significant differences were present within the BIC high-level competencies (t= -2.85456, p= 0.005086). This is outlined in Table 4-7.

Table 4-7: t-test results (per high-level competency) comparison of the SA and Kenyan samples

Variable	Mean SA	Mean KE	t-value	P
BPO	2.183036	2.284615	-0.805568	0.422099
BFC	2.040179	2.242308	-1.97904	0.050121
BIC	1.696429	1.992308	-2.85456	0.005086
OK	1.982143	2.230769	-1.53008	0.128650
TC	2.982143	2.846154	0.811398	0.418757

These results indicated that overall, BIC competencies were valued more within the South African context than in the Kenyan context. This indicated that contexts with more mature BPM initiatives tended to find interpersonal competencies important. From these findings, the following proposition was developed:

- ***Proposition 3. The Kenyan context is perceived to under-value BIC Interpersonal competencies more than the SA context.***

To analyse these contextual differences further, a t-test was done with the 16 constituent competencies. The findings of these are presented in H4 below.

4.2.4. H4 Findings

The importance of constituent BPA competencies in the Kenyan Context will be different than the importance in other African contexts.

For H4, The study first used a simple mean ranking formula and the results indicated that at least 5 different competencies had a mean difference of 0.3 or more. These competencies from highest to lowest were Business Requirements Elicitation (0.7), Business Analysis (0.4), Holistic Overview of Business Thinking (0.3), Business Process Improvement (0.3), Organizational Knowledge (0.3). Table 4-8 shows the simple mean results for the Kenyan and South African Survey. In order to verify these differences in mean, the Student t-test was used on all 16 BPA competencies. The Student t-test was viewed as useful in comparing the means from the two contexts and see which competencies had significant differences. The results indicated that 4 competencies had a high t-value (where samples were different from each other) and a significant p-value (where those differences were significant). The table below further outlines the results of both the importance ranking.

Table 4-8: Simple mean results for the Kenyan and South African Survey

Constituent competencies	Kenya (Importance)		SA (Importance)		Rank Difference	Importance Difference
	Rank	Mean	Rank	Mean		
BIC4-Trustworthiness	1	4.3	1	4.45	0	-0.1
BIC3-Business Communication	2	4.2	2	4.43	0	-0.1
BFC3-Client Experience Thinking	3	4.1	5	4.25	-2	-0.1
BFC1-Business Analysis	4	3.9	3	4.34	1	-0.4
BFC2-Holistic Overview of business thinking	5	3.9	6	4.21	-1	-0.3
BPO3-Business Process Risk and Compliance Assessment	6	3.8	10	3.68	-4	0.2
BPO2-Business Process Improvement	7	3.8	6	4.21	1	-0.3
BIC1-Facilitation and Leadership	8	3.8	8	4.02	0	-0.2
OK-Imp-Organizational Knowledge	9	3.7	7	4.02	2	-0.3
BPO1-Business process and Value chain modelling	10	3.7	9	3.77	1	-0.1

BIC2-Business Requirements Elicitation)	11	3.6	4	4.32	7	-0.7
BPO4-BPA drive and promotion	12	3.4	11	3.61	1	-0.2
TC2-ERP systems Knowledge	13	3.2	14	2.93	-1	0.3
TC3-User Interface design)	14	3.1	12	3.21	2	0
TC1-Software Oriented Architecture	15	3.0	15	2.91	0	0.1
BFC4-Mathematical and Statistical competency	16	3	13	3.04	3	0

From highest to lowest significance, these competencies were; Business Process Elicitation (t=-4.19617, p=0.000053), Business analysis (t=-2.78208, p=0.006283), Business Process Improvement (t=-2.50155, p=0.013724), Holistic Overview of Business Thinking (t=-2.14885, p=0.033672). These results are outlined in Table 11 below:

Table 4-9: t-test results (per competency) comparison of the SA and Kenyan samples

Variable	Mean SA	Mean KE	t-value	P
BPO1	2.232143	2.292308	-0.361010	0.718732
BPO2	1.785714	2.138462	-2.50155	0.013724
BPO3	2.321429	2.123077	1.105567	0.271144
BPO4	2.392857	2.584615	-1.06922	0.287132
BPA1	1.660714	2.061538	-2.78208	0.006283
BPA2	1.785714	2.092308	-2.14885	0.033672
BPA3	1.750000	1.815385	-0.447908	0.655034
BPA4	2.964286	3.000000	-0.186039	0.852731
BIC1	1.982143	2.200000	-1.36355	0.175282
BIC2	1.678571	2.400000	-4.19617	0.000053
BIC3	1.571429	1.707692	-0.994844	0.321831
BIC4	1.553571	1.661538	-0.711668	0.478063
OK	1.982143	2.230769	-1.53008	0.128650
TC1	3.089286	2.953846	0.645883	0.519599
TC2	3.071429	2.769231	1.510676	0.133522
TC3	2.785714	2.815385	-0.140690	0.888352

Largely, most of the competencies that were deemed important in the South African Context where also deemed important in the Kenyan Context. In order to uncover further this major difference in means between the two contexts, a further investigation of BPAs within the Kenyan

context was carried out. This further investigation involved two short follow-up interviews with 2 BPAs focusing on their perception of these four competencies with respect to their role as BPAs. Of note was BPO3 (*Business Process Risk and Compliance Assessment*) which had a significant difference in means between the Kenyan and South African contexts. A possible reason for this is explained in the next section.

a) Business Process Risk and Compliance Assessment (BPO3).

When analyzing the simple ranking of means presented in Table 10, the results for BPO3 showed importance mean for the Business Process Risk and Compliance Assessment competency for Kenya was at 3.9 while SA stood at 3.7. This indicated that Kenyan BPAs ranked BPO3 much higher (Rank 6) than the South African counterparts (Rank 10). Upon further analysis of literature, the study identified possible reasons for this difference. The study carried out by Chakabuda and Seymour in 2014 was done approximately three years after the current data analysis done in 2017-2018. A significant change has happened during this time in risk and compliance assessment area with more and more companies investing in enabling their staff members that there are potential non-compliance threats or weaknesses that the organization might face to mitigate against these risks. A report indicates that, as organizations become more globalized, there is a need to conform to set industry standards to reduce potential risks or repercussions on the organization (Gareth, 2017). The report suggests that the increase in information security risks, and an upsurge of regulatory requirements to curb these risks, has led to The Business Process Risk and Compliance Assessment competency being viewed as critical to the organization (Gareth, 2017).

*b) Business Requirements Elicitation (*BIC2).

The importance mean for the Business Requirements Elicitation competency for Kenya was at 3.6 while SA stood at 4.32. On the other hand, Kenyan BPAs ranked Business Requirements Elicitation much lower (Rank 11) than the South African BPAs (Rank 4). The student t-test confirmed this significant difference between the samples with the t-value and p-value being quite high for this variable at 4.19617 and 0.000053 respectively. This indicated that BPAs in South Africa had a greater appreciation for Business Requirements Elicitation as a core competency for the BPA. Literature analyzed describes Business Process Elicitation as a skill or competency that is required during the implementation of Enterprise Systems (Jeyaraj, 2010). Business Process Elicitation has also been described as an initial problem identification step in collecting requirements when developing a solution as well as attaining a better understanding of the

customer's business context (Cardoso, Almeida, & Guizzardi, 2009). Similarly, a study targeting SA BPAs suggested that the Business Process Elicitation competency involved the ability to gather information from business users or process owners who were experts in a specific business process (Sonteya et al., 2012). The following are some direct quotes with two interviews carried out.

"In our company, most of the requirements collection is done by the technical team" -BPA2

"Process Elicitation or collecting requirements does not really fall under what I do" – BPA1

Further, One BPA interviewed explained that it was mainly a team within the ICT department that drove much of the requirements collection.

Int2 (BPA in an Engineering organization):

> "*What ICT did a few years ago, a section was created still within IT called Relationship Management, so we work very closely also with Relationship Management. This is where process development starts and you get to know the requirements and scope of the process, " – BPA 1*

The overall feedback from the BPAs indicated that they felt that Business Process Elicitation was a function carried out by the technical developers of the solution or the enterprise system rather than a distinct competency requirement for the BPA. Sometimes, requirements elicitation was viewed as a job that could be outsourced to an external IT company or even to the ERP systems vendor. This provided an interesting discovery that required further investigation. Following these findings, the following proposition was developed:

Proposition 4a: While Business Process Elicitation is critical for BPM, the Business Process Elicitation competency is perceived to be undervalued within the Kenyan context.

c) Business Analysis (BFC1)

The mean in the South African context was found to be much higher than the mean in the Kenyan context. In other words, BPAs in South Africa found Business Analysis more important than those in Kenya. The Business Analysis competency has been defined as the ability to investigate various business situations by identifying the ways in which these businesses can be evaluated and

improved (Paul et al., 2014). Other functions found within business analysis include requirements determination and improving business systems.

Feedback received, regarding these competencies, from a discussion with one BPA working for an ERP systems vendor suggested that most times, Kenyan companies do not invest enough in roles that do not have a direct relation to the overall objectives of the company. For example, if the core function of a business is power generation, then there are less likely to value a role that is not directly linked to the process of power generation. In many circumstances, the business analysis role is viewed as consultative where external consultants are called in to analyze the business. The following is a direct quote from an interview with the BPA who emphasized the business analysis functions were not always a priority for the company and that the core functions of a company are more of a priority:

> *"If you're in an IT company, the core focus is to develop and sell software as a finance guy you're in the wrong place, you're not in the core business, you need to be the guy developing or the guy selling software. If you're in an audit firm and your work there is cash collection, if you're not doing the actual audit you're not in the core business or if you work for a learning institution and you're a secretary… the core is either a lecturer or in the exam section or admissions, you must be directly interacting with the students, if you're not you're missing it."*
> - BPA9

From these findings, the following propositions were developed:

- ***Proposition 4b: While Business analysis is critical for BPM, Business analysis competency is perceived to be undervalued within the Kenyan context.***

d) Business Process Improvement (BPO2)

Similarly, the Business Process Improvement competency (BPO2) has often been associated with process-based change. It has been defined as an essential component of process-centric organizations that wish to continue advancing and evolving (Shtub & Karni, 2010). Business process improvement also enables organizations to understand their ability to adapt (Adesola & Baines, 2005; Shtub & Karni, 2010) as well as a key requirement for the ever-expanding Knowledge economy (Sallos, Yoruk, & García-Pérez, 2017). However, again, in the case of BPO2, the SA context viewed it as much more important than in the Kenyan context. Further

analysis through interviews with individual BPAs indicated that their organizations often faced a lack of structure within the organization. Often times the teams within the organization were closed off to each other. Given that business process improvement requires an end-to-end redesign of existing processes, a lack of awareness about what other departments are doing can make BP improvement initiatives rare and unappreciated. However, it was important to note that most BPAs admitted that their respective organizations were taking steps to make BP improvement easier by provided better structure and increased openness between teams and between departments that were once viewed as autonomous. Literature also strongly suggests that if organizations have an open culture then they are better able to facilitate organizational learning (Nemanich & Vera, 2009). The following are quotes elaborating further on the importance of structure and openness, as a good starting point for BP improvement competency development, presented by two BPAs (BPA1 and BPA10) who are based in Kenyan companies.

> *"I think as the structure progresses, System Analysts, technical guys will remain under System Analysis and then the Business Processes team will be taken under Relationship Management. So that way it makes it very clear that the process starts with the Relationship Management"* – BPA1

> *"Processes and systems are now more structured. Before, people were not very open, but now the environment is more open and inclusive with people going out of their way to explain and justify various issues."* – BPA10

As part of the data collection, a BPA (BPA3) from SA context was asked about the BP improvement competency and what impact it had on the organization. The BPA emphasized that it was an integral part of her job as a BPA and something that would be difficult to do without input from different point persons within the organizations. Often as a BPA, you had to know who to talk to in order to understand the AS-IS process and further work with them in order to redesign to the TO-BE process. To achieve this, a proper structure and openness within the organization were critical factors. The following is a direct quote from the interview:

> *"Because I'm involved in process improvement, I look at the Business Processes, I'm mostly involved in and I'm often assigned to improve these processes, it involves process optimization which is an understanding, analyzing the current process or the as is and then talking to the person involved in the process flow. This includes analyzing operating procedures and then establishing where to optimize the actual processes. Every now and*

then we're looking and we're taking on new processes, and I'm very much involved in trying to design new operating models…we optimize or we're looking at a new process that needs to be designed." – BPA3

BPA3 appreciated that it was important to continuously redesign or create new processes and operating models to ensure adaptability of the organization to the industry. From these findings, the following propositions were developed:

- ***Proposition 4c: While Business Process Improvement competency is critical for BPM, Business Process Improvement competency is perceived to be undervalued within the Kenyan context.***

e) Holistic Overview of business thinking (BFC2)

From the Student t-test carried out with the Kenyan and SA samples, the Holistic Overview of business thinking competency (BFC2) exhibited a significant difference in importance between the two samples as indicated in Table 11. BFC2 has been defined as the ability of a business analyst to think and apply knowledge in process dimensions (Sonteya et al., 2012). As well as the ability to view the environment as a living system that is dynamic and complex (Sonteya et al., 2012). An important element in BFC2 is the ability to understand the process dimension which involves being able to capture organizational best practices that are derived from practice. This capture then leads to business process reviews and can trigger business process improvement initiatives (Zacarias & Martins, 2011). BPAs would, therefore, need to understand the dynamic interaction between the process and practice dimensions (Zacarias & Martins, 2011). From literature analyzed it was clear that BFC2 is linked to the BA competency and BP improvement competency. The interview carried out with the BPA from the SA context clearly coincided with findings from literature and further backed up the findings of the study that SA context had a more mature approach to BPM than the Kenyan context.

Yes. I think it's extremely important especially in my role because when you got into a company and you're asked to assist in BPM then that's your starting point, but you need to understand what the company is about. So, yeah, the organizational structure, the whole value chain, you have to start there and then once you have that understanding

you need to break down to the level where you're going to be involved it will be a specific business unit or a specific process" – BPA3

This indicated that within the SA context there was a clear need to understand and appreciate the organization as a whole as a dynamic and living enterprise. On the other hand, Kenyan BPAs were often limited to handling business process within a single function of the organization, therefore, an end to end view of business processes of the entire organization is often difficult to achieve. This is further elaborated in the interview extract below:

"So, I handle operations, my colleague handles procurement, another one with finance, HR and so on" – BPA1

From these findings, the following proposition was developed:

- ***Proposition 4d: While a** holistic overview of business thinking competency **is critical for BPM, Holistic overview of Business thinking competency is perceived to be undervalued within the Kenyan context**.*

Based on the overall findings of H3, a central proposition 3 was developed indicating the importance of these four competencies to the progression or maturity of BPM initiatives in organizations.

4.3. Summary of findings

This study examines the research question: *"What are the competencies required for the BPA role in organizations in Kenya.* To answer the research question, the study used a framework of 16 different competencies. From quantitative data, their means by importance were calculated. Here, trustworthiness was perceived as the most important competency while Mathematical and Statistical competency were least important. In terms of competency grouping the Business Interpersonal Competencies were most important while technical competencies were least important. This concurred with similar literature on BPA competencies (Chakabuda et al., 2014; Sonteya et al., 2012). Table 4-10 provides a summary of the findings of the four hypotheses developed for the research question.

Table 4-10: Propositions and summary of findings with respect to the Kenyan context

Proposition	Description
1. The BPO orchestration competencies and the fundamental BPA competencies are perceived to be more important to organizations with managed and optimized BPM than they are to organizations with initial or repeatable BPM.	Organizations with managed and optimized BPM already have well-coordinated BPM activities. They, therefore, require personnel who could effectively manage and continuously optimize these BPM activities.
2. The BPO orchestration competencies are perceived to be more important to organizations with ERP systems than they are to organizations without or with partial ERP systems implementations.	Companies intending to carry out an ERP systems implementation need to define and improve their business processes to reduce the risk of project failure. BPO competencies are critical for carrying out definition and improvement of business processes. Business processes orchestration should take place before an ERP systems implementation commences.
3. The Kenyan context is perceived to under-value BIC Interpersonal competencies more than the SA context.	Interpersonal competencies are a necessary ingredient for the BPA. The ability to work with integrity, to elicit business processes and to effectively communicate within a team were deemed important in contexts with mature BPM.
4a. While Business Process Elicitation (BIC2) is critical for BPM, the Business Process Elicitation competency is perceived to be undervalued within the Kenyan context	Within the Kenyan context, it is necessary to emphasize that Business Process elicitation is an important competency for the BPA. Process elicitation tasks should not be left to the technical developer and the BPA should be a core driver of these activities.
4b. While Business analysis (BFC1) is critical for BPM, Business Analysis competency is perceived to be undervalued within the Kenyan context.	Business Analysis may not be perceived as a core competency in many organizations but through it, organizations are better able to identify opportunities and strengths of the organization and even drive the development of new services.
4c. While Business Process Improvement (BPO2) competency is critical for BPM, Business process improvement competency is perceived to be undervalued within the Kenyan context.	Business process improvement is a critical competency required for organizational advancement. Business process improvement activities thrive in organizations that have a clear structure such that roles of every worker are well defined and where teams are open so that processes are easily defined and visible understanding processes from an end-to-end point point-of-view.
4d. While a holistic overview of business thinking competency (BFC2) is critical for	Having a holistic view of business process thinking enables the BPA to carry out process discovery by

BPM, holistic overview of business thinking competency is perceived to be undervalued within the Kenyan context.	understanding the best practices of the organization and transforming them into business processes that form part of the operations of the organization.

5. Organizational interventions to build the Business Process Analyst: the 4I framework perspective

This chapter illustrates how the 4I framework of organizational learning can be used to describe the organizational interventions implemented in organizations to develop requisite competencies in BPAs. This chapter reports on the second research question which was: What organizational learning interventions build the required competencies in Business Process Analysts? To address this research question, a qualitative data collection and analysis approach was used. Data was collected from BPAs working in organizations in Kenya. The study utilized the 4I framework of organizational learning to describe interventions and interactions that Kenyan organizations use to build the required BPA competencies.

Table 5-1 provides an outline of the results of the thematic data analysis. The high-level codes are derived from the 4I framework while the constituent codes the basic themes developed during thematic analysis.

Table 5-1*:* Outline of the Basic and organizing codes with code prevalence

High-level code	Code	Code prevalence	Highly/lowly Prevalence
Intuition	**On-the-Job (do it yourself)**	15 interviews	High
Interpreting	**Staff to staff mentorship**	12 interviews	High
	Job shadowing	3 interviews	Low
Integrating	**External consultants**	6 interviews	Low
	Intergroup Collaboration	16 interviews	High
	Stakeholder engagement	9 interviews	High
	Top management support	6 interviews	Low
	Vendor certification	10 interviews	High
	Vendor software tools	5 interviews	Low
Institutionalizing	**Organization run training**	13 interviews	High
	Knowledge sharing	8 interviews	High
	Employee Assessment	4 interviews	Low

5.1. A description of the organizational interventions: the Kenyan context

As described in Table 5-1, once the themes were identified and coded into basic nodes, the study described how they fit into the 4I framework of organizational learning. The 4 elements making

up the 4I framework were therefore used as the high-level codes. The 11 basic codes outlined above were organized into their corresponding high-level codes.

The thematic data analysis involved the description and exploration of the thematic network. Description encompassed looking at each component of the network and supporting it with text (text excerpts) from the interviews. The stage also involved a further exploration of emerging patterns (These emerging patterns are discussed in detail in Chapter 6). The next section describes each of the 4I processes and their constituent basic codes:

5.2. Intuiting

Intuiting is the beginning of new learning. It is viewed as largely a subconscious process that involves being able to perceive similarities and differences, patterns and possibilities. It consists of an expert view and an entrepreneurial view (Crossan et al., 1999).

Expert view: Process of pattern recognition derived from the past or from tasks that are already institutionalized. An Individual must carry out a certain task many times, then, reflect on past practices and learn about better ways of carrying out the task. Eventually, the expert no longer needs to think consciously about the action (Crossan et al., 1999).

Entrepreneurial view: This view is concerned with innovation and change, that no two circumstances are the same. Patterns, however similar they may be, are not identical. This is the ability to determine new patterns and make connections between these patterns (Crossan et al., 1999).

The text excerpts analysed pointed towards BPAs working in Kenyan based organizations having to discover new knowledge on their own in order to accomplish their tasks well. In other instances, these BPAs needed to use their pre-existing knowledge to improve how they executed their role. The Intuiting process has one basic constituent code, the *On-the-Job* intervention, which is now described.

5.2.1. On-the-Job or do it yourself (DIY).

The On-the-Job Intervention was found to be a prominent theme throughout the study. The On-the-job code and was coded in a total of 15 interviews. The On-the-Job intervention is therefore considered both a highly prevalent and common theme for this study.

The On-the-Job or Do it Yourself (DIY) intervention is not an intervention from the organization in the strict sense but the proactive steps that an employee makes to achieve the competencies required to fulfil their job requirements. In most cases, employees working within these Kenyan organizations are required to do a lot of the learning on their own or find their own innovative ways to accomplish tasks with the aim of ensuring that outcomes are in line with the requirements of the organization. One such BPA mentioned that for them to be more productive in their job they had to be proactive in carrying out their own research by experimenting or innovating to implement a particular process change:

> *"We go back to doing our own research and see… is it a process that can be integrated into SAP"* – BPA1

Therefore, innovation and an entrepreneurial way of thinking was a critical way in which BPAs built their requisite competencies. This is further elaborated in the quote from a BPA that relied a lot on innovative thinking during process management tasks:

> *"…it's just your own personal decision to do the best that you can with whatever tools that you have."* – BPA12

For the Kenyan context, in addition to an entrepreneurial way of thinking, the On-the-Job intervention also called for expert knowledge of the ERP systems in use, organizational processes and how these could be redesigned in order to optimize them:

> *"Then we go back to doing our own research and see is it a process that can be integrated into SAP or is it just a workflow process already in SAP or it's something that we can just sort of build our own system " – BPA1*

However, the Intuiting intervention and more specifically the On-the-Job intervention is not without its drawbacks. The following section looks at some limitations of this intervention as identified from the data analysis carried out.

a) Limitations of the On-the-Job (DIY) Intervention

BPAs who were interviewed relied heavily on the On-the-Job intervention when carrying out their day-to-day work. With respect to the context of this study, the BPAs did admit that the On-the-Job intervention came with its challenges. The most glaring one was focused on a negative ripple-effect that could occur if a BPA, by implementing a DIY approach to a task, made a mistake unknowingly that could have major negative effects on other modules in the ERP systems or even the ERP systems as a whole:

> *"Because we're learning On-the-Job, there could be some mistakes that we make that could have repercussions on single processes or the entire process of the organization"* – BPA9

BPAs also emphasized that to some extent the On-the-Job (DIY) approach lacked a level of professionalism and it was necessary for most organizations in Kenya to move towards a standardized mode of operation and widely approved best practice:

> *"Being a corporate organization, you cannot afford to have everybody doing things their own way, it creates a lot of confusion…you have to harmonize because at the end of the day you're harmonizing this information to go and bank it in one central place…we need to move toward a standard. That's why we'll try and standardize as much as possible, we're always moving towards a standard, they call it the company ideal, how the ideal should appear or look." – BPA 2*

In summary, the Intuiting stage covers the On-the-Job (DIY) intervention. This encompasses the process by which BPAs as individuals create novel ideas through their own personal day to day experiences. These experiences, have the potential of becoming best practices over time. Further, this accumulation of experiences facilitates their communication to others (Lawrence et al., 2005). The next section on Interpreting covers the progression from intuiting.

5.3. Interpreting

The Interpreting process picks on the conscious elements of the individual learning process, represented as metaphors and progresses these metaphors through the development of cognitive maps (Crossan et al., 1999). Here, language plays a pivotal role. Interpreting, the communication

of individual insights through metaphors, takes place in relation to a domain or environment such as within a BPA team in an organization and when a BPA observes a process owner executing a process. It involves the development of language through some conversational process. Interpreting includes the transfer of some intuitive insight and then making sense of it through conversation. For example, an experienced BPA passes on insights and experiences through regular dialogue to a novice or less experienced BPA. Through this dialogue, it is interesting to note that the experienced BPA can also gain a better understanding of why they do what they do.

For the study, the relevant excerpts for the Interpreting process pointed towards two interventions namely the *Staff to Staff mentorship* and the *job shadowing* intervention. The one constituent code derived from data for this process, Staff to Staff Mentorship, is now described.

5.3.1. Job shadowing

Job shadowing has been described as a learning approach used in the workplace where the learner observes experienced personnel handling specific tasks (Schmidt, 2004). This code had low prevalence and was coded in a total of 3 interviews. Job shadowing is ideal when attempting to impart skills to new personnel during the induction process or to existing personnel who may be required to gain some new knowledge or skillsets (Bindal & Goodyear, 2014; Rainbird, 2000; Schmidt, 2004). In information systems, job shadowing is widely used as a means of knowledge transfer for personnel with regards to building their IT and business related skillsets. Findings from this study indicate that job shadowing was used as a learning tool for BPAs from the perspective that they were required to understand how process owners and business users executed business processes. One BPA described the job shadowing intervention as immersive in the sense that they got an opportunity to observe first hand how certain business processes were executed and the context which these processes were triggered. It offered an authentic learning experience for the BPA:

> *"whenever they had patients who would accept me to even sit there during their interviews and their treatment Process, I would. And I would literally watch him do it on the system, I would time it and see how does this work, how doesn't this work? And just look for small wins that would help them get better at it."* – BPA14

a) Limitations of the job shadowing intervention

Major limitations of the job-shadowing intervention identified in this study were that most BPA consultants who were paid on an hourly basis were unable to fully justify that they had been productive during the time spent observing process owners and business users performing their tasks:

> *"But as a consultant, you don't have that luxury because it means you're going to bill, so now you rely more on interviews and building up a relationship with the users to such an extent where they feel free to share with you openly what are their challenges."* – BPA14

5.3.2. Staff to Staff mentorship

In the Staff-to-Staff mentorship intervention, an experienced employee interprets and communicates the process of doing certain tasks through their experience and knowledge to an inexperienced employee. This code had high prevalence and was coded in a total of 12 interviews. This study confirms that, for Kenyan based BPAs, it is a very common intervention with 7 BPAs speaking about Staff Mentorship and 31 text excerpts describing the intervention. Despite the BPAs speaking considerably about the Staff mentorship intervention, most of them spoke hesitatingly. The general consensus was that mentorship was important but difficult to implement in the long term. This is discussed further under limitations of Staff mentorship. Staff mentorship is also viewed as important for upward progression within an organization (Vokić & Vidović, 2010). It was useful to novice BPAs in that it allowed them to learn from their more experienced counterparts and it facilitated the process of knowledge management within organizations.

> *"The first time I started working as a Business Analyst, my supervisor told me, "This is how you prepare for an assignment. This is how you document the existing Business Process as part of understanding it." So, I learned it from someone in the organization." – BPA11*

There was an observation that in the Kenyan context, Staff Mentorship was done on a regular basis, it allowed the BPAs to go in-depth into the end-to-end processes of the organization with respect to how they were automated by the ERP systems. This was of great value to the new BPAs because most of what they learnt during these sessions was not documented at organizational level:

"Most of the staff there they're so good in terms of…one to one personal communication. So, when they're doing something maybe like opening a tender, some guy will come and call me and tell me, "Let's go, we open a tender so you can learn the process"."- BPA6

On the other hand, it was also useful for the Senior BPAs in terms of facilitating sense-making of some of the hands-on learning that they had been accustomed to. In some cases, it offered these BPAs an opportunity to test new processes that they planned to implement.

"when I sit with an intern for example and explain to them when it comes to the Company operations you have to understand the full cycle from Finance -- Finance is not just we have a bank account, there's a lot that goes into it" – BPA2

Based on the interviews carried out with BPAs, the Staff-to-Staff Mentorship intervention was encouraged by organizations as a way of inducting newly hired BPAs to their role in the organization. It was a cost-effective way of knowledge transfer. However, Staff-to-Staff mentorship was also dependent on the attitudes and any pre-existing relationship between the mentor and mentee. Further elaboration of drawbacks of this intervention is presented in the next section.

a) Limitations of the Staff-to-Staff Mentorship Intervention

As mentioned, within the Kenyan context, a major limitation of the Staff-to-Staff mentorship intervention is that BPAs assumed that the attitudes of both the mentor and mentee are optimal for teaching and being taught respectively. Often, the more experienced BPA (mentor) felt that taking on a new BPA (mentee) would add an additional burden to their already busy schedule. A BPA mentioned that sometimes instead of getting mentored they were asked to go and search for the knowledge on their own. This inadvertently led to a situation where, instead of transfer of competence-progression in organizational learning, the BPA was forced to learn On-the-job:

"Go talk to Procurement and understand what they do, and you're thinking…" – BPA1

In addition to a lack of proper mentorship within the organization, the BPAs who acted as mentors often felt that if a new BPA made a mistake On-the-Job, they would be held responsible, they, therefore, saw the mentorship intervention as risky business. Therefore, unless the organization enforced this intervention these BPAs were not well motivated to be involved:

> *"You, have to make sure there are no excuses if that person messes up it's your responsibility. You have to train and train well so that by the time they're going live they fully understand the system because a small mistake can be made…you're dealing with millions…"* – BPA2

In addition most BPAs associated mentorship with informal counselling and not necessarily as a means to attain the necessary BPA competences:

"…the question I would ask, "Do you have a mentor?" The answers were like this, "Yeah, my mentor is … although she's not my direct boss. But she's so nice, she listens to me when I have problems when I'm having stress at home." " – BPA13

Further, the BPAs interviewed were more inclined to requesting the new BPA to learn either On-the-Job or through organization supported formal interventions to competency building that were already integrated into the organization. They preferred this option instead of taking on the "risk" and time required to mentor a new BPA. In addition, literature indicates that both On-the-Job learning and staff to staff mentorship are viewed as more traditional forms of learning that cannot keep up with the dynamic global economy that exists today (Clark, Huckman, & Staats, 2013). It is, therefore, necessary for organizations to explore other possible approaches to knowledge creation and competency building within the organization (Clark et al., 2013). The following is a direct quote from literature that supports this position.

> "Traditionally, they gain this knowledge through formal university training followed by domain-specific knowledge acquisition "On-the-Job" through learning-by-doing and mentorship from co-workers. However, globalization has dramatically changed this traditional skill acquisition paradigm". (Valentine, Staats, & Edmondson, 2012 p.1)

Further to this, literature emphasizes that in order for there to be some form of organizational learning within the current global economy, it is necessary for organizations to look towards some form of collective knowledge creation and learning (Valentine, Staats, & Edmondson, 2012).

5.4. Integrating

Integrating addresses coherent, collective action. It is the first step in the 4I Framework of organizational learning that covers the group level holistically. Authors state that once an idea at the intuiting stage has been communicated, using metaphors, into some valid interpretation, it

then becomes possible to integrate these ideas into the activities that can be carried out collectively (Crossan et al., 1999; Lawrence et al., 2005). That is the development of a shared understanding of the members of the group. The dialogue process attempts to develop stories which reflect the complexity of the actual practice. Stories generated in the integrating step become a repository of wisdom. For example, BPAs in an organization can collectively decide to follow a certain procedure (these procedures may be ad-hoc or informal) when redesigning organizational processes. This collective action could be agreed upon based on the learning experiences of the BPAs and some tried and true practice that they are aware of. Based on the findings from the data analysis it was quite clear that this was a critical stage for BPA competency building. The interventions that were categorized into this process of the 4I framework included *External Consultants, Stakeholder Engagement, Top management support, Vendor certifications, Vendor support tools* and *Inter-group collaboration*. This stage in the 4I Framework had a total of 5 interventions. These are further analyzed below.

5.4.1. External consultants

The External Consultants Intervention had low prevalence and was coded in a total of 6 interviews. Overall, the BPAs who described this intervention perceived it as critical to knowledge transfer. The BPAs who mentioned this intervention were senior BPAs with experience working on BPM projects and ERP systems implementations with external consultants. External consultants have in the past been used as a source of knowledge acquisition and knowledge transfer (Beer & Eisenstat, 1996; Wye et al., 2015). They can act as change agents when organizations are planning to make changes to their organization through information systems implementations (Wye et al., 2015). Studies have also indicated that organizations tend to value knowledge coming in from the outside in the form of external consultants rather than from internal expertise (Scott & Hascall, 2016). This view strongly applies to Kenyan based BPAs who rely greatly on information provided to them by external consultants. Studies also indicated that one of the measures of a successful ERP systems implementation was high-quality consultant service delivery (Tsai, Chou, Leu, Chen, & Tsaur, 2015). ERP systems implementers are therefore more willing to pay for these services as they tend to value the expertise of these external consultants (Scott & Hascall, 2016). In the case of the study, these consultants were sourced from outside the organization. they were viewed as experts in areas deemed relevant to the day-to-day work of the BPAs. One BPA had encountered a variety of consultants who were called in to provide services related to their expertise:

"The consultant is normally approved, we vet and make sure that they're approved …" – BPA8

Feedback from the interviews indicated that consultants were brought in to help in specific areas such as ERP systems, business processes and soft skills development. Most commonly, these consultants were not brought in on a regular basis by the organization but rather upon request from employee groups.

"Then there are external consultants, they come in, and they train people on leadership skills, managerial, presentations skills, things like that… Yeah, an image consultant, a financial consultant, financial management consultant, coaches. Then, of course, the topics that they discuss, they normally ask people a year in advance what skills or what training would you like" – BPA2

Often these consultants sat down with the BPAs and take them through specific areas such as specific modules within the ERP systems. BPAs interviewed said that these consultants provided a good knowledge source that they could use to enhance their competency.

"We get to sit with the SAP consultants as well, there's some good knowledge transfer that happens." – BPA1

These sessions were sometimes quite ad-hoc and informal but as more BPAs were exposed to these consultants the easier it became to integrate this new knowledge.

*They organize for external consultants throughout the year then they give people chances to attend different sessions, they teach about leadership, management or finances. You can do a one-week training, a whole day…*BPA2

a) Limitations of External Consultants intervention

External consultant interventions are perceived as very costly to the organization. This is in line with findings from literature that indicates that the high cost of external consultants was a barrier to successful ERP systems implementation simply because organizations were not willing to invest in them (Nassar, Warrad, & Siam, 2017; Pollanen, 2014). Therefore, due to the potentially

high cost of hiring an external consultant, it is often left to the discretion of the group to determine if they require assistance from an external consultant.

This is compounded by the fact that sometimes Kenyan organizations are not willing to incur the cost of getting external consultants. This is especially so if these consultants are in technical areas such as BPM or ERP systems. This high cost of hiring a consultant is because of the shortage of qualified consultants specializing in BPM and ERP systems. The average cost for a BPM/ERP systems consultant in Kenya is USD 300 per hour as described BPA1 who worked closely with technical consultants. On average the cost of an ERP systems consultant worldwide is approximately USD 69.25 (payscale):

> *We were often charged an average of USD 300 per hour for both BPM and ERP systems consulting services. Their main target is multinationals – BPA1*

Besides this, Kenyan companies suffered reduced supply of competent BPM/ERP systems consultants and they often had to ship in consultants from abroad:

> *"Our company has also tried to bring in or ship in consultants which is also costly, they have tried to do departmental training, but they're not as intensive as in a situation where they get someone to actually do the course in South Africa" – BPA9*

In turn, this high cost of consultant services leads to a situation where the BPAs have to learn on their own. This then leads to a steep learning curve with a higher likelihood of errors when interacting with the BPA systems. BPA9, a BPA working in a large organization with an implemented and operational ERP systems, argued that none of the BPAs working in the organization had experienced knowledge transfer through an external consultant.

> *"The Business Process Analysts apparently are very willing to learn, but they are restricted because of the costs that the company has to incur in order to expose them. So, as I mentioned earlier it may be easier to just learn by doing…of course, that means that there are some things that will never be known …because of learning On-the-Job or there could be some mistakes that are made that could have repercussions on the entire system.*"– BPA 9

Therefore, even though the External Consultants intervention was a good tool for collective knowledge transfer and effective competency building, it was perceived as an unsustainable intervention because of the significant cost implications it brought on the organization.

5.4.2. Inter-group collaboration

The Inter-group collaboration intervention had high prevalence and was coded in a total of 16 interviews. In addition, the intervention was strongly described in 36 text excerpts. The intervention was powerfully emphasized by the BPAs. In order to provide a possible reason for this, it is important to understand that BPM is defined as a clear understanding of the end-to-end processes of an organization (Hammer, 2015; Lee & Dale, 1998; Van Der Aalst, 2013). It is, therefore, necessary for BPAs to understand the processes that take place across different departments (inter-departmental) and within organizations (intra-departmental) (Maddern, Smart, Maull, & Childe, 2014; Tinniä, 1995). In this regard, the inter-group collaboration intervention involves collaboration between process owners and business users working within functional departments in an organization and the BPA team. Within Kenyan based organizations, much like other contexts, the process owners, business users and BPA groups work together, where, on the one hand, the functional departments provide insights into the way their departmental processes run, and BPAs offer expertise on how best to improve these processes. One BPA mentions the close involvement that they have with multiple departments when it comes to understanding and redesigning processes.

> *"let's say Transport… the Transport section realizes they're using a lot of manual processes or they still have a process that's manual then they will come to us and ask us, "Is there a way we can automate this?" So we'll sit down with them and they'll step by step take us through their transport process."* BPA1

There was also an emphasis on the importance the organization places on inter-departmental collaboration:

> *"So, we would sit down and analyze, if they make this technical decision, how will it affect the sales? How will it affect finance? Before a decision is given to the head office, we usually go through it all of us and see where -- if it makes sense to go that way" – BPA12*

In terms of a more structured approach to competency building with regards to using ERP systems, different departments can also work together to develop competency building plans for their employees. This is a critical activity because it allows the members of the department as well as the BPA team to reflect on some problematic processes that need to be redesigned or improved.

> *"So, it's very much around process optimization which involves understanding, analyzing the current process or the as is and then talking to the person involved in the process flows"* – BPA3

This intervention was popular and was perceived as very effective in improving the competencies of BPAs. It was also viewed as cost-effective and promoted pro-activity and teamwork from different arms of the organization.

a) Limitations of the inter-group collaboration intervention

A major disadvantage of inter-group collaboration is that whilst BPAs collaborate regularly with process owners, BPAs would often carry out process owner or business user tasks. Similarly, process owners tended to delegate or authorize BPAs to handle the running of different organizational processes. Often, BPAs faced negative repercussions from top management if they by-passed a process owner and did the task themselves. An example of this is described in the text excerpt below:

"…that's what I was telling you when somebody does not understand…sometimes I used to find myself going in the system because I know the settings of the system, and I'd give my customer the seat. So, we will discuss that issue later after the customer has paid for their ticket because I want to lock in these sales…I will be doing it myself, and then the problem is that if your boss does not understand the times you had to bypass the other person then you find yourself in problems because then they're saying, "Were you doing some favour? Do you know this client personally? And were you getting some kickbacks and that's why you had to force this seat?"– BPA13

This delegation often leads to a lack of clarity regarding the role that the BPA plays in the organization. BPAs are often led to take up functional roles within their respective organization. This is a massive shift from their actual role of analysis re-design and implementation of organization-wide processes. Compounding this problem, results from the Kenyan context illustrate that inter-group collaboration intervention was perceived as very effective for the organization. However, most organization over-relied on it to the point that they did not expose

their BPAs to any other form of capacity building such as formal capacity building from ERP systems vendors. This led to a situation where BPAs complained their competencies were restricted to only what they had learnt from within the organization.

> *"As I mentioned no one on the functional side of SAP, anyone falling within the five departments mentioned earlier has gotten any sort of certification. As mentioned this leads to a situation where mistakes can be made as you are dealing with the system and because you've not done any formal training these mistakes can actually have severe repercussions"* – BPA9

5.4.3. Stakeholder engagement

Research describes Stakeholder engagement as those activities that an organization carries out in order to positively involve important stakeholders such as suppliers, customers and partners in the organizations day to day processes (Greenwood, 2007). This code had high prevalence and was coded in a total of 9 interviews. Stakeholder engagement is driven by trust-based collaborations (Min Foo, 2007). Studies also include the concept of customer engagement as an important aspect of stakeholder engagement where the customer has a say in the way different processes are managed or redesigned for optimization within the organization (Hollebeek, 2011). Stakeholder engagement was not as impactful as the other interventions in the integrating category. The intervention was described mainly as an afterthought in terms of its impact towards BPA competency building. The intervention was used in the Kenyan scenario to enable BPAs to consider the specific requirements made by important stakeholders, such as customers when carrying process redesign:

> *"Okay they are those standard requirements or standard processes, like customer statements, we have documentation for each market, but then the documentation is different depending on the specific requirements for each market."* – BPA2

In this intervention, the focus is to ensure that the employees are made aware of the stakeholder's needs and requirements and how these requirements affected the business processes.

> *"what we then had to go back and do now was to sit down with the people and say, "Okay, let's go through this system with you, these are your Processes, isn't it?" They're like "Fine." "What are the challenges you see?"* – BPA14

Stakeholder engagement, therefore, involved collective appreciation, from the BPA team, that processes can change depending on factors such as specific market requirements and market demographics. It involves learning based on interaction with stakeholders and thereby understanding specifications made by these different stakeholders.

a) Limitations of Stakeholder engagement intervention

Studies suggest that whilst stakeholder engagement is a very important way of getting a holistic picture of the organization and having a clear idea of the different requirements of the various stakeholders, it is often viewed as a time-consuming. Most stakeholder engagement tools such as the Delphi method and focus group discussions require a large time commitment. Similarly, other engagement processes such as seminars and conferences are quite expensive. Finally, samples involved in stakeholder engagement may need to be representative of what the BPA may want to analyze unless the sample is selected very carefully; this again could be quite time intensive (O'Haire, McPheeters, & Nakamoto, 2011).

5.4.4. Top management support

The top management support intervention was placed within the integrating theme mainly because it described top management being at the forefront of some collective action proposed by the BPA team. This code had low prevalence and was coded in a total of 6 interviews. Literature suggests that top management support is critical to high-quality implementation and use of information systems (Thong, Yap, & Raman, 1996). Similarly, engagement with top management can greatly facilitate learning and competency building in workers especially within ERP systems implementations (Albadri & Abdallah, 2009). In the BPM domain, top management buy-in is considered critical as they are the ones who initiate and support BPM initiatives (Trkman, 2010). BPAs interviewed in the course of this study suggested that top management support paved the way for closer interaction with process owners and business users anytime BPAs were required to learn more about business processes of the organization and how these business processes could be improved:

> *"naturally, people in organizations look up to what is the tone being set at the top. So, if the senior leaders of the organization say that we have to continuously improve our Business Processes, then the moment a Business Process Analyst engages a process owner to improve on their process, the process owner is already in the right frame of mind knowing that this is something that is important for the organization, they have to do it."* - BPA11

a) Limitations of the top management support

In the same way that top management support aids in competency development for the BPA teams, lack of top management support can be detrimental to any collective action that BPA teams hope to achieve or in a similar breadth any competency areas that BPAs may wish to improve on. One BPA complained that a change in their top management team from a more committed team to a less committed one had resulted in negatively impacting BPM initiatives that the organization had hoped to start and complete.

> *"right now the management that we're under does not listen. But the previous management, they used to listen and see if they can apply it and implement… With the previous management, let's say, they would have requests for something, whether it's technical or financial. So, we would sit down and analyze, if they make this technical decision, how will it affect the sales? How will it affect the finances?"* – BPA12

Any barriers to process improvement that BPAs faced from process owners were magnified when the BPAs received minimal support from top management. In some cases, BPAs faced negative repercussions from top management for initiatives they made towards carrying out process improvement.

> *"There are those flights that are the best connecting flights for these international passengers…it becomes frustrating whereby now you just decide, this one is usually difficult, I will be doing it myself, and then the problem is that if your boss does not understand the times you had to bypass the other person then you find yourself in problems."* – BPA13

5.4.5. Vendor certifications

In the Vendor Certifications intervention, an employee or group of employees attend ERP systems vendor learning sessions to learn details of the system. After going through the sessions and passing the exam the employees are given a certification. In the manufacturing sector, these certifications are viewed as an indicator of the level of competency of an individual (Tsai & Kuo, 2010). They are widely respected within the Kenyan context. Further, these certifications are perceived as a measure of expertise and proficiency in many information systems careers such as BPM and ERP systems specialist careers (Draghici, Olariu, & Rozman, 2014; Tsai & Kuo, 2010). This code had high prevalence and was coded in a total of 10 interviews emphasizing its

importance with regards to BPA competency building within the Kenyan context. Within the BPA profession, vendor certifications are well sought after because they enable individuals wishing to enter the BPA profession acquire a better BPM career portfolio (Kröckel & Hilgarth, 2011). Similarly, BPAs who were interviewed in the study respected these certifications as they perceived them as valuable to enabling them to advance in their career and improve the overall quality of their work:

> *"In terms of training yes, especially on the tools we use, so for example, we're using ARIS BPM software as a tool, we started out with Visio and then we changed to ARIS so yes, after these training we were better able to understand, in terms of practical BPM, the Six Sigma program was helpful"* – BPA3

Most of the BPAs who had completed and passed vendor certifications would become trainers within their department in that they were used by the organization to pass on the knowledge they had learnt to the rest of the BPA team:

> *"Train the Trainer model is where you find some of the learners from the organizations who went for the certification level training. They are either in the academies in Johannesburg or at partner led training centres. They go back and offer training of their own colleagues"* – BPA8

It was viewed as a critical component for knowledge transfer:

> *"I think it's because we're very many, so once you train the first set of people you don't have to keep re-training through vendor academies there's always someone who knows something about the system."* – BPA17

a) Limitations of the Vendor Certifications Intervention

BPAs interviewed admitted that more often than not, their employers were not willing to invest in taking them through vendor run capacity building sessions. Due to the significant cost implication of these certification process:

> *"The cost of training for the other SAP-related courses through the SAP Academy costs over one million and this is also applicable to training functional Business Process Analysts"* – BPA9

The Kenyan based BPAs often had to leave the country to complete their vendor certifications as most of the time these vendor certifications offerings do not run in Kenya. This meant that the organization had to largely incur large training costs to get their BPAs to complete the certification. Due to this and similar to the External Consultants intervention, the vendor certification intervention is perceived as a costly intervention and may not be scalable for many organizations. For this reason, organizations find it difficult to institutionalize this intervention. Often it is left to the discretion of the department or team to implement.

5.4.6. Vendor support tools

Vendor support tools are described as tools that are provided by the software vendor such as an ERP systems vendor. Whilst only these tools encompass updated documentation repositories, support conferences and vendor support helpdesks. Once an organization implements the ERP systems they are eligible for these support tools (Babey, 2006). The maintenance fees for the support tools are paid annually. The cost of maintenance fees will often be increased on a yearly basis (Babey, 2006). This code had low prevalence and was coded in a total of 5 interviews. The 5 BPAs who emphasized this intervention had participated in ERP systems implementations and were conversant with the vendor support tools offered once the ERP system was operational:

> *"Workforce Performance Builder this is a specific solution SAP has developed for training purposes."* – BPA8

Within the Kenyan context, these vendor support tools were also seen as a solution to the high cost of vendor training that is experienced by many BPAs.

> *"…we cannot afford to take people often for these training so we actually use Google a lot and SAP Help" – BPA1*

a) Limitations of Vendor Support tools

Vendor support tools intervention comes with a major cost implication that forms a part of the ERP systems implementation contract. research suggests that these costs will often be up to 24 per cent of the initial licensing cost. The vendor support tools covered in the maintenance fees will often have an escalator clause that allows the vendor to increase maintenance fees periodically once the system is implemented (Babey, 2006).

5.5. Institutionalizing

The Institutionalizing process is the last stage in the 4I framework of organizational learning. In this process, all parts of the organization are involved in the organizational learning process (Crossan et al., 1999). The outcomes of the institutionalization phase is a move from ad-hoc approaches to learning to well-established routines or structures and clearly outlined rules and procedures (Crossan et al., 1999). As organizations begin to fall into patterns of interaction and communication, organizations attempt to capture the patterns and interaction in order to formalize them (Crossan et al., 1999). At this point, all the knowledge that has been collected at individual and group level becomes embedded into the organization. This includes organizing knowledge collected from the other phases into a coherent form that can be reused by the entire organization. It is important to note that not all knowledge is institutionalized. Aspects such as systemic power and influence may affect which ideas get institutionalized at the organizational level (Lawrence et al., 2005). This process addressed the different ways in which organizations as a whole build competency in their BPAs. It was important to note that BPAs relied a great deal on this particular process as it moved beyond individual and group learning to organization-wide learning. The Interventions found within the Institutionalizing process are *Employee Assessment, Internal Help desk, Organization run training programmes* and *Organization Software tools.*

5.5.1. Employee assessment

Employee assessments are defined as tools used by organizations to gain an understanding of an individual's abilities. This code had low prevalence and was coded in a total of 4 interviews. Despite the Employee Assessment intervention not being spoken about by a majority of the BPAs, those who did speak about it argued that it was a standard organizational intervention of measuring and developing competencies in the workers. Employee Assessments help in determining how personnel will behave and the possible future actions that they are likely to perform (Edenborough, 2005). These assessments are beneficial to both the employee and the organization because they help the organization find a role for the employee that best matches their abilities (Edenborough, 2005) and can also improve the decision making process during recruitment (Edenborough, 2005). Even after an employee has been hired, these assessments are applied routinely in order to measure the competency levels of the employee (Edenborough, 2005). These assessments can also be used to evaluate employee performance on a regular basis. This intervention was common among the BPAs interviewed who mentioned that the organization had run some psychometric assessment during their recruitment process. These Routine psychometric assessments with the BPAs to determine strengths, weaknesses and areas of

expertise/talent. BPA3 mentioned that regular appraisals were done to establish the development needs of each worker:

> *"We're now going on with the whole program of actually doing a psychometric assessment with everyone so we can properly find out what the developmental needs are."* – BPA3

> *"We need to identify some of their strengths and some of their interests and then point them in the right direction"* – BPA8

Once hired, These Kenyan based BPAs emphasized that for them to use any part of the ERP systems, they first had to go through a number of routine tests in order to establish that they were conversant with the system or had completed the requisite training:

> *"You're tested like now if you're doing order cash how to process an order, if you're looking for credit exposure how do you open the credit exposure report,"* – BPA2

Employee assessments were also part of a performance evaluation or appraisal mechanism for BPAs. These appraisals were carried out on a regular basis by an immediate supervisor or manager in order to diagnose the areas the BPA was good at, the training the BPA had done and advising the BPA on areas that they needed to improve :

> *"Appraisals, meetings we do like once every month, we discuss how it's working with the market, the training we have done and advising, things like that."* – BPA2

These assessments were so important for some of the BPAs because it was often used as a way to measure if the BPA was ready for a promotion or for a change to another department.

> *"We have an application with questions … they'll give you a series of 20 questions and then you're supposed to answer, then it gives you results and it gives whether you've passed or failed…this is done when someone has a promotion coming up" – BPA2*

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a) Limitations of the Employee Assessment intervention

Within the Kenyan context, this intervention was seen as a very valuable tool for diagnosing

competencies of BPAs. However, employee assessments were perceived as time-consuming because they often required that they BPA spend time outside their normal work duties to complete these assessments. Organizations, therefore, enforced assessments by having policies that emphasized that without these assessments, BPAs could not complete their probationary period, if they were recently hired, or they could not be promoted, if they were up for promotion:

> *"You have to keep doing the assessment until you pass."* – BPA2

With regards to the Kenyan context, the BPAs negatively perceived the Employee Assessment intervention. Employee Assessment was perceived as an intervention enforced by the organization. At the same time, it was also viewed as necessary because it allowed a BPA to either successfully complete the probationary period or get a promotion.

5.5.2. Knowledge sharing

Knowledge Sharing has been described as the ability to diffuse information through the participation of different departments in an organization and within external networks that the organization interacts with (Dyer & Nobeoka, 2000). This code had high prevalence and was coded in a total of 8 interviews. For knowledge sharing to be successful, it is important to motivate staff to participate and share what they know, prevent excessive self-interest among individuals and reduce the cost and resources needed to seek and access valuable knowledge (Dyer & Nobeoka, 2000). Studies have also suggested that successful knowledge sharing approaches are found in small groups where specific knowledge is acquired and used regularly (Dyer & Nobeoka, 2000). In information systems and in BPM specifically, knowledge sharing is an important component of software process improvement (J.-C. Lee, Shiue, & Chen, 2016) Similarly, organization software tools promote efficient knowledge sharing by storing ideas and concepts into the collective memory of the organization (Burchill et al., 2000; Dennerlein et al., 2015). These tools include the in-house developed software/intranets which employees can use to access different learning resources and even do online tests. A BPA could proactively access information about the organization through the organization software tools in order to help them with their role.

> *"I'm exposed to nearly all of the information at the Company in terms of having access to the Internet where there's all these - there's a library for information on the journey*

that we have travelled from when it started all the way to where it is now and where it's going" – BPA7

In certain instances, the Knowledge sharing supported the On-the-job learning intervention where for example, if an inexperienced BPA was unable to get sufficient advice from a more experienced BPA, they had the option of accessing the repository to learn on their own. Access to this intervention ensured that BPAs were trained on and understood the policies and procedures laid down by the organization and that they were not just working blindly on their own:

The Intranet where they have specific credentials that they can put in and then they use these credentials to log in to manuals that may be helpful to them. – BPA9

"Workforce Performance Builder you own it, you think about it like this, you buy software and that software it's a training software. All you need to do is to upload your training content, your PDF files, your videos and then you have a module for registering the staff members as students." – BPA8

a) Limitations of knowledge sharing

A major limitation of knowledge sharing intervention lies in the ability of the workforce to ensure that knowledge diffused is consistent and factual. This is more so if the workforce stores knowledge from external sources such as search engines (Zablith, Faraj, & Azad, 2016). Given that many people are accessing and adding knowledge within the organization, then it is possible for the repository to hold information that is not accurate which in turn can lead to a series of errors while using information from this repository (Zablith et al., 2016). A way to mitigate this is by ensuring that there is some quality control process that safeguards the accuracy of the information before it is accessed (Jennex & Olfman, 2009; Zablith et al., 2016).

5.5.3. Organization run training

The Organization run training intervention includes all formal and structured training that is initiated, facilitated and examined by the organization. The organization run training intervention, therefore, differs from the Vendor certification and External Consultant interventions because it focuses mainly on those training activities carried out in-house. Organizations will often initiate training in order to enable the workforce to learn new skills and then implement these new skills into their day-to-day tasks (Saks & Burke, 2012). For this study, This code had high prevalence and was coded in a total of 13 interviews.

With regards to the Kenyan context, some organizations opt to carry out certain in-house training to remove the high cost incurred when hiring an external consultant or when sending employees to training locations outside the country. These organization run training are developed and executed by in-house staff who, in the past, may have gone through some certification or intense learning. They thereafter became trainers of their fellow colleagues. These will usually follow a train the trainer approach:

> *"I am already trained as a trainer, so I have sort of mastered my area then I become an internal trainer."* – BPA1

This intervention was implemented often when the organization wanted to communicate a new policy to the workforce or enforce an already existing one:

> *"I would say yes because training in the Company is very key and we also have a knowledge transfer section within the company and in terms of training we have internal training" – BPA1*

The train the trainer approach was seen as a possible solution to the cost implications of bringing in external consultants or paying for an entire BPA team to get vendor certifications:

> *"It's because we're very many, so once you train the first set of people you don't have to keep re-training through vendor academies there's always someone who knows something about the system."* – BPA2

There were also in-house training done to induct new BPAs into the organization:

> *"For a new staff member, there's a whole induction course"* – BPA3

As well as less formal interaction sessions with top management:

> *"We have engagement sessions, we had one here with the CEO of the company, actually went on a roadshow to see people in all different locations, not only to introduce yourself but to introduce the new values and … new ways we do business…sometimes it's actual training where you go on a training process to understand a thing about the values or the mission of the business."* – BPA3

a) Limitations of Organization run training intervention

While Organization run trainings were a useful and sustainable way of amplifying BPAs' competencies, they are difficult to organize on a regular basis and still required substantial resource usage from the organization.

5.6. A Summary of findings

The summary of findings is presented by outlining the 12 basic themes that make up the organizational interventions for the development of competencies in BPAs in Kenya. Chapter 6 of the study delves further into the last stage of thematic network analysis. This section looks at an integration of the thematic network with the BPA competency framework introduced in Chapter 4. It provides an interpretation of patterns between the interventions developed in this chapter and the competencies analyzed in Chapter 4 of the study. It provides the final link in attempting to answer research question 2 which set out to identify which interventions built BPA competencies.

Table 5-2: Operationalization of Organizational interventions within the 4I framework of Dynamic learning for the Kenyan Context

Process	Interventions	Dominance of Intervention		Contextual Limitations
		High	**Low**	
Intuiting	*On-the-Job*	X		- DIY mistakes may have a ripple effect on an integrated system such as ERP systems
Interpreting	*Staff-to-Staff Mentorship*	X		- Perceived as an additional burden on the mentor BPA. - Errors made by a mentor may be propagated to Mentee.
	Job shadowing		X	- unable to fully justify that they had been productive during the time spent observing process owners and business users performing their tasks
Integrating	*External Consultants*		X	- High cost to the organization as the supply of external consultants within the Kenyan context is very low

	Inter-group collaboration	X		- Unclear roles for the BPA. The BPA is often authorized to carry out tasks that should otherwise be done by process owners and process users
	Top management support		X	- Top management is at the forefront of some collective action proposed by the BPA team. Top management can either drive or dissuade collective action
	Stakeholder Engagement	X		- Expensive and time consuming to implement - Difficult to develop an appropriate stakeholder sample for specific objectives of the engagement
	Vendor certifications	X		- The high cost of implementation as there are limited training offerings available within Kenya. BPAs are required to travel abroad to attend training
	Vendor support tools		X	- Forms a part of the vendor maintenance costs that can be increased every year through escalation clause described in the ERP systems implementation contract
Institutionalizing	*Employee Assessment,*		X	- Unpopular with BPAs as it is perceived as a subjective tool of competency development - Seen as a barrier to promotion or completion of the probationary period
	Organization run training programmes	X		- Requires substantial planning time and resource utilization by the organization
	Knowledge sharing	X		- Difficult to update resources across the organization. Risk

				of misinformation being propagated

6. Organizational interventions and their impact BPA competency building

The chapter intends to finalize on the second research question: What organizational learning interventions build the required competencies in Business Process Analysts? This has been done by mapping the interventions described in Chapter 5 with the BPA competencies that they had the highest impact. In order to define patterns between the BPA competencies and the organizational learning interventions, matrix coding technique using the Nvivo data analysis tool was used. The matrix coding approach has been used in inductive studies for conceptual and theoretical development, specifically within a grounded theory project (Hutchison, Johnston, & Breckon, 2010). In this case, the main question was to identify those interventions that impacted specific BPA competencies the most.

Matrix coding with Nvivo software was presented using three components:

a) The columns: contained the 16 BPA competencies from the Framework of BPA competencies as described in chapter 4
b) The rows: contained the 12 interventions described in chapter 5
c) The cell: contained the number of coding text excerpts at the row and column intersections

Table 6-1: Node Matrix for Basic competency themes and corresponding Interventions

		Competencies															
		I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**	**XIII**	**XIV**	**XV**	**XVI**
	A	6	2	2	5	5	3	6	1	10	5	8	0	7	1	5	5
	B	7	0	2	0	3	3	2	1	11	0	10	0	0	3	0	2
	C	17	4	13	3	13	17	9	7	25	5	29	0	11	9	1	5
	D	0	10	4	1	0	4	0	1	0	0	2	0	3	0	1	11
	E	24	7	19	7	18	22	15	13	21	7	24	0	8	3	8	5
	F	6	4	4	9	7	8	7	9	11	11	12	1	12	3	6	4
	G	0	0	3	0	0	4	0	0	0	0	0	0	0	0	0	0
	H	17	1	8	0	15	7	5	3	19	5	22	0	11	4	2	3
	I	5	2	9	2	5	8	2	5	7	4	7	0	1	3	0	0
	J	0	1	3	0	0	3	0	0	1	0	2	0	1	0	0	0
	K	12	1	6	0	5	4	2	1	20	1	14	1	2	4	1	3
Interventions	**L**	7	1	4	1	8	6	4	1	10	0	10	0	1	3	0	3

Key

Interventions		**Competencies**	
A	Employee Assessment	**I**	BPO4
B	External consultants	**II**	BPO3
C	Inter-group collaboration	**III**	BFC1
D	Knowledge sharing	**IV**	BIC3
E	On-the-Job (do it yourself)	**V**	BPO1
F	Organization run training	**VI**	BPO2
G	Job Shadowing	**VII**	BIC2
H	Staff to Staff Mentorship	**VIII**	BFC3
I	Stakeholder engagement	**IX**	TC2
J	Top management support	**X**	BIC1
K	Vendor Certifications	**XI**	BFC2
L	Vendor software tools	**XII**	BFC4
		XIII	OK
		XIV	TC1
		XV	BIC4
		XVI	TC3

Table 6-1 shows the node matrix generated from Nvivo for the basic competency themes. While Table 6-2 shows the node matrix generated from Nvivo for the high-level competency themes. The following sections describe patterns that emerged. These patterns describe which interventions impacted the most on BPA competencies. Coding text excerpts that were ranked the top 2 for each BPA competency-Intervention pair were interpreted as being high impact. High impact pairings are highlighted in the tables below and are described in the following sections.

Table 6-2: Node Matrix for High-Level competency themes

High-Level Competency themes	*BFC*	*BIC*	*BPO*	*OK*	*TC*
1 : Employee Assessment	*10*	*8*	*9*	*7*	*10*
2 : External consultants	*10*	*2*	*7*	*0*	*11*
3 : Helpdesk	*0*	*0*	*0*	*0*	*6*
4 : Inter-group collaboration	*21*	*10*	*16*	*7*	*24*
5 : On-the-Job (do it yourself)	*22*	*14*	*19*	*8*	*17*
6 : Organization run training	*10*	*9*	*5*	*10*	*8*
7 : Organization software tools	*12*	*5*	*11*	*8*	*12*
8 : Staff to Staff Mentorship	*21*	*6*	*19*	*11*	*18*
9 : Stakeholder engagement	*6*	*5*	*3*	*0*	*6*
10 : Vendor Certifications	*14*	*2*	*14*	*2*	*20*
11 : Vendor software tools	*10*	*4*	*10*	*1*	*9*
In1-Intuiting	***22***	***14***	***19***	***8***	***17***
In2 -Interpreting	***21***	***6***	***19***	***11***	***18***
In3- Integrating	***46***	***16***	***37***	***9***	***54***
In4-Institutionalizing	***25***	***16***	***20***	***20***	***28***

6.1. BFC – BPA fundamental competencies

Integrating

Research on BFC refers to these competencies as those that form the foundation of the abilities that a BPA needs to have. They include the ability to assimilate information on Business Processes more than the typical user within an organization (Hill, Sinur, Flint, & Melenovsky, 2006; Mathiesen et al., 2013; Sonteya et al., 2012). It involves the ability to redesign processes from the current business process state to the future business process state (Ko, 2009; Mathiesen et al., 2013; Sonteya et al., 2012). These fundamental competencies form the basis on which BPA expertise is built (Sonteya et al., 2012). From the co-occurrence matrix, the Integrating process contributed the highest to the development of these competencies. Therefore, collective action, shared understanding and mutual adjustment was perceived as mandatory for the development of these fundamental competencies. As established in Chapter 1, in Kenya, the BFC group of competencies are perceived as very important by BPAs in companies with mature and optimized BPM. Enhancing the growth of BPA Fundamental competencies in BPAs can help organizations optimize their BPM initiatives.

From the Kenyan context perspective even though other learning processes such as intuiting and interpreting helped in the development of these competencies, organizations depended largely on the group-based interventions as a means of building basic BFC competencies. The Integrating process was, therefore, the most dominant in enhancing the growth of the BFC competencies. One BPA suggests that a lot of the learning on these basic competencies was dependent on what the group already knew with additional interactions with external consultants:

> *"Within ourselves as well we've realized we can learn a lot…we get to sit with the SAP consultants as well, there's some good knowledge transfer that happens."* – BPA1

The next sections delve further into mapping constituent codes of the BFC competencies with those interventions that have the highest impact on their development.

6.1.1. BFC1- Business Analysis

On-the-Job (DIY) intervention; Knowledge sharing, Staff-to-Staff mentorship

The business analysis is described as the ability to plan and monitor business analysis activities, collecting requirements, Enterprise analysis and assessing that the final solution matches well with the organization's initial requirements (Paul et al., 2014; Sonteya et al., 2012). The business analysis competency is seen as critical to enabling the development of enterprise solutions that can ensure that organizations remain competitive in its industry and forms the basis on which the BPAs competencies are built (Mathiesen et al., 2011; Mathiesen et al., 2013; Sonteya et al., 2012). Findings from Chapter 4 indicated that Business Analysis was perceived to be highly undervalued by organizations in Kenyan undervalued while, on the other hand, it was perceived as a valuable competency in the South African one. The On-the-job intervention had the highest impact on its development.

This study found that BPAs based in Kenyan companies are having to learn the BPA role practically and on their own. This was perceived as a major contributing factor to gaining the business analysis competency. This is likely because the needs and requirements of the organization were quite dynamic and often changed over time. The BPA, therefore, had to be able to appreciate that collecting requirements was a dynamic process that often changed and that they had to be able to detect and accommodate this change and then communicate their findings to top management.

> *"Then we go back to doing our own research... once we've done that the design part is already done then we still have to have a business case to top management" – BPA1*

Therefore being able to perceive the business requirements of the organization through research, interactions with process owners and communication with top management contributed greatly to the development of the Business analysis competencies for the Kenyan based BPAs who were interviewed in this study.

Organization software tools intervention contributed to the development of the business analysis competency. This was achieved by facilitating research and access to organization-wide information. The BPA often used this information to understand the organization's requirements, for example, one BPA relied heavily on Google online search engine to carry out research and understand aspects relevant to their industry with respect to business analysis functions:

Most of it was On-the-Job training and software tools... - BPA1

Staff-to-Staff mentorship intervention also contributed significantly to the development of the Business Analysis competency, it offered a way that experienced BPAs could quickly communicate their findings to the less experienced BPAs as they carried out business analysis related work.

> *So we'll sit down with them and they'll step by step take us through their transport process at a particular time.* – BPA7

Given that business analysis functions happened in a rapidly changing environment, most of what was learnt at the individual levels (intuiting process through on-the-job and interpreting process through Staff-to-Staff mentorship) was not captured at the group and organizational levels. In addition, most organizations tend not to be clear on how the business analysis competency works (Paul et al., 2014) and this may lead to a situation where the organizations do not fully appreciate the need to integrate and institutionalize ideas developed at the individual level.

6.1.2. BFC2- Holistic Overview of business thinking

Inter-Group collaboration, On-the-Job and Staff-to-Staff mentorship

A holistic overview of business thinking is regarded as the ability to understand and apply one's tasks to the dynamic interaction between the process and practice dimensions (Zacarias & Martins, 2011). Holistic Overview of Business Thinking (BFC2) defines that ability to view the organization as a "living system" (Sonteya et al., 2012). In addition, findings from Chapter 5 indicated that BFC2 was among those competencies that BPAs within the Kenyan context highly undervalued. Further, based on findings from the study, three interventions impacted the greatest on its development. These were inter-group collaboration, online knowledge repository and staff-to-staff mentorship. The inter-group collaboration had the highest impact on the BFC2 competency. BPAs interviewed argued that, by getting exposure to what different teams or departments in the organization did, they were better able to have a big picture view of the organization:

> *"The one thing I did especially for my workplace is to insist because before my boss wasn't very keen on it, the discovery sessions as a group. Is literally insisting and tell him, "We need to do discovery. We need to understand the Business Process, even if they're telling us to automate one component, we need to see the holistic view,"* – BPA14

"they're different departments who use different parts of the system, so when you're in this department you learn this part ...when you're P2P that's pay to pay, you learn how payments are processed" – BPA2

The On-the-Job intervention provided a way in which BPAs could access information relevant to the organization, its business processes and its operations as a whole. The intervention enabled BPAs to acquire knowledge that the organization had compiled from individual experiences.

"had that background of working with lots of details and I was able to analyze and then to understand the concept of what's the process and everything in the process, so it's process thinking. So, in the sense of background, I think that would be a requirement. I'm not sure that's something that you can really learn to do, but when you're in business and you see how things go." – BPA3

Staff-to-staff mentorship also contributed to the development of the holistic view of business thinking competency. Similar to Business Analysis, experienced BPAs acknowledged that they quickly imparted a lot of what they learnt about the operations of their organization to their less experienced counterparts. This way the less experienced BPAs got to a glimpse of the organization and how the different parts worked; much like how living system works. Here is a comment made by one of the junior BPAs interviewed. This BPA was taken into the organization through the mentorship program that enabled him to have exposure to the core business processes of the organization:

"I was in the mentorship program and what they're doing here is that different sections have their own different module, they have for example… supply chain, materials…so I learnt a lot, I've been active, I have the skills now." – BPA7

From the data collected and analysed, this particular competency was critical as it enabled the BPAs to view organizations as dynamic and complex entities and that they should be ready to adapt and change in line with their industry requirements.

6.1.3. BFC3- Client Experience Thinking

On-the-Job (DIY) intervention; Organization run training

Definitions from literature describe Client experience thinking as the ability to align the needs of the customer with the overall strategic direction of the organization. Studies suggest that there are two types of clients that organizations have to consider (Sonteya et al., 2012). The external client, that is the buyer who interacts with the organization in order to purchase a product or service and the internal client, that is those individuals that the organization has a much more permanent relationship with such as managers, process owners and users (Sonteya et al., 2012). A BPA needs to be able to understand the needs of these two categories of clients while developing business processes that add positive value (Van Der Aalst, La Rosa, & Santoro, 2016). With respect to the Kenyan context, the interventions that had the highest impact on the Client experience thinking competency were On-the-Job (DIY) intervention and Organization run training. BPAs interviewed stated that much of what they had learnt with regards to client experience had been learnt experientially with them having to do a fair share of research into customer requirements and then tailoring processes that fit in with these requirements. One BPA mentioned that when it became necessary to adapt the ERP systems in order to improve the users' experience, they would have to sit down and do their own research and establish how these improvements could be incorporated into the ERP systems:

> *"The customer is like a key, so everything goes back to the customer. If the customer is not happy, then the process is wrong and we have to start again…I learnt through experience"*- BPA15

The organization run training intervention contributed significantly to the development of the client experience thinking competency by offering a platform on which innovations could be presented. These innovations were often geared toward improving the value proposition of the organization for both its internal and external clients.

> *"We also have a technical seminar where innovations are presented, so in case it's an innovation that has come from our department, one of us will put it all together like a solution to a customer problem and come up with the research and the figures…"This is what we are doing currently, we look at the amount of savings the company can make if we decide to automate this process."* – BPA5

The BPA, in this regard, was required to clearly understand the needs of the clients, establish what process improvements would have positive value on the clients and then implement the relevant process changes.

6.1.4. BFC4 - Mathematical and Statistical competency

Organization run Training, Vendor Certifications

Mathematical and Statistical competency, BFC4, is aligned with the ability to develop process models that measure the quality of a process. It focuses on understanding a wide set of statistical technologies including process improvement methodologies such as Six Sigma and lean (Sonteya et al., 2012; Van Der Aalst et al., 2016). Besides knowledge on these methodologies, a BPA is also supposed to be able to identify variabilities in processes and then identify, analyse and evaluate the impact that process changes might have on process performance (Van Der Aalst et al., 2016). Organization run training and Vendor certifications were seen to impact these competencies the most. Organizations had to invest in setting up training programmes and ensuring that their BPAs attended and passed vendor certifications. This enabled the BPAs to enhance their mathematical and statistical skills.

> *…"the training I've gone in I've got a link to Six Sigma Black Belt qualification, and I did happen to be in a Program Manager training, I happen to have the qualification as well…But I think mostly the link to Six Sigma Black Belt training was most helpful."*- BPA3

One BPA argued that the organization has set up several in-house pieces of training on these methodologies but besides this, it was also necessary for them to undertake and pass relevant vendor related courses.

6.2. BIC – Business Interpersonal Competencies

Institutionalizing

Research shows that BIC competencies are crucial in today's dynamic business environment (Bedwell, Fiore, & Salas, 2014). These competencies are a component of success in IS projects (Müller et al., 2016; Sonteya et al., 2012). Therefore, being able to manage and build relationships is an important part of a BPAs day-to-day work (Müller et al., 2016). As part of their role, BPAs

will often be required to sit down with different stakeholders and collect requirements from them. In order for them to do this well, they need to be able to build strong interpersonal links with these stakeholders (Sonteya et al., 2012). The data collected for this study showed similar feedback. There was a common consensus that these competencies were a basic and critical requirement for BPM. Findings from Chapter 4 indicated that while BIC competencies were found to be critical in African contexts such as the South African context it was highly undervalued within the Kenyan context. Data analysis indicated that the Institutionalizing process of the 4I framework contributed the most to the development of these competencies. BPAs acknowledged that enforcement of policies and procedures by the organization helped them become more trustworthy and reliable while organization run training armed the with good communication and leadership skills. Besides institutionalizing, the intuiting process through on-the-job intervention was important when developing the Business process elicitation competency.

> *"We have training, they organize training throughout the year then they give people chances to attend different training, they teach about leadership, management or finances."* – BPA2

The next sections provide further detail on the various interventions that impact the BIC competencies.

6.2.1. BIC1 - Facilitation and Leadership

Organization run Training

This is the competency that relates to the ability to lead and direct people toward a common goal or objective (Becker & Bish, 2017; Sonteya et al., 2012; Viitala, 2005). It also includes the willingness to lead in the implementation of BPM within the organization (Rosemann & vom Brocke, 2015). The BPA must, therefore, ensure that BPM initiatives are aligned with the overall strategy of the organization (Rosemann & vom Brocke, 2015). They are also required to attach a level of detail across all process levels of the organization and from this being able to provide leadership during process change activities. In addition, these facilitation and leadership competencies enable the BPA to work independently and provide leadership during project management and change management related activities (Sonteya et al., 2012). Findings from the

study with respect to the Kenyan context indicated that the organization run training intervention had the highest impact on the development of the BIC1 competency:

> *"…one is given room to make independent decisions and one is trusted to come up with an idea, make a plan and follow through with it. In terms of training, the Human Resource department is now more proactive and engaged."* – BPA10

The organizations often allowed BPAs space to nurture their leadership skills but at the same time invested in formal training on leadership and facilitation in order to consolidate the BPA fundamental competencies (BFC). Most of the organizations that the BPAs worked for made an effort to institutionalize leadership capacity building initiatives. BPAs acknowledged that they did not have to learn these skills outside the organization:

> *"…the organization provides for team management training, I have never had the need to go outside of the company to obtain any of those course materials or anything."* – BPA3

BFC was so highly valued that often organizations would include it as a part of the internship program that they ran with potential BPAs coming into the organization. One junior BPA commented that it was part of the training he underwent prior to taking up his role as a BPA:

> *"What they do is to pick from different universities, private and public, depending on whether they have availability of funds because they offer it for free. They call it CSR but CSI, Corporate Social Investment because they're looking at the university students as the future leaders in those areas"* – BPA7

All in all, it was clear that most organizations valued Facilitation and leadership and went to great lengths to institutionalize training based interventions that could build Facilitation and leadership competencies in their BPAs. There was also a clear understanding that BPAs could be trained to acquire leadership and facilitation qualities which were necessary for their day-to-day tasks.

6.2.2. BIC2 - Business requirements elicitation

On-the-job

The Business Process Elicitation competency has been termed as a critical component during the implementation of information systems and acts as one of the phases during the software development lifecycle found in the software engineering field (Afsana, Chakraborty, Chatterjee, & Kaza, 2015). It is the ability to interact with clients and users in order to collect requirements

and determine the needs and expectations of users (Afsana et al., 2015). In addition, BIC2 is also regarded as that competency which:

> "…entails being able to find the story buried in every process and communicating it to a wider audience in either a written or oral context." (Schlegel, 2011 p. 5)

Findings from Chapter 4 of this study show that the BIC2 competency was the most undervalued competency within the Kenyan context in comparison to the South African context. This study argues that BIC2 is a core competency over and above business analysis and process improvement. Not only must a BPA be able to develop solutions or initiate process re-design but also be able to identify needs and requirements communicated by users and go further to identify weaknesses or opportunities buried in organizational processes (Schlegel, 2011). BIC2 is hence not limited only to the software engineering process but is a critical competency required to drive BPM. In this regard, findings from Chapter 5 indicated that The Business Requirements Elicitation was found to be undervalued in Kenyan organizations more than in other contexts such as the South African context. An analysis of data collected indicated that the BIC2 competency was built mainly through the on-the-job intervention. BPAs acquired BIC2 through hands-on learning. Similar to the business analysis competency, it is likely that there were no formal institutionalized mechanisms to build BIC2 in BPAs within organizations in Kenya possibly because elicitation of requirements was a dynamic process that occurred within an ever-changing business environment as well as the finding that Kenyan based BPAs undervalued BIC2 more that they should have. To support this argument, BPAs explained that most of what she had done to gain the BIC2 competency was hands on which required an extensive understanding of the business environment and how operations within the organization work:

> *"I think we needed to change it, so I understand why we needed to change it, we needed to change it because mainly -- this one I think I would tag it with quality, the quality was low…I'd say because we were not meeting clients' goals...it relies on experience. It was based on my experience"* – BPA16

In addition, Business requirements elicitation was perceived as a critical building block of BPM and a competency that was not easy to teach but that one had to learn by doing:

> *"I'm not sure that's something that you can really learn to do, but when you're in business and you see how things go and you actually think of it as this little building block."* – BPA3

Another intervention that BPAs felt helped in the development of BIC2 was the inter-group collaboration intervention. This is possible because the very essence of BIC2 is the ability to work with different groups in the organization in order to collect requirements. This is also in-line with findings from chapter 5 which suggest that clear structures and open teams are useful in developing BIC2. BPAs interviewed supported this by arguing that by creating a collaborative environment within the organization, BPAs were able to build their requirements elicitation competency. So important was this intervention that one BPA felt that it was critical to initiating process automation within ERP systems implementation projects:

> *"we do have a lot of collaboration ... because we develop our systems based on industry knowledge, the best example is healthcare, it's one of the areas that has not been automated as well as it ought to be, so what we do is we reach out to the experts. Someone who has become a hospital administrator for many years, he sits down with us, we understand the processes in a hospital, the challenges, the areas that are really critical for them as a business, then we automate those."* – BPA9

In summary, BIC2 contributes to the development of BPM related activities within organizations. This is because it entails having a deeper view of processes and how the needs and requirements of the user can be aligned to process changes. BIC2 can be best developed by enabling an environment where the BPA is able to learn hands-on (On-the-job) and through the facilitation of clear structures and open teams that collaborate effectively (inter-group collaboration).

6.2.3. BIC3 - Business Communication

Organization run training

The day-to-day tasks of the BPA involve communicating with different stakeholders such as customers, process owners and top managers (Sonteya et al., 2012). It involves the ability to not only communicate verbally but in writing as well (Sonteya et al., 2012). Being able to effectively communicate with these stakeholders can have a positive impact on BPM by driving process collaboration and enhancing the way in which groups work together to achieve positive process outcomes (Rosemann & vom Brocke, 2015). Findings from the study show that organization run training had the most significant impact on BIC3. Kenyan organizations were perceived to have institutionalized competency building for the BIC3 competency. BPAs mentioned that they had

undergone several training programs established by their organizations that targeted this specific competency:

> *"The general ones are usually yes as you say communications, we've once been taken also for public speaking, you find again you get to interact with people on a day to day basis, so that also improves your training skills for example."* – BPA1

BPAs were often required to become a trainer of trainers (ToTs), their skills were fed back into organization run training progress. In order for these training programs to be successful, therefore, having good communication skills was a necessity:

> *"We go back and offer training to our colleagues, so a Train the Trainer model. We use this model to deploy or to pass knowledge."* – BPA8

BIC3 had two-fold benefits for the BPAs and the organization at large. On the one hand, BIC3 enabled BPAs to communicate with stakeholders when carrying out BPM and on the other hand it was a critical competency required for knowledge transfer and possible institutionalization of BPM related policies and procedures. Due to the obvious benefits of BIC2, organizations were ready to invest in regular training for their BPAs.

6.2.4. BIC4 – Trustworthiness

Organization run training

BIC4 is defined as a critical component of building relationships. It involves being able to work with integrity, honesty and trust (Sonteya et al., 2012). BIC4 is important for the BPA because they often access sensitive information about the organization which they are required to keep confidential (Sonteya et al., 2012). Trustworthiness is also considered as a metric for service quality (Grover, Cheon, & Teng, 1996) and a dominant factor for gauging the professionalism of an individual (Rotter & Stein, 1971). The organization run training had the highest impact on these competencies according to BPAs in Kenya. BPAs acknowledged that their respective organizations had put in place policies and procedures that enforced a certain behaviour from their staff members. One BPA even suggested being trustworthy was part and parcel of the

cultural behaviour of people in the organization. If you were not perceived as trustworthy then you were likely going against the culture of the organization:

> *"Based on the fact that one has worked here…for some time and learnt the university culture, you get to understand how things work, see or face repercussions from other colleague's experiences and how the university is run. As a staff member, based on the decisions you make, there are rewards and consequences for every action."* – BPA10

Other BPAs commented that sometimes their organizations would run training for all staff-members if they felt that, for instance, there were increased cases of fraud:

> *"Yeah, that one you do, you'll have talks actually, they explain to you the definition of aspects such as money laundering, if they notice like for example, there was a time there was an issue with money laundering in one of the departments, so if they find an issue has cropped up and then maybe the staff didn't deal with it very well they will organize and do a training on it."* – BPA2

The findings of the study indicate that the organization played a key role in building BIC4 by first developing a culture that nurtured integrity, honesty and trustworthiness and by offering training opportunities to ensure that BPAs understood how they should behave within the organization.

6.3. OK – Organizational Knowledge

Institutionalizing

Staff-to-staff mentorship, Organization run training

This entails having a clear understanding of the goals and objectives of the organization. It also involves the ability to synthesise the strategic direction of the organization (Sonteya et al., 2012). This competency also entails the ability to appreciate that different types of companies have different strategic directions and that a BPAs role is to align BPM initiatives to this strategy (Sonteya et al., 2012). Organizational knowledge feeds into holistic overview of business thinking by offering an understanding of what the organization wants to do and hence the process changes that need to be implemented to get there (Jiménez-Jiménez, Martínez-Costa, & Sanz-Valle, 2014). The study found that staff-to-staff mentorship and organization run training interventions had the highest impact building the organizational knowledge competency. One BPA argued that

Similarly, there was an acknowledgement that the organization invested heavily in training BPAs on important aspects of the organization such as its vision, mission, long term goals and short term strategies:

> *"The organization has started with sensitizing and educating people on the vision, mission and strategy... We have a relatively new workforce, so the first and most important thing is to enlighten people on what the organization is about, its history, its vision, mission and goals. So, this is where we build from. For strategy, the organization has to carry out a workshop,"* – BPA10

It was important to note that BPAs had the critical role of passing on information about the strategic direction of their companies. Moreover, BPM is an area that is very closely linked to strategy implementation (Burlton, 2015).

> *"We have internal training …let me explain, for internal is more of us taking up our day to day Processes like for example myself I am already trained as a trainer, so I have sort of mastered my area then I become an internal trainer. So when it comes to ERP systems that's how we carry out some of the Processes, I am able to go out in the field to our plant and train them how to use say plant maintenance* – BPA1

Therefore, having BPAs who were well conversant with this, in the form of organizational knowledge, was critical to the successful implementation of the strategy (Burlton, 2015).

6.4. TC – Technical Competencies

Integrating

Given that BPM skills are centred on having an understanding of BPM terminologies, systems and methodologies, having the requisite technical skills were mandatory (Sonteya et al., 2012). In addition, BPAs acted as intermediaries between the technical side and business side of process management (Lai & Mahapatra, 2004; Müller et al., 2016). This meant that they had to understand technical terminology and application, in fact, research, shows that technical competencies are important enablers of BPR (Lai & Mahapatra, 2004). The study found that the integrating process was the most impactful for the growth of technical competencies. Kenyan based BPAs perceived that they had acquired their technical competency through close collaboration with different teams and groups in and outside the organization:

"An example is under teamwork where especially when we're dealing with the functional department we need to be able to work out as a team so that we're able to customize the system effectively and produce a solution that is high-quality." – BPA9

BPAs also stated that being able to sit down as a team with ERP systems consultants was very helpful in building the requisite technical skills:

"We have also tried to bring in or ship in consultants" – BPA9

6.4.1. TC1 - Software Oriented Architecture (SOA) Knowledge

Inter-group collaboration

Software-oriented architecture (TC1) is defined as a popular approach to software development. SOA allows organizations to maximise on the existing software infrastructure and enable sharing of data across distributed applications (Fouad, Gilliam, Guleyupoglu, & Russell, 2017). SOA is also beneficial to organizations in that it provides a mechanism for the description, linking and integration of reusable business services (Cen, 2015). Having SOA knowledge was critical for BPAs because it allowed them to understand the business process models required for their various business functions. The inter-group collaboration intervention was determined to be the most impactful for building the SOA competency. BPAs working within the Kenyan context required input from different groups and teams in order to build SOA related competencies. They needed to understand, holistically, how the SOA layer has been set up and then carry out process re-design that can work well within the layer. This required substantial teamwork or group collaboration in order to achieve this holistic understanding:

"It is typically the organization which is divided into two components as far as SAP is concerned, the technical team and the functional teams. You need a technical team, we call them the BASIS and the ABAPAS, those are just internal names. You need them to be able to manage things in the background, set up things, troubleshoot, fix, they're the techies, the gurus, yeah…then we have those ones you need them to be able to run the Business Processes of the organization." – BPA8

There was a significant collaboration that needed to happen between the technical team and the business side and more often than not it was the BPAs that acted as intermediaries. They,

therefore, had to have a clear understanding of SOA and how it applied to the different processes in the organization.

6.4.2. TC2 - ERP systems Knowledge

Inter-group collaboration

This is described as having an understanding of ERP systems as company-wide business software packages which organizations use to integrate their information systems (Charland, Léger, Cronan, & Robert, 2016). BPAs value ERP systems Knowledge because it allows them to understand the details of how the ERP systems works and from this develop business processes that can bring out the integrative nature of these information systems (Sonteya et al., 2012; Al-Mashari & Al-Mosheleh, 2015). This is a particularly important competency to have during ERP systems implementations because:

"In ERP systems implementations, customization should usually be undertaken to ensure a fit between business process systems and current organizational processes(Al-Mashari & Al-Mosheleh, 2015 p. 1).

The ERP systems knowledge competency was impacted the most through the inter-group collaboration intervention. BPAs relied heavily on knowledge transfer through teams based knowledge. Often a few BPAs were trained on ERP systems concepts and then they would pass on this knowledge to their colleagues. This knowledge transfer was different from institutionalized organization run training. They were often informal setups where knowledge was transferred between teams and groups:

> *"It's an informal setting, we sit down together then you do the learning, you take them through the system."* – BPA2

In addition, most Kenyan organizations resorted to an inter-group collaboration intervention to train their BPAs on ERP systems knowledge because of the high cost of training through an ERP systems vendor. One BPA stated that once someone was taught something about the system they passed on their knowledge to others through group interactions:

> *"I think it's because we're very many, so once you train the first set of people you don't have to keep re-training through vendor academies there's always someone who knows something about the system."* – BPA17

6.4.3. TC3 - User Interface design skills

Knowledge sharing

User Interface design skills (TC3) involves having an understanding of software usability. It also involves the ability to develop systems and processes that users can navigate through and complete a task in an effective and efficient manner (Albert & Tullis, 2013). In addition, the systematic design of a user interface can enable a user to complete a task faster and better (Chorianopoulos, 2008; Marcus, 1995). A BPA is required to have design skills because they are directly involved in the automation of business processes. Throughout the automation process, the process and system user should be kept in mind (Sonteya et al., 2012). Data analyzed in the study indicated that BPAs found their user interface design skills were built through online knowledge repositories or online courses:

> *"So you practice but not on the live environment, you practice on the site, so that you see if can make make dummy like entries and then you can be able to practice to see the whole process and is also used for testing, if you want to test a new process, if you want to introduce something you test it on that and then now you do it on the live once you've confirmed everything is okay."* – BPA3

BPAs often looked for information on user interface design from online repositories and online systems where they ran user-based testing for re-designed business processes. These user related tests were done before loading the process changes onto a live environment.

6.5. BPO – Business Process Orchestration Competencies

Integrating

The business orchestration competencies were defined as the ability to understand how a process works (Antonucci & Goeke, 2009). BPO also involves process analysis, managing process changes while at the same time educating users who will be executing the various processes (Sonteya et al., 2012). In addition, BPO encompasses the enactment, monitoring and measurement of business processes within the organization (Sonteya et al., 2012). BPO has been viewed as core to the actual execution of business processes and has been termed as the coordination and invocation of services or activities that need to be performed within a given business process (Reed, Butt, Nene, Singh, & Addala, 2016; Sadok, Okba, Souraya, & Oueslati, 2017). Similarly, findings from chapter 4 of this study strongly suggest that, for the Kenyan based BPAs, the BPO competencies are important within companies that had mature BPM and within

companies that had ERP systems implementations. This study argues that these BPO competencies are important in Kenyan based organizations that wish to grow their BPM initiatives as well as those that are in the process of implementing an ERP system or already have an ERP system in operation. This is mainly because these set of competencies provide an overview of what skills a BPA needs to have when executing process changes or automating processes through an information system. Further, data analysis showed that the integration process contributed the most to the development of these competencies. This meant that BPAs relied a great deal on learning that was group-based. It also required that the BPAs have exposure to different groups, teams and departments:

> *"We get to first of all place you in one of the Processes… some have been over the years now been taken for the Functional so that they get to understand for example if it's HR this is what goes in to be HCM if its Operations Maintenance this is what goes into SAP PM. So, we have that as one of the key plans."* - BPA1

The acquisition of this set of competencies was through the development of stories at the group level. These stories reflected the complexity of the actual business process orchestration activities:

> *"So that way it makes it very clear that the process starts…where you as an engineer, me as the BPA person understanding the process get to know or discuss the requirement and the scope and manage the projects and manage the Change Management, then we just liaise with their Systems Analysts do to now do the actual Programming or Configurations."* – BPA1

BPAs collectively decided to follow specific approaches when implementing process orchestration mechanisms and these thereafter became repositories of knowledge. The next section delves further into the constituent competencies for BPO.

6.5.1. BPO1-Business Process and Value chain modelling

On-the-job, Inter-group collaboration

The Business process and value chain modelling competency (BPO1) is defined as the ability to model business processes such that an organization can easily understand the various business processes in operation and how these business processes impact the value proposition of the organization (Sonteya et al., 2012). These value propositions were represented within the organization as value chains which can then be broken down into specific processes that contribute to the value chain (Harmon, 2015). Understanding process value chain, therefore, involves understanding which activities within a business process contribute directly to the value chain. It then involves being able to model these activities in a way in which the organization can understand (Harmon, 2015). The on-the-job intervention contributed the most to the development of BPO1. BPAs relied a lot on hands-on learning when developing the BPO1 competency. The main reason for this was that modelling and aligning business processes to the value chain was such a practical activity. In addition, software or online tools such as test environments, which were availed by the organization, were greatly valued when building BPO1:

> *"You can be able to practice to see the whole process …, if you want to test a new process, if you want to introduce something you test it on that ground and then now you do it on the live once you've confirmed everything is okay."* – BPA2

The BPAs acknowledged that a lot of the process automation that they did was first based on their own personal research and from extensive interactions with process owners:

> *"Then, of course, we will pick up the normal Business Analysis Process, step by step workflow it, if there are forms let's see the forms, are they manual, are they on our workflow system? Then we go back to doing our own research...."* – BPA1

Data analysed in the current study established that inter-group collaboration also contributed significantly to the development of BPO1. One BPA stated that while trying to assess how their ERP systems could be changed to improve their overall service delivery, they required substantial input from different groups and departments they even went further to form groups based on their specific expertise:

> *"They are placed in groups…their areas of specialization. So, you find this is a better chain process than before …, where some issues are not raised or comprehensively explored."*-BPA10

BPO1 was built through two interventions, the on-the-job and inter-group collaboration interventions.

6.5.2. BPO2- Business Process Improvement

On-the-job

Business Process Improvement (BPO2) involves the ability to analyse complex problems and systems and then developing process improvements that could solve these problems (Sonteya et al., 2012). It is the ability to transform As-Is business processes to To-Be processes (Vanwersch et al., 2016) that enhance internal efficiency and change, for the better, how organizations function (Shtub & Karni, 2010). Findings from Chapter 4 indicated that, within the Kenyan context, BPO2 was highly undervalued in comparison to the South African context. For BPO2, BPAs relied significantly on practical hands-on learning or on-the-job intervention. A lot of their job consisted on being able to intuitively identify a problem with a given process and the discuss possible ways of solving this problem:

> *"On the bigger part, a lot has been hands on. We usually work with our experiences and how we've handled issues/problems before."* – BPA10

They also relied considerably on inter-group collaboration due to the fact that for process improvements to be actualized, the BPAs required information from different groups within the organization. They also required some form of collective action from these groups in order to enact and monitor process improvements. One BPA acknowledged that feedback from different groups was essential to building BPO2:

> *"Definitely, there are times we've sat planning…and realized that we needed to have started planning earlier on in terms of certain processes and requirements. One group suggested something and it worked."*-BPA10

Another intervention that was perceived to build BPO2 was the online knowledge repository. This was mainly because these repositories contained stored knowledge of existing business processes. The BPAs apply this knowledge during their process improvement activities. Tools such as Aris (from Software A.G) and Visio (from Microsoft) were used during business process improvement efforts:

> *"on the tools we use, so for example, we're using ARIS BPM software as a tool, we started out with Visio and then we changed to ARIS"* - BPA3

6.5.3. BPO3-Business Process Risk Compliance Assessment

Knowledge sharing

Business Process Risk and Compliance Assessment competency (BPO3) is in line with the growing need for BPM practitioners to be aware of the legislative and regulatory policies and procedures that have become part and parcel of how organizations operate (Sonteya et al., 2012). BPO3 is linked to how organizations operate and the way in they are expected to operate both at a global level and also at an industry level. The intervention that impacted BPO3 the most was online knowledge repository. This held information about the legal or regulatory requirements of the organization:

> *"I did learn much on the way and also through their website they'd share their PDF and PPDA Acts and regulations."* – BPA6

> *"we were having a challenge with fraud in one of the organizations we are able to collect this centrally and you look at the process and you understand why there's a challenge in fraud." – BPA8*

In addition, this information enabled them to identify potential risks to the organization and hence implement measures within BPM that could be used to mitigate these risks.

6.5.4. BPO4 - BPA drive and promotion

On-the-job

The BPA drive and promotion competency refers to the ability to initiate a BPM cycle (Sonteya et al., 2012). The BPM cycle encompasses an understanding of the strategy of an organization and from this being able to jumpstart process management based on the strategic direction that the company would like to take (Macedo de Morais, Kazan, Inês Dallavalle de Pádua, & Lucirton Costa, 2014). It involves a managerial level understanding and the validation of the steps that an organization wishes to take in the course of strategy development (Macedo de Morais et al., 2014). For BPO4, the on-the-job intervention was perceived as most impactful for its growth. Similar to other BPO competencies, BPAs argued that a lot of what they learnt on process orchestration required a lot of their own initiative and willingness to learn as they worked. More so, BPAs appreciated that they were working in very dynamic environments that required a readiness to adapt and change in order to fit in with the demands of their environments. Processes that worked during one period were rendered obsolete during another and so BPAs had to be able to intuitively

detect that it was now time to initiate a new BPM cycle via the BPM drive and promotion competency:

> *"the guys they take as superusers are the people who've used the system for a long time …, they can also be able to identify weaknesses in the system, they test it often if they need something tested that person is the one who is going to do it. So, someone who is very conversant with the system."* – BPA2

Additionally, BPAs stated that Online knowledge repository interventions were also valuable in building BPO4 because they provided valuable information that BPAs could use and even get tested on. These online tools were often a good way for the organization to pass on valuable information on future directions.

> *"Yes, you own it, the Workforce Performance Builder you own it, you think about it like this, you buy software and that software it's a training software. All you need to do is to upload your training content, your PDF files, your videos"* – BPA8

6.6. Summary of competency – intervention mapping

Table 6-3 below outlines the mapping of both high-level and basic competencies and those interventions that impact each competency the most. It was important to note that BPAs felt that most of their core BPA competencies were built On-the-Job through the intuiting process.

Table 6-3: Contextual outlook of the Competency Intervention mapping for the Kenyan context.

Competency	High Impact Intervention	Contextual propositions per competency from Chapter 4
BFC - Business Fundamental Competencies	*Integrating*	Drives BPM Maturity
BFC1 Business Analysis	On-the-Job (DIY) intervention; Online knowledge repository, Staff-to-Staff mentorship	Perceived to be undervalued in the Kenyan context
BFC2 Holistic Overview of Business Process Thinking	*Inter-Group collaboration, On-the-Job Staff-to-Staff mentorship*	Perceived to be undervalued in the Kenyan Context
BFC3 Client Experience	*On-the-Job (DIY) intervention; Organization run training*	
BFC4 Mathematical and Statistical	*An organization run Training, Vendor Certifications*	Respondents tended to perceive this competency as least important competency for the BPA role
BIC - Business Interpersonal Competency	*Institutionalizing*	Perceived to be undervalued in the Kenyan context
BIC1 Facilitation and Leadership	*Organization run Training*	
BIC2 Business Requirement Elicitation	*On-the-job*	Perceived to be very undervalued in the Kenyan context
BIC3 Business Communication	*Organization run training*	
BIC4 Trustworthiness	*Organization run training*	
OK - Organizational Knowledge	*Institutionalizing Staff-to-staff mentorship, Organization run training*	

BPO – Business Process Orchestration	*Integrating*	Perceived to drive BPM Maturity and ERP systems implementations and Organization-wide ERP systems operations
BPO1- Business Process and Value Chain Modelling	*On-the-job,* *Inter-group collaboration*	
BPO2 - Business Process Improvement	*on-the-job*	Highly Undervalued within the Kenyan context
BPO3 - BPM risk and compliance assessment	*Knowledge sharing*	
BPO4 - BPM drive and Promotion	*On-the-job*	
TC – Technical Competencies	*Integrating*	
TC1 - Software Oriented Architecture	*Inter-group collaboration*	
TC2 - ERP systems knowledge	*Inter-group collaboration*	
TC3 - User Interface Design	*Knowledge sharing*	

While mapping the higher level themes, data analysis indicated that BPAs perceived that BFC was impacted mainly by the integrating process while the BIC and organizational knowledge competencies were impacted through the institutionalizing process. Finally, the BPO competencies were impacted by the integrating process.

In addition, competencies that were undervalued within the Kenyan context (BIC2, BFC1, BPO2 and BFC2) tended to rely mainly on Intuiting and Integrating processes. Institutionalizing interventions were limited possibly because these Kenyan based organizations did not fully appreciate the importance of these competencies and had therefore not embedded the necessary institutionalizing interventions to enhance these competencies.

7. HEI curriculum prescriptions to developing BPA competencies in students – A DSRM approach

The previous chapters have first analyzed the BPA competencies that were perceived to be important through testing of 3 hypotheses. Following this, the study synthesized a set of 12 interventions that BPAs felt were important for the development of their competencies. In the 6th chapter, a framework was developed that mapped to the BPA competencies with the BPA competencies that the interventions had the highest impact. Following from this, this chapter provides an artefact to be used in the development of the curriculum and that HEI can introduce in their BPM courses. The chapter attempts to answer the research question: *"How can the HEI curriculum and pedagogical interventions and interactions develop these competencies in students?.* The chapter uses activity systems analysis to describe how the interventions would be adopted within the BPM course. As discussed in chapter 3, the study uses the DSRM specified by Peffers (2007) for artefact development. This chapter provides a detailed report of the process of problem identification and motivation for the development of the artefact; definition of the objectives for the final artefact solution; design of the artefact; demonstration of the artefact and finally evaluation and communication of the artefact.

7.1. Problem identification and motivation

Throughout the course of the study, findings from both the survey and the BPA interviews indicated that there were no formal courses that extensively delved into BPM concepts, the BPA role and competencies required for the role. Many BPAs stated that they had not had any formal course related to BPM work from their respective HEIs. In fact, the study found no literature that discussed BPM or the BPA role within the Kenyan context. With regards to the survey that received 65 responses from BPAs coming from various organizations, 21 had done a course related to BPM as part of organization run training and not as part of any HEI programme. These very low numbers point towards a gap in BPM education and HEI curriculum in Kenya. Further to this, there was a clear indication, from interviews carried out with 16 BPAs working in the industry, that they had experienced a steep learning curve from the time they began their role until the point where they were proficient in their job:

> *"It was more of steep because again as I said…in 2010 the ERP systems project was brought in, so again you have to understand what is an ERP system then understand what SAP is, how does it now come to fit into the Processes. So, it has actually been…very steep."* – BPA1

They argued that nothing significantly relevant to BPM and BPM within ERP systems had been taught to them at their respective HEI:

> *"…but when it comes now to the System Analysis, Business Processes side of it especially when you're talking about ERP systems we're not there yet. I haven't found a college or a university that offers something specific or close or directly related to ERP systems, it will always be mentioned…with some of the units but no. So, you'll find you have to go back now to SAP Company or Oracle Company to be taken to one of their academies to understand first what an ERP system is, what Oracle…SAP is. So, we still have a bit to do with when it comes to ERP systems in this country."*- BPA1

Further to this, there was consensus among the BPAs interviewed that their organizations invested a lot of time and resources in implementing various interventions for them to build their BPM competencies:

> *"Through the SAP academy run by SAP, but it's also quite expensive because for them it's their product and it's a very small niche of people who call themselves SAP experts or SAP certified… So, still in Kenya or in Africa it becomes a very expensive venture even for us as a Company or as an industry...SAP training is very expensive. I know in other parts of the world they offer ERP systems units like SAP for example at the university level, so for us, we still haven't got there yet, so that's also a gap."* – BPA1

> *"Business Process Analysts apparently are very willing to learn, but they are restricted because of the training costs that the company has to incur in order to train them."* - BPA8

7.2. Definition of the objectives of the solution

The main objectives of the final solution or artefact were to provide a qualitative description of the learning activities that could be used to build BPA competencies in students undertaking BPM related courses. At this stage, the researcher analysed the results from the problem identification and requirements specification phase.

7.2.1. Objective 1: Defining the concepts of the activity system

From the requirements collected during the first phase, the researcher defined how each of the concepts of the Activity Theory would be adapted for the study for purposes of designing the final artefact. This included reflecting on the insights provided by the 4 experienced lecturers on how they tailored their BPM courses in their respective HEI. The interview schedule instrument used

with the 4 lecturers was based on the concepts of the Activity Theory (Appendix 4 and 5). Following the insights provided during requirements specifications, the next section discusses how each concept of the Activity Theory was adapted to this study.

a) Identifying and defining the subject/collective Subject

The subject/collective subject concept defined the attributes of the individual or group that acted or caused activity to take place. This concept included having an understanding of the student prerequisites and the teaching approach that was used in the BPM course. The student prerequisite theme was used to define the characteristics of the student who was eligible to participate in the BPM course. Lecturers teaching BPM and ERP systems courses emphasized that these courses were usually taught to students who were either in their third or fourth year of the undergraduate program:

"Because this is a third-year program we expect them to have gone through a second-year Information Systems course which covers Systems Analysis and Design and implementation." – Lect1

Lecturers interviewed also provided an indication of some of the skills, such as system design and basic computer programming, that the students were required to have before starting the BPM course:

"Coding is necessary because when we move into the BPM space they're first of all modelling but at the same time we're relating how a process model might be realized through multiple use cases" – Lect1

In terms of teaching approach, it was necessary to analyze the methodology that the lecturer used throughout the BPM course. The teaching approach focused on how the lecturer planned a learning activity for the students. Lecturers who were interviewed emphasized that developing a proper structure prior to the commencement of the course was essential and that both practical and theoretical components were essential for the learning activity:

"we hold back a little bit on the technology front and we introduce them to what is a Business Process, what is Process Analysis, how can you analyze a process, techniques about analyzing a

process, BPMN methodology, how to map a process and then we start introducing them into the technology…an Enterprise Systems technology can be used to automate the process."- Lect2

b) **Sourcing for the required tools or instruments**

The tools and instruments concept of the Activity Theory describes what resources were necessary for the BPM course to run. The main tools and instruments identified during requirements specification were human tools and ICT based tools. In this study, human tools described the characteristics of the qualified human resource that was used to facilitate the BPM class. These human tools were identified as lecturers, tutors or lab assistants:

"Usually, tutors are students who have previously done the course, but also we encouraged that they should have also done TERP 10 certification at least, and we monitor their performance to understand who's strong in that area and we let them really focus more on that." – Lect2

ICT tools were described as the IT related tools that were used during the classroom session by either the student attending the class or the human facilitating the class:

"the students learn not just to model a process using the BPM and notation but to also execute automated process within the Bizagi Suite" – Lect1

c) Identifying and defining the Object/Objective

The object or objective is achieved through the student, an implemented teaching methodology and through human and ICT tools. The object or objective defined the problem space within which a subject, in this case, the student, acted. Some of the objectives include learning of BPM concepts and the ability of the student to reflect on what had been learnt. Therefore, in order for the course to have been deemed to have achieved its object or objective, it was necessary for the students to understand and synthesize the BPM concepts taught to them in the classroom, reflect on these concepts and carry out hands-on project work to demonstrate that they had learnt.
Further, one of the main objectives of the BPM course was to ensure that the student understood BPM to the point that they could apply these concepts practically within projects and assignments that they were given throughout the course. This same view was held by an experienced lecturer teaching BPM:

"we're doing a project at the moment with a health clinic…where we're almost moving through a BPM process with the students as a research project but also hopefully with some more practical benefit for them to implement certain process improvements… it's that research project-based idea and then using BPM as a way to actually engage in research project work with them." – Lect1

One lecturer interviewed identified the importance of ICT tools specifically ERP systems software in helping students understand BPM both theoretically and practically

"The other thing is, of course, the ERP systems software with the course, it's developed very well and through this, there is a good relationship between what we are learning theoretically. It has become easy to understand the processes" – Lect4

Besides Analysing BPM on a theoretical and practical level another critical objective was enabling the students to reflect on what they had learnt such that they understood BPM from a real-world perspective.

"section of their project submission requires them to reflect...hopefully it helps them going forward, but in any case, I think that's the aspect that if a student would really learn how to appropriately reflect it would significantly improve their ability to absorb the learning" – Lect2

Similarly, one lecturer emphasized that for students to do well in the course they were required to fully understand why they had to complete certain milestones. The students were dissuaded from cramming to pass the course.

"It's not the kind of course where you can just cram for an exam as you say and then write the exam because of those deliverables, those project deliverables and the way each of them builds up the previous ones" - Lect1

d) Developing the necessary learning artefacts

This concept described those elements that were created once the learning activity started. From the data analysed the learning artefacts identified during requirements specification pointed towards class assignments and projects completed by students and a repository of questions compiled by lecturers. The class assignments and projects were completed by students during a given learning activity. The students were required to apply their own solutions to problems presented during the learning activity. A similar approach was used by a lecturer as described:

"The project involves going to the industry, get a Business Process, analyze it, interact with people, gather data and draw that process, present it to us, get feedback and make a recommendation, use technology, use SAP, use everything to figure it out." - Lect2

Repository of questions was described as questions created for a specific learning session. Through this repository, students were able to practice what they have learnt and provide solutions to the problems described in the questions and exercises:

"yes there are, and there's a booklet that we have which we've been using for the time that I've taught the course, and now we've even gotten a book that's to be published and it's going to cover further information about the course… when I got to the course in 2014 there was very little on BPMN. So, now I've been able to create new questions and basically work on trying to build on the questions around BPMN" – Lect3

e) Defining the rules for assessing the student (subject)

Rules acted as the main mediation process between the community such as the lecturers, HEI, industry and the student. In this case, the students were the main subject. Rules were the evaluation criteria for assessing the performance of the subject for a given activity. Throughout the course, the students were evaluated with respect to their lab work, continuous assessment tests and a semester project. The lab work and continuous assessment tests were evaluated by the lecturer through a previously prepared marking scheme. Here it was necessary for the lecturer to ensure that the student had learnt. One lecturer provided an elaborate outline of the rules and measures put in place for their BPM course to determine the extent to which the students had learnt:

"…they need to do some small exercises which are part of class work, and these small exercises which are part of class work will usually hold about 10% of the total required score. Then they're also required to do two-semester tests, and these two-semester tests carry 80% of the total course work."- Lect 3

Besides assignments, the lecturer also gave the students a semester-long project based on the process lifecycle. The project that was largely hands-on and involved interaction with small business owners. This coincided with the requirements collected in phase one where a lecturer explained that students were required to apply the theoretical concepts learnt in class within a real-life industry environment. The students were deployed to industry and asked to recommend and implement process improvements:

"*the other practical aspect of the course is obviously the project which students have to work on*

the practical project, here's another component of practical that's embodied in the project, so it probably comes down to 50/50" - Lect 2

f) Defining the major stakeholders of the learning environment and their responsibilities (Division of labour)

Division of labour addressed the roles and responsibilities of different stakeholders involved in the BPM course. Stakeholders that were identified included lecturers, students, industry and even software vendors. Based on findings made during requirements specification, specific areas where stakeholders were involved included industry players who provided industry and software vendor learning resources; students who were responsible for completing classroom activities; lecturers who were responsible for preparation and evaluation of class activities.

Industry and vendor learning resources or experiences were useful for students in terms of real-world exposure. In one case, a lecturer provided an example of the learning experience that students get during their hands on projects within Industry:

"We have a formal internship program in our Honour's year which is – so we don't try to – I think there's so much effort that goes into that that we can't possibly run it across all the different levels. So, we have that formal – we put a lot of effort into it that. It's a winter internship in our Honour's year. Some of the students yes will go off in that internship and there may then be an environment where they would apply more of the BPM skills " – Lect 1

As critical stakeholders, students had the responsibility to use the resources and knowledge available to them to enhance their skills and competencies. Students are provided with the necessary means for a learning activity, it is their responsibility to make use of these means:

" students should have an open mind and more willing to learn new technologies. - Stud1(student focus group)

Lecturers had the responsibility of keeping up to date with trends in BPM. They are required to remain proficient in the relevant areas. The lecturer also had the responsibility for planning and implementing learning activities:

"I'm deciding on what that would be, so I'm deciding whether we're going to do the vacation leave request exercise this week or the loan request exercise, so I'm deciding those sort of pieces of work in the lab." – Lect 2

Vendor learning resources were also important as part of the division of labour. these are resources such as reading material that is provided by a vendor such as a BPM software vendor or an enterprise system vendor. In some cases, vendors are instrumental in creating learning environments that are critical for competency building for both the student and the lecturer:

"…SAP obviously we work very closely with them, they provide the support to allow us, through their University Alliance Program, to access their technology and make effective use of it in a teaching environment because that's the biggest challenge, really it's a big expensive technology and using it in class requires sometimes a lot of resources SAP has tried to put mechanisms in place to help with the different products, also additional products, BI products and everything." – Lect2

g) Defining the learning environments for the course (Community)

The community concept of the activity described the environment within which the learning activity took place. Ideally, this activity would happen within HEI but also encompassed interaction with other important stakeholders such as industry and software vendors. These stakeholders contributed to making the learning environment richer. HEI resources were made available within the HEI environment, they include library facilities, classrooms and laboratories. These coincide with curriculum documents analysed during the study. These curricula emphasized the attributes of the learning environment where learning activities should happen:

> *"Project team laboratories to accommodate team projects essential to the IS program. Classrooms equipped with computer projection, Internet, and local network access, and appropriate computing and software infrastructure." (Topi et al.,*2010)

The learning environment extended to external learning environments these included industry interactions and software environments provided by BPM vendors. These were successfully achieved when the HEI has a robust relationship with both industry and vendors. A lecturer emphasized the importance of maintaining robust relationships with external players:

"there's usually support from vendors, I wouldn't say vendors have been very difficult, usually, there's reasonable support from them whenever you interact with them and tell them you want to use their technology." – Lect 2

7.2.2. Objective 2: Defining and assessing the outcomes of the activity system against the desired end result

The outcomes exemplified the desired end result to be achieved after the learning activity had completed. With respect to the study, the main outcome was a student who had the required BPA competencies. In summary, the outcome of each activity system followed the intervention-competency mapping described in Chapter 6 (RQ3). The objectives presented in this phase (Definition of the objectives of the solution) were used as a guide for identifying and describing how the 4 processes of the 4I framework and the constituent interventions could be represented as activity systems. This is further elaborated in the next section.

7.3. Design of the artefact

The artefact was designed based on the findings of RQ2 and RQ3 as elaborated in chapter 5 and chapter 6 of this study. These research questions investigated 12 interventions used to develop BPA competencies. These 12 interventions were categorized into the 4 processes of the 4I framework. Following these findings, the blueprint developed based on 4 activity systems representing the 4 processes of the 4I framework namely intuiting, interpreting, integrating and institutionalizing. The next sections describe the design of the 4 activity systems.

7.3.1. Intuiting activity system

The intuiting activity system was designed to focus on how students would learn the BPM course by learning on the job. The design, therefore, addressed students proactively learning BPM concepts with limited direction from the lecturer. Figure 7-2 illustrates the intuiting activity system.

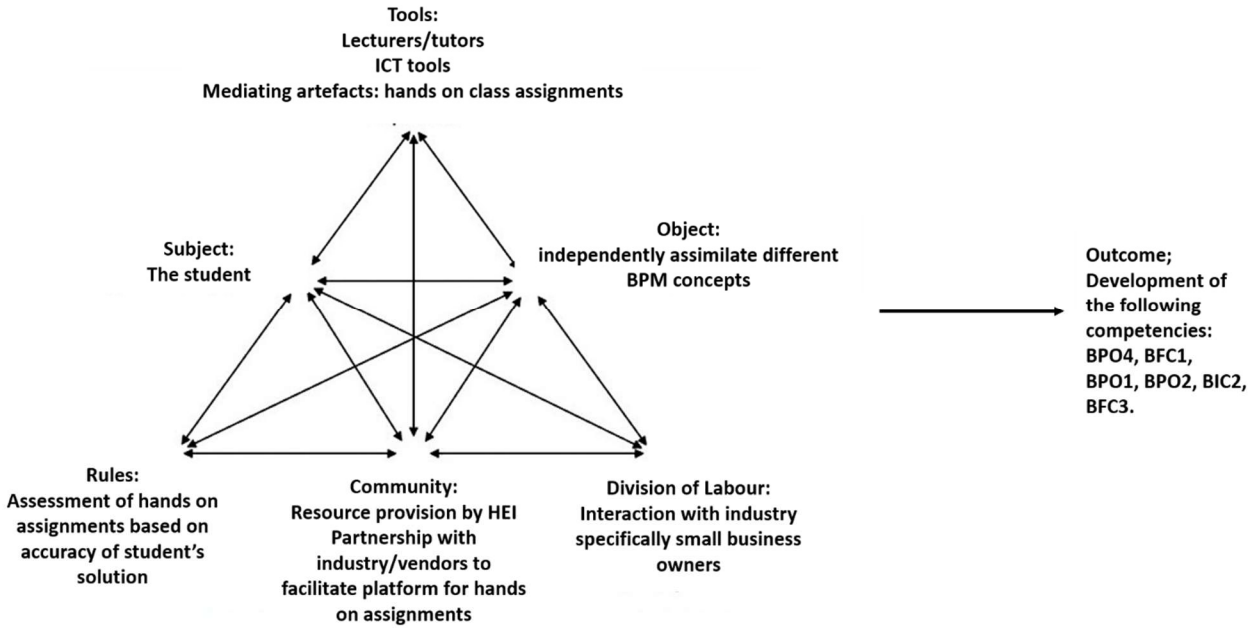

Figure 7-1: The intuiting activity system design

a) Subject/Collective subject: the design of the intuiting activity system aimed to identify students as the subject of the intuiting activity systems. Student prerequisites were included in the design to enable students to work unsupervised and complete tasks given in class on their own. A requirement of the activity system's design was that students were required to demonstrate the ability to use prior knowledge to complete a task at hand. The artefact targeted students completing their 4th year in the Bachelor of Business Information Technology course. The most appropriate teaching approach that the design supported was one based on hands-on learning through experience. Therefore, the design of the activity system required students to complete tasks based on past learning examples. Appendix 13 provides details of the design of a lab exercise on IBM blue works modelling tool that the students were required to complete.

b) Tools/Instruments: This part of the intuiting activity system design included human participants such as a lecturer and a tutor. The design of this activity system required that lecturers develop classroom examples for students. The design requires that students solve similar problems on their own. The design of the intuiting activity system detailed ICT tools requirements which included hardware such as projectors, as visual aids. Other ICT tools included in the design of this activity system were software such as modelling platforms (Bizagi or IBM Blueworks). This software was included in the design to enable students to test solutions to problems that they were presented with.

c) Object/ Objective: The design of this activity systems ensured that individual students were able to independently assimilate different BPM concepts and connect theories learnt in the classroom through practical hands-on work. The researcher designed the activity system to include personal reflection through the use of a reflecting journal.
d) Mediating artefacts: the activity system design included class assignments and projects to enable students to build on what they had learnt while solving and thereafter explaining how they came up with proposed solutions. Similarly, the activity system design required students to develop their own questions/insights based on reflection or application of concepts learned
e) Rules: Rules specified and designed for this activity system focused on assignment and project evaluation criteria. All assignments designed for this activity system were hands-on and practical in nature.
f) Division of labour: the intuiting activity system was designed to encourage students to interact with industry, specifically small business owners through a semester-long project. This would enable them to see first hand how concepts learnt theoretically applied in the real world. The design required students to have a deep willingness to learn with either limited or no direct supervision.
g) Community: the activity system design required that HEI provide resources such as lab and classrooms. The HEI also made reference books available to students (Dumas et al., 2013; Vom Brocke & Rosemann, 2010). The artefact design would ensure that the students were exposed to software learning tools IBM Blueworks provided by a software vendor (IBM in this case).
h) Outcome: following findings from RQ3, The intuiting activity system was designed to have the highest impact on developing the following competencies: BPO4, BFC1, BPO1, BPO2, BIC2, BFC3.

7.3.2. Interpreting activity system

The interpreting activity system was designed to address how students would learn the BPM course by observing process owners as they completed specific tasks (job shadowing) and through mentorship from tutors and their fellow students (student to student mentorship). The focus, therefore, was designing an interpreting activity system that would get students to learn by observation and to learn from their peers.

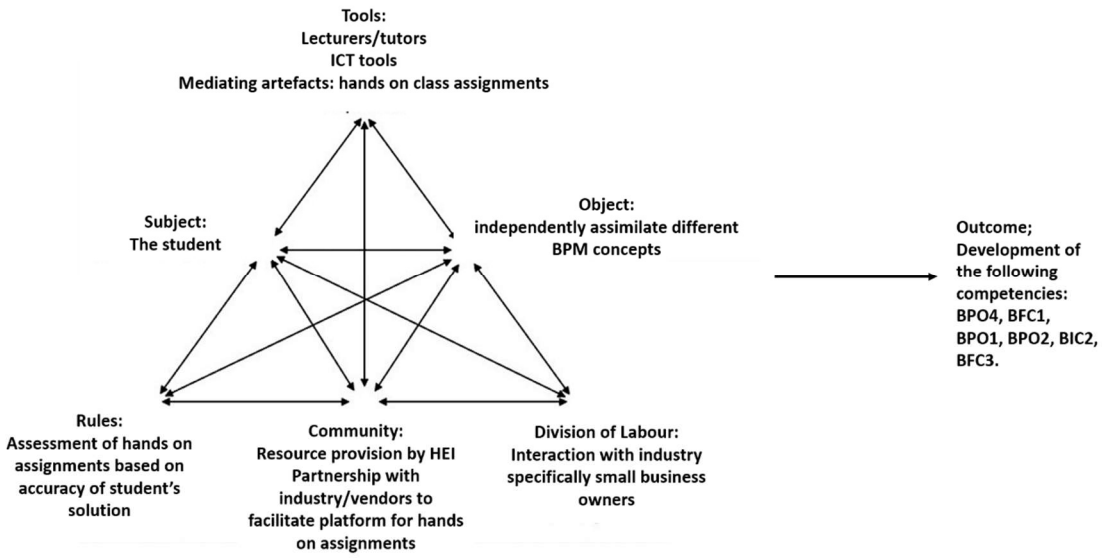

Figure 7-2: The Interpreting activity system design

a) Subject/Collective subject: the design of the interpreting activity system aimed to identify students as the main subject. The design of this activity system required students to observe the execution of tasks by a business owner and learn from peers such as tutors.
b) Tools/Instruments: as part of the design, Students were required to shadow business owners as they executed their day-to-day business processes. The design of this activity system also required that experienced tutors and group leaders work with less experienced students to solve course problems while the teacher only provided oversight. ICT tools incorporated into the design of this activity system comprised modelling software to draw process models and shared workspaces and tools were applied.
c) Object/Objective: the design required that individual students be able to independently assimilate different BPM concepts and connect theories learnt in the classroom through a tutor and in practical work through the process owner. The interpreting activity system design encouraged students to self-reflect with the aim of understanding the importance of what they had observed from the tutor in class or from the process owner during the semester project.
d) Mediating artefacts: the design for the class assignments and projects for this activity system were based on short exercises and demos presented by a tutor and through the semester-long project where they had to interact and observe the work done by the business owner(s) of the small business that they had elected to work with. The researcher developed this activity system design to encourage students to create their own questions/insights based on reflection or application of concepts learnt.

e) Rules: the rules designed for this activity system included the assignment and project evaluation. The rules design was therefore based on how well the student understood and replicated concepts learnt by the tutor and whether the students understood holistically the different processes of the small business they had selected as part of the semester project.

f) Division of labour: the interpreting activity system design specified that students would interact directly with industry, specifically small business owners, through a semester-long project where they were able to see first hand how BPM concepts learnt theoretically applied in the real world. The design stipulated that the lecturer leave students free to plan interaction sessions with the tutor assigned to them and with the business owner they were observing so long as it did not affect the students' learning timetable.

g) Community: the activity system was designed to ensure that HEI provided resources such as lab and classrooms. The design directed that the HEI make reference books available to students and that the student interact directly with industry and software tool vendor.

h) Outcome**:** this activity system was designed to have the highest impact on developing the following competencies: BPO4, BFC2, TC2, BFC4.

7.3.3. Integrating activity system

This activity system was designed to address how students would learn the BPM course through some collective action including teamwork related activities. The activity system was designed to incorporate interventions such as external consultants who would be invited to guest lecture during the semester; intergroup collaboration (where approximately 80% of the coursework was designed for group work), this design implementation is further elaborated in section 7.5; besides this, the stakeholder engagement interventions was designed into the artefact such that it involved interacting constantly with the small business owners during the semester project; top management buy-in was another critical intervention of this activity system. Top management support was through the Dean and academic director of the faculty running the BPM course. The Dean and academic director supported a more flexible timetable for the students which allowed them to spend more time on the semester project. The top management support also helped during the process of embedding the BPM course into the undergraduate curriculum. The integrating activity system was designed to enable students to obtain BPM related vendor certifications if they wished to go deeper into the BPM domain.

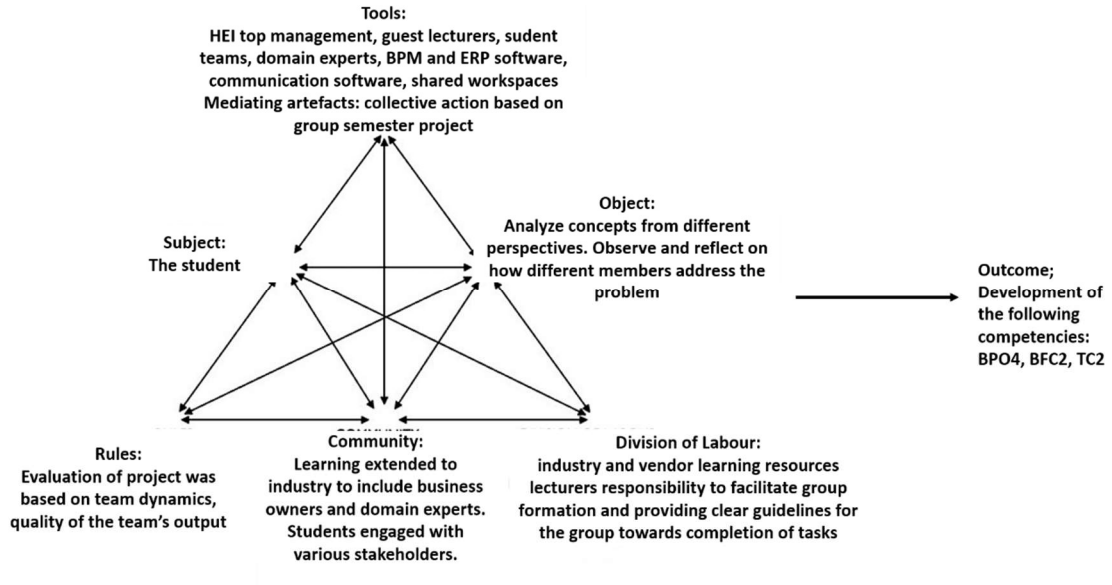

Figure 7-3: The Integrating activity system design

a) Subject/Collective subject: the design for the integrating activity system required that students participating would have the minimum requirements for the course and a willingness to engage with fellow classmates, domain experts and important stakeholders. The student would be open to undertaking a relevant vendor certification. The teaching approach used was based on collective action and involved aspects such as providing students with real-life problems and facilitating interaction with different stakeholders in order to solve these problems. Appendix 14 provides an example of the group work exercise used incorporated into the design of this activity system.
b) Tools/Instruments: the researcher designed this activity system to encompass a carried range of human participants. These included HEI, top management, guest lecturers, student teams and domain experts. ICT tools included BPM and ERP systems software specified in the design would be used in the problem-solving process throughout the semester. In addition, communication software was specified in the design as a means to interact and engage with stakeholders further, students were exposed to learning material that they could use to obtain vendor certifications if they wished. This learning material was designed to be distributed through e-learning platforms.
c) Object/Objective: the researcher specified that for this activity system design, the objective would be students ability to analyzing concepts from different perspectives and reflecting on problem-solving steps with diverse group members. As well as being able to observe and reflect on how different members addressed the problem.
d) Mediating artefacts: the Integrating activity system design was centred on group activity

and collective project. The design involved the development of guidelines for the semester project that students had to complete as a group. The designs specified that students would have access to stakeholders such as the small business owners for whom a solution would be developed, domain experts, tutors and lecturers who would provide valuable insights throughout the course of the semester project.

e) Rules: rules for this activity system were designed to include the evaluation of the project based on team dynamics, quality of the team's output at the end of each milestone and finally, the business owner's feedback on the teams' final output.
f) Division of labour: this activity system was designed to include industry and vendor learning resources: that were used as a point of reference for the group during the semester project. Further, the design specified that it was the students' responsibility to work effectively within a diverse group. The students were required to contribute skills towards solving a problem. Similarly, the design specified that it was the lecturer's responsibility to facilitate group formation and provision clear guidelines for the group towards completion of tasks. For the integrating activity system design, the industry was useful in terms of providing recommendations for competitive certifications.
g) Community: The integrating activity system design extended learning by having relationships with industry, represented by the small business owners that the students were working with, and vendors. These relationships were designed to be crucial to enhancing the student groups' exposure and students were required to carry out site visits to the small business they were working with and engage with various stakeholders
h) Outcome**:** this activity system was designed to have the highest impact on developing the following competencies: BPO4, BFC2, TC2.

7.3.4. Institutionalizing activity system

The institutionalization activity system was designed to address student learning through well-established routines or structures and clearly outlined rules and procedures. The learning process focused on the lecturer's ability to have structured patterns of interaction and communication with students. The institutionalizing activity system was designed to focus on the collection of knowledge at both individual and group level and involved preparation of HEI approved student assessment guides, course outlines and marking schemes for all coursework and exams done, formalized lecturing sessions and workshops with students and development of a knowledge sharing platform.

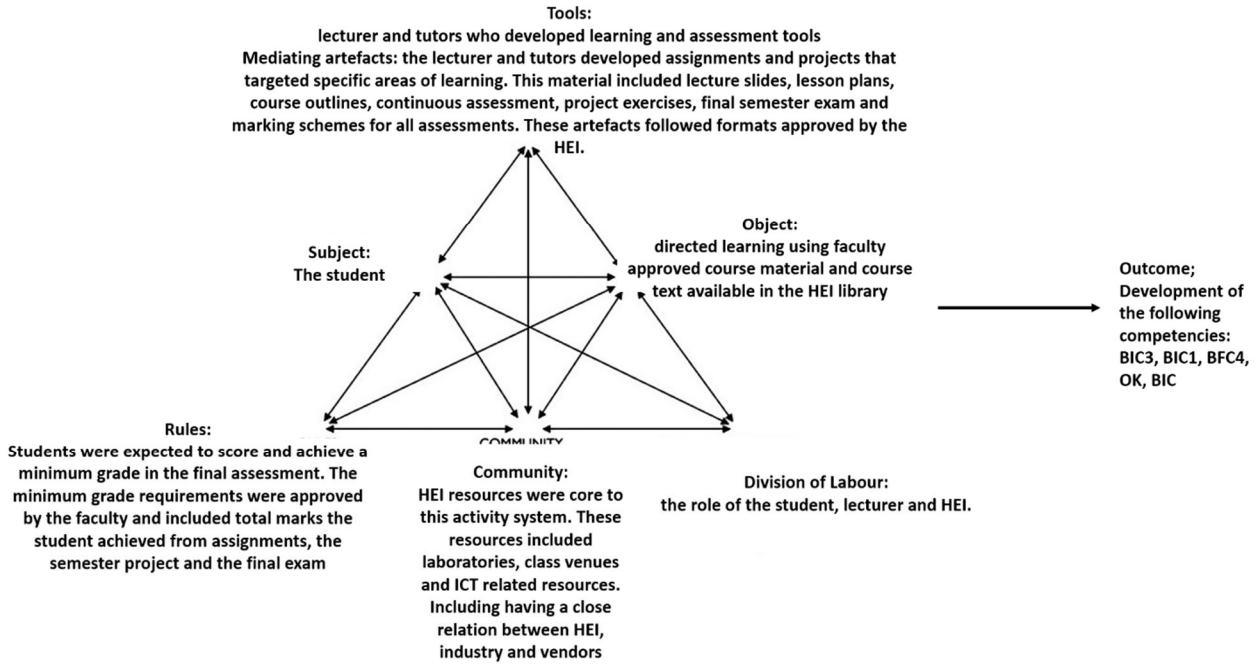

Figure 7-4: The institutionalizing activity system design

a) Subject/Collective subject: for this activity system design, students were assessed for projects completed and problems solved during the duration of the course. The design stipulated that students were required to get a minimum grade stipulated by HEI in order to have passed the course. The students were required to attend formal lectures developed by the lecturer. Appendix 15 shows an example of a continuous assessment test designed for the activity system.

b) Tools/Instruments: Human tools designed included the lecturer and tutors who developed learning and assessment tools. These assessment tools were based on key learning points for the course and had to be moderated by the HEI before they could be used for the course. ICT tools that were designed for this activity system were online learning platforms which contained course relevant information that students accessed and used. This can be online databases such as search engines and document repositories.

c) Object/Objective: this activity system was designed with the objective to arm students with the requisite BPM knowledge. The design specified that this would be achieved through directed learning using faculty approved course material and course text available in the HEI library.

d) Mediating artefacts: for this activity system, assignments and projects designed targeted specific areas of learning. This materials included in the design were lecture slides, lesson plans, course outlines, continuous assessment, project exercises, final exam and marking

schemes for all assessments. These design followed formats approved by the HEI and a knowledge sharing portal where artefacts such as class assignments/projects and course questions can be stored and reused.

e) Rules: the rules specified for this activity system design described what students were expected to score and achieve as a minimum grade approved by the faculty. The design specified that the minimum grade included total marks the student achieved from assignments, the semester project and the final exam.

f) Division of labour: Division of labour for the institutionalizing activity system focused on the role of the student, lecturer and HEI. It was the student's responsibility to fulfil criteria specified in the student assessment to the best of their ability. Further, it was the lecturers' responsibility to plan assessment intervals and semester project milestones with the student. This was done to establish progress made by the student. HEI was responsible for ensuring that all required resources for the course were made available for the duration of the semester.

g) Community: HEI resources were core to this activity system design. These resources included in the design encompassed laboratories, class venues and ICT related resources. The researcher, while designing this activity system, took into account that it was important to have a close relationship with Industry and software vendors.

h) Outcome**:** this activity system was designed to have the highest impact on developing the following competencies: BIC3, BIC1, BFC4, OK, BIC4.

7.4. Demonstration of the artefact

The artefact, represented as a BPM course, ran during the 1st semester of the 2018 academic year. The student participants were 4th-year students undertaking an undergraduate degree in Business and Information Technology. The semester started in the month of April 2018 and ran for 12 weeks which ended in the month of July 2018. The artefact was demonstrated during the first 10 weeks of the semester when actual learning took place. Thereafter, week 10-11 was study week wherein students prepared for the end-of-semester exams and week 11-12 was the exam period where students completed their final semester exam. In order to pass the course, the students were required to attain a mark of 40% and above. Course work, including the semester project, carried 40% of the total while the final semester exam carried 60% of the total. The end of semester exam was mandatory for the student to pass the course. This section describes how the artefact was implemented during the 10 weeks of the semester.

7.4.1. Week 1- 2: Introduction to the course and group formation

The students were presented with the course outline. The course outline would form the basis of the semester's work. Further, the course outline was approved by the faculty's academic director before the semester begun. In addition, an online portal was created using the Learning Management System provided by the University's library. Here, all course material was stored. The students were provided with an enrollment key to access the online portal. They were allowed to use the online portal to interact with the lecturer and tutor as well as with their fellow classmates. During week 1 of the semester, the lecturer taught concepts of business processes and BPM within the context of business and technology. During week 2 of the semester, the lecturer taught the BPM lifecycle. The lecture sessions were prepared using relevant and approved BPM textbooks (Dumas et al., 2013; Weske, 2012). Thereafter, the students were required to form groups of 6 and attempt the first exercise of the semester project. Exercise 1 involved selecting any small business and researching on the main functions of the business. The students were then required to select a specific business process that they would work with for the entire semester. Table 7-1 outlines the activity systems and specific interventions used during Week 1 and 2.

Table 7-1: The activity systems and specific interventions used during Week 1 and 2

Activity system	Intervention(s)
Institutionalizing	Structured learning (Organization run training): Lectures sessions prepared by the lecturer Knowledge sharing: Online portal to access and share course material.
Integrating	Intergroup collaboration: Formation of student groups as part of a semester project Stakeholder engagement: students interaction with small business owners Top management support: approval of course outline by faculty academic director

7.4.2. Week 3-4: Introduction to BPMN, process modelling labwork and the AS-IS process

During the 3rd week of the semester, the students reported their exercise 1 findings. All the student groups were able to identify a business process of an appropriate small business. The lecturer introduced the students to BPMN and process modelling. The lecturer invited a guest speaker from a software company to talk about the process modelling tool that they had developed. The process modelling tool was provided to the University for purposes of running BPM related courses. After the guest lecture, the students were required to complete 5 process modelling

exercises using the aforementioned process modelling tool. The student groups allocated tasks to each group member. Each group member, therefore, had to participate in the modelling exercise in order to get marks allocated to the exercise. During the 4th week of the semester, a tutor was assigned to the class to assist with the grading of the exercises and helping students navigate through the modelling exercises. During this period, students received the second exercise of their semester project which required them to prepare the AS-IS model of the process that they had selected during the first exercise. They were required to utilize lessons learnt from the 5 modelling exercises that they had completed. Table 7-2 summarizes the activity system and specific interventions used during Week 3 and 4.

Table 7-2: The activity systems and specific interventions used during Week 1 and 2

Activity System	Intervention
Intuiting	On-the-job-DIY: a hands-on approach to 5 modelling exercises
Interpreting	Student to student mentorship: tutor sessions during the modelling exercise
Integrating	Inter-group collaboration: group interaction for the modelling exercises and a semester project External consultants: guest lecturer from software vendor invited to the class
Institutionalizing	Structured learning (Organization run training): Lectures sessions prepared by the lecturer Knowledge sharing: Online portal to access and share course material.

7.4.3. Week 5: Continuous assessment test 1 and process modelling

During week 5, the students undertook their first assessment test. It is a requirement from the University that all courses have at least 2 sit-in continuous assessment tests. During week 5 all student groups were required to present the AS-IS model for their selected business process. Table 7-3 summarizes the activity system and specific interventions used during Week 5.

Table 7-3: The activity system and specific interventions used during Week 5

Activity System	Intervention
Intuiting	On-the-job: individual assessment during the sit-in test
Integrating	Inter-group collaboration: completion of the AS-IS model as a group
Institutionalizing	Student (employee) assessment: pre-determined assessment criteria to grade students' sit in assessment tests

7.4.4. Week 6-7: Qualitative and Quantitative process analysis

During week 6, the lecturer took the students through qualitative process analysis. A lecturer from the mathematics department gave a lecture to the class on quantitative process analysis methods such as simulation and modelling. During week 7, the students were presented with exercise 3 of the semester project which required them to analyse the AS-IS model developed in exercise 2. Further, they were required to discuss and justify the potential areas of improvement that they had discovered after doing both a qualitative and quantitative analysis of the business process. During this period, the students were required to make visits to the small businesses they had selected and keenly observe how the process was executed first hand.

Table 7-4: The activity systems and specific interventions used during Week 6 and 7

Activity System	Intervention
Interpreting	Job-shadowing: students observed process owners as they executed a specific business process
Integrating	Stakeholder engagement: students made visits to their selected businesses to collect relevant information on the business process Inter-group collaboration: students carried out exercise 3 as a group
Institutionalizing	Structured learning: lecture sessions were prepared and disseminated by the lecturer using the HEIs approved format

7.4.5. Week 8-9: Continuous assessment test 2, Process re-design and the TO-BE process model

During week 8 of the semester, students were lectured on process redesign, process monitoring and process automation concepts. During week 9, the students completed their 2nd continuous assessment test as per the requirements of the University. They were also presented with the 4th and last exercise of the semester project which required them to clearly outline how they re-designed their selected business process and then went on to model it as the TO-BE model. Where possible, the students were required to report their findings back to the small business owner explaining their proposed TO-BE model. The small business owner was left free to adopt the TO-BE model.

Table 7-5: The activity systems and specific interventions used during Week 8 and 9

Activity System	Intervention
Intuiting	On-the-job: individual assessment during the sit-in test

Integrating	Inter-group collaboration: completion of the TO-BE model as a group Stakeholder engagement: student groups providing recommendations to small business owners on how they could improve their business process
Institutionalizing	Student (employee) assessment: pre-determined assessment criteria to grade students' sit-in assessment tests

7.4.6. Week 10: Compilation and presentation of final semester project output

The students compiled and presented exercise 4 of the semester project. Their project marks were updated and were based on performance in all 4 exercises. Student groups were left free to upload their semester projects onto the online portal. These completed projects would be used as examples that future students undertaking the BPM course could use. During the 10th week, the students began their short study period in preparation for the end of semester exams.

Table 7-6: The activity systems and specific interventions used during Week 10

Activity System	Intervention
Intuiting	On-the-job: individual assessment during the final exam
Integrating	Inter-group collaboration: completion and compilation of the semester project as a group
Institutionalizing	Student (employee) assessment: pre-determined assessment criteria to grade students' sit in assessment tests Knowledge sharing: upload of student projects onto online portal for reference by future BPM students

7.5. Evaluation of the BPM course (the artefact)

As part of the evaluation, the students were required to fill in a survey. The researcher carried out a pilot survey soon after the semester ended in June 2018. This survey asked students to rank competencies they found important for completing the BPM course. The first survey provided some good insights into the perceptions of the students with regards to which of the 16 BPA competencies were important for completing the course. These insights are further discussed in 7.5.1. The researcher went on to adjust the questions of the survey and this time students were asked to state which competencies they found useful for completing the BPM course. This survey ran with the same group of students (as the pilot survey) before they left for their long vacation in October 2018.

7.5.1. The evaluation process

For the first survey that ran in June 2018, 69 out of the 110 students who undertook the course completed the survey. As discussed in section 7.5, this pilot survey contained 16 questions each with a 5 point Likert scale where 1 represented "Not important" and 5 represented "Extremely important". Each question addressed the 16 BPA competencies discussed throughout this study. The students were required to indicate which competencies they found important for completing their semester course work and group project. Feedback from the survey indicated that students perceived that business analysis competency was the most important. On the other hand, the students perceived that the Mathematics and statistical competency was least important. Given that the first survey was similar to the survey run with BPAs in Chapter 4 of this study, the researcher opted to compare results from the two samples and assess if there were any differences in their perceptions of the BPA competencies. Table 7-7 provides a summary for the BPM students and BPAs (derived from chapter 4 of this study) mean and ranking per BPA competency.

Table 7-7: BPM students and BPAs comparison of survey feedback

Competency Importance	BPM students (with artefact) – N=69		BPM practitioners (no artefact) – N= 65	
	Mean	Rank	Mean	Rank
BFC1-Business Analysis	4.52	1	3.9	4
BFC3-Client Experience Thinking	4.48	2	4.1	3
BPO1-Business process and Value chain modelling	4.46	3	3.7	9
BPO2-Business Process Improvement	4.39	4	3.8	6
BIC2-Business Requirements Elicitation	4.39	4	3.6	11
BIC4-Trustworthiness	4.38	6	4.3	1
BIC3-Business Communication	4.31	7	4.2	2
BPO3-Business Process Risk and Compliance Assessment	4.25	8	3.8	6
BIC1-Facilitation and Leadership	4.21	9	3.8	6
TC1-Software Oriented Architecture	4.21	9	3	15
OK-Imp-Organizational Knowledge	4.18	11	3.7	9
TC2-ERP systems Knowledge	4.16	12	3.2	13
TC3-User Interface design	4.09	13	3.1	14
BPO4-BPA drive and promotion	4.06	14	3.4	12
BFC2-Holistic Overview of business thinking	4.01	15	3.9	4

BFC4-Mathematical and Statistical competency	3.84	16	3	15

It is likely that BPM students perceived that the business analysis competency important because, throughout the semester, they were required to complete tasks that involved them understanding business-related problems and developing solutions to these problems. Further, chapter 4 addressed four competencies that had been perceived to be undervalued within the Kenyan context. At the same time studies indicated that these competencies were critical for the BPA (Chakabuda et al., 2014; Sonteya et al., 2012). These competencies were BFC1-Business Analysis, BPO2-Business Process Improvement, BIC2-Business Requirements Elicitation and BFC2-Holistic Overview of business thinking. These competencies were specifically targeted for development through the BPM course that the researcher ran from April to July 2018 (the artefact). The results of the evaluation indicated that 3 of the 4 competency areas, BFC1-Business Analysis, BPO2-Business Process Improvement and BIC2-Business Requirements Elicitation were perceived as important for completing semester tasks by the BPM students. While BFC2-Holistic Overview of business thinking was not. In fact, BFC2-Holistic Overview of business thinking was perceived as the second least important competency.

From these findings, it was necessary to include a task that required the students to research on the small business and understand all its business processes besides the business process that they had selected to work with for the semester project. This would enable them to understand how the business process that they were working with fitting in with the entire operations of the small business. This new task would be incorporated into the course during the next academic year of 2019. In the second survey for artefact evaluation that ran in October 2018, the researcher assumed that high use of a specific competency would lead to greater competency attainment. This is in line with one of the premises of the 4I framework that specifies that the more certain knowledge and resources are used or applied the more this leads to the assimilation of this new knowledge (Crossan et al., 1999; Dutta & Crossan, 2005). Similarly, it is important to note that competency refers to the knowledge that provides an individual with the capacity to perform optimally within a given role (Setzer, 2006).

Following this assumption, the 2nd survey contained a 5 point Likert scale similar to the pilot survey, but this time, 1 represented “Extremely not useful” while 5 represented “Extremely useful”. Out of the 110 students who completed the course 57 students responded to the second survey. This reduction in responses from the pilot survey was likely due to the fact that the students had already completed the survey a few months earlier and felt that they were being

asked to repeat an exercise that they had already completed in the previous semester. Furthermore, the survey ran in October 2018 which is an examination period at the University and students were likely to have given more focus to studying for the coming exams rather than investing time in a course they had already completed. All the same, 57 responses were deemed appropriate for carrying out analysis and evaluation of the artefact. Table 7-8 outlines mean and rank results for the BPM students who completed the second survey.

Table 7-8: BPM students second survey feedback

Competency (Usefulness) – N=57	Mean	Rank
BFC1-Business Analysis	4.51	1
BPO1-Business process and Value chain modelling	4.47	2
BFC3-Client Experience Thinking	4.46	3
BIC2-Business Requirements Elicitation	4.42	4
BPO2-Business Process Improvement	4.35	5
BIC4-Trustworthiness	4.34	6
BIC3-Business Communication	4.30	7
TC1-Software Oriented Architecture	4.20	8
BPO3-Business Process Risk and Compliance Assessment	4.18	9
BIC1-Facilitation and Leadership	4.14	10
TC2-ERP systems Knowledge	4.12	11
OK-Imp-Organizational Knowledge	4.07	12
BPO4-BPA drive and promotion	4.07	12
TC3-User Interface design	4.07	12
BFC2-Holistic Overview of business thinking	3.93	15
BFC4-Mathematical and Statistical competency	3.78	16

Feedback from the second survey indicated that students found that the BFC1 - business analysis competency had been useful in helping them complete the BPM course. On the other hand, the students felt that the Mathematics and statistical competency had not been useful in helping them complete the course. Further, students perceived that they used the BIC2 – business requirements elicitation competency slightly more than the BPO2 – business process improvement competency. The reason for this is likely because the students spent a considerable amount of time collecting business requirements from the small business owners when they undertook process analysis. Due to time constraints and given that this was the first time the course was run at the HEI, business process improvement work was done mainly on a theoretical level where students were only required to give recommendations to the small business owner on areas of the process that they could improve. In the future, the course can be extended to enable students to

actually implement their recommended process improvements with the small business owners. Furthermore, the results of the second survey confirmed what had been detected in the pilot survey. That BFC2-holistic overview of business thinking was perceived as not having been useful to completing the semester coursework. This finding coupled with similar findings from the pilot study meant that it was crucial to adjust the artefact to include a section of the course that addressed the usefulness of understanding the entire functions of the selected business. This re-confirmed the need for a new task to be incorporated into the course as specified in section 7.6.1.

7.5.2. Prescriptions for the BPM course

Table 7-9 outlines the prescriptive statements for the BPM course. These were refined after the 2 iterations of the evaluation phase.

Table 7-9: Recommended implementation of designed activity systems (prescriptive statements) after evaluation

Activity system designed	Intervention	Recommended implementation within HEI (Prescriptive statements)
Intuiting	On-the-Job	All students are required to undergo an individual assessment represented as a continuous assessment test
		All students are required to complete 5 lab exercises. All the exercises will require hands-on problem-solving using a process modelling tool such as Bizagi or IBM Blueworks.
Interpreting	Student to student mentorship	The lecturer is required to plan for tutor sessions during the modelling exercise. The lecturer must also promote consultative meetings between students when solving problems within their student groups
	Job shadowing	As part of the semester project, students are required to observe, and record steps taken by process owners as they execute specific business processes
Integrating	Intergroup collaboration	Students are required to form groups of 5-6 persons as part of the semester project. For the project, students are required to analyse and redesign specific business processes of a small business owner.
	Stakeholder engagement	Students are required to interact with small business owners to analyse and redesign their business processes. Students are required to make visits to their selected businesses to collect relevant information on the business process
	Top management support	The lecturer is required to get top management support, specifically from the faculty academic director, for all course content of the BPM course. This is to be done through the director's approval of a course outline.
	Vendor software tools	The student groups are required to interact with modelling tools such as Bizagi and IBM Blueworks when modelling the AS-IS and TO-BE models of the semester project.
	External consultants	The lecturer is required to invite guest lecturers with strong backgrounds in BPM/ERP from industry or from specific software vendors
	vendor certifications	The lecturer is required to incorporate vendor certifications learning material especially those certifications for BPM and ERP systems.

Institutionalizing	Knowledge sharing	A Learning Management System (LMS) will be set up for students to access and share course material. The lecturer is required to upload past student projects for reference by future BPM students.
	Organization run training	The lecturer is required to prepare structured learning sessions. These lecture sessions are to be prepared and disseminated by the lecturer using the HEIs approved format and HEI approved core text. The lecturer's material is to be stored within the LMS of the HEI.
	Employee Assessment	The lecturer is required to prepare the student's assessment criteria. The lecturer is required to grade students' sit in assessment tests, semester projects and end of semester exams

7.6. Communication of the artefact

During the month of June 2018, shortly after the pilot evaluation of the artefact, the researcher presented details of the artefact implementation at the teaching and learning workshop for lecturers teaching BPM and ERP systems-related courses. The presentation detailed the experiences of the researcher during the BPM course. Furthermore, the researcher took part in curriculum development exercises where the artefact was presented and eventually embedded within the BBIT curriculum if the HEI. In the last part of 2018, the researcher developed a similar course specifically tailored to BPAs who had not received any formal HEI education in the area of BPM. A forum for these BPAs would then take place in early 2019. In addition to this, the researcher intends to present the findings of this artefact in relevant journals and conferences during the course of 2019.

8. Conclusion

The final part of the study is presented in this section. The conclusion re-visits the main aim of the study through an analysis of the research problem. The research questions are addressed with the aim of explaining how solutions to these research questions contributed to finding a solution for the research problem. The research approach and research method used for each of the questions is then described. The next part of the conclusion presents a summary of the findings of the research and the final part of the chapter details the research contributions of the study as well as the future research directions and possibilities. The chapter also provides a summary of the limitations faced by the study.

8.1. Problem statement and research questions revisited

The research presented in the thesis is titled "Developing business process analyst competencies through HEI". The study focuses on the Kenyan context where the BPA role is still a very new one especially within the context of ERP systems implementations that require management of complex business processes. BPM has also be viewed as a critical success factor for ERP systems implementations. Besides having an appreciation of complex business environments, BPAs are also required to balance stakeholder needs with end-user solutions. This study argues that the link between competency and pedagogy is difficult to ignore. This implies that to gain competency in a certain area it is important to receive guidance in that area through some form of learning. This study identified that no study had investigated the interventions that can develop BPA competencies required by organizations in Kenya. In addition, no BPA curriculum suited to the Kenyan context has been developed.

The output of this thesis focused on four research questions targeting competency building for BPAs. The study investigated BPA competencies that drive BPM initiatives and manage ERP systems implementations in organizations in Kenya. The study analyzed the educational and organizational interventions that impacted these competencies. From the results of this analysis, this study developed a BPM curriculum through the use of DSRM. This novel BPM curriculum was aimed at developing requisite competencies in students. This research reports on these 4 questions or objectives through 4 different research chapters.

8.2. Literature review and research method

This study adopted the hermeneutic approach to carrying out a literature review. Systematic approaches to literature review were found to be limiting. Therefore, for purposes of this study the researcher opted to move away from the more highly structured systematic literature reviews to the hermeneutic approach which allowed for dialogical interaction between literature and findings the develop as the study matured and also allowed for the synthesis of literature from a wide variety of journals, conference proceedings and books. This hermeneutic approach involved a search and acquisition cycle and an analysis and interpretation cycle that happened iteratively through the course of this study. The literature review chapter synthesized studies in three focus areas derived from the 4 research questions of the study. This study explains the interventions that develop BPA competencies in organizations in Kenya and designs and implements an artefact to be used in HEI to build BPA competencies in students. In order to achieve this, this study adopted the pragmatic philosophy. The pragmatic philosophy was ideal for this study as it formed a basis for the use of mixed methods. This research used a hybrid inductive-deductive approach and adopted a mixed methods strategy. The study used homogenous sampling where data were collected using a cross-sectional time horizon. Quantitative data were collected using multiple survey instruments while qualitative data were collected using semi-structured interviews and focus group discussions. Analysis approaches that were used included the Kruskal-Wallis and Student t-test for RQ1, thematic analysis and matrix coding for RQ2 and RQ3 and artefact development through DSRM for RQ4.

8.3. Summary of findings

This section summarizes the findings with respect to the 4 research questions of this study.

8.3.1. Research question 1

What are the competencies required for the BPA role in organizations in Kenya?

It was important to commence this study by answering this RQ1 given that no prior research on BPA competency requirements in the Kenyan context had been carried out. This part of the study was discussed in Chapter 4.

Findings from RQ1 established that most competencies had similar levels of importance to South Africa. However, with respect to the BPO competencies and the Fundamental BPA competencies are more important to organizations with managed and optimized BPM than they are to organizations with initial or repeatable BPM. Similarly, the study found that within the Kenyan context Business process orchestration competencies were perceived as being more important to

organizations with ERP systems than they are to organizations without or with partial ERP systems implementations. This coincided significantly with this study's synthesis of literature. However, this study also found that the Kenyan context was perceived to under-value interpersonal competencies (BIC), business process elicitation (BIC2), business analysis (BFC1), business process improvement (BPO2) and holistic overview of business thinking (BFC2) when compared to the SA context. This was different from findings from literature that suggest that these competencies are essential for the BPA role. These findings helped uncover and describe competency requirements for BPAs within the Kenyan context. In addition, the findings helped uncover those critical competencies that were perceived to be undervalued in the Kenyan context and thereby set the pace for investigating and describing learning interventions that could build these critical competencies in Kenyan BPAs.

8.3.2. Research question 2 and 3

What are the organizational interventions that impact these competencies?;

How do these interventions impact BPA competencies?

After establishing the BPA competency landscape of the Kenyan context, chapter 5 and 6 of this study used the 4I framework of organizational learning as a lens to describe 12 interventions used to develop BPA competencies 8 out of the 12 interventions described were found to be dominant.

1. For the intuiting process, the On-the-Job intervention was dominant.
2. For the interpreting process, the staff to staff mentorship intervention was also dominant.
3. For the integrating process, the inter-group collaboration intervention was highly prevalent. Similarly, stakeholder engagement was another important intervention. The vendor certification intervention was also highly prevalent.
4. For the institutionalizing process, organization run training programmes were perceived to be highly prevalent.

Another highly prevalent intervention was knowledge sharing. Table 6-3 further outlines the mapping of both high-level and basic competencies and those interventions that impact each competency the most. It was important to note that BPAs felt that most of their core BPA competencies were built On-the-Job through the intuiting process. Similarly, the integrating process, specifically the intergroup collaboration intervention was also impactful in developing the requisite BPA competencies.

8.3.3. Research question 4

How can the HEI curriculum and pedagogical interventions and interactions develop these competencies in students?

Thereafter, to answer RQ4, the study used the DSRM to design and develop a BPM curriculum artefact. The BPM curriculum comprised 4 activity systems for each of the processes of the 4I framework of organizational learning, intuiting, interpreting, integrating and institutionalizing. This BPM curriculum artefact was implemented in HEI to 4th-year undergraduate students over the course of a full semester of 4 months. The results of the evaluation of the BPM curriculum established that students found it useful for building critical BPA competencies such as business analysis, business requirements elicitation and business process improvement.

8.4. Research contribution

This section discusses the contribution of this research. The relevance of this study was assessed based on its theoretical, methodological and practical contributions.

8.4.1. Theoretical contribution

This research provides a theoretical contribution to BPM competency building literature. This was achieved through the generalization of the empirical findings of this research that provides descriptive, explanatory and prescriptive knowledge (Gregor, 2006). RQ1 and RQ2 provide a descriptive contribution. RQ1 assessed the Kenyan context with respect to BPA competency requirements. In this study, 7 propositions were developed and formed the basis for getting a better understanding of the phenomenon of interest. RQ2 described the organizational interventions for building BPA competencies. These interventions were categorized into the 4 organizational learning framework of the 4I framework of organizational learning. RQ3 explained how organizational interventions impact BPA competencies. This was achieved by addressing the existing patterns between the organizational interventions and BPA competencies. Additionally, RQ3 provided a high-level view of the phenomenon of interest and the relationships that exist within the phenomenon of interest (Gregor, 2006). In this case, the phenomenon of interest with regards to the relationships that exist between the Organizational interventions developed in research question 2 and the BPA competencies that they impact the most. RQ4 prescribed the required components for the development of BPM curriculum in HEI. The outcome was a novel artefact represented as a BPM curriculum. In this regard, RQ4 presented a design theory as the theoretical contribution.

8.4.2. Practical contribution

Inherently, design and action research outcomes are required to make change beneficial to a specific phenomenon of interest. Therefore, given that there was no BPM curriculum at the commencement of this study, a major practical contribution of this study was the establishment of a BPM course curricula to be used by undergraduate students undertaking courses in business and Information Technology. This BPM course would contribute to preparing these undergraduate students to take on BPA roles while also reducing the learning curve currently being faced by BPAs in industry. Similarly, employers of BPAs would benefit practically from this BPM course because they would be able to hire graduates with the appropriate competencies to fit into the BPA role. Furthermore, employers would be able to reduce costly competency building investments such as formal training and learning materials for their BPAs as is currently the case. Similarly, the BPM curriculum is generalized and can, therefore, be customized and use by HEI in other contexts as part of undergraduate programmes and in various industries as part of ongoing education for BPA related competency building initiatives. Overall, A Kenyan workforce skilled in BPM will contribute significantly to enhancing business process outsourcing projects in the country which aims to be a global hub for business process outsourcing. This then will enhance the objectives of Kenya's long term strategy, the Vision 2030. This strategy places business process outsourcing as a major component of the economic pillar.

8.5. Limitations of the study

This section examines the limitations that this study faced. These limitations were categorized into two groups, the limitations of the method chosen for the study and the contextual limitations faced by the study.

8.5.1. Method limitations

This study used a homogenous sampling approach where respondents were required to have very specific attributes, that of the BPA role. This meant that this study collected data from a single perspective, that of the BPA role. It is likely that this study did not provide a holistic view of the BPA role from various perspectives such as human resource practitioners, top-level managers and other relevant perspectives. Similarly, this study followed a cross-sectional time horizons that involved research over specific points or periods in time. The cross-sectional study adopted involved single data collection points. Given that this study focused on the process of learning and competency building, it would have been further enriched if the researcher had utilized a longitudinal study that would have provided further insights on how students learn and build these BPA competencies over a given period of time (Chen & Hirschheim, 2004). A major method

limitation of this study is that, due to time constraints, the researcher utilized a summative artefact evaluation as described in section 3.12.5. This meant that the artefact was only evaluated at the end of the demonstration phase. Similarly, the evaluation looked holistically at the competencies students used during the BPM course rather than evaluating each aspect of the course to measure their impact on building competencies in students. Related to this is that this study evaluated the artefact in only two iterations. One was a pilot study completed in June 2018 and another was a second evaluation carried out in October 2018. In order to carry out a more comprehensive evaluation, a formative evaluation would have been more appropriate. This formative evaluation would have been used throughout the BPM course.

8.5.2. Contextual limitations

This study focused on the Kenyan context. Due to this, it is important to note some contextual limitations that the study faced. One major contextual limitation faced was that, because the BPA role is such a new role in the Kenyan context, the researcher had to describe to the organization, prior to data collection, the specific characteristics of the BPA. This leads to significant time wastage while trying to identify if the person from whom data would be collected actually did fit into the profile of a BPA. Furthermore, since there was no prior BPM course running in the Kenyan context, it became necessary for the researcher to collect requirements for the artefact from a different context. In this case, SA based lecturers teaching in HEI who had experience lecturing BPM and ERP courses were contacted and interviewed. In addition, due to policy constraints enforced by the HEI, students were only able to redesign processes for small business owners. It would have been beneficial for students to also interact with large organizations with complex business processes.

8.6. Future directions and closing comments

The concluding chapter of this thesis assesses the approaches adopted by this study as well as provides a summary of the findings of the study with respect to the 4 research questions answered. This study aimed to investigate the interventions that develop BPA competencies in organizations in Kenya and design and implement an artefact to be used in HEI to build BPA competencies in students. The findings of this research present insights on BPA competency building in Kenya. This was an area that had not yet been previously investigated. The findings of this study offer a design theory arising from descriptive and explanatory contributions. This study lays the foundation for future research directions in the area of BPA competency building and competency building in the IS field in general. Some ideas for future research include:

1. An opportunity to refine the artefact by improving on the evaluation approach that was used in this study. A future study could adopt a formative evaluation approach.
2. An opportunity to use action research as a methodology to validate the educational interventions established in this study. Action research would drive in-depth engagement with both BPAs in industry and students undertaking BPM curriculum in HEI with the aim of effecting contributions to both theory and practice.
3. An opportunity to expand the data sample to include other practitioners such as project managers, business analysts and HR experts in order to extend the findings of this study. Besides expansion of the data sample, it would be interesting to establish differences in respondents coming from different industries.
4. An opportunity to carry out a comparative study spanning different contexts and covering large versus small sized businesses in order to further refine and improve the contributions of this study. This would provide an opportunity for the researcher to apply the same research method. The findings from such a comparative study would go a long way in validating the findings made in this study. In addition it would be interesting to identify any student/instructor responses between different contexts.

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Competency	Definition	Related Text excerpt
BIC1 (Facilitation and Leadership)	The ability to develop goals as a team and follow through with them within specified deadlines.	"…one is given room to make independent decisions and one is trusted to come up with an idea, make a plan and follow through with it…" – BPA 10
BIC3 (Business Communication)	The ability to interact effectively with business owners.	"if you're the credit controller you need to know the external market it's in a province in France, so you need to know how to communicate with them. So communication skills by having virtual meetings where you do a conference call." – BPA2
BIC4 (Trustworthiness)	Ability to build relationships based on trust, integrity and honesty.	"I do have that quality of being trustworthy and being able to have integrity and keep information confidential. I got this from the first time when I undertook professional training in the area of IT Audit." – BPA11
BIC2 (Business Requirements Elicitation)	The ability to understand what business owners say they do and what they require to induce process change. The ability to document and illustrate this.	"We work very closely also with Relationship Management. This is where process development starts and you get to know the requirements and scope of the process," – BPA1
OK (Organizational knowledge)	Understanding the overall strategic objectives and goals of the organization	" For a new staff member there's a whole induction course, and then we regularly get inter-departmental session for engagement sessions, we had one here with the CEO of the company, actually went on a roadshow to see people in all different locations, not only to introduce yourself but to introduce the new person values and the new thing, new ways we do business." – BPA3
BPA1 (Business Analysis)	Ability to collect requirements and bridge between business and IT.	"specific courses or programs for Business Analyst are available in [company]..." – BPA3
BPA2 (Holistic Overview of business thinking)	The ability to see the organization as a living system, thinking in process dimensions.	"Then we go back to doing our own research and see is it a process that can be integrated into SAP or it can be just a workflow process esteemed to SAP or it's something that we can just sort build our own system in-house." – BPA1
BPA3 (Client Experience Thinking)	The ability to focus on the client with respect to a given business process that the client interacts with.	"I think we do that very well, maintain the relationship with the customers by making sure if they have queries we respond." - BPA12

BPA4 (Mathematical and Statistical competency)	The ability to use process improvement methodologies such as lean and six sigma.	"I think mostly the link to Six Sigma Black Belt training was most helpful." – BPA3
BPO1 (Business process and Value chain modelling)	Ability to use modelling tools including rules management when designing business processes.	"if you want to test a new process, if you want to introduce something you test it on that ground and then now you do it on the live once you've confirmed everything is okay." – BPA2
BPO2 (Business Process Improvement)	The ability to analyze a process and recommend necessary areas that can be adjusted in order to give value to the organization.	"we were having a challenge with fraud in one of the organizations and you look at the process and you understand why there's a challenge in fraud, … I get someone who has a fraud background, … then breaks it down to me, shows me the solution."- BPA 8
BPO3 (Business Process Risk and Compliance Assessment)	The ability to understand the risks faced by the organization and how process management can reduce risks and enhance organizational compliance.	"This was enhanced by my background at some point doing audit work and risk management work. How I look at a process is that each process has a particular objective it wants to achieve, and risk is about anything that may bring uncertainty in that objective being met." – BPA11
BPO4 (BPA drive and promotion)	The ability to initiate process change by starting a new BPM cycle.	"So, when they're doing something maybe like opening a tender, some guy would come and call me and tell me, "Let's go, we open a tender so you can learn the process." – BPA6
TC1 (Software Oriented Architecture)	The ability to understand what business services are utilized during a given business process.	"I look at the processes with individual process owners. So, each individual process owner will say, "For this process, I need input A, B, C, D, which comes from maybe another department or it comes from within the department, and then each of the steps, each of the steps and who is involved in each step." – BPA11
TC2 (ERP systems Knowledge)	The ability to understand the	"they showed us how to go about earlier problems and even software problems, and they also give us some tips on how to access the SAP and how it works." – BPA5

	integrated systems and how they are aligned with the business processes of the organization.	
TC3 (User Interface design)	The ability to design interfaces and screens that will be used by business users to execute a business process.	"Because before you'd have to put the information into one worksheet, then go again to another worksheet and you put the same information to get now maybe a different computation. But now I only input one then it's linked to all the others. So, if I input the information into this one worksheet, all the other worksheets will from this one, and I don't have to go duplicate work, that's one." – BPA12

Appendices

Appendix 1: BPA competency framework codebook

Codebook and code reliability testing for the BPA competency framework (Sonteya et al., 2012)

Appendix 2: Framework of organizational learning codebook

Codebook and code reliability testing for the 4I framework of organizational learning (Crossan et al., 1999)

4I framework codes	Definition	Related text excerpt
Intuiting	Preconsciously recognizing patterns and possibilities existing within a particular area of experience (Crossan et al., 1999).	"Most of it was On-the-Job" – BPA1
Interpreting	Explanations provided through words and actions for a given idea or insight (Crossan et al., 1999).	"…what we would do is, we would go and sit with them, you'd find me with a lab coat like I'm a doctor and I'm basically just to shadow, to shadow a doctor." – BPA14
Integrating	Developing shared meanings between individuals. Involves some coordinated action (Crossan et al., 1999).	".. depending on which department you're in,…you train them on how to use the one where they have their rights, where they're going to have rights to use the system" - BPA2.
Institutionalizing	Tasks are well defined and actions have been accepted as routines	"Policies also help to reinforce that because if, for example, you have a policy whereby for organizations that have things like ISO, quality management systems and things like that. The policy will state that every year they must look at their processes and find ways to improve. So, policies also help to reinforce Business Process Analysis and relevance of the Business Process Analyst" - BPA11

Appendix 3: Initial set of themes/codes for RQ2

Intervention	Description
1: Apprentice programs	This intervention includes intern and apprentice programs where the organization runs training specifically for interns (often university students). In some cases, apprentice programs provide initial exposure to the Enterprise System of an organization. Apprentice programs also involve providing support and can be organized through collaboration with Universities. "They showed us how to go about earlier problems and even software problems, and they also give us some tips on how to access the SAP and how it works."
2: Employee assessment	This intervention involves running psychometric assessments with employees to determine strengths, weaknesses and areas of expertise/talent. These assessments also include regular appraisals between the employee and their manager. The intervention aims to point employees in the right direction when it comes to allocating them roles within the organization. Some organizations will also often carry out training throughout the year so that all employees benefit. “so we're now going on with the whole program of actually doing a psychological cycle-metrical assessment with everyone so we can properly find out what the developmental needs are." and "We need to identify some of their strengths and some of their interests and then point them in the right direction."
3: External consultants	In this intervention, external consultants in specific areas such as Enterprise Systems, Business Processes, Leadership and image consulting are hired by the organization to provide the employees with the skills required to excel in their jobs. Often these consultants will sit down with the employees and take them through certain areas. External consultants also provide manuals and training resources to organizations which employees can easily access. External consultant interventions are often very costly to the organization. "Bringing in or shipping in consultants is also costly", "We get to sit with the SAP consultants as well, there's some good knowledge transfer that happens."
4: Helpdesk	The Helpdesk intervention involves contacting a department that has specialised in solving issues often related to the enterprise system of an organization. This department may be in-house or may be a service provided by the Enterprise Systems vendor. Often the helpdesk personnel will explain what the issue was with the Enterprise system and this can help employees understand or gain more knowledge of the system. “If other employees have problems with their machines or the SAP is not connecting then we go there personally and ask them to troubleshoot the problem, so you get a lot of more of knowledge "
5: Informal setting	This intervention involves creating an informal environment for knowledge transfer. It would include informal social gatherings such as luncheons where employees meet and network and in the process share knowledge. It also involves learning through observation. "It's an informal setting, we sit down together then you do the training, you train them through the system". “I think on Friday, we had a luncheon together where we had some very interesting conversation around just the functions in our department such as coming together to think of ways in which they can build applications to take the organization further."
6: In-house repository of questions	This intervention focuses on organizational databases that hold questions that employees must do in order to fulfil some organizational requirement. These questions can be developed in-house or may be provided by a vendor. These questions are found in conjunction with online examination tools. The examination tool picks a certain number of questions at random. Often, employees must answer these questions in order to complete an induction or promotion process. "An application with questions and then you enter into the application and then they'll give you a series of 20 questions and then you're supposed to answer, then it gives you results and it gives whether you've passed or failed." "They have like a bank of questions and then they're just picked randomly, so you find each time you have a different set of questions."
7: In-house vendor training (Move to external consultants)	Same as external consultants

8: Interdepartmental collaboration	This intervention involves collaboration between many departments in an organization. For example, new employees can be given the opportunity to work in all the departments of an organization as part of their induction process. Different departments can also work together to develop training plans for their employees. This intervention is also critical when collecting information about the different business processes of the organization. "So it's very much around process optimization which involves understanding, analysing the current process or the as is and then talking to the person involving process flows". "We work very closely also with Relationship Management. This is where process development starts and you get to know the requirements and scope of the process."
9: On-the-Job or Do It Yourself (DIY)	This is not an intervention from the organization in the strict sense but the proactive steps that an employee makes in order to achieve the competencies required to fulfil their job requirements. In most cases employees are required to do a lot of the learning on their own or find their own innovative ways to accomplish tasks so long as the outcomes are in line with the requirements of the organization. "Go talk to Procurement and understand what they do". "You have to have used the system for a while, so you have the basic knowledge about the system, how it works, and things like that."
10: Online tools	These are any computer-based tools available for use by the employees. These tools include the Google Search Engine and other in-house developed software/extranets where employees can use to access different learning resources and even do online tests. Enterprise System Vendors also provide useful online tools that are used as learning resources. An example of this is SAPs Workforce Performance Builder. "So, you log in, you read the contents and then you do the examination, you pass and then yeah. So that covers the mission, the vision, the code of conduct," "Workforce Performance Builder you own it, you think about it like this, you buy software and that software it's a training software. All you need to do is to upload your training content, your PDF files, and your videos and then you have a module for registering the learners."
11: Organization run training	These are formally structured training that is initiated, facilitated and examined by the organization through selected employees of the organization. Some organizations opt to carry out certain training, such as enterprise systems training, in-house in order to remove the cost incurred when hiring an external consultant or when sending employees to training locations to be trained. "We regularly get inter-departmental briefings for engagement sessions, we had one here with the CEO of the company". "there's a whole range of these different training courses that are available, and every year we have an opportunity to actually look at these and decide which we should like to go on"
12: Training schedules (Move to Organization run training)	Same as Organization run training
13: Private-public and University partnership	These are initiatives that are related to some level of government and private sector collaboration. The intervention focuses on developing apprenticeship programs for interns still at the university or developing relevant training programs for employees
14 : Report on trainings and Appraisals (move to employee assessment)	Same as Employee Assessment
15: Secondment	In this intervention, an employee can make a specific request to be moved to another department in order to get some skills that they feel they require. Secondments are often temporary and help employees attain the necessary skill sets as well as learn more about the processes found in other departments of the organization. "They're different departments who use different parts of the system, so when you're in this department you learn this part"
16: Stakeholder engagement	In this intervention, the focus is to ensure that the employees are made aware of the stakeholders' needs and requirements. It involves understanding that processes can change depending on factors such as market and demographics. It involves learning based on interaction with different stakeholders. "There's also market specific, so they might have the basics but maybe that specific market that they will be working there are certain reports, requirements that don't necessarily match where they were working before or what they've been doing before, so you have to train them to market specific". "Okay they're those standard requirements or standard processes, as a customer statements, we have documentation for each market."

17: Teamwork	This intervention focuses on learning from your team. The team includes the people who a given employee works with on a regular basis. Where employees take it upon themselves to train and learn from each other. IT involves having a common goal as a team and ensuring that all the members of the team have the requisite skills to achieve the necessary tasks. "The guys they take as superusers are the people who've used the system for a long time and they can be able to train others, they can also be able to identify weaknesses in the system, they test it often, if they need something tested that person is the one who is going to do it. So, someone who is very conversant with the system." "We have like, it's called 70/20/10, 70% of your training you do it in your job, 20% is through your relationships with other people, 10% is your interaction with your manager"
18: Testing	This seems to be a popular intervention in many organizations. It is seen as an ideal way of assessing the competencies and skills sets of an employee. Testing is operationalized through some computer-based tool and employees have to answer questions from a repository of questions. Employees who are singled out for promotion must pass a specific test in order to complete the promotion process. New employees coming into the organization may also need to pass a test to complete the orientation. "Anywhere you're given rights or given a new role, you're first tested" "They're recorded somewhere because everything is online, it's in the system, so everything is recorded, how you'll answer, how many times you failed the test, how many time passed, the questions that you were asked, what you answered, all that is recorded."
19: Staff to Staff mentorship	Here an experienced employee is charged with passing on their experience and knowledge to an inexperienced employee. It is a very common intervention. The new employees will often learn by observing what the experienced employee is doing. It is common for the experienced employee to use dummy data on a test environment to demonstrate certain functions of the enterprise system. The new employee is then supposed to carry out and complete a similar task using dummy data on the test environment. "I can create dummy entries, I make a dummy order and maybe make some dummy entries then I can ask them to maybe do allocations". "So you have to make sure there are no excuses if that person messes up it's your responsibility."
20: University collaboration (Move to PP and University Partnership)	Same as PP and University partnership
21: Vendor Certifications	In this intervention, an employee or group of employees are sent to the Enterprise Systems Vendor company to learn details of the system. After going through the training and passing the exam the employees are given a certification. This is an expensive approach to training employees and may not be a scalable method for many organizations. “The training I've gone in I've got a link to Six Sigma Black Belt qualification". "Sales Academy Training, this is a certification level training, it's conducted in SAP sales academies around the world, the most common one for our region"
22: Virtual Meetings	In this intervention, employees have an opportunity to learn and discuss issues with other people who may be in a different geographical location. It includes regular conference calls where the employee learns more about a specific market or learns more about different technological innovations that are relevant to them. "If you're the credit controller you need to know the external market it's in a province in France, so you need to know how to communicate with them. So communication skills by having virtual meetings where you do a conference call". "they can actually attend seminars in town"

Appendix 4: Activity Systems/ Activity Theory concept definitions

Activity system set of definitions used for the study (Yamagata-Lynch, 2010) (Engeström, 1999)

Concept	Definition	Application to study
Subject/Collective subject	In order for an activity to take place, there needs to be an individual or collective subject that acts	Lecturer: includes the teaching approach of BPM and ERP systems concepts, use of ERP systems or simulator for instruction. Student: learning of BPM/ERP systems concepts. the configuration of ERP systems. Knowledge acquired by the student, ability to reflect and apply concepts taught
Tools/Instruments	The resources that a subject uses to achieve an objective or to produce an object. It is what is used in the transformative process from object to outcome.	Human tools: Lecturer, tutors ICT based tools: Multimedia, Software, class exercises focusing on BPM and ERP systems implementations and process models including a good understanding of organizational context.
Object/ Objective	That which is achieved through an acting subject/collective subject using tools available	Competency building: the ability to solve problems concerning critical BPM and ERP systems issues such as implementation, a clear understanding of organizational business processes. Develop students into reflective learners with the requisite knowledge to manage org BPM and implement and run an ERP system.
Artefacts	These are created during the process of the activity. They contain a historical remnant of the activity.	Language used. Repository of questions and class assignments.
Rules	These are used in the mediation process between the community and the subject. It includes explicit and implicit norms and social relations.	The evaluation process for assignments done in class and field-based project work.
Division of labour	The distribution process for the activity among community members. The roles and responsibilities of each individual in the community required to achieve the activity.	Roles of teacher and student. Support from HEI implementing ERP systems curriculum and Vendor. Support from vendors distributing ERP systems solutions as well as support from Industry running the solutions.

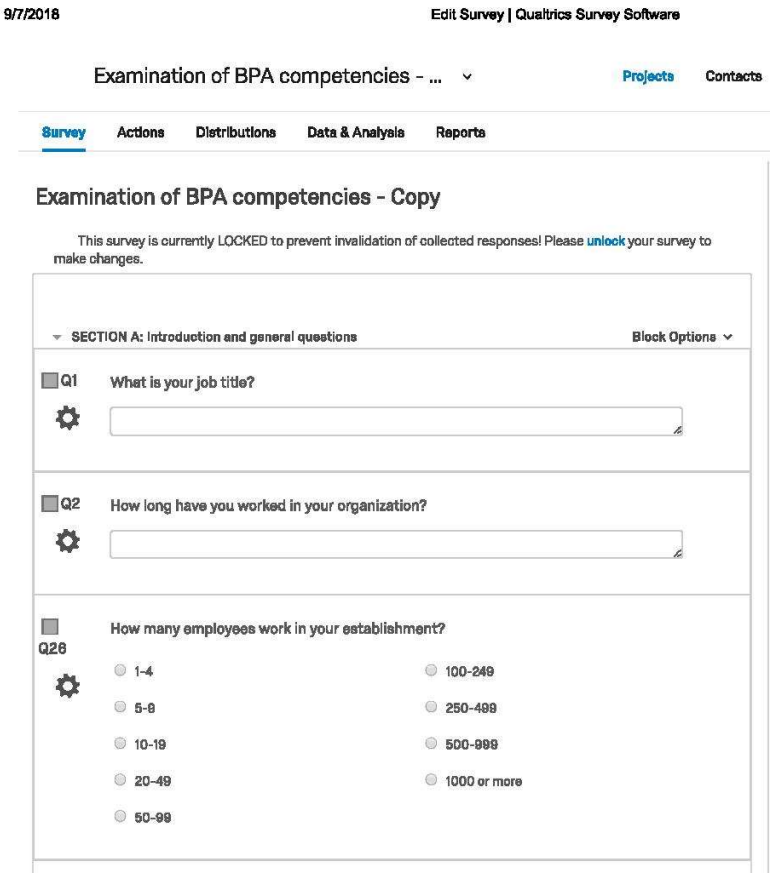
Community	The environment within which the activity is carried out	HEI institution that is running the proposed curriculum and related courses. Relationship building with industry running and vendors.
Outcome	The desired end result of the activity	Competency attainment for critical ERP systems roles of process analyst. Development of industry requirements with ERP systems curriculum and learning. TC Competencies: SOA knowledge, UI skills, ERP systems knowledge BPO Competencies: BPM drive and promotion, BP Value chain, BP risk and compliance, BP improvement Organizational Knowledge Competency BIC Competencies: Facilitation and leadership, Business communication, Trustworthiness, Business requirements elicitation BFC Competencies Client experience, Mathematical and statistical competency, Business Analysis, Holistic overview of business thinking

Appendix 5: Activity Systems/ Activity Theory: Testing the reliability of the concept definitions

Theory-driven Concept	Data from curriculum documents
Subject/Collective subject	Student prerequisites "Students in all majors should have a working knowledge of how to effectively use software for word processing, electronic mail, Web browsing, spreadsheet modelling, database management, presentation graphics, statistical analysis, and external database retrieval." Teaching approach: "Students will learn how to identify, document, model, assess, and improve core business processes. Students will be introduced to process design principles.
Tools/Instruments	Human tools: "each faculty member's workload be spent in receiving training in new technologies and acquiring new knowledge and skills. The changes in the field place heavy demands on IS faculty who are required to tailor the curriculum to meet local and regional conditions" ICT tools: "Example software will be used to illustrate how enterprise systems work"
Object/ Objective	Analysis of BPM concepts: "The main focus of this course is both understanding and designing business processes" Analysis of ERP systems concepts: "This course is designed to provide students with an understanding of the theoretic and practical issues related to the application of enterprise systems within organizations" Reflection: "The use of case studies for discussion and reflection in this course is highly recommended."
Artefacts	Class Assignments and projects: "students generate their own solutions, make their own decisions, commit to and complete assignments, and present and explain solutions" "A group project is highly recommended to assess both practical/applied aspects and the conceptual/ theoretical content of the course." Repository of questions: "Exercises may enable students majoring in functional areas to gain additional IS skills and system understanding through the use of application packages in their major fields of study"
Rules	Assignment evaluation: "exercises should teach the complex concepts that are often too abstract to grasp without practical examples" Project evaluation: "Team projects with actual clients that demonstrate applied learning"
Division of labour	Industry learning resources: "it is recommended that they work in teams and that industry supports the project by providing stipends to the students for their work because the financial

	incentive has been shown to improve the relevance of the project topic and the quality of the student output." Student responsibility: "Students can build on their prerequisite understanding to investigate useful concepts, functions, and capabilities provided by information systems…Students proficient at this level are prepared to enter a career in the IS field. They have competencies in basic technical areas and apply these to business processes and project management." Teacher responsibilities: "…a capable faculty is the first required resource…Faculty needs both academic training and practical experience [Looney et al., 2007]. There must be enough faculty to provide course offerings that allow the students to complete a degree in a timely manner." Vendor learning resources: "…includes exposure to and hands-on use of one of the many enterprise system vendors (SAP or Oracle, SSA Global, Microsoft (Axapta, Great Plains and Solomon), Intuit, or Minicom)."
Community	HEI resources: "Library support is an important part of an academic program. It is especially important for disciplines with the rapid development of knowledge such as the Information Systems field. Libraries should provide both traditional and digital access wherever possible to journals, proceedings, monographs, and reference books" HEI relationship with industry and vendors: "program is enhanced significantly when faculty acquire practical experience in the profession through activities such as training, consulting, sabbatical leaves, and industry exchange programs."
Outcome	Learning outcomes: "…professionals must have strong analytical and critical thinking skills…strong ethical principles and have good interpersonal communication and team skills…must design and implement information technology solutions that enhance organizational performance…"

Appendix 6: Survey Instrument for RQ1



Q25

How important are the following competencies for people who help your organization to understand and improve organizational business processes.
NB: Business processes include but are not limited to procurement processes, hiring processes etc

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Business Process and Value chain modelling					
Business Process Improvement					
Business Process risk and compliance assessment					
Facilitation and Leadership					
Business requirement elicitation					
Business communication					
Trustworthiness					
Business analysis					
Holistic overview of business thinking					
Client experience thinking					
Mathematical and Statistical competency					
Organizational Knowledge					
Software Oriented Architec-ture (SOA) Knowledge					
ERP Knowledge					
User Interface Design Skills					
BPM Drive and promotion					

Q31 Satisfaction with graduates' workplace skills and applied knowledge

	Strongly Disagree	Disagre
The graduates have an understanding of the organization's business process and Value chain modelling	☐	☐
The graduates have an understanding of the importance of Business Process Improvement	☐	☐
The graduates have an awareness of Business Process risk and compliance assessment	☐	☐
The graduates demonstrate facilitation and leadership qualities	☐	☐
The graduates are able to appreciate the importance of Business requirement gathering	☐	☐
The graduates are able to carry out business communication effectively	☐	☐
The graduates are trustworthy	☐	☐
The graduates have an understanding of Business analysis	☐	☐
The graduates appreciate the importance of a holistic overview of business thinking	☐	☐
The graduates understand the importance of client experience thinking	☐	☐
The graduates have some mathematical and statistical competency	☐	☐
The graduates understand the mission, vision and overall strategy of the organization	☐	☐
The graduates have some awareness of Software Oriented Architecture	☐	☐
The graduates have some awareness of ERP Knowledge	☐	☐
The graduates have some awareness of User Interface Design Skills	☐	☐
The graduates understand the importance of driving and promoting business process management	☐	☐

Q30 In which industry are you currently employed?

Mining ▼

Q4 Has your organization implemented any Enterprise Resource Planning System (ERP) such as SAP, Microsoft Dynamics or Oracle?

- ○ Yes
- ○ Partial implementation. Please provide a further description.
- ○ No

Q5 If you answered Yes to the Question above, please indicate the number of years that your organization has used the ERP system?

- ○ Less than 1 year
- ○ Between 1 and 5 years
- ○ More than 5 years
- ○ × Not Applicable

Q6 Does your organization have any business process improvement initiatives?

- Yes
- Maybe. Please provide a further explanation
- No

Q7 If you answered Yes to the question above, for how many years has your organization implemented these business process improvement initiatives?

- Less than 6 months
- between 6 months and 1 year
- between 1 and 2 years
- More than 2 years
- × Not Applicable

Q14 Have Business Process Analysts in your organizations done any BPA related courses/certifications? Please describe.

Q24 Where was the course/certification offered?

- Through our personnel development office
- Through a certification body external to my organization. Please state the organization.
- Through a higher education institution such as a University or college
- × Not applicable

Q27 Do you feel that this courses/certifications are relevant to BPAs in your organization? Why or Why not

- Definitely yes
- Probably yes
- Probably not
- Definitely not

Q24 How would you rate the maturity of Business Process Management in your organizations

- Initial: Organization has little or no process awareness
- Repeatable: Some Processes are understood and can be repeated but not documented
- Managed: Processes are measured and controlled and metrics are defined
- Optimized: Continuous process improvement from quantitative feedback

Q19 Our Last Question: Please add any other information that your feel would be important and relevant


Add Block
End of Survey
Survey Termination Options...

Appendix 7: Interview Schedule for RQ2 and RQ3

PART 1:

A. (Established Rapport) My name is Elizabeth Wamicha. I am currently carrying out research on the organizational interventions that you as a BPA use to build competencies required to complete your day to day tasks.
B. (Purpose) I would like to ask you a set of 16 questions covering BPA competency areas and some experiences you have had in acquiring these competencies.
C. (Motivation) I hope to use this information to better understand the different ways in which BPAs grow their skillsets as they handle their day-to-day tasks. I hope to use the findings to develop suitable curricula for use in HEI
D. (Time Line) The interview should take about 45 to 60 minutes. Are you available to respond to some questions at this time?

PART 2: Organizational interventions

1. Describe the ways in which you or the organization has improved the technical competencies of its BPAs. How were these interventions carried out?
   Technical competency areas include:
   i) User interface design
   ii) ERP systems knowledge
   iii) Software-oriented architecture

2. Describe the ways in which you or the organization has improved the business process orchestration competencies of its BPAs. How were these interventions carried out?
   Business process orchestration competency areas include:
   i) Business process and value chain modelling
   ii) Business process improvement
   iii) Business process risk and compliance assessment
   iv) BPA drive and promotion

3. Describe the ways in which you or the organization has improved the organizational knowledge competencies of its BPAs. How were these interventions carried out?

4. Describe the ways in which you or the organization has improved the interpersonal competencies of its BPAs. How were these interventions carried out?
   Business interpersonal competency areas include:

   i) Facilitation and leadership
   ii) Business requirements elicitation
   iii) Business communication
   iv) Trustworthiness

5. Describe the ways in which you or the organization has improved the BPA fundamental competencies of its BPAs. How were these interventions carried out?
   BPA fundamental competency areas include:

   i) Business analysis
   ii) A holistic overview of business thinking
   iii) Client experience thinking

iv) Mathematical and statistical competency

Part 3: It has been a pleasure finding out more about you and your role as a BPA. I should have all the information I need. Would it be alright to call sometime in case I have any more questions? Would you be comfortable referring me to any other BPA in your organization or that you know? Warm thanks for your time.

Appendix 8: Requirements specification Interview schedule for RQ4

PART 1 - Subject/ Collective subject:
In order for an activity to take place, there needs to be an individual or collective subject that acts.

1. Lecturer:
    a) What teaching approaches have you used to teach BPA concepts in class?
    b) Besides these teaching approaches that you have used/use are you familiar with any others?
2. Student:
    a) What was your learning experience as you were taught BPA concepts?

PART 2 - Tools and Instruments:
These are resources that a subject uses to achieve an objective or to produce an object. It is what is used in the transformative process from object to outcome

1. Lecturer
    a) What ICT tools do you use to teach BPA related courses?
    b) How do you set up your classes and assignments? Are they practical or mainly theoretical?
    c) Do you have tutors or lab assistants to assist during class sessions? What role do they play?
2. Students
    a) What tools do you have access to when learning BPA related systems?
    b) Do these class exercises help you to achieve a good understanding of business processes in the organizational context?

PART 3 - Object/ Objective:
These are resources that a subject uses to achieve an objective or to produce an object. It is what is used in the transformative process from object to outcome.

1. Student
    a) What competencies have you been able to achieve through the BPA related courses that you have attended?
    b) Have you gained a clearer picture of issues around Business Process Analysis, ERP systems implementation and running an ERP system within an organizational context?
    c) Have you gained a clearer understanding of organizational business processes through the course?
    d) Have you been able to reflect on the knowledge you have obtained? Is this knowledge useful in understanding and analyzing business processes in organizations with ERP systems? Why or why not?

PART 4 - Artefacts:
These are created during the process of the activity. They contain a historical remnant of the activity.

1. Lecturer
    a) Do you have a repository of questions and class assignments for use during current and future learning sessions? How have you created these questions or have they been supplied by an external party?
    b) Have these questions been improved on with time to cover additions/changes in teaching approaches?
2. Student
    a) Have you been able to develop your own set of questions and/or projects that could help you better understand BPA concepts?

PART 5 - Rules:
These are used in the mediation process between the community and the subject. It includes explicit and implicit norms and social relations.

1. Lecturer
    a) Are there any prerequisites required in order for a student to do a course related to business process analysis?
    b) Elaborate on what evaluation processes you use to assess the performance of the student in assignments and field-based project work.
2. Student
    a) Do you think the current assessment processes fully recognize the competencies gained by the students doing these courses? Is any further improvement required?

PART 6 - Division of Labour and Community:
This is the distribution process for the activity among community members. The roles and responsibilities of each individual in the community required to achieve the activity and The environment within which the activity is carried out.

1. Lecturer
    a) Have you received any assistance from your HEI while implementing your curriculum? Expound further on the support provided
    b) Have you received any assistance from your vendor of ERP systems solutions while implementing your curriculum? Expound further on the support provided
    c) Have you received any assistance from your industry running ERP systems solutions while implementing your curriculum? Expound further on the support provided
    d) What is the overall role of the lecturer in ensuring that these courses are a success in your HEI
    e) How have you integrated BPA related studies into you're already existing curriculum?
    f) Have there been further relationship building initiatives with major stakeholders such as students, HEI, vendor and industry?
2. Student
    a) What is your role as a student in ensuring that these courses are a success in your HEI?
    b) Do you feel like there is sufficient collaboration between your HEI and the vendors and Industry? Why or Why not?
    c) Has it been easy to get an internship/employment with your current competencies and knowledge?

Appendix 9: Artefact evaluation survey instrument for RQ4:

Which of the following competencies did you and your group members find useful when completing the BPM course ?

Which of the following competencies did you and your group members find useful when completing the BPM course?

	Extremely useful	Somewhat useful	Neutral	Somewhat not useful	Extremely not useful
Business process and value chain modelling: The ability to understand events and data required to start and run a process	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
Business Analysis: The ability to define needs and recommend solutions to the organization	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
Holistic overview of business thinking: The ability to use previous education in business and your own personal experience to complete the project	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
Business process risk and compliance assessment: The ability to understand the risks faced by the organization and how process management can reduce these risks	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
Business process improvement: The ability to analyze a process and recommend necessary areas that can be adjusted in order to give value to the organization	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
Business communication: The ability to interact and communicate effectively with different stakeholders.	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
Trustworthiness: the ability to work with a high level of integrity	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
Facilitation and leadership: The ability to develop goals as a team and follow through with them within specified deadlines	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
Organizational Knowledge: the ability to understand the vision mission and values of the organization.	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
Business requirements elicitation: the ability to understand the time, cost, quality and flexibility related requirements needed to ensure effective process change	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
BPA drive and promotion: The ability to initiate process change by starting a new BPM cycle.	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
ERP knowledge: Having an understanding of the integrated systems used to automate business processes	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
User Interface Design: the ability to design user interfaces for machines and software running the automated business processes	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
Software Oriented Architecture: The ability to design a software development model that supports distributed application components	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
Mathematical and statistical competency: the ability to use mathematical models to analyze and redesign processes	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful
Client Experience Thinking: The ability to focus on providing high value to the customer	○ Extremely useful	○ Somewhat useful	○ Neutral	○ Somewhat not useful	○ Extremely not useful

→

Survey Powered By Qualtrics

Appendix 10: Ethical approval from – University of Cape Town

UNIVERSITY OF CAPE TOWN
FACULTY OF COMMERCE
Igniting Knowledge and Opportunity

Commerce Faculty Ethics in Research Application Form

Any person planning to undertake research in the Faculty of Commerce at the University of Cape Town is required to complete this form **before collecting or analysing data**. If any of the questions below have been answered YES, and the applicant is NOT an Honours student, the form it should be submitted to the supervisor (where applicable) and from there for approval by the Faculty EIR committee: Ms Samantha Alexander (**samantha.alexander@uct.ac.za).**

It is assumed that the researcher has read the UCT Code for Research involving Human Subjects (Available at http://web.uct.ac.za/depts/educate/download/uctcodeforresearchinvolvinghumansubjects.pdf) in order to be able to answer the questions in this form.

Students must include a copy of the completed form with the dissertation/thesis when it is submitted for examination.

1. PROJECT DETAILS		
Project title: Developing Business Process Analyst competencies through higher education institution interventions - A Kenyan study		
Principal Researcher/s: Elizabeth Wamicha	**Email address(es):**	elwamicha@gmail.com
Research Supervisor: Assoc. Prof Lisa Seymour	**Email address(es):**	lisa.seymour@uct.ac.za
Co-researcher(s):	**Email address(es):**	
Department: Information Systems		
Brief description of the project: With the growing number of Enterprise Resource Planning (ERP) based courses on offer in Higher Education Institutions (HEI), ERP systems have become a core part of teaching in HEIs. "For this, universities face a massive task of balancing investments into programs with the need to meet industry demand, which can potentially be offset through appropriate pedagogy (Eden, Sedera, & Tan, 2012, p.7)." In this regard, most studies have not attempted to determine and explain the interventions and interactions that can develop Business Process Analyst (BPA) competencies required by organizations with ERP systems in Kenya. The research study therefore intends to explain these interventions and interactions, with focus on the Kenyan context.		
Data collection: (please select) ■ **Interviews** ■ Questionnaire ■ Experiment ■ **Secondary data** ■ ■ **Observation** Other (please specify): _____		
Have you attached a research proposal OR a literature review with research methodology? (please select) ■ **Yes** ■ No		

Com Ethics_V4

2. PARTICIPANTS		
2.1 Does the research discriminate against participation by individuals, or differentiate between participants, on the grounds of gender, race or ethnic group, age range, religion, income, handicap, illness or any similar classification?	YES	**NO**
2.2 Does the research require the participation of socially or physically vulnerable people (children, aged, disabled, etc.) or legally restricted groups?	YES	**NO**
2.3 Will you be able to secure the informed consent of all participants in the research? (In the case of children, will you be able to obtain the consent of their guardians or parents?)	**YES**	NO
2.4 Will any confidential data be collected or will identifiable records of individuals be kept?	YES	**NO**
2.5 In reporting on this research is there any possibility that you will not be able to keep the identities of the individuals involved anonymous?	YES	**NO**
2.6 Are there any foreseeable risks of physical, psychological or social harm to participants that might occur in the course of the research?	YES	**NO**
2.7 Does the research include making payments or giving gifts to any participants?	YES	**NO**

If you have answered **YES to any of these questions**, please describe how you plan to address these issues (append to form): Consents forms will be written and secured in work office.

Affiliations of participants: (please select)

■ **Company employees** ■ Hospital employees ■ General public ■ Military staff ■ Farm workers ■

■ **Students** Other (please specify): _____

Race / Ethnicity:

Are you asking a question about race/ethics in your questionnaire?

■ Yes ■ **No**

Which race categories have been used?

Have you included the option: "Prefer not to answer" as part of your race/ethics question?

3. PROVISION OF SERVICES

Does your research involve the participation of or provision of services to communities? NO
If your answer is YES, please complete below:

3.1 Is the community expected to make decisions for, during or based on the research?	YES	**NO**
3.2 At the end of the research will any economic or social process be terminated or left unsupported, or equipment or facilities used in the research be recovered from the participants or community?	YES	**NO**
3.3 Will any service be provided at a level below the generally accepted standards?	YES	**NO**

If you answered YES to any of these questions, please describe below how you plan to address these issues.

3. ORGANISATIONAL PERMISSION

If your research is being conducted within a specific organisation, please state how organisational permission has been/will be obtained:

A letter indicating permission from the organization (Strathmore University) has been attached to the Ethics Form

Have you attached the letter from the organisation granting permission? (please select)

Yes No, but this will be obtained before commencing the research Not applicable

Are you making use of **UCT students** as respondents for your research? (please select) Yes **No**

If yes, have you contacted Executive Director: Student Affairs for permission? (please select) Yes No

Was approval granted? (please select) Yes No Awaiting a response

Are you making use of **UCT staff** as respondents for your research? (please select) Yes

No If yes,

you contacted Executive Director: Human Resources for permission? (please select) Yes No

Contact Emails: Executive Director: Human Resources (Miriam.Hoosain@uct.ac.za)
Executive Director: Student Affairs (Moonira.Khan@uct.ac.za)

4.INFORMEDCONSENT

What type of consent will be obtained from study participants?

- ○ Oral Consent
- ○ **Written Consent**
- ○ Anonymous survey questionnaire (covering letter required, no consent form needed)
- ○ Other (please specify)

How and where will consent/permission be recorded? **Written consent on attached permission forms**

Have you attached an informed consent form to your application? ■ **Yes** ■ No

5. SPONSORSHIP OF RESEARCH

If your research is sponsored, is there any potential for conflicts of interest? NO
If your answer is YES, please complete below

4.1 Is there any existing or potential conflict of interest between a research sponsor, academic supervisor, other researchers or participants?	YES	**NO**
4.2 Will information that reveals the identity of participants be supplied to a research sponsor, other than with the permission of the individuals?	YES	**NO**
4.3 Does the proposed research potentially conflict with the research of any other individual or group within the University?	YES	**NO**

If you have answered **YES** to any of these questions, please describe how you plan to address these issues (append to form)

I certify that I have read the the Commerce Faculty Ethics in Research policy ■
(http://www.commerce.uct.ac.za/Pages/ComFac-Downloads)

I hereby undertake to carry out my research in such a way that

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

Signed by:

	Full name and signature	Date
Principal Researcher/Student:	Elizabeth Waithira Wamicha	19th February 2016

This application is approved by:

Supervisor	L F SEYMOUR	19th February 2016
HOD (or delegated nominee – for all Honours Projects):		29th February 2016
Chair: Faculty EIR Committee (only for postgraduate research at Master and PhD level)	Prof U Rivett	1 March 2016

The approval of this application is based on the researcher ensuring that all requirements regarding the permission to interview staff at the various organizations have been obtained prior to any surveys being conducted.

Com Ethics_V4

CHECKLIST	SELECT
A full copy of a research proposal or a literature review with methodology is attached in a separate file	■
Interview schedules / cover letters / questionnaires / forms and other materials used in the study are attached in separate files	■
Organisational consent letter / UCT student or staff approval letter	■
On your cover letter to your questionnaire have you included the following?	NA ■
1. The following UCT Logo 	■
2. A sentence explaining the aim of the research	■
3. Sentences of a similar nature to below must be included in the cover letter or consent form:	
This research has been approved by the Commerce Faculty Ethics in Research Committee.	■
Your participation in this research is voluntary. You can choose to withdraw from the research at any time.	■
The questionnaire will take approximately X minutes to complete	■
You will not be requested to supply any identifiable information, ensuring anonymity of your responses.	■
OR	
Due to the nature of the study you will need to provide the researchers with some form of identifiable information however, all responses will be confidential and used for the purposes of this research only.	■
Should you have any questions regarding the research please feel free to contact the researcher (insert contact details).	■
4. Have you scanned in your signature for the last section of the form?	■

Appendix 11: Ethics Approval Letter – Strathmore University

Strathmore UNIVERSITY

17th February 2016

Elizabeth Wamicha
PhD Student
Department of Information Systems
University of Cape Town
Email: ewamicha@strathmore.edu

Dear Elizabeth,

AUTHORISATION TO COLLECT DATA AT STRATHMORE UNIVERSITY

The Strathmore University Research Office has granted you the authorization for a period of six months commencing March 24th to September 23rd 2016 to collect data from 15 staff and up to 30 students within the University as specified in your request dated February 9, 2016. The data collection is for your PhD Research study entitled **"Developing Business Process analyst Competencies through Higher Education Institution Interventions-A Kenyan Study"**

Please note that this letter does not constitute an ethical approval of your research.

Please sign the acknowledgement below binding you to share the findings of your study and the resulting publications with the Strathmore Universality Research Office through email address: research@strathmore.edu

We wish you well in your undertakings,

Yours sincerely,

Dr. Virginia Gichuru
Dean, Research

Acknowledgement:

I agree to the above conditions of authorization

Full names: ELIZABETH WAMICHA

Signature: _____ **Date:** 17/02/2016

Ole Sangale Rd, Madaraka Estate, PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
+254 (0)703 034200 Email info@strathmore.edu www.strathmore.edu

Research Participant Consent Form

I, _____, consent to participate in the research on developing Business Process Analyst competencies through higher education institution interventions.

I am aware that participation is voluntary and that I may choose to withdraw from this study at any time, should I choose to do so.

_____ _____

Signature Date

Appendix 12: Cover letter and consent form

Department of Information Systems
Leslie Commerce Building
Engineering Mall, Upper Campus
OR
Private Bag X3 - Rondebosch - 7701
Tel: +27 (0) 21 650 2261 Fax: +27 (0) 21650 2280
Internet: http://www.commerce.uct.ac.za/informationsystems/

January 2016

Request to conduct research and interview participation consent form

Dear Sir/Madam,

In terms of the requirements for completing a PhD Degree in Information Systems at the University of Cape Town a research study is required.

The researcher, in this case Elizabeth Wamicha, has chosen to conduct a case study entitled ***developing Business Process Analyst competencies through higher education institution interventions - A Kenyan study.*** The researcher would like to request permission to conduct this case study at Strathmore University.

Your participation in this research is voluntary. All information will be treated in a confidential manner and used exclusively for the purpose of this study. No individual names will be recorded or published. You will not be requested to supply any identifiable information, ensuring anonymity of your responses. You can choose to withdraw from the research at any time for whatever reason, in accordance with ethical research requirements.

The data collection method will be one-on-one interviews with a small group of lecturers teaching ERP systems courses, students and recent graduates currently working as business analysts. The interviews will be conducted over the period of the study in one hour sessions. If you are willing to participate in this study, kindly sign the attached form and return to me at your earliest convenience.

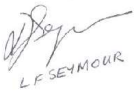
Should you have any questions regarding this research, please feel free to contact me on (+254)721-407225 or email: ewamicha@strathmore.edu.

Your participation in this study would be greatly appreciated, but is entirely voluntary.

Sincerely,

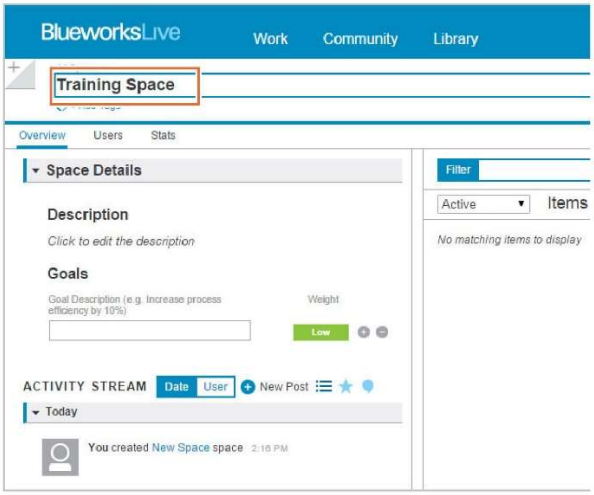
Elizabeth Wamicha
Researcher \ PhD Student, (UCT)
Department of Information Systems
University of Cape Town,
Assistant Lecturer
Strathmore University
Email: ewamicha@strathmore.edu

Assoc. Prof Lisa Seymour
Research Supervisor
Department of Information
Systems
University of Cape Town
Email: lisa.seymour@uct.ac.za



Appendix 13: Intuiting and Interpreting activity system 'hands-on' lab exercise

__ b. Change the name of the space to: `Training Space`



__ 2. Make the space a part of the **I'm Following** space repository.

__ a. Click the star next to the space name.

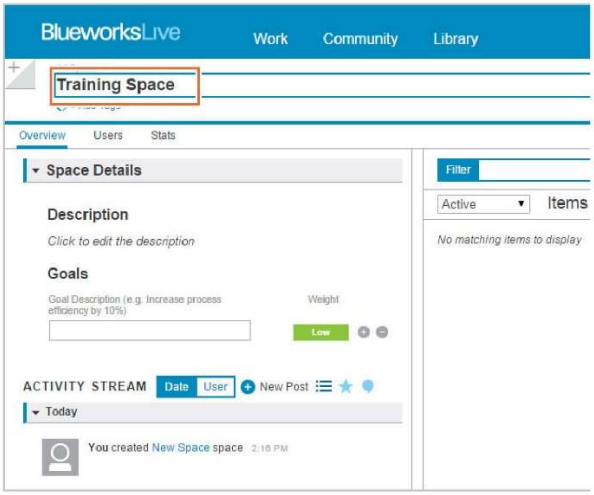
__ b. Verify that the star changed color to signify the space is now part of the **I'm Following** spaces.

__ 3. Add tags to the space.

__ a. Click the **Add Tags** below the space name.

__ b. Type `education` followed with a comma.

__ b. Change the name of the space to: `Training Space`



__ 2. Make the space a part of the **I'm Following** space repository.

__ a. Click the star next to the space name.

__ b. Verify that the star changed color to signify the space is now part of the **I'm Following** spaces.

__ 3. Add tags to the space.

__ a. Click the **Add Tags** below the space name.

__ b. Type `education` followed with a comma.

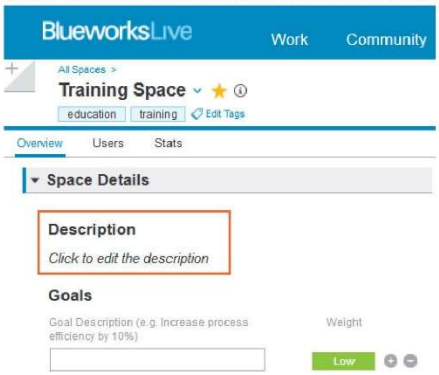
__ c. Type `Training` in the next entry box and press Enter to add tags.

__ d. Verify that two tags are present for the space: education and Training.

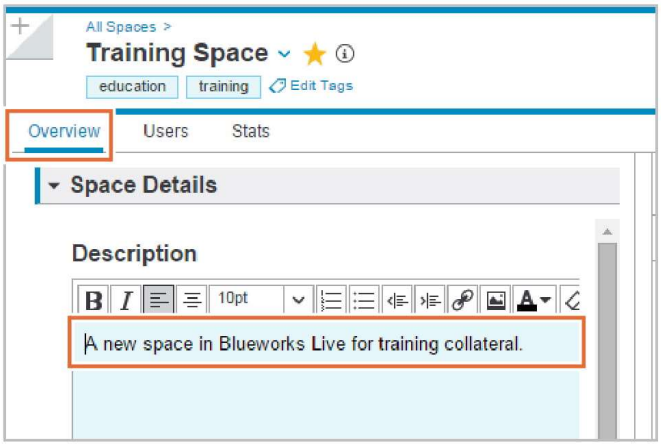
__ 4. Add details to the space.

__ a. Verify that you are in the **Overview** section of the *Training Space*.

__ b. Expand the **Space Details** section and click the **Description** area to access the editor.



__ c. Type the following description: `A new space in Blueworks Live for training collateral.`



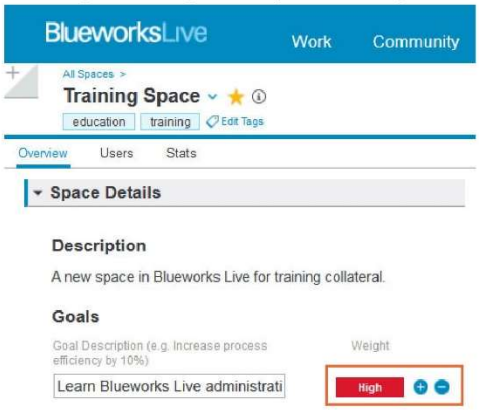
__ d. Click outside the editor to save the description.

__ 5. Add goals to the space.

__ a. Click the **Goal** entry box.

__ b. Type the following goal: `Learn Blueworks Live process discovery`, and press Enter.

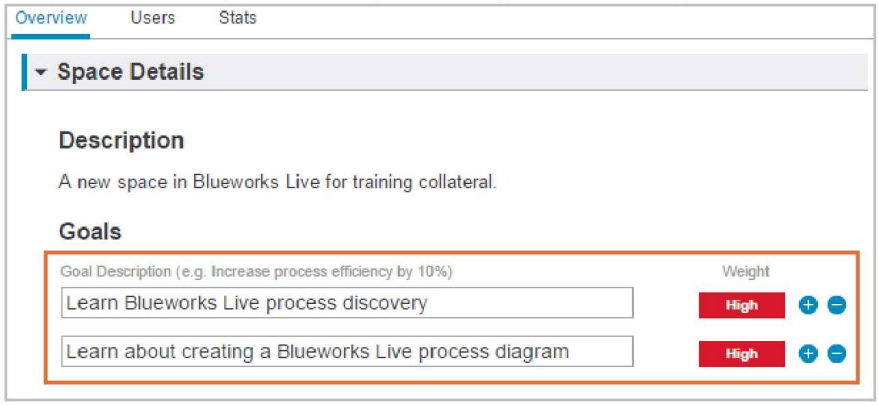
__ c. Click the **Weight** icon to the right of the entry until it is set to **High**.



__ d. Click the **+ plus sign** next to the weight. A new entry box appears.

__ e. In the next entry box, type the next goal: `Learn about creating a Blueworks Live process diagram`, and press Enter.

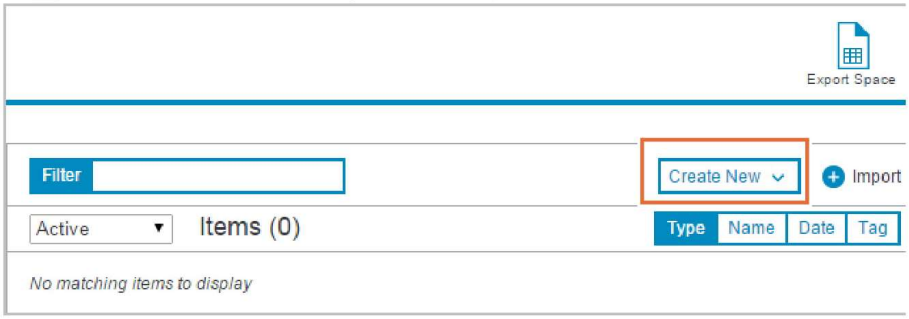
__ f. Click the **Weight** icon to the right of the entry until it is set to **High**.



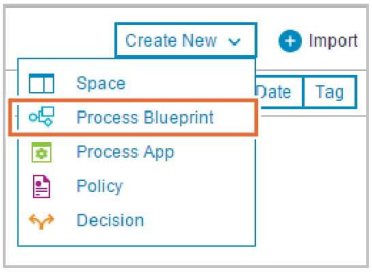
Part 4: Create a blueprint process

__ 1. Create a blueprint process.

__ a. Click **Create New** on the right side of the space interface.

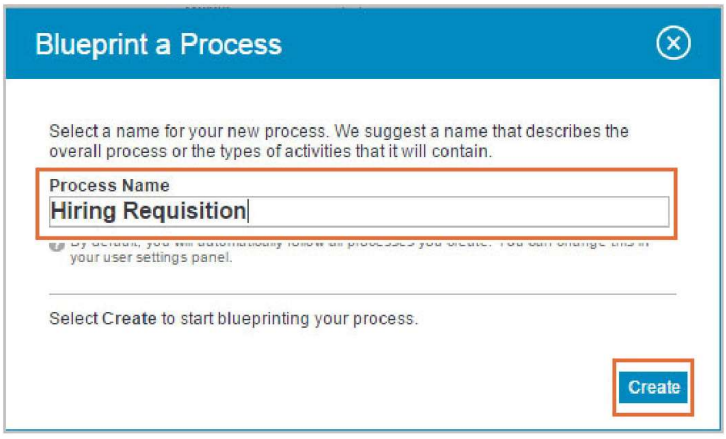


__ b. Select **Process Blueprint** from the menu options.



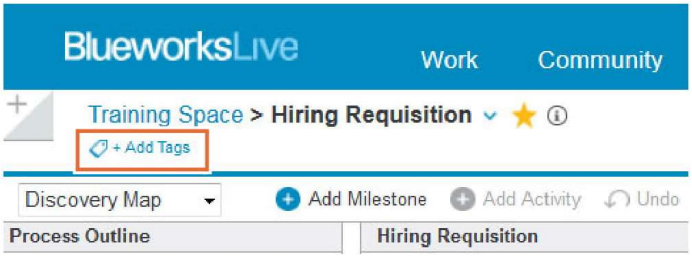
__ c. Type the name of the new process in the entry field: `Hiring Requisition`

__ d. Click **Create**.

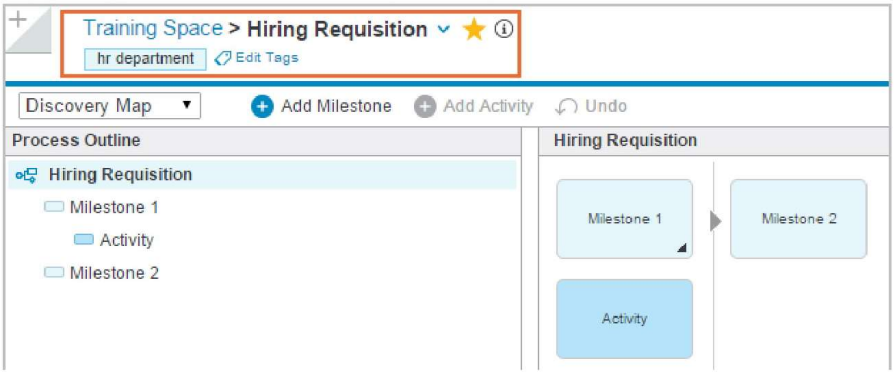


__ 2. Modify the process information.

__ a. Click the **Add Tags** option at the top of the process blueprint discovery map.



__ b. Type `hr department` in the entry field and press Enter.



__ c. Verify that the star next to the process name is highlighted to ensure that it is a blueprint process that is in the **I'm Following** repository.

Appendix 14: Integrating activity example

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BBT 4402: Business Process Management

Exercise 4

Time: 1 week

To be done in groups of 6

TITLE: REDESIGNING THE AS-IS PROCESS

Instructions: In this exercise, you will apply skills learnt from process redesign discussion in class

Task: As a group discuss the AS-IS process developed in Exercise 2 and Exercise 3 and using the 9 steps of process redesign discussed in class, show how you redesigned your process from an AS-IS model to a TO-BE model.

Use **Lesson 5 notes (process redesign)** to complete the exercise.

You will be required to make a presentation of **no more than 5 slides** outlining the following:

1. The As-Is model
2. Which of the 9 steps you carried out as a group to redesign the AS-IS model (you need to incorporate a minimum of 6 steps)

- Task elimination
- Task composition
- Triage
- Resequencing
- Parallelism
- Process specialization and standardization
- Resource optimization
- Communication optimization
- Automation

3. The final To-be model and a justification of the improvements made during process redesign.

Marking scheme

a) Did the students select and justify the re-design steps used appropriately? (7 marks)
b) Does the final to be model capture the improvements suggested in Exercise 3 appropriately? (3 marks)

Appendix 15: Institutionalizing activity system: Continuous Assessment Test (CAT) one

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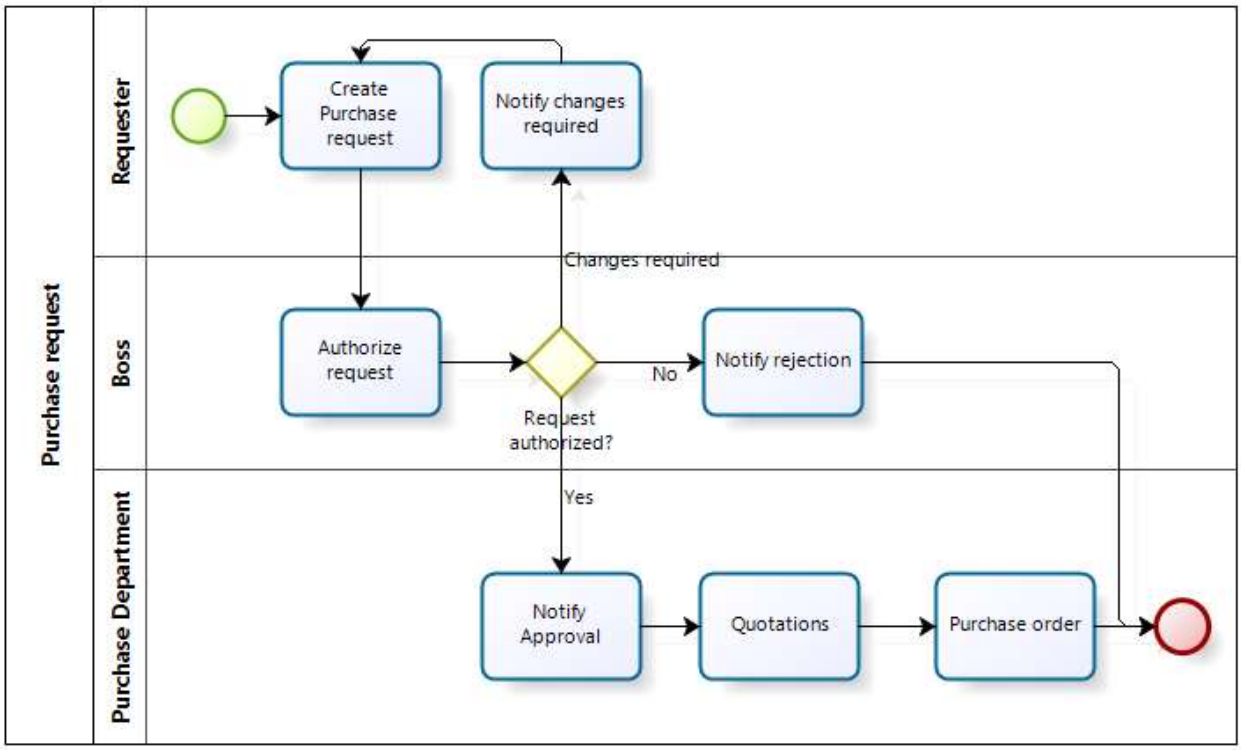
CAT 1

Time: 45 min

Total marks: 10 (5% of total)

1. What is the business process? Draft a simple flow chart showing a Hiring process and the activities required to accomplish the business process. (5 marks)
2. Distinguish between a parallel gateway and message event. (2 marks)
3. Look at the as-is process below. Write down the steps required to complete the process. (3 marks)


Purchase request
Requester
Boss
Purchase Department
Create Purchase request
Notify changes required
Changes required
Authorize request
Request authorized?
No
Notify rejection
Yes
Notify Approval
Quotations
Purchase order