CHAPTER ONE
Introduction

1.0 introduction

Continuously increasing and complex change in technology innovations, liberalization of markets and increase in consumer's awareness and preferences have introduced new conditions in the market place (Nzewi, 2015). Moreover, the market place is becoming instability and complex competition in the business environment (Cruz-González, 2015). Organizations have only one way to survive must cut out their wasteful and unproductive activities and concentrate resources in their areas of core competence to achieve superior performance. Thus, business firms in continuously searching to increase productivity via reduced process time and cost, and flexibility while satisfying the needs of the customers by fundamentally rethinking the way they do business (Agarwal, 2010) . Add to that, Frow (2015), mentioned the service firms try to change their essential operational capabilities by rethinking and redesign of their process and performance to adapt to environment changes.

Furthermore, to success in this unstainable environment, organizations must have a unique strategy and distinctive structure and processes which are fast, high quality, flexible as well as low cost (Bottani, 2015; Postma, 2015). Earlier thinking on BPR make several companies began business process redesign with

a continuous improvement approach such as Total Quality Management to avoid the potential risks. This approach considered is most important attempts to understand and measure the current process and make gradual improvement overtime. This method of improving business process is effective to achieve gradual and incremental improvement (Hussein, 2008). However, many main factors recently have accelerated the need for a rapid improvement of business processes; new technologies, such as computer applications and systems are bringing new capabilities to the business organizations. Another effect factor is the opening of the world market and increased over sea trade. This policy changes bring more firms into the market place, and the competing becomes more complex. Furthermore, recently consumers are becoming more awareness, as increasing number of firms are launching into the markets which gave consumers a verity options to choice. This factors puts pressure on firms to deliver goods and services to customers with low cost, high quality and high speed.

One approach for managing rapid change and dramatic improvement that has emerged is (BPR). The BPR became one of the popular management solutions in dealing business in extremely fast technological advancement, and any changes or transformation among firms because it assistants to improve the performance of organizations (Evren & Ayşegül, 2015). BPR devises new ways of organizing tasks, human and redesigning IT systems to that the processes support the organization to achieve its objectives (Hammer & Champy, 1993).

Changes in the service industry have increased over the last decades as a result of rising market challenges, due by rapid technological advancement. All these changes accelerate the need for organizational transformation, where the entire processes, organization climate and organization structures are changed (Nzewi, 2015). The digital revolution has improved and assistant the service firms to create and develop innovative new services and products. Although, a world business firms adopted new and improved types of information technology based communications such as virtual office in which all management operation based on technology(Costa,2015), yet there are variety services firms in the Sudan are suffer and face complex challenges (Kbreab, 2015).

Furthermore, the traditional work values and cultures of a typical services industry will not be enough to drive growth and retain customers (Nzewi, 2015). Thus, the service firm must be competent and focus on their core strengths, as well as be able to provide services and offer innovations with participation from their customers. Furthermore, today's the organizations are must adequately equip to operate in unsustainable business environment; where customers, competition, and change demand flexibility and quick response (Boguslauskas,2015).

The decline in organizational performance of Sudanese services firms in terms of return on assets, equity and operating cost requires attention of stockholder to re-searching for process performance improvement (Ahmed, 2015). There for, Appling successful BPR program in safe mode will assistant to overcome these challenges and build new information technology resource and assets.

Based on the underlying problem presented above, the study attempts to answer the following main research questions; what is the relationship between BPR and organizational performance of service firms?

In addition, the study seeks to achieve the main objective is assessing the effect of BPR implementation on Sudanese services firms' performance.

1.1 Background of the Study

This research is exploring the relationship between the Business Process Reengineering (BPR) and its potential effect on organizational performance. As well as explaining moderating role of learning capabilities on the relationship between the BPR and organizational performance. This study attempt to develop a valid and reliable a model and measurement instrument for the study objectives.

1.1.1 BPR and Business Process

BPR is defined by Hammer as “the fundamental rethinking and radical design of business process to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, and service and speed (Hammer et al 1995). Malhotra (1997), is define BPR is the analysis and redesign of workflows within and between enterprises in order to optimize end-to-end processes and automate non-value ended tasks.

On other hand, continuously increasing and complex change in technology innovations, liberalization of markets and increase in consumer's awareness and preferences have introduced new conditions in the market place (Nzewi, 2015).

Moreover, the market place is becoming instability and complex competition in the business environment (Cruz-González, 2015). Organizations have only one way to survive must cut out their wasteful and unproductive activities and concentrate resources in their areas of core competence to achieve superior performance. Thus, business firms in continuously searching to increase productivity via reduced process time and cost, and flexibility while satisfying the needs of the customers by fundamentally rethinking the way they do business (Agarwal, 2010) . Add to that, Frow (2015), mentioned the service firms try to change their essential operational capabilities by rethinking and redesign of their process and performance to adapt to environment changes.

Furthermore, to success in this unstainable environment, organizations must have a unique strategy and distinctive structure and processes which are fast, high quality, flexible as well as low cost (Bottani, 2015; Postma, 2015). Earlier thinking on BPR make several companies began business process redesign with a continuous improvement approach such as Total Quality Management to avoid the potential risks. This approach considered is most important attempts to understand and measure the current process and make gradual improvement overtime. This method of improving business process is effective to achieve gradual and incremental improvement (Hussein, 2008).

However, many main factors recently have accelerated the need for a rapid improvement of business processes; new technologies, such as computer applications and systems are obtaining new capabilities to the business

organizations. Another effect factor is the opening of the world market and increased over sea trade. This policy changes bring more firms into the market place, and the competing becomes more complex. Furthermore, recently consumers are becoming more awareness, as increasing number of firms are launching into the markets which gave consumers a verity options to choice. This factors puts pressure on firms to deliver goods and services to customers with low cost, high quality and high speed.

One approach for managing rapid change and dramatic improvement that has emerged is (BPR). The BPR became one of the popular management solutions in dealing business in extremely fast technological advancement, and any changes or transformation among firms because it assistants to improve the performance of organizations (Evren & Ayşegül, 2015). BPR devises new ways of organizing tasks, human and redesigning IT systems to that the processes support the organization to achieve its objectives (Hammer & Champy, 1993).

Changes in the service industry have increased over the last decades as a result of rising market challenges, due by rapid technological advancement. All these changes accelerate the need for organizational transformation, where the entire processes, organization climate and organization structures are changed (Nzewi, 2015). The BPR became one of the popular management approaches in dealing business in rapid technological advancement, and any changes or transformation among organization because it helps to improve the performance of companies (Hammer & Champy, 1993). Willmott, (2016) study argued that BPR

implementing will introduce new ways of organizing tasks, organizing human and redesigning IT systems add to that the processes support the organization to realize its objectives. Thus in various industries and services are inspired to get its benefits for business success (Evren & Ayşegül, 2015).

Furthermore, many of researchers and scholars describe the BPR is a pioneering attempt to change the way work is performed by simultaneously addressing all the aspects of work that impact performance; including the process activities, the people's jobs and their reward system, the organization structure and the roles of process performers and managers, plus the management system and the underlying corporate culture which holds the beliefs and values that influence everyone's behavior and expectations (Cypress, 1994).

likewise, Goksoy and et al. (2012) reported BPR is one of the management methodologies assist organizations and firms in provide innovative ways, radical changes, fast administrative processes strategic value-added, and systems, policies, organizational structures, information technology and content function and work flow to achieve improvements. Therefore, in this study BPR is aimed to assist the Sudanese services firms fundamentally rethink how it does its work of administration of services in order to dramatically improve customers' service and cut operational costs. In addition, this study is guided by Resource Based View (RBV) of the central premise of RBV and addresses the fundamental question of why firms are different, how firms achieve and sustain competitive advantage by deploying their resources (RBV) of the firm.

1.1.2 BPR in the Service Firms

Services organizations in general and those in the developing countries in particular have faced complex problems that due to many factors such as: bureaucracy, work procedures and systems, lack of a customer service focus, and corruption (Reyes, 998). The suggested solution to those problems need not just a less radical business process change but a radical re-engineering via business process reengineering (Weerakkody, Janssen and Dwivedi 2011; Reyes 1998).

Since 1990s, the BPR became as attractive and powerful weapon to obtain commutative advantages and improve the organizational performance in the service firms (Sia and Neo, 2008). Therefore, many of business firms over globe had applied BPR in their operation the services firms number of services firms were adopted and had successful implementation.

Thus business firms were achieved high increase in the return on short-term and long term, as well as their application would lead to the provision of the completion time of processes and thus gain increased rates of performance (Shin and lamella, 2002). According to MilE and et al, (2003) state that " an organization is more likely to achieve greater profitability if reengineering is implemented in a proactive manner as part of an organization's business strategy. An organization that implement business process reengineering reactively as a ‘‘quick fix’’ do not achieve significant performance outcomes". All these changes

impose the need for organizational transformation, where the entire processes, organization climate and organization structures are changed.

According to Salimifard and et al., (2010) the services firms would have achieved a high benefit via BPR. Therefore, many service firms over globe including developing countries such as Ethiopia (Tesfaye Debela, 2009); Nigeria (Ringim, 2011), Jordan, (Shin and lamella, 2002); Saudi Arabia, (Alhmaly &Otaibi, 2004) and united arab emirates (Hesson Andal-Ameed, 2007); were started to implement the BPR program.

On other hand, the BPR applied covered almost of services firm especially financial firms; higher education, (Digna, 2010), found the use of the BPR leads to an increased level of job satisfaction among university staff in all administrative levels; telecommunications and information technology and health institutions. While the many researchers and writer's inconsistence with previous view which argued the implementing the BPR will ultimate to improve the organizational performance as well as describe it by hard surgery. Therefore, all these factors impose the need for organizational transformation, where the entire processes, organization climate and organization structures are changed.

1.2 Statement of the Problem:

The digital revolution has improved and assistant the service firms to create and develop innovative new services and products. Although, a world business firms adopted new and improved types of information technology based

communications such as virtual office in which all management operation based on technology(Costa,2015), yet there are variety services firms in the Sudan are suffer and face complex challenges (Kbreab, 2015).Thus, a world business firms has adopted new and improved types of information technology based communications such as virtual office in which all management operation based on technology. There for, the international economics has embarking major steps to adopt the information technology in business to achieve high organizational performance (Nzewi, 2015).

The traditional value and culture of a typical services industry will not be enough to drive growth and retain customers. In addition, service firms need to reengineer their process and strategic planning to survive. Every service firm must be competent and focus on their core strengths, as well as be able to provide services and offer innovations with participation from their customers.

Furthermore, today's the organizations are must adequately equip to operate in unsustainable business environment; where customers, competition, and change demand flexibility and quick response. Any service firm that can offer this will lead the financial and services industry (Wongsansukcharoen, 2015). Boguslauskas, (2015), a study found that redesigning organizational structure, process, culture and system that will flexible and efficiency to adapt effectively to rapid change in business environment in service industry (Boguslauskas,2015).

The decline in organizational performance of Sudanese services firms in terms of return on assets, equity and operating cost requires attention of

stockholder to re-searching for process performance improvement. The services sector in Sudan not only complete locally, but will also set up defensive strategies against global competitors from abroad. Furthermore, the local financial industry was opened to new foreign competitions that will lead liberalization and globalization of banking industry (Ahmed, 2015).

Obviously, the service firms in Sudan comparing with international services business are suffer and have face several challenges and issues such as poor infrastructure, lack of funding, and government regulations plus the global challenges this business complex environment push the Sudanese service sector to research and bring safe business solutions like business process reengineering. Sudanese services sector involve financial intuitions; financial, communication, and education. Under the financial sector master plan unveiled by (CBOS).

The BPR a competitive advantage and provide the capabilities that enable organizations react effectively to threats and opportunities in an insecure future and an unstable environment. Cost reduction, better deploy technologies for implementation on the real terms based on needs, service effectiveness and a process improvement which has been continued in a more structured manner are taken place as a implementation of BPR (Ozcelik, 2010). Sia and Neo, (2008) argued the BPR became as attractive and powerful weapon to enhance the organizational performance in the service firms.

Many authors such as (Sidikat, 2008; Digna, 2010; Fitzpatrick & O'Neill, 2003); argued that business process reengineering (BPR) in firms services have

continued to increased organizational performance and identified the BPR factors that played a major role to successful outcomes for reengineering projects to includes: change management systems and culture, top management commitment, project management, and information technology infrastructure.

Likewise, to achieve competitive advantages and improve organizational performance, many organizations in the 1990s had started applied business process reengineering projects in their business process (Martin and Cheung, 2000; Buhalis and Owen, 2010; Misra et al., 2008). Supported that view by Rrezaie and et al, (2013) have mentioned the BPR is increases development of inter-organizational relationships and significant increases in the business integration.

Current study addresses the gaps in the literature by investigating the BPR is having potential direct and indirect effect on organizational performance;

Firstly: the direct relation between business process reengineering and organizational performance in services firms a study of Sudanese services firms, through the recognition of the range of effect and interrelation of business process reengineering success factors; organizational change, top management commitment, information technology infrastructure, change management systems and culture and management competence.

Secondly: indirect relation through the moderating effect of learning capabilities (knowledge stock and learning flows) on relationship between the reengineering factors and organizational performance.

The BPR initiative built mainly to improve the organizational performance. The value of business process reengineering can be seen at impact level of process performance and overall organizational performance such as productivity, profitability and market advantages. Number of organizations that have undertaken business process reengineering have improved the performance of their business processes (Hammer and Shampy, 1993).

The BPR strategy was becoming important in global business for the future in order to survive in the tight competition and changing environment. At last decade, in general business firms has been face by many significant issues such as increasing competition and globalization many of companies and firms fail to achieve optimal performance which include the financial, marketing, environmental, social and other goals that imposes companies' administrators to change and innovation, and is considered reengineering.

BPR, one of the modern management solutions helps firms provide innovative ways, and radical changes and fast administrative processes strategic value-added, and systems, policies, organizational structures, information technology and content function, work flow, to achieve improvements. (Goksoy, Ozsoy and Vayvay, 2012). number of old and new international researches and studies focusing on implementation of the BPR program in business firms to achieved

great performance, found that in hammer and champy study, (1993) which suggested BPR implementation will lead to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed.

On other hand, Ranganathan and Dhaliwal (2001) reported the BPR will assist organizations to achieve breakthrough performance in a variety of parameters such as delivery times, customer service, and quality. Adeyemi, Sidikat(2008) a study confirmed these suggests by BPR remains an effective tool for organizations striving to operate in the competitive world; organizations are required to re-engineering their business processes in order to achieve breakthrough performance and long-term strategy for organizational growth.

Current consumers now shift from traditional services to a variety of new ways to digitally communicate, advertise, and transact business. Therefore, the lack of adequate theoretical frameworks to understand the influence of BPR on organization performance in service firms particular in developing economies is in need of correction. This study identified itself as a direct response to this lack, and presented the one main and two sub-research questions through which the study will obtain its objectives.

1.3 Research Questions

Based on the underlying problem presented above, the study attempts to answer the following research questions:

1. What is the relationship between business process reengineering and organizational performance of service firms?
2. Does learning capabilities moderate the relationship between business process reengineering factors and performance?

1.4 Research Objectives:

The study was being guided by the following objectives:

1. To investigate relationship between BPR and organizational performance in Sudanese services firms
2. To examine the relationship between BPR and organizational performance. in Sudanese services firms.
3. Develop a conceptual framework linking BPR to organizational performance in Sudanese services firms.
4. To determine the potential moderating role of learning capabilities in relationship between BPR and organizational performance in Sudanese services firms.
5. Characterize and distinguish measures of efficiency, flexibility and learning capabilities in order, to measure and assessment organizational performance

6. To determine the extent of application level of BPR in Sudanese service firms.
7. Add and contribute in academic field by attempt to study and analysis the modern management methodology such as the business process reengineering.
8. Empirically test the conceptual framework based on data collected from a Sudanese services firms.
9. Suggest managerial recommendations.
10. Develop conclusions and recommendations for future studies and researches.

1.5 The Scope of the Study

This study focuses on large Sudanese services firms. The choice of the large services firms based on many logical reasons; firstly, this sector has a major impact on Sudan economy. Further, foreign competitions enforced the Sudanese services firm to adopting and sponsor new change strategies such as BPR to enhance organizational performance (efficiency, effectiveness and flexibility).

On other hand one of the main of success factors to stay in the market by adopting new strategies to enhance the services quality, at end of twenty century a lot of studies and researches presented various of management initiatives to improve the organization performance include total quality management customers care and BPR.

The consequences of liberalization and globalization challenges in international financial service industry in general (Wei & Nair, 2006), and Sudanese context particularly are becoming a driving force to the services firms to research to management solutions through radical changes strategies such as business process reengineering. Secondly the uniqueness of Sudanese services firms embarks to adopt and execute new management programs such as BPR. Central bank of Sudan calling the financial firms to adopting and develop new management strategies to improve and enhance the overall performance. Thirdly, based on successful international attempts of business process reengineering program applied in services firms and it need to strong abilities and adequate finance available in services sector.

1.6 Research Significant:

Current research derives its significant in general, it potential make significant theoretical and practical contributions. The following two sub-sections present some of the possible contribution expected out of the current research endeavor.

The research derives its significant in general of the importance of the use of

1.6.1 Theoretical contributions:

The theoretical contribution of this study can be considered in terms of the Following areas of knowledge:

- The study will identify the extent of BPR in Sudanese large services firms. The study can add interest knowledge in Sudan context and

provide a base for future researches. The knowledge can also contribute to the resource-based view literature by showing the importance of resources to create sustainable competitive advantage.

- Current study will examine the relationship between BPR and organizational performance by adopt three dimensions of OP; effectiveness, efficiency and flexibility.
- This study will clarify the role of learning capabilities on relationship between business process reengineering and organizational performance. This can contribute to knowledge about how resources and capabilities are developed inside the firm in interaction with external effect.
- This research emphasizes and reinforces the significant of change through process re-engineering in order to raise organizational performance through high quality, high speed and low cost.
- Increase and improving the knowledge of the importance of process change through re-engineering and its effect on organizational performance.
- This research, clarify and emphasizes the significant of studding the modern management methodology try to localize and customize in Sudan context.

1.6.2 **Practical contributions**:

Many practical contributions are expected to emerge from this research. These practical contributions are as follows:

- This study will attempt to provide an operational framework for the relationship of BPR, organizational performance, and moderating effects of learning capabilities in services firm's works in Sudan context. This frame work can help as a practical guide for firm managers as well as planning experts and process designers by enhancing and extending their understanding of concept business process reengineering to successful applying in their firm to achieve optimal performance.
- Current study will provide great interest information as input to government policy makers, who responsible for business development, to encourage the Sudanese service firm's to adopt and customize implementing the business process reengineering to improve their performance.
- Present study is significant to the management Sudanese services firms by providing information regarding the effect of business process re-engineering on organizational performance. The finding of this study is important to the management other parastatals.
- Current study provide empirical evidence based on large samples and validated measurement model explains the relationship between the BPR and organizational performance.

1.7 Operational Definition of Key Terms

Operational definitions of key terms are detailed in table 1.1 following:

Table 1.1: Operational definition of key terms

Domain	*Constructs*	*Definition/ Description*	*Sources*
Business Process Reengineering		the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed	Hammer & Champy, (1993); Nzewi, 2015)
	Organizational Change	restructuring and redesigning the organizational activities in order to keep abreast with challenges for meeting with customers need	Al-Mashari and Zairi, (1999)
	Information Technology Infrastructure	The degree of the expenditure in organization to develop it infrastructure such as it training, consultant, computer, software, and physical infrastructure of it in an organization	Md Sin & Razalli (2015); Bhatt, (2000)
	Change Management Systems and Culture	Change management, which involves all human- and social-related changes and cultural adjustment techniques needed by management to facilitate the insertion of newly-designed processes and structures into working practice and to deal effectively with resistance.	Al-Mashari And Zairi, (1999)
	BPR Project management	Aligning BPR strategy corporate strategy, Effective planning and use of project management techniques, Setting performance goals measures, Adequate resource, Disciplined approach in BPR, External orientation of methodology, Effective use of consultants, Abuilding a BPR visitation, Effective process redesign, Integrating BPR with other improvement approaches, Adequate Identification of BPR Values	
	Management Competence	The most noticeable managerial practices that directly influence the success of business process reengineering implementation are top management support and commitment, championship and sponsorship, and effective management of risks.	Al-Mashari Zairi, (1999)
Organizational Performance		Organizational performance is a result of the effectiveness and efficiency of the actions that an organization undertakes.	Venkatraman & Ramanujam, 1986); (Neely, Gregory & Platts 1995).
	Efficiency	Efficiency refers to how economically the organization's resources are utilized by an activity such as a business process that produces a given	Venkatraman & Ramanujam, 1986);

		output or that delivers a given service.	(Neely, Gregory & Platts 1995).
	Effectiveness	The abilities of organization to achieve the organizations objectives and goals.	Venkatraman & Ramanujam, 1986); (Melville Et Al. 2004).
	Flexibility	The abilities of organization to response to environment change and extent to which services match consumer satisfaction	Venkatraman & Ramanujam, 1986); (Melville et al. 2004).
Learning Capabilities		The abilities of organizations to promote, continuously develop and sustain abilities to learn and create new actionable knowledge	Ingelgard et. al. (2002); Revilla, (2006)
	Stock of Knowledge	Is refers to all that is already known or needs to be known, which includes knowledge as something that individuals, groups or Organizations have (knowledge as possession) and do (knowledge as practice).	Revilla, (2006)
	Learning Flows	learning flows capture the enacting processes of interplay between knowledge and knowing so that new knowledge and new ways of knowing emerge	Revilla, (2006)

Source: prepared by the researcher (2016)

1.8 Organization of the Study:

The research consists of six chapters, namely :

Chapter One: including; the introduction, BPR in service firms, statement of the problem, research questions, research objectives, scope of research, research significant terms, operationalization definition of key terms and last one limitations of the research,

Chapter Two: literature review of research including the following parts; part one including the concept of BPR and its effects on organizational performance. The BPR definition, BPR critical success factors, significant of BPR application, BPR dimensions. Part two, organizational performance; concept and theories of performance and organizational performance measurements. Part three covering focusing on the relationship between BPR and organizational performance through the theory of resources base view (RBV). Part four; focusing on learning capabilities; concept, dimensions. Part five the moderating role of learning capabilities in relationship between the BPR and organizational performance. In sum, reviewing and criticizing the related

literature on research main concepts aims to identify and build research theory link relevant concepts of business process reengineering factors and organizational performance through the learning capabilities

Chapter Three: theoretical framework and research, covering; introductions theoretical base of the study, theoretical framework of the study, hypotheses development, control variables and summery and conclusion hypotheses.

Chapter Four: research methodology including; introduction, general research design, services sector in Sudan, population and sample, respondents selection criteria, measurement of variables, learning capabilities, questionnaire design, pilot study and instrument, survey administration, statistical analysis techniques descriptive statistics, factor analysis, reliability analysis, tests of differences correlation, multiple regression, hierarchical regression analysis and summary of the chapter.

Chapter Five: data analysis and interpretation; consist of introduction, response rate, profiles of sample firms, respondents' characteristics, bias test for goodness of measures, factor analysis, modification of research framework, and hypotheses, descriptive analysis, correlation analysis, hypotheses testing Summary of the Chapter.

Chapter Six: Provides a summary of research including contributions, limitations and implications, introduction, recapitulation of the study findings discussion, contributions of the study, limitations to the study, and directions for future research, summary and conclusion.

1.9 Summary of chapter

This chapter has argued that BPR is one of hot topics management programs used to achieve high performance of firms, globally service firms are increasingly adopted business process reengineering as an important reform tool. Several

countries are currently adopting and implementing BPR to modernize their services, apply electronic government program and improve performance. The next chapter presents a literature review regarding business process reengineering, organizational performance and learning capabilities.

CHAPTER TWO

Literature Review

2.0 Introduction

In this chapter, the researcher focused on the review of related literature on BPR, organizational performance and learning capabilities, the review is conducted under the objectives of the study and focuses mainly on six sections which are , introduction, concept and background of business process reengineering in section one, organizational performance in section two, section three will discuss the concept of learning capabilities, section four the relation between business process reengineering and organizational performance, in section five learning capabilities moderating variables, summary in section six.

2.1 Concept of BPR

2.1.1 Definitions of BPR

Business processes have been a focus of the information technology (IT) sector since the 1960s, as IT has frequently been utilized automate processes (Davenport 2008). In spite of the improvement and arrangement of advanced information systems and IT infrastructures to automate business processes, expected advantages have not been achieved, because of what has largely been the simple automation of non-value adding and flawed processes (Davenport and

Short 1990; Hammer 1990). This case called for an improved business process management approach, with one response being the rise of BPR, a process-based innovation (Davenport and Short 1990; Hammer 1990).

The concept of BPR was first introduced in 1990 by Hammer's (1990) article 'Reengineering Work: Don't Automate, Obliterate'. At that time, BPR was taken as process-based innovation to result in dramatic improvement in performance through the radical redesign of the underlying business processes of organizations (Hammer 1990; Davenport and Short 1990). Business Process Reengineering is a management strategy, developed at the beginning of the 1990s, focusing on the analysis and design of workflows and processes within an organization. Business Process Reengineering aimed to help organizations fundamentally rethink how they do their work in order to dramatically improve customer service, cut operational costs, and become world-class competitors. (USA, business process reengineering Assessment Guide, 1997).

The first publications of the fundamental concepts of business process reengineering by Hammer 1990 and Davenport and Short 1990 (Al-Mashari and Zairi, 1999). Hammer's claim was simple: Most of the work being done does not add any value for customers, and this work should be removed, not accelerated through automation. Instead, organizations should reconsider their processes in order to maximize customer value, while minimizing the consumption of resources required for delivering their product or service. A similar idea was advocated by

Thomas H. Davenport and J. Short in 1990, at that time a member of the Ernst & Young research center, in a paper published in the Sloan Management Review.

In the mid-1990s, as many as 60% of the Fortune 500 organizations claimed to either have initiated reengineering efforts, or to have plans to do so(Walter Hamscher,1994). Business Process Reengineering seeks to help organizations radically restructure their organizations by focusing on the ground-up design of their business processes. According to Davenport (1990) a business process is a set of logically related tasks performed to achieve a defined business outcome. Re-engineering emphasized a holistic focus on business objectives and how processes related to them, encouraging full-scale recreation of processes rather than iterative optimization of BPR processes.

The BPR is also known as business process redesign, business transformation, or business process change management. The term, "reengineering" is tightly interlinked with the need for the organization to be remade inventive, namely a new business model to achieve the re-inventiveness of the organization (Champy, 199).

In early 1990's many top executive's managers feared that their organizations would be overtaken by more efficient foreign competition or local startups. It's becoming an absolute requirement for organizations in almost every business to either rethink or die (Harris, 1999).

BPR was originally conceived as a way for large, established organizations to reorganize themselves around their customers' needs, and in doing so become more efficient and improve quality. The key to BPR is the "radical redesign of business processes for dramatic improvement" (Harris, 1999). Having, the world has continue changed and business organizations started to face many a renewed variable, therefore, one cannot imagine economic cycles as before (recession followed by flourishing, then and again where and so on). This may obviously appear on the fact that the environment in which we live today there is no fixed position or predictable and easily due to a dynamic markets or adjustments in customers' requests or technological changes or even the nature of the competition. Hamer and Champy in 1993 attributes the change made by business organizations rewards the new trends of business process reengineering, to their main forces, the 3'C' ; these three forces begin all the letter (C) in English, a Customer, Competition and Change.

Numbers of services firms have embarked on implementation of this new management strategy that will ensure quality customer service, speedy delivery of services, cost containment that will make them achieve competitive advantage and enhance profitability. (Kabiru Jinjiri Ringim and et al.,2011).

Table 2.1: Definitions of BPR

Author (s), (Year)	Definition
Hammer et al. (1995)	Is defined by Hammer as "the fundamental rethinking and radical design of business process to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, and service and speed.
Lowenthal, (1994)	Is radical rethinking and design operations an organizational structure and focusing on the cor competencies of the organization to achieve dramati improvements in organizational performance
Heygate, (1993)	Is " redesign of the basic processes
Davenport, (1993)	Is "encompasses the envisioning of new work strategie the actual process design activity, and th implementation of the change in all its comple technological, human, and organizational dimensions".
Nzewi (2015)	is the main way in which organizations become mor functional by identifying the critical business processe analyzing these processes and redesigning them fo efficient improvement and benefit.

Source: prepared by the researcher (2016)

With refer to table (2.1) and comparing the conceptual elements underpinning these definitions, it is possible to find points of convergence and disconvergence. These conceptual similarities can be summed up in the following points:

- **Rethinking:** This is a process that it is itself utterly dependent on creativity, inspiration and old fashion luck. Drucker (1993) argues that this paradox is apparent only not real most of what happens in successful innovations is not the happy occurrences of a blinding flash of insight but rather, the careful implementation of spectacular but systematic management discipline.

- **Radical**:

Business process reengineering can succeed with an evolutionary implementation plan, but the design effort must be radical. In some cases, this emphasis on radical change has been linked to failure. Because people interpret the word ‘‘radical’’ in

different ways, it is important that managers clearly communicate the level of desired Change.

- **Dramatic**:

BPR is clearly not for organizations who want a 10% improvement. It is also for those who embark to business development . Through successful business process reengineering projects, dramatic improvement will be achieved. Despite the failures of many enterprises to achieve all business process reengineering objectives in reengineering projects, organizational improvements in terms of cost reduction, productivity, sales, quality, customer service, customer satisfaction and speed are evident. As a result, business process reengineering became one of the most popular management technique in business organizations especially the banking industry (Tangand Zairi, 1998; Wilkinson et al., 1995).

- **Processes**: are the central part in reengineering philosophy and it relates to process-design. Process implies the combinations of people, machines, tools, techniques and material in a systematic series of steps and activities (Goran & Jovanić, 2010). According to Hammer 1999, a process is everything that transpires from the beginning – the point at which a customer or constituent requires something – to the point that a customer is satisfied with the results, or it is a series of inter-related administrative activities that transforms process inputs to outputs. Like, meet the demands of clients. The same process consist of various activities, as in the process customer requests, contain many of a series activities like :

review customer account, product processing, shipping, financial claims, etc.(R. L. Manganelli, M. Klein,1994).

Since first half of 1990s, many authors have produced ideas regarding what business process reengineering really? is their views and beliefs corresponded with the definition of Hammer and Champy (1993). Likewise, Lowenthal, (1994) define BPR is “Radical rethinking and design operations and organizational structure and focusing on the core competencies of the organization to achieve dramatic improvements in organizational performance ". While Heygate, (1993) define it is "redesign of the basic processes ". Similar definition by Tinnila , (1995) BPR is: “strategic, operational and organizational perspectives “. In details definition by Davenport, (1993) state BPR is "encompasses the envisioning of new work strategies, the actual process design activity, and the implementation of the change in all its complex technological, human, and organizational dimensions".

There are numbers of BPR definitions adopted by many researchers and practitioners, but the primary focus of most of those definitions and related literature focused on the redesign of processes using the framework and approach to information technology for organizational change events. This naturally raises the importance of information technology as one of the main contents of the re-engineering processes that distinguishes it from other changes programs, focusing re-engineering processes have a material effect on customers, and administrative processes rather than functions, services or products. Many of researchers and

scholars argued that BPR is different from other management change strategies and approaches which utilize to improve the organizational performance such as continuous improvement strategy total quality management (Manganelli, 2003).

Table 2.2: BPR and Management Change Strategies

	Reengineering	**Rightsizing**	**Restructuring**	**T.Q.M**	**Automation**
research Hypotheses	All things	Number of Workers	Relations among management levels	Customer requirements	**Technical applications**
Chang scope	Administrative process	Functions, Workers	Organizational Structure	Beginning from the base	**systems**
Focus	Administrative process	Functional departments	Functional departments	Functional departments	**Procedures**
Change Objectives	Supernatural and fast	Cumulative and progressive	Cumulative and progressive	Cumulative and progressive	**Cumulative and progressive**

Source: Raymond L. Manganelli, Mark KleinThe; Reengineering Handbook, (2003)

2.1.2 The Significant of Implementation BPR

The labor division model designed in the nineteenth century simply do not work as organizations enter the twenty-first century. In (1995) Hammer and Champy, present concepts of redesigning business processes and propose to move the organization from a narrow mesh of task-oriented jobs to one comprised of multi-dimensional jobs where workers are expected to think, take responsibility, and act accordingly .

The significance of implementation of reengineering and its importance in acceleration of the technological development of the organization, a state and the

society itself, improvement of working conditions, costs reducing, profit increase, resulting in facilitating keeping a position in the market (Goran Jovanić,2010).

Most organizations are function or department-oriented, and not process-oriented. Often, many people are involved in order fulfillment, but nobody tracks a product and reports the status of an order directly. Reengineering makes one individual responsible for the complete business process (Self, 1995).

There are several factors accelerate to introduce and a adopting BPR as change strategy in business firms to re-engineer their business processes:

- to re-invent work methods to satisfy customers,
- to be consistently competitive,
- cure systemic process and behavioral problems,
- enhance capability to expand in other industries,
- to accommodate an era of change,
- to satisfy their customers, employees, and other stakeholders who want them to be dramatically different and/or to produce different results,
- to survive and be successful in the long term ,
- To invent the "rules of the game" (Hammer &Champy,1995).

Under the pressure of a new economy complex changes, that service firms must be adjusted to a new situation where there is no more space for big series , that continued to change the market situation in developing countries as a result of globalization require financial institutions to be proactive by looking beyond the

local competition . New product development and innovative service delivery became the focus of organization through implementation of Business process reengineering. The business process reengineering is radical in nature, as new way of doing thing evolved by abandoning the old fashion to achieve remarkable performance improvement (Kabiru Jinjiri Ringim, 2011).

2.1.3 **Success Implementations of BPR**

In spite of (50-70 percent) of enterprises in the U.S.A implementing business process reengineering will fail to achieve all business process reengineering objectives (Hammer and Champy, 1993).

Most enterprises will achieve a large portion of these objectives. (Raymond and Bergeron, 1998). Further research indicated by Sock lingam and Doswell (1996) found that success rates of business process reengineering implementation are (72 percent) in north of America and (77 percent) across Europe. In recent studies by Al-Mashari et al. (2001), the overall average of success in implementing business process reengineering was (55 percent), the USA having achieved a (61 percent) success rate and Europe a 49 percent. However, it is dangerous to generalize these success rates because these evaluations are very subjective and cross-national differences may exist.

Table 2.2 revealed a list of successful organizations (from different countries) achieved as a result of business process reengineering initiatives.

In order to ensure successful and fully business process reengineering, it must be implemented appropriately. Without proper implementation, enterprises may find difficulties in reaping the benefits of business process reengineering. “The mixture of results makes the issue of business process reengineering implementation very important". (Al-Mashari and Zairi, 1999, p. 87). M. Al-Mashari and M Zairi, (1999) were explained the BPR has great potential for increasing productivity through reduced process time and cost, improved quality, greater customer satisfaction, but it often requires a fundamental organizational change .

Embarking on business process reengineering is no easy task. According to Champy (1995) business process reengineering is a painful process because the whole set of values and beliefs in the enterprise are being challenged. As a result, the implementation process is complex, and needs to be checked against several success/failure factors to ensure successful Implementation, as well as to avoid implementation pitfalls. It requires a lot of foresight and planning, but Hammer and Stanton are convinced that organizations who successfully implement business process reengineering will reap the rewards, which include lower costs, higher quality products and services, increased customer satisfaction and loyalty, and greater market share.

Stanton and Hammer provide some insights for how to implement business process reengineering more smoothly and with less pain. In addition, Synthesis of

the research that has been conducted in identifying best implementation of business process reengineering, six themes have emerged: strategy, management commitment, information technology, customer focus, continuous improvement, and performance outcomes. The impact of each factor is discussed in the following section.

According to Central Bank of Sudan (CBOS) annuals reports in 2015, the Sudanese services firms has great contribute in Sudan (GDP) about 48% in 2014. The Sudanese service firms has face great challenges such as open financial markets, foreign competition, technical progress, customer service and etc.., implementation the business process reengineering in Sudanese services firms context will assistant these firms to survive and improve. In addition, based on global attempts were conducted in developed and developing countries confirmed the BPR is an effective way to gain a competitive advantage and high organizational performance. Therefore, this study will adopt BPR with in the five dimensions: change of management system and culture, management competence, organizational change, top management commit, and information technology infrastructure. The critical success factors are considered as interdependent variables.

Table 2.3: The Successful Implementation of BPR

Company/Respondents	Country	Rate of success (percent) in specific areas (e.g. productivity, cost reduction, quality etc.)Author/s	Author
IBM Credit	USA	90 percent reduction in cycle time	Hammer and Champy (1993)
Taco Bell	USA	22 two percent sales growth 31 percent profit growth	Hammer and Champy (1993)
Hewlett-Packard	USA	150 percent improvement in on-time deliveries	Davenport and Short (1990), Hammer (1990)
48 Senior Managers	USA& CANADA	24 percent cost reduction	Drew (1994
79 Companies from Various UK Industries	UK	60 percent or more improvement over the initial way of working	Jarrar and Aspinwall (1999a)
Aptech	INDIA	38 percent increase in turnover 64 percent increase in post-tax profit	Businessline (1999a)
Infosys	INDIA	61 percent increase in revenue	Businessl ine (1999a)
Housing Development Board	SINGAPORE	Average of 87 percent improvement in customer service Average of 34 percent improvement in general administration	Thong et al. (2000)

Source: Khong(2003)

2.1.4 Critical Success Factors of BPR

- Change management systems and culture

Change management can be referred as process for restructuring and redesigning the organizational activities in order to keep abreast with challenges for meeting with customer's needs. Changes in organization are being managed by the leader or manager of the organization by incorporating the employees into the process to achieve a positive goal.

Radical changes in organization are being achieved through effective communication, involvement of employees, reward and motivation, socio-cultural adjustment need to overcome resistance and facilitate the acceptance of the desired procedures or policy the factor that relates to change management in organization includes :Reward and Recognition in form of motivation: this refers to the extent of the organization to motivate its employees through various means in form of hygienic or motivating factors. The hygienic factors include inducement by increasing salary, bonuses, and etc.

The motivating factors encompasses job enlargement, job enrichment, job rotation, promotion, offering higher responsibility, acknowledgement of higher performance achievement of employee etc. The organization reward system should be revised as part of motivation process for the business process reengineering effort, effective motivation package for an organization has to be widely spread and give equal chances and opportunities for all employees job

enlargement through introduction of new job titles can be considered as an example of motivation and encouragement of people to endorse the reengineering program without fear, effective communication: can be defined as the extent to organization to keep their employees up-to-date with related changes in policies and procedures regularly. Effective communication in organization clear rumor mongering and filters noises any developmental changes in policies or process that may affect them either positively or negatively in order to achieve desired goals.

Communication should be open, honest and clear especially when discussing sensitive issues related to change such as personnel reductions and then

organizational culture: Is defined as the extent to which organizational norms and values become acceptable to the employees. Effective organizational culture exhibit professionalism of its employees to work as a team for achievement of desired objectives. As business process reengineering encourages integration, teamwork, cooperation, coordination and empowerment of employees in the reengineered work environment. However, trust and honesty among team members is also needed, and within the organization as a whole.

- BPR project teams

BPR teams one of essential factors of successful BPR implementation. BPR teams should be adequately composed, Team members should be experienced in variety of techniques, and teams should be made up of people from both inside and outside the organization (Hammer and Champy, 1993, Almashari and zairi, 1999).

In same manner, Khong,(2003) suggested BPR teams plays important roles in applying and implementing BPR program such as explores the potential challenges and risks associated with implementing the BPR project, besides suggests the solutions to overcome these challenges. These risks and challenges involve downsize the employment, efficiency, productivity, customer satisfaction, sales, profitability, employee turnover and absenteeism, quality awareness, employee morale and teamwork, organizational structure and culture, improved communication, processes, information technology.

- Information Technology Infrastructure

Information technology infrastructure is one of the most important factors in successful applying business process reengineering program (Hammer and Champy, 1993; Khong, 2003).

Many of authors and scholars argued that Information Technology Infrastructure capabilities as measure the organization information technology infrastructure alignment with business process reengineering strategy, organization's expenditures incurred on information technology infrastructure, personnel training, information System maintenance, hardware's and software.

A predominant theme in all business process reengineering literature has been the importance of using information technology as an enabler and a tool to build new processes. Information Technology is the automation of processes, controls, and information production using computers, telecommunications, software and

ancillary equipment such as automated teller machine and debit cards (Khalifa , 2000). Information technology infrastructure is important to Sudanese banks because it can improve customer service and help keep up with the competition.

A high level of information technology experience enables the smooth implementation of the organization's strategy, develops reliable and cost effective systems for the organization, and anticipates customer needs. (Bhatt & Grover, 2005) It is a term that generally covers the harnessing of electronic technology for the information needs of a business at all levels.

There are lists of some services that have been revolutionized through the use of Information Communication Technology as including account opening, customer account mandate, and transaction processing and recording. Information and Communication Technology has provided self-service facilities (automated customer service machines) from where prospective customers can complete their account opening documents direct online. It assists customers to validate their account numbers and receive instruction on when and how to receive their cheque books, credit and debit cards. Communication Technology deals with the Physical devices and software that link various computer hardware components and transfer data from one physical location to another.

- Organizational Change

Organizational change plays a key role in the application of Reengineering. We note here that Reengineering does not mean the reorganization

and reduction or expand regulation horizontally, although it may result in a horizontal expansion. The problem does not lie in the organizational structure, but in the flow of operations and trends shift that needs to be a new administrative organization, and the formulation of new policies and procedures and the nature of the work, and the promise of the powers and responsibilities and Communications (Rifai, 2006).

Star, (2002) was suggested, BPR will lead to organizational transformation, such as change the business management manner from functional based (hierarchy level) to process based (team work), that implies shift from the principle of specialization and division of labor in the regulations traditional to integrate several functions are similar in one job, and merge operations horizontally and vertically so assigned to one side and work is performed in the place most suitable and not necessarily the Specialists.

Change jobs and simple tasks to work vehicle be the responsibility of the team that needs to be multi-skilled, and have the team manager of the process and represents the unified communications team (Al-Harthy, 2007). Convert the organizational structure of the hierarchy to horizontal, where is canceled hierarchical levels and the use of the organization flat, who works on the survival of the organizational structure constant, and achieve new organization more powers and development of means of communication, and flexible organizational transformation (Alghamdi, 2011).

- Management Competence

Sound management processes guarantee that business process reengineering program will be executed in the best way (Al-Mashari and Zairi, 1999). The most discernible managerial practices that directly affect the success of business process reengineering implementation are top management support and commitment, championship and sponsorship, and effective management of risks. Table 2.3 revealed numbers of BPR definitions and its factors.

Table 2.3: Critical Success Factors of BPR

Ref.	BPR Factors
Yasin Ozcelik , 2013	Business Process Reengineering Project Management. Information Technology. Finance Resource.
Kabiru Jinjiri Ringim And Et Al.2011	Change Management, Business Process Reengineering Project Management, Top Management Commitment, Customer Focus, Effective Process Redesign, It Infrastructure, Adequate Financial Resources, Less Bureaucratic Structure And It Capability To Be Important Factors For Business Process Reengineering.
O. K. Omar, Et Al ,2011	Information Systems. Business Process Reengineering. Project Management.
Debela And Hagos ,2011	Information Technology And Communication Strategy Plan Human Resource: System Consultants Employees
Gawi,2007	
Al-Mashari And Zairi (1999)	(1)Change Management System And Culture, (2) Management Competence, (3) Organizational Structure, (4) Business Process Reengineering Project Management, And (5) IT Infrastructure.
Kok Wei Khong,2003	(1)Change Management System And Culture, (2) Management Competence, (3) Organizational Structure, (4) Business Process Reengineering Project Management, And (5) It Infrastructure.
Niell And Sohal,1999	IT Structure Change Management

Source: prepared by the researcher (2016)

2.2 Concept of the Organizational Performance

2.2.1 Definition of Organizational Performance

A variety of definitions exist concerning organizational performance: Organizational performance is a result of the effectiveness and efficiency of the actions that an organization undertakes (Neely, 1999). Slater & Narver (1995) mentioned that performance is reflects an organization's understanding and knowledge regarding customer needs and expectations. Organizational performance could be linked with market orientation, organization learning, human resource productivity, quality improvement or any other component (Banker & Sinkula, 1999; Ahamd, 2010).

Accroding to Razalli, study (2008) found that hotel performance could be improved through adopting managers' competence and customized (flexibility) service design for select clientele in the service sector. Carmeli and Tishler (2004) were suggested the managerial capabilities, human capital, perceived organizational reputation and organizational culture have a positive effect on organization service performance. On other hand Bryson, et al (2007) demonstrated the relevance of identification and effective utilization of competencies in strategy formulation and implementation for better organizational success. Based on their observations, Bryson, et al (2007) again mentioned the indicated importance of identification, exploitation, development, sustenance and protection of organizational competencies for better organizational effectiveness.

Other than the above empirical studies, Hansen (2007) also indicated the relevance of the RBV approach for organizations because of its focus on efficiency; that is, on using the internal resources of an organization most efficiently to effectively fulfill the organization's stated mission and goals. In addition, the business organization can maximize their customer satisfaction for better profitability, increased sales volume, which ultimately improves overall performance benefit. Assessment of firm performance is essential for organizations managers, regulators and customers. A research conducted by Ray, Barney and Muhanna recommend that organizational performance be measured at both the process and overall organizational level. That indicates to the organizational performance is a highly aggregated concept that collects the performance of the various business processes contributing to overall organizational performance. The performance of organizations could be assessed by resource-based view, as explored by a number of researchers (Wernerfelt, 1984).

In addition, Efficiency and effectiveness are the central terms used in assessing and measuring the performance of organizations (Mouzas, 2006). According to Venkatraman (1989) content that the organizational effectiveness and efficiency can be measured using both financial and non-financial indicators. Financial performance indicators include profit, rate of return and costs. Non-financial performance indicators are customer satisfaction, market share, learning

and innovation, new service/product introduction, product/service quality, flexibility, and service/product delivery.

The conclusion which emerge from the above discussion reveals there are some great arguments about organizational performance conceptualization and measurements. Overall, organizational performance is also determined according to the effectiveness of attaining strategic objectives and goals, profit, rate of return and cost. Almost studies used the effectiveness and efficiency to measures the organizational performance. Effectiveness refers to the achieved outcomes in relation to strategic objectives or goals and customer requirements.

The efficiency refers to how economically the organization's resources are utilized by an activity such as a business process that produces a given output or that delivers a given service. That is, effectiveness with a primary focus on external operations, and efficiency with a primary focus on internal operations and processes. Organizational effectiveness and efficiency can be measured using both financial and non-financial indicators (Venkatraman and Ramanujam, 1986).

There are number of studies used non-financial measures to evaluate the effectiveness and performance of organization (Venkatraman & Ramanujam, 1986) and argued that appropriate performance measures depend on the organizations and their objectives such as profitability, market share and cost reduction. In today's global dynamic and competitive environment, firms could improve and diversify their products and services to meet changing customers' demands and enhance their performance for successful survival.

In addition, various studies have shown that no single criterion can be used meaningfully in evaluating the performance of a organization. It is common for organizations to use a mixture of measures, financial and nonfinancial to evaluate performance (Doupnik & Perera, 2009).

concluded, organizational performance is assessed by the application of financial or both financial and non-financial measures. That lead the firms must decide whether to use financial criteria, nonfinancial criteria, or some combination of the two to measure and evaluate performance (Doupnik & Perera, 2009). Consist with almost of researches which had been take financial and nonfinancial present study adopted the efficiency, effectiveness and flexibility to measures the overall performance.

2.2.2 Financial Performance Measures

Financial performance is generally defined as the use of outcome-based financial indicators that are assumed to reflect the fulfillment of the economic goals of the firm (Qi, 2010). Financial measures based on accounting data (Doupnik & Perera, 2009). Financial statement data are compared within a firm, industry averages and with other firms (Weygandt, Kimmel & Kieso, 2012).

Financial performance indicators include profit margins, and revenue, sales growth, cost reduction and return on investment (Doupnik & Perera, 2009). Financial indicators, such as return on investment (ROI), earnings per stock (EPS) and return on equity (ROE) are used by the number of organizations to measure their progress. Rashid et al., (2003) measured firm's financial performance using

the financial indicators, such as return on assets, return on investments and current ratios. Financial ratios reflect the financial performance of the organization by an examination of financial statements, as indicated by profitability, liquidity, leverage, asset utilization and growth ratios (Ho & Wu, 2006). Analyzing financial statements involves evaluating three characteristics: an organization's liquidity, profitability, and solvency (Weygandt, Kimmel & Kieso, 2012).

Earnings are the summary measure of firm performance produced under the accrual basis of accounting. Earnings are important since they are used as a summary measure of firm performance by a wide range of users (Dechow, 1994). The success of a firm depends ultimately, on its ability to generate cash receipts in excess of disbursements. Therefore, one performance measure that could be used is net cash receipts (realized cash flows) (Dechow, 1994).

The profitability ratios measure the operating success of the organization for a given period. Financial analysts frequently use profitability as the ultimate test of management's operating effectiveness (Weygandt, Kimmel & Kieso, 2012). Profitability analysis focuses on the ability of a organization to earn profits.

Liquidity ratios measure the short-term ability of the organization to pay its maturing obligations and to meet unexpected needs for cash. Short-term creditors such as financial funds and suppliers are particularly interested in assessing liquidity (Weygandt, Kimmel & Kieso, 2012). Solvency ratios measure the ability of an organization to survive over a long period of time (Weygandt, kimmel & Kieso, 2012).

2.2.3 Non-financial Performance Measures

Nonfinancial measures are those measures of performance that are based on information not obtained directly from financial statements (Doupnik & Perera, 2009). Important nonfinancial measures include market share, customer and employee satisfactions, product and process innovation, on-time performance, product reliability, customer response time, personnel development, employee morale, and productivity and product quality (Choi & Meek, 2011).

Non-financial performance indicators are customer satisfaction, market share, learning and innovation, new service/product introduction, product/service quality, flexibility, responsiveness and service/product delivery (Venkatraman and Ramanujam, 1986). Earlier researches suggested that market share is important, followed by productivity improvement, quality control, and employee development and safety (Choi & Meek, 2011).

The nonfinancial measures are better predictor of a firm's sustainable performance and they help managers monitor and assess their firm's progress towards strategic goals and objectives (Hussain & Hoque, 2002). A research conducted by (Kung & Yan, 2010) assessed the supplier’s performance evaluation criteria. The criteria of innovation ware the first ranking; quality, the second; efficiency, the third; customer responsiveness, the fourth; and integration capability, the fifth.

2.4 **Dimensions of Organizational Performance**

Table 2.4: Dimensions of Organizational Performance

source	dimensions
Ozcelik , (2013)	Labor productivity, return on assets, return on equity.
Hamann and et al	Accounting returns, growth, and stock market performance.
Kassahun, (2012)	efficiency, transparency, good governance , accountability e-Government
Hajer & Yusof , (2012)	Productivity, Ease of use Quality management
Ringim, (2011)	Increasing revenue, Reducing operating cost, Zero Error Operational Processes, Customer Service Management
Khalil (2008)	Reducing operating cost, Increasing revenue
Khong, (2012)	Business Process Reengineering improves organizational performance in terms of: Cost, quality, customer service, speed, process efficiency, effectiveness and Productivity.
Debela and Hagos, (2011)	Efficiency, effectiveness.
. Omar, et al , (2011)	cost, quality , service and speed
Digna, (2010)	job satisfaction, efficiency, effectiveness
Khalild, (2009)	cost reduction, return on funds investment
Venkatraman & Ramanujam (1986),(1989)	Organizational effectiveness and efficiency can be measured using both financial (profit, rate of return and costs) and non-financial indicators(customer satisfaction, market share, learning and innovation, new service/product introduction, product/service quality, flexibility, responsiveness and service/product delivery)

Source: prepared by the researcher (2016)

Therefore, the organizational performance is a highly aggregated concept that camouflages the performance of the various business processes contributing to overall organizational performance. According to Ray, Barney and Muhanna (2004), were suggested that organizational performance be measured at both the process and overall organizational level.

2.4 BPR and Organizational Performance

Several empirical studies have been conducted to establish the associate between BPR factors and organizational performance (Ahmed et al., 2007; Abdolvand et al., 2008; Khong & Richardson, 2003).the table (4.5) show the international researches and studies were conducted on BPR and organizational performance. The findings of these studies indicated that most organizations that have undertaken BPR achieved numerous benefits, including cost savings through elimination of redundant activities and reducing duplication of work across functions, improved customer focus, better integration across the organization, quality, lead times, speed, flexibility, innovation and improve competitive advantage.

In analyzing quality, BPR enhances process quality by ensuring that the end product does not have any defects and therefore reduce wastage, and meets customer expectations. This study adopted the view which suggest the overall organizational performance is used to assess the impact of implementing business process reengineering, a great number of studies focusing on the process reengineering-performance relationship provide a positive evaluation of reengineering resulting in increased corporate performance (Kok Wei Khong and Stanley Richardson, 2003).

Furthermore, business process reengineering has a direct and immediate effect at the business process performance level (Davenport, 1993). Improvement

in quality of service, cycle time, costs and flexibility contributes to overall organizational performance. Literature review also indicated that higher degrees of business process orientation and higher performance at the business process level lead to higher overall organizational performance impact (Kohli and Hoadley 2006). In same manner, Hayder and Samaka, suggested in 2007. The best possible solution for shorter and more efficient processing path was achieved. Great savings in cost, time and human resources were achieved. These include the efficient reengineered process, efficient database design, search facilities, electronic document archive and easy-to-use user interface.

According to Chase, Aquilano & Jacob, (2004), BPR reduces cycle time by doing a good job of coordinating work across functions. Also BPR improves delivery speed, delivery reliability, and product development speed. For speed as a competitive dimension, Slack, Chambers & Johnston, (2007) report BPR improves delivering speed by shortening cycle time in serving a customer, minimizing delays in serving a customer, speed up communication, fastening decision making and shortening the period taken to deliver a service since its request and also develop new products very fast relative to the competition. BPR equips the organization with necessary tools to be flexible enough to respond to changes in business environment.

Flexibility refers to the ability to change the products volume, variety and nature (Chase et al., 2004). An organization that can change its product volume depending on demand or offer many other range of products and also be able to

customize the product to the customer specification will gain competitive advantage over its competitors who have lesser flexibility in these dimensions. Despite the numerous advantages of BPR, its implementation is perceived to be a difficult task and many unsuccessful experiences have been reported in the literature. According to Al-Mashari, Irani and Zairi (2001) 50-70 percent of BPR efforts fail to achieve its programmed results. Accordingly, to implement BPR successfully, reengineering factors should be identified and analyzed.

Business factors are areas which organization must accomplish to achieve a successful BPR implementation. On other hand, successful reengineering efforts lead to great business transformation such as new products, services, customer's services and improved information flows. In addition to dramatic increases in revenue and operating savings (Davidson, 1993).

Table 2.5: BPR and Organizational Performance

Auther(year)	Methodolgy	IVs	DVs	Main findings
yasin ozcelik , 2013	survey 220 of questioners for data set on large firms in the united states	business process reengineering project management information technology finance resource	performance measures: labor productivity , return on assets return on equity	firm performance increases after the business process reengineering projects are finalized.
asmare emerie kassahun, 2012	exploration + survey 240 of public organizations in ethiopia	business process reengineering resources implementation problems		potential failure risk of business process reengineering projects may increase beyond a certain level of .scope
muatamed abed hajer , zawiyah mohad yusof ,2012	survey of 170 small and medium enterprises (smes) in baghdad. iraq	self-confidence self-efficacy technical readiness	efficiency, transparency, good governance, accountability e-government	building a model integrating resources, competencies, business process reengineering depth implementation problem variables in the framework linking business process reengineering with public sector organization performance
o. k. omar, et al (2011)	supply chain management	information systems business process reengineering project management	productivity ease of use quality management	a proposal new business process reengineering model
j. tai(2011)		knowledge management and technology in bbr and its impact on	cost, quality, service and speed	the most effective ways to improve performance so that it combines several functions and jobs in the business units consistent use of information technology as well as to contribute to the improvement of methods of communication.

Source: prepared by the researcher (2016)**.**

2.4 The Concept of Learning Capabilities

Contemporary organizations require a strong learning capabilities to gain competitive advantage. Helfat & Peteraf, (2003) were suggested the capabilities are set of unique and composite skills and knowledge embedded in organizational processes. Therefore, the advancement of capabilities has been acknowledgement as one of the methods by which business firms can accomplish a competitive advantage (Vorhies & Marogan, 2005; Weerawardena, 2003).

Learning capabilities a key mechanism for adapting to changes in the business context, knowledge stock, sharing know-how and experiences, and for providing innovative solutions (Nonaka & Takeuchi, 1995). Based on RBV the learning capabilities is an extension of organizations intangible resources, to survive and develop in increasingly uncertain and changing markets. Learning capabilities are considered "intangible" resources because they are very difficult to imitate.

Such resources constitute a kind of "capital" for an organization which is a source of competitive advantage. Thus, the organizations are trying to use learning capabilities in order not only to get solutions for existing problems but also to improve their position and performance continuously in the face of changing conditions (Edmondson & Moingeon, 1998). Learning capabilities are important within all service industries in general, particularly if used through changing strategies. The resource-based view emphasizes the firm’s resources as the

essential factors of sustaining competitive advantage and enhancing the organizational performance.

Number of studies have defined the concept of learning capabilities; to cite for example, Fiol and Lyles, (1985) who expound it as "the process of improving actions through better knowledge and understanding". Learning is organizational to the extent that, first, it is done to achieve organizational purposes; second, it is shared or distributed among members of the organizations; and third, learning outcomes are embedded in the organizations' systems, structures, and culture (Snyder & Cummings, 1998).

Furthermore, Drucker (1988) believes that knowledge is the only reliable resource of competitive advantage. The concepts of the learning capabilities can be utilized to guide the organization to increase its capacity to withstand and exploit unexpected and rapid change (Stephen and Peter, 1995).

According to Snyder and Cummings (1998), change in organizations' abilities and continuous re-designing business processes are necessary for survival. As the capacity of change and re-engineering are associated with organizational learning, organizations have to be able to learn from past experiences, effectively use "lessons learnt", correct errors and disseminate this knowledge within the organization if they are to change and adapt themselves to the continuously changed market (Vakola, 200).

The organizations which have rare, valuable, and un-imitated resources have a great chance to achieve superior performance (Barrney, 1991). It is for this

reason the researcher believes that both ‘the availability of resources’ and ‘learning process’ are important to convert and refine a firm knowledge resource responded to set of environmental conditions for providing competitive advantage (Grant, 1996). Therefore, the effect of knowledge and leaning process on overall organizational performance is always acknowledged.

Being part of resource based view of firm, Knowledge- based view argues that heterogeneous knowledge bases among organizations and their abilities to create and apply this knowledge, make remarkable differences in organizational performance. In depth reviewing the literature on learning capabilities has provided some relevant insights. Furthermore the literature emerges there is no general consensus on how to define and operationalize the learning capabilities construct.

The study conducted by roger & et al., (2002) were defined the learning capabilities by four components; commitment to learning, shared vision, open-mindedness, and intra_organizational knowledge sharing.

Based on these arguments some researchers have put the concept of learning capabilities on level with knowledge management (Isabel and Revilla 2006), whereas other have described as ability of organization to promote, continuously develop and ability to learn and create new actionable knowledge. Isabel and Revilla (2006) were suggested the learning capabilities is multidimensional nature of constricts, but still difficult to reach to reliable measures for learning capabilities. Recently there are various views of thinking about learning

capabilities views, for example, Di Bella and Nevis (1998) classifies to three main view of learning concept:

First view, normative perspective for which learning capabilities conducted under special set of conditions;

Second view, for which learning present a late phase of organizational development;

Third view, which assumes that learning capabilities innate to all organizations and there is no one best way for all organization to learn.

The center point of the capabilities view is not on some future vision of becoming a learning organization, or in the characteristics to put in place to determine a learning capability. The attention is on exploring that as of already exists, and accordingly in understanding what is learning and how we learn.

In spite of numerous authors on learning capabilities have verifiably demonstrated the significance of learning capabilities, it is hard to locate an express meaning of the concept. There is partial agreement that learning capability is a multidimensional concept including knowledge processing for change and improvement (Jerez Go´mez et al., 2005).

Current study adopt a description of the organizational capability to learn can be made by means of two fundamental measurements of learning capabilities concept knowledge (what is learned) and its associated learning processes (how is learned). (Ingelgard and Roth, 2002). Knowledge is an established theoretical construct that has been proposed as heterogeneous resource

that firms value in different manifestations as a basis for competitive advantage (Amin & Cohendet, 2004).

On any case, the issue of creating competitive advantages in organizations is not only about the identification of knowledge as the basis for competitive advantage, but also about understanding how organizations can develop, hold, exchange and utilize that that knowledge (Argote and Ingram, 2000), which is the role of learning processes in organizations. There are interest argue according to Crossan et al., (1999) that all organizations has a stock of knowledge which needs to continually flow through learning processes to act as per the ecological prerequisites.

The stock of knowledge refers to all that is already known or should be known. Also the knowledge includes; individuals knowledge, groups knowledge and organizations knowledge (Crossan et al., 1999). Consequently 58 knowledge stocks involving 58 knowledge (perception) and knowing (work) (Cook and Brown, 1999) at the individual level, the gathering level, and the authoritative level. Learning flows is result of interaction of between knowledge and knowing so that new learning and better approaches for knowing develop (Cook and Brown, 1999).

The learning streams can be considered as knowledge streams that add to the aggregation of information. In addition, learning flows take knowledge stocks and result in new or adjusted information planned to comprehend the world and for making taking action accordingly (Sanchez, 2001). The continuous interaction

between knowledge stocks and learning flows within organizations is appear in the concepts of exploration and exploitation (Crossan et al., 1999).

2.5 **The Moderating Role of learning capabilities**

A number of researchers have emphasized the direct effect of learning capabilities on organizational performance. Marque & Simo, (2006) suggested that training employees to acquire process skills helps in improving organizational efficiency; this view supported by Azmawani,(2013) reported the knowledge application and knowledge protection interact with individual and group skills training to improve organizational efficiency. Added to that the knowledge acquisition, knowledge application and knowledge protection interact with process skills training to enhance organizational effectiveness and overall performance (Schein, 1976; Tzafrir, 2005). Roger & et al. (2002) a study found there is positive relationship between the learning capabilities and firm innovativeness, which in turn affects firm performance. These effect can be considering as direct effects.

On other hand, many of researches focusing on additional effect of the learning capabilities such as moderating effect in relations with performance. Lee1, & Kim (2015), a study founded that the learning capabilities has significant affected on relationship between the types of alliance and organizational performance.

In summary, the gaps in literature can be summarized as follows:

- BPR is essential firm's directors. In any case, there is an absence of studies on the BPR as far as hypothetical models, ideas, and testable recommendations.
- Most of the studies focus on applicability of BPR critical success factors, methods, models and lessons to the applications and implementation (Hafeez, 2003; Alhmaly &Otaibi, 2004; Ahmad Zairi, 2007; Hamid, 2008; Deeb, 2009; digna,2010; Damanhouri, 2015).
- Most, of the studies focus on the role of IT in business process reengineering applications in firms (Hammer Champy, 1993; Olalla, 2000; Attaran, 2003; Kasasbeh, 2004; Algosaimi 2009; Wu Xiaosong and Li Yijing , 2012; Razalli et al, 2012; Razalli & Aizat, 2015).
- Most, of the studies focus on the integration between BPR strategy and other change management strategies such as, especially relationship between total quality management (TQM) and business process reengineering (Edward and Gore, 1999; Gonsalves, 2002; Saman, 2003).
- Almost most of previous studies were conducted in the developed countries. In developing, practically in Sudanese business context there is a lack of empirical studies that investigate direct and indirect effect of BPR on organizational performance.
- The current study focusing mainly on the BPR and related constructs as independent variables and overall performance or business performance as a dependent variable. A limited of literature addresses the effect of BPR on

organizational performance through the learning capabilities. Further, previous studies have mostly ignored the existence of multiple organizational performance measures.

A moderator variable is a qualitative/quantitative variable that affect the direction and/or strengthen of the relationship between an independent or predictor variable and dependent or criterion variable (Baron & Kenny 1986). The moderating variable of great interest is organization IT capability and its influence on the intangible resources (BPR factors) performance relationships (Liu, Liu, & Hu, 2008).

2.6 **Summery of Chapter**

This chapter discussed the concept and background of business process reengineering, also discussed concept of organizational performance and concept of learning capabilities, further discussed the associate between the business process reengineering and organizational performance and then learning capabilities as moderating variables.

CHAPTER THREE

Theoretical Framework and Research Hypotheses

3.0 Introductions:

This chapter include of four sections; first section, theoretical base of the study, second section will discuss theoretical framework of the study, section three, research hypotheses which will develop based on the conceptual framework, section four will discuss the control variables, last section summary of the chapter.

3.1 Theoretical Base of the Study

The conceptual foundation of this research is mainly drawn from the resource-based view theory (RBV). The RBV is one of the major views in strategic management and attributes superior organizational performance to internal resources (Wernerfelt 1984; Barney 1991).

Strategic resources and capabilities are defined as having the ability to be simultaneously valuable, rare, imperfectly imitable and non-substitutable (Barney, 1991). Furthermore, differences among firms in the resources they choice and stock lead to firm heterogeneity (Barney, 1991). Firm heterogeneity is defined as relatively the differences in strategy and structure across firms in the same industry (Oliver, 1997). These differences lead to variations in firm performance among firms in similar industries (Peteraf, 1993).

Resources include financial, human and technological resources, physical assets and any items that can be considered strengths in a typical strength, weaknesses, opportunities and threats analysis (Bryson, Ackermann and Eden 2007). Resources can be tangible (such as financial resources or physical capital) and intangible (such as human capital, organizational knowledge, organizational culture or organizational networks and relationships).

The resource-based view is one of the most influential perspectives in the organizational sciences used in analysis of firms performance different (Franz W. Kellermanns and others 2013). According to Hansen (2007), the resource-based view is theoretical view widely applied to explain variations in organization performance. And also explain the using an organization's resources most efficiently to create public value.

Many researchers employ resource based view have generally used two constructs: resources and competencies (Bryson, Ackermann and Eden, 2007). Resources are those assets upon which an organization might draw to achieve its goals or to perform well on its critical success factors (Bryson, Ackermann and Eden, 2007).

In recently studies, resource-based view became useful theory to investigate the relationship between the BPR and organizational performance (Wade and Hulland, 2004). Thus the resource based view theory lays the foundation for the conceptual framework of this study, as it provides the essential

concepts to frame the conceptual linkage between resources, learning capabilities, business processes reengineering and organizational performance.

The resource based view provides a right guide to identifying the research constructs, developing the research model and developing the research hypothesis, beside it provides a theoretical framework to evaluate the link between business process reengineering and learning capabilities and organizational performance.

Therefore, the impact of business processes reengineering on organizational performance can be directly or indirectly (Ringim, 2012). On the other hand, knowledge based theory may serve as a useful framework in explain the moderating effects of learning capabilities. knowledge based theory emphasize that learning capabilities support the successful processes change through business process reengineering, the firms try to rise their learning capabilities in order to gain competitive advantage and enhance the organizational performance.

The significant role of learning capabilities to business process reengineering has long been acknowledged. The learning capabilities is one of assistant factors of successful implementation to business process reengineering in organizations. It is also important to educate people in information technology related to innovations for competitive advantage, the potential of information technology in redesign the business and the leadership of empowered organizations (Al-Mashari, Zairi, 1999).

In addition, there is additional role of learning capabilities that contribute in heterogeneous knowledge bases among firms, and the ability to create and apply knowledge, are the main determinants of performance differences (Isbel & Revellia, 2006).

The significant of learning capabilities to overall organizational performance has long been acknowledged. Based on resource based view and knowledge based view that heterogeneous knowledge bases among firms, and the ability to create and apply knowledge, are the main determinants of performance differences (Isbel and Revellia, 2006). Implement the business process reengineering under high learning capabilities will lead to fully and successful implementation. In sum, that the resource-based view and knowledge based view of the firm are theory guidance in this study are logically.

3.2 Theoretical Framework of the Study

Following the theoretical based of the study, the conceptual framework for this study as shown in figure 3.1 showed the list of business process reengineering identified and rated in this study and proposes link of process reengineering factors to organizational performance. The theoretical framework of the study proposes that learning capabilities has moderating effects on relationship between process reengineering factors and firm organizational performance.

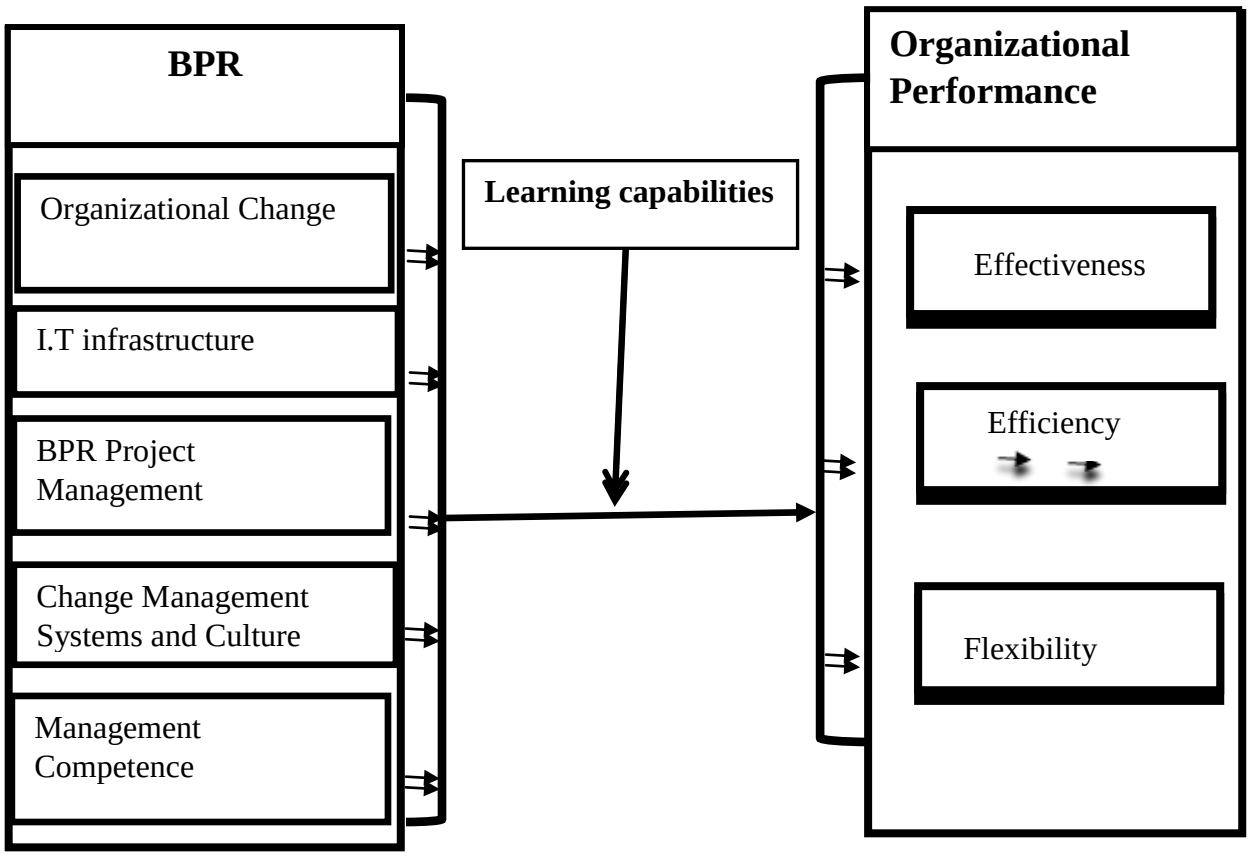

Figure 3.1*:* Theoretical Framework of the Study

Source: prepared by the researcher (2016)

The model of the study in figure 3.1 is guided by theory Resources Based View (RBV), which states: effective and efficient application of all useful resources that the company can muster helps determine its competitive advantage (Wernerfelt, 1984),(Hafeez et.al 2007).

3.3 Hypotheses Development

Figure 3.1 provides the conceptual model together with the hypotheses that show how the constructs of the research model are related to each other. This study try to find answers for many of the hypotheses that have been put forward by conducting tests it and check their validity, the purpose of the study is to assess the impact of BPR on firm's performance. Based on literature review, it is hypnotized:

3.3.1 The Relationship between BPR and Organizational Performance

This study assumes that the Organizational performance has been a direct positive influence by Process Reengineering. As discussed earlier, there are many possible business benefits from re-engineering. These benefits will translate into improved organizational performance Therefore, higher degrees of process reengineering lead to higher overall organizational performance impact (Kohli and Hoadley 2006).

In same manner, Davidson in (1993) reported successful reengineering efforts ultimate lead to business transformation. New products, services and customers' services appear in the improved information flows. Process reengineering efforts produced new business opportunities in addition to dramatic increases in revenue and operating savings. The above arguments underpin the first hypothesis of this study:

H1: There is a positive relationship between BPR and organizational performance.

Sub-hypotheses can be derived as follows:

3.3.1.1: **The relationship between BPR and Effectiveness**.

the effectiveness of attaining strategic objectives and goals, profit, rate of return and cost one of main factor which used to measure the organizational performance that means effectiveness refers to the achieved outcomes in relation to strategic objectives/goals and customer requirements. Many of research and studies continually confirmed the great effects on firm performance factors specially on effectiveness (cost, quality, service and speed of services) so that it combines several functions and jobs in the business units consistent use of information technology as well as to contribute to the improvement of methods of communication (K. Omar, Et Al , 2011). Yasin Ozcelik ,(2013) enforcing this view, the firm performance such as labor productivity, return on assets, return on equity increases after the BPR projects are finalized.

The study hypothesizes that:

H1.1: There is a positive relationship between BPR and effectiveness.

H1.1a There is a positive relationship between organizational Change and effectiveness.

H1.1b: There is a positive relationship between the information technology infrastructure and effectiveness.

H1.1c: There is a positive relationship between reengineering project management and effectiveness.

H1.1d: There is a positive relationship between organizational culture and systems and effectiveness.

H1.1e : There is a positive relationship between management competence and effectiveness.

3.3.1.2 The relationship between BPR and Efficiency.

Efficiency refers to how economically the organization's resources are utilized by an activity such as a business process that produces a given output or that delivers a given service. According to according to Kassahun (2012) successful reengineering efforts direct lead to business efficiency, transparency, good governance and accountability e-Government.

H1.2: There is a positive relationship between BPR and efficiency.

H1.2a There is a positive relationship between organizational structure and efficiency.

H1.2b: There is a positive relationship between the information technology infrastructure and efficiency.

H1.2c: There is a positive relationship between reengineering project management and efficiency.

H1.2d: There is a positive relationship between organizational culture and systems and efficiency.

H1.2e : There is a positive relationship between management competence and efficiency.

3.3.1.3 The relationship between BPR and Flexibility.

Gerwin (1986) states, "Flexibility is the ability to respond effectively to changing in business environment. Growing dynamics of environmental changes, rapid development of IT and communication technologies, on-going globalization, new forms of organizational structures are the crucial factors enforcing continual changes in organizational management process. Under those circumstances only those organizations which are capable of keeping pace with the changes and turning them into opportunities will be able to sustain high competitive advantage and secure conditions for development. According to Koste & Malhotra,(1999) .

At last decade the intentional change variable force the business organizations to adopted performance enhanced programs such as business process reengineering which argue radical change in process for breaking out in super performance and adapting to environment change in various areas of organization functioning such as the use of machinery, labor, material flows, range of products, operations, development, volume of operations, product portfolio, financial

management, innovation and new product launches. Hence flexibility is frequently considered within the organization subsystems such as finance, information, production, market and strategic management.

Most studies collectively suggest that there are substantial benefits for firms that successfully implement the process changes associated with reengineering projects (Hunter et al.,) confirm this claim by Devaraj and Kohli show that investments in IT can contribute to a higher level of revenue if they are supported by BPR initiatives. The fundamental philosophy of business process reengineering (BPR) is an innovative approach to change management, resulting in best practices. However, its overextension and misuse have resulted in dissatisfaction and have raised many concerns (Altinkemer et al., 1999).

Based on above arguments the hypothesis derived:

H1.3: There is a positive relationship between process reengineering and organizational performance flexibility.

H1.3a There is a positive relationship between organizational Change and flexibility.

H1.3b: There is a positive relationship between the information technology infrastructure and flexibility.

H1.3c: There is a positive relationship between reengineering project management and flexibility.

H1.3d: There is a positive relationship between organizational culture and systems and flexibility.

H1.3e: There is a positive relationship between management competence and flexibility.

3.3.2 The Moderating Role of Learning Capabilities on the Relationship Between BPR and Organizational Performance.

The RBV suggest that firms with valuable, rare, and inimitable resources have the potential of achieving superior performance (Barney, 1991). Knowledge-based resources is part RBV theory. It define is considered particularly important for providing competitive advantage (Grant, 1996; Spender, 1996), and learning processes are thus necessary to transform and refine a firm's knowledge resources in accordance with the environmental conditions. This link between knowledge and learning processes is often associated with the organizational capability to learn (Crossan et al., 1999; Sanchez, 2001).

The knowledge-based view of the firm, which emerges as an extension of the resource-based view of the firm, argues that heterogeneous knowledge bases among firms, and the ability to create and apply knowledge, are the main determinants of performance (Grant, 1996). The analysis shows the positive some relevant insights link existing between: learning capability and non-financial performance; and non-financial performance and financial performance (Revilla, 2006).

The BPR experts and Practitioners recommended to fully and successfully implementation business process reengineering in organizations should be taken in account some factors challenges such as organizational culture which is one of the keys challenges faced by organizations when applying reengineering is the willingness to change, which is one of the critical factors in the success of the application reengineering so organizations need to change the organizational culture of the old to the new culture based on a change in the principles, values and concepts and beliefs to suit the principles reengineering (Al-Otaibi, 2009). Terziovski, Fitzpatrick and O' Neill (2003) believed that must change attitudes of individuals and organizational culture when applying reengineering and to reduce staff resistance to change.

According Maaytah (2010) that the resistance to change of reengineering customary when individuals in order to protect their positions, so management must attention to training and education to create a culture of openness to change, knowledge and creativity, and accept the challenge in the work and composition of the teams, and the delegation of authority, and give freedoms, and policy change and according Tayfur (2006), it has to be the creation of an organizational culture when applying reengineering rely on instilling the values and positive attitudes towards certain principles, including: improving governance and deepen the spirit of commitment, and encourage creativity teamwork and spread the spirit of the team, and take responsibility and control, and spread the spirit of challenge and the desire to achieve it.

This study suggest that the organizational performance is has been effected by business process reengineering across the learning capabilities; knowledge stocks and learning flows. As discussed in (Chapter Two) Many of researches and studies conducted to investigating significant of moderating effect of learning capabilities as moderator factor but there (based on researcher information extend) are an empirical examination of such a relationship was not found in the literature. The positive impacts of learning capabilities have also been studied previously, but the studies often focus only on the positive impacts of learning capabilities on firm performance Isabel, (2006).

Learning capabilities moderates the relationship between business process reengineering and firm performance. Thus, the study hypothesizes that:

H2: The effect of BPR on organizational performance is stronger when learning capabilities is higher.

This second main hypothesis leads to more detailed sub-hypotheses which comprise of the two dimensions of Knowledge stocks and Learning flows as follows.

3.3.2.1 The Moderating Role of learning capabilities on the Relationship between BPR and Efficiency.

There are various perspectives of thinking about learning in organizations, one of more significant perspectives is a capability perspective (Easterby-Smith, 1997), which presumes that learning is innate to all organizations and there is no

one best way for all organizations to learn. The focus of the capability perspective is not on some future vision of becoming a learning organization, or in the characteristics to put in place to determine a learning capability. The focus is on learning that already exists, and thus in understanding what is learning and how we learn. There is agreement that learning capability is a multidimensional construct involving knowledge processing for change and improvement (Jerez Go´mez et al., 2005). Knowledge is an established theoretical construct that has been proposed as heterogeneous resource that firms value in different manifestations (Amin and Cohendet, 2004)

H2 The effect of BPR on organizational performance is stronger when learning capabilities are higher.

H2.1.1a The effect of organizational structure on efficiency is stronger when learning capabilities are higher.

H2.1.1b: The effect of IT infra-structure on efficiency of performance is stronger when learning capabilities are higher..

H2.1.1c: The effect of organizational culture on efficiency of performance is stronger when learning capabilities are higher.

H2.1.1d: The effect of reengineering project management on efficiency of performance is stronger when learning capabilities are higher.

H2.1.1e: The effect of management competence on efficiency of performance is stronger when learning capabilities are higher.

3.3.2.2 The Moderating Role of learning capabilities on the Relationship between BPR and Effectiveness

H2. 2 The effect of BPR on effectiveness of performance is stronger when learning capabilities are higher.

H2.2. 1a The effect of organizational structure on effectiveness of performance is stronger when learning capabilities are higher.

H2.2. 1b: The effect of IT infra-structure on effectiveness of performance is stronger when learning capabilities are higher.

H2. 2.1c: The effect of organizational culture on effectiveness of performance is stronger when learning capabilities are higher.

H2. 2.1d: The effect of reengineering project management on effectiveness is stronger when learning capabilities are higher.

H2.2.1e: The effect of management competence on effectiveness is stronger when learning capabilities are higher.

3.3.2.3 The Moderating Role of learning capabilities on the Relationship between BPR and Flexibility

H2.3 The effect of process reengineering on flexibility is stronger when Knowledge stocks are higher.

H2.3.1a The effect of organizational structure on flexibility stronger when learning capabilities are higher.

H2.3.1b: The effect of IT infra-structure on flexibility is stronger when learning capabilities are higher.

H2.1.1c: The effect of organizational culture on flexibility is stronger when learning capabilities are higher.

H2.1.1d: The effect of reengineering project management on flexibility is stronger when learning capabilities are higher.

H2.1. 1e: The effect of management competence on flexibility is stronger when learning capabilities are higher.

3.4 Control Variables

A total of four control variables were included: service type, ownership status, firm size and business age are common control variables (McWilliams & Siegel, 2000). Firm size was measured with a scale that asked the respondents to report the number of employees in the firm.

3.5 Summery of Chapter

This chapter proposed the theoretical research model based on the resource perspectives of the RBV theory. The theoretical framework embraces the various perspectives on BPR and organizational performance and logically links the process reengineering resources to organizational performance. The chapter

explained how the various elements of the research model, including the RBV perspective itself, were drawn from the findings from the process reengineering literature, organizational performance literature. The chapter also discussed the hypotheses implied by the theoretical model. Based on this theoretical model and the research hypotheses proposed in this chapter, the next chapter will discuss the methods and techniques followed to operationalize the theoretical model and empirically test the hypotheses.

CHAPTER FOUR

Research Methodology

4.0 Introduction

In this chapter, the general research design described first. It is followed by the justification for selecting services firms as its target population. And then, a discussion on the population of interest, sampling procedures and sample, survey design and survey method are described. It includes a discussion on the modification of scale items and an explanation of the different measurement scales being used followed by questionnaire design. The methods used in collecting data, in analyzing the data, and in testing the hypotheses are also described.

The research adopts the descriptive and analytical method, which is appropriate to the subject of the study, as it aims to describe the phenomenon and to identify the components, through the identification, analysis and interpretation of the factors affecting them. Accordingly, the study was divided into:

- Secondary Data: rely on reference to the research and period studies on the subject of the BPR affecting the application, and reference books and related stories.
- Primary Data: depends on the initial data collection of the research population, using the survey method.

4.1 Methodological Choice

The choice of a study methodology depends on the ontological and epistemological choices and the objectives of a particular study (Hall and Howard, 2008). The current study was conducted based on the positivist paradigm. It tests hypotheses derived from a theoretical model, developed based on both previous studies and exploratory study. As such, the main purpose of the research is essentially theory validation/verification following the hypothetic-deductive approach (Guba and Lincoln 2005). Whenever the purpose of a study is hypothesis testing using statistical methods and generalization to a larger population from the sample based on numerical data, quantitative survey research is the preferred option (Creswell, 2009).

4.2 General Research Design

The purpose of this study was to investigate the effect of the business process reengineering on organizational performance by services firms in Sudan. Beside it seeks to identify the relationships between business process reengineering and performance through learning capabilities as a moderating variable. Looking into the business process reengineering applications and its effects on business process was studied and since 1993 when the reengineering theory born and founded by Hammer and Champy, many international attempt were conducted. However, Business process reengineering (BPR) application and effects has been receiving attention from industries as well as the academic

community, because it is likely to change management practice and working processes in organizations in the future.

However, it is commonly agreed that BPR is important but also problematic. This study explores the principles and assumptions of BPR and identify its affecting on organizational performance direct and direct effect through the learning capabilities.

The research setting was a cross-sectional study design. It includes gathering data only once or at one point in time appropriate to the research objectives (Cavana, Dalahaye, & Sekaran, 2001). The advantage of using a cross-sectional method is that it is economical and does not take time like a longitudinal method. The majority of the past studies on BPR used case study descriptive research design (O'Neil & Sohal, 1999). The data from this study was collected from senior management, executives, managers and head of departments.

4.3 Services Firms in Sudan

The services sector consists of the health, education, transport, communications, roads and bridges, building and construction, telecommunications and other services. The following give an overview of the performance of the services subsectors. Based on CBOS annual report 2014, the average contribution of the services sector reached 44% during the period 2007-2011 and 47.8% during period 2012 - 2013. The share of the services sub-sectors to GDP declined in 2013 compared to 2012. Trade, hotels and restaurants

decreased from 8.9% in 2012 to 8.8% in 2013, transport and communications from 10.9% in 2012 to 10.8% in 2013, finance, insurance, real estate and business services from 12.4% in 2012 to 12.3% in 2013, public services and social services from 1.3% in 2012 to 1.2% in 2013 and government services from 11.7% in 2012 to 11.4% in 2013. The contribution of transport and communications declined slightly from 10.9% in 2012 to 10.8% in 2013, while the contribution of the building and constructions and non-profit private services remained constant at 3.4% and 0.8% in 2013 and 2012 respectively.

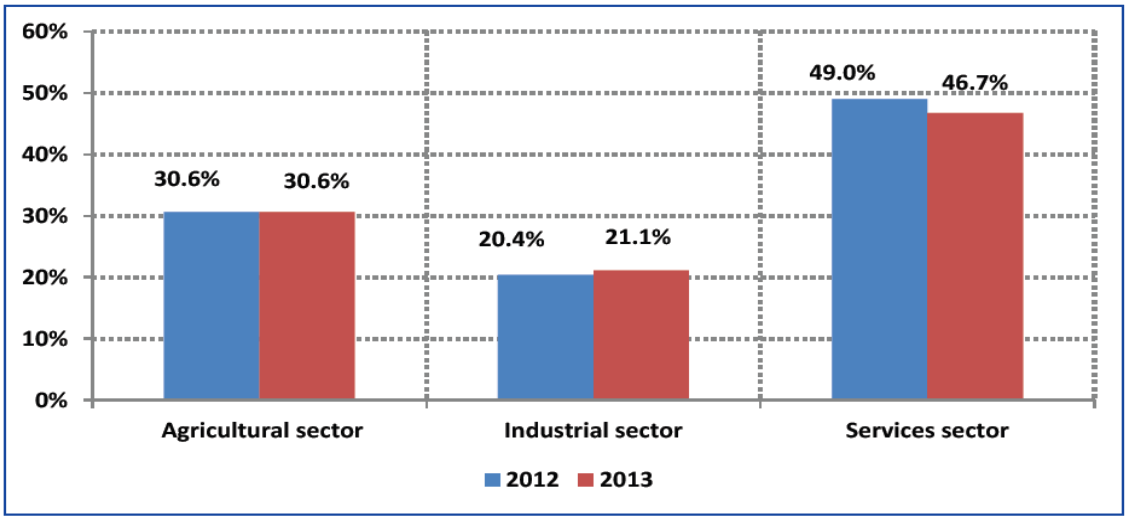

Figure 4.2: Contribution of the Economic Sectors to GDP for (2012 _ 2013)

Source: prepared by Bureau of statistics (2014)

Sudan has a small, undeveloped service firms. The owner form of Sudan's services firms comprises of either fully or partially private-owned firms. The Sudanese financial sector one of most important component of Sudanese services sector for example suffers from weak lending practices, supervision and regulation. Besides, a majority of the population is not associated with the formal

banking sector due to limited access to credit, which also hinders Sudanese businesses. Sudan has a small capital market, which primarily trades in bank shares, on the nation's Khartoum Stock Exchange.

The services sector growth rate decreased from 3.4% in 2012 to 2.1% in 2013. This was due to the decrease in the growth rate of its subsectors including building and constructions from 5.8% in the year 2012 to 2.0% in 2013, transport and communications from 5.9% in 2012 to 2.7% in 2013, financial intermediation services from 2.2% in 2012 to 1.1%, the government services from 3.0% in 2012 to 1.1% in 2013. Public services and other social services, non-profit private services sectors and imports fees growth rate decreased at different rates. Trade, hotels and restaurants rate of growth increased from 2.1% in 2012 to 2.6% in 2013, insurance, real estate and business services, from 2.0% in 2012 to 2.5% in 2013.

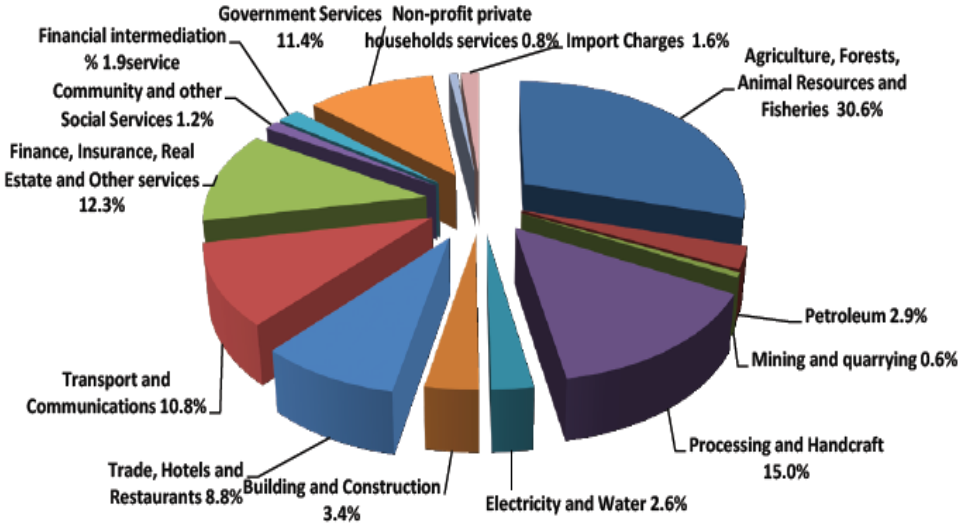

Figure 4.3: Percentage Share of GDP Components in 2013

Source: prepared by Bureau of statistics (2014)

Sudanese Services Firms based on CBOS report 2014 are following:

1) The education Firms comprises both public and high education. Numerates the number of students in government and private schools in primary and secondary stages for the academic years 2011/2012 and 2012/2013.
2) Transport and Communications: This section addresses the means of transport in Sudan which includes shipping lines, airlines, railways, river and land transport. Shows the volume of goods and the number of passengers transported via the above-mentioned means.
3) Telecommunication and figure (4.1) reveal the number of subscribers of telecommunications and the internet for the years 2012 and 2013. The quality of service provided is key element in the development and promotion of the communication sector, as it gives clear indication of the conformity of the operators' network with recognized standards. The

communication sector is highly competitive in the supply and quality of service, using the latest technologies in fixed telephone lines, mobiles, and internet and banking services.

4) Hotels and Tourism: Tourism is considered as one of the promising sectors in Sudan and an important source of for the economy. This is evidenced by the fact that Sudan has enormous tourism potentials that can be further exploited, developed and promoted to attract tourists from across the globe
5) Roads and Bridges The construction of roads and bridges continued during the year 2013 which witnessed the construction of more than 579.6 km equivalent to 82.3% of the targeted plan for 2013, covering the different states of Sudan especially Eastern and Darfur states. Moreover, 53.2 km of roads had been rehabilitated representing 28.2% of 2013 plan. In addition, several national roads have been widened.

4.4 Population and Sampling

Population is defined as "set of all objects such as people, events or things that interested researchers studied" (Sekran, 2010, p.379). Population of current study is all firms in Sudanese service sector.

The sample frame of this study was defined services firms in Sudan, were selected since they have greater contribution to the Sudan economy in terms of their great contributions to output, employment. The CBOS annuals report 2014 in which declare list of Sudanese service firms was used as the sampling frame.

Services sector was selected as target population in this study, it is possible to use nonprobability sampling method for the selection of respondents.

In conducting empirical quantitative survey research, designing a sample that truly reflects the theoretical population is critical (Bartlett, Kotrlik and Higgins 2001; Bryman and Bell 2007). Sample design requires making decisions on the sampling frame, the sample size and respondent selection. This study used purposive sampling technique by choosing large manufacturing firms as a judgment sample. Judgment sampling occurs when a researcher selects sample members to conform to some criterion (sekran, 2010, p.397). This method was undertaken due to two reasons. Firstly, this procedure satisfactorily meets the research objectives which mentioned in chapter one. Secondly, nonprobability sampling less time and cost compare with probability sampling (Sekaran, 2003).

In concerning to sample size, it is necessary to determine the minimum required returned sample size and the initial sample size (Bartlett, Kotrlik and Higgins 2001; Bryman and Bell 2007). In determining the minimum required returned sample size there are various view; Bartlett, Kotrlik and Higgins (2001) view suggests considering factors such as the population size, desired level of accuracy and the type of data analysis. In contrast, Hair et al. (2006) view recommends determining the minimum required returned sample size based on the type of data analysis to be used and the expected rate of missing data. In determining the minimum required returned sample size, Bartlett, Kotrlik and

Higgins (2001); Bryman and Bell (2007) were suggested taking into account the potential impact of lower response rates. Roscoe (1970) suggests that sample size greater than 30 and less 500 suitable for majority of researches.

In addition, Roscoe have another view based on number of study variables which called Multivariate researches. The sample size may be in flows math equation, sample size result of multiplication of number of variable in constant value 10. Furthermore, Sekaran (2003) suggested that a sample of 260 is suitable for a population of 800. Hair et al. (2010) suggests that in multiple regression sample size should be 100 or larger to be meaningful thus, 100 usable responses or larger are sufficient for analysis in this study.

The current study determines the sample size following Hair et al.'s (2006) and Roscoe (1970) suggestions and with reference to past studies. This study intended to use factor analysis using the Statistical Package for the Social Sciences (SPSS, which require a minimum usable sample size of 100–200 (Lewis, Templeton and Byrd 2005; Hair et al. 2006). Research on required sample size also indicates that a sample size of 200 is good for various types of statistical analysis (MacCallum, Browne and Sugawara, 1996). Further, a review of previous BPR and organizational performance studies showed that the average actual sample size (actual responses) obtained was 157.

4.5 Respondents Selection Criteria

After the sample frame and sample size were resolved, the following an important step to be made related to which body in the organization was most suitable to react to the study instrument. This study adopt the only a single response per firm was considered for this research. When a single respondent is used to represent a firm. The respondent approached should be the most informed and knowledgeable person about the issue of interest in that firm (Grover et al., 1998).

Current study examines the effect of Business Process Reengineering on organizational performance in Sudanese service firms, the most appropriate person to get interest information and data from the general manager and departments managers that represent the respective services firms in Sudan. Head of the firm was considered the most appropriate person, with the best knowledge and information on BPR and organizational assessment. Thus, the respondents selected for this research were services firm's managers or directors of the 221 sample firms.

The selection of the most informed person as respondent is consistent with the practices of previous BPR studies, such as those by Grover et al. (1995, 1998), and Albadvi, Keramati and Razmi (2007). The Therefore, the principal informant method was used, and the general managers or director or departments managers were identified as the key informants. These respondents are most

frequently act as the creators of the firm‟s business philosophy (Deng & Dart, 1994), these managers are important because they are able to understand and describe organizational performance potential of a firm‟s resource and capabilities (Barney, 1991). Thus, the questionnaire was addressed to the general manager or director or department's manager in each firm. In this study, attempts were made to increase the response rate such as by reminding the respondents through telephone call, SMS and self-visit (Sekaran, 2006), such as in 200 and Sung and Gibson, (1998) sample size is also 200.

4.6 Measurement of Variables

4.6.1 Measurement of BPR (Independent variable)

The BPR construct was initially operationalized by 31 initial items measuring five dimensions: organizational structure change, BPR project management, IT infrastructure, change management systems and culture and management competence. The five items used to operationalize information technology infrastructure dimension are based on Al-Mashari and Zairi (1999) and Rezalli & et. al (2015), and the seven items used to operationalize change management systems and culture are based on Terziovski, Fitzpatrick and O' Neill, (2003) ; Ahmad et al, (2007) and Salimifard, et al, (2010), and the eight items used to operationalize organizational structure change are based on Terziovski, Fitzpatrick and O' Neill, 2003 ;Ahmad et al, (2007) and Salimifard, et al, (2010); Bann, 2004; Al-Otaibi, 2009, and the eight items used to operationalize business

process reengineering project management are based on Terziovski, Fitzpatrick and O' Neill, (2003) ;Ahmad et al, 2007; Salimifard, et al, (2010); Khong and Richardson 2003), last one seven items used to operationalize management competence are based on Khong and Richardson, 2003; Al-Mashari and Zairi, 1999. Each of these variables was measured by a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 4.1: Measurement of BPR

Construct/category	**Dimensions/ Items**	**Source(year)**
Change Management System	8 items: Revision of Motivations, Rewards Systems, Effective Communication, Empowerment, People Involvement, Training and Education, Creating an Effective, Culture for Organizational, Change Stimulation of Receptivity, of The Organization to change.	Kok Wei Khong, (2012); Al-Mashari&Zairi, (1999); Ahmad et al (2007). Terziovski, Fitzpatrick and O' Neill, 2003 ;Ahmad et al, (2007) and Salimifard, et al, (2010); Bann, 2004; Al-Otaibi, 2009
Organizational change	6 items : An adequate job integration approach, Effective BPR teams, Appropriate job description and location of responsibilities	Kok Wei Khong, (2012); Al-Mashari&Zairi, (1999); Ahmad et al (2007) and Rezalli and et. al (2015)
IT Infrastructure /investment	7items: Adequate Alignment of IT, Infrastructure and BPR Strategy, Building an Effective IT, Infrastructure, Adequate IT Investment, Sourcing Decisions, Adequate Measurement c IT, Infrastructure Effectiveness on BPR, Proper IS Integration, Effective Reengineering of Legacy IS, Increasing IT Function Competency, Effective Use of Software Tool	Kok Wei Khong, (2012); Ahmad et al, (2007). Khong and Richardson, 2003; Al-Mashari and Zairi, 1999.
Management Competenc	8 items: Committed and strong leadership, Championship and sponsorship, Management of risk.	Khong, (2012); Al-Mashari&Zairi, (1999); Ahmad et al, (2007). Terziovski, Fitzpatrick and O' Neill, (2003) ;Ahmad et al, 2007; Salimifard, et al, (2010); Khong and Richardson 2003)
BPR Project Managemen	7 items: Aligning BPR strategy corporate strategy, Effective planning and use of project management techniques, Setting performance goals measures, Adequate resource, Disciplined approach in BPR, External orientation of methodology, Effective use of consultants, Abuilding a BPR visitation.	Al-Mashari&Zairi, (1999); Ahmad e al, (2007); and Salimifard, et al, (2010). Terziovski, Fitzpatrick and O' Neill (2003)

Source: prepared by the researcher (2016)

A neutral response – “neither disagree nor agree” – was adopted to reduce uninformed responses. Whenever possible, established scales were utilized. When the items had to be modified, the items were derived from the literature.

4.6.2 Measure of Learning Capabilities

Learning Capabilities construct was initially operationalized by 11 initial items measuring two dimensions: knowledge stocks and learning flows. Seven items used to operationalized knowledge stocks based on Grant, 1996; Easterby-Smith, M., Crossan, M. and Nicolini, D, 2000. Decarolis and Deeds, 1999; Ingelgard and Roth, 2002, and 4 items used to initial operationalized the learning flows based again on Grant, 1996; Decarolis and Deeds, 1999; Ingelgard and Roth, 2002. Each of these variables was measured by a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). A neutral response – “neither disagree nor agree” – was adopted to reduce uninformed responses. Whenever possible, established scales were utilized. When the items had to be modified, the items were derived from the literature.

Table 4.2: Measurement of Learning Capabilities

Construct/category	Dimension/items	source
Organizational Flexibility	4 items: Time; Scope; Purposefulness; impac area.	Golden W. P. Powell (2000
Effectiveness	4 items: Market position; Growth in sale Result in market share and Result i market growth.	Venkatraman (1989); Jean François Henri (2004)
Efficiency	3 items: Profit margins; Return on sales (ROS and Return on investment (ROI).	Venkatraman (1989)

Source: prepared by the researcher (2016)

4.6.3 Measurement of Organizational performance (Dependent Variable)

The organizational performance constructs was operationalized with 11 initial items, measuring dimensions such as effectiveness (rate of objectives the achievement), efficiency (output value comparing to input value), and flexibility (rate of response to environment changes). Initially pulled the 11 items that were measure the organizational performance construct. Based on previous literature, 7 of the items are based on Ringim and et al., (2012) and Jean-François Henri (2004), four items, are is based on Khong and Richardson, (2003) and Golden W. P. Powell (2000). The respondents were asked to evaluate both construct of firm performance financial performance and flexibility of the company within the past three years on a scale of 1 (much worse) to 5 (much better).

Table 4.3: Measurement of Organization Performance

Construct/category	Dimension/item	source
Learning capabilities	11 items: Knowledge stock; learning flows Experimentation; risk taking interaction with the externa environment; dialogue; an Participative decision-making.	Easterby-Smith, M., Crossan, M. and Nicolini, I (2000); Grant, (1996); Decarolis and Deed (1999) and Ingelgard and Roth, 2002.

Source: prepared by the researcher (2016)

4.6.4 Control variables:

A total of four control variables were included: the service type measured by four scales, firm owner's type measured by five scales, firm size measured by the number of employees in the firm by five scales and age of business measured by the number of years since the firm had established.

4.7 Questionnaire Design

The questionnaire was formed into six parts (1, 2, 3, 4, and 5) follow, with a total of 57 items.

Part (1) asks about background information pertaining to the firm, including: type of service, age of business, owner form and number of employees. The objective of this section is to provide information about prominent characters of the firm that assist in identifying similarities and difference among the sampled firms. Such identification is important for succeeding analysis and interpretation or explanation of the results of the analysis.

Part (2) addresses the scale items related to BPR factors; IT infrastructure, organizational structure change, BPR project management, change management systems and culture and management competence.

Part (3) addresses the scale items related to two dimensions of learning capabilities; knowledge stocks and learning flows.

Part (4) addresses the scale items related to three dimensions of organizational performance;

Effectiveness, efficiency and flexibilities.

Part (5) seeks personal information about the respondent. The layout of the questionnaire is shown in Appendix A1.

4.8 Pilot Study and Instrument

The purpose of the pilot test was to ensure the clarity and contextual appropriateness of the language of instrument's statements (that is, are the questions understood as intended?) and to assess feasibility (that is, it the instrument practical?) from the respondents' point of view.

In order to ensure the content validity of the initial instrument research. The pilot tested through a face-to-face discussion with number of practitioners and academics in Sudan and from outside of Sudan, they were asked to comment on the clarity of the questions and outline any practical difficulties they foresaw in answering them. These practitioners and academics, they were asked to remark on the clarity of the questions and wording, beside specify any practical difficulties they expected in answering them.

The practitioners and academics stated that all items in research instrument and the instructions were clearly phrased and that they understood them well. Regarding to expect problems with the instrument's practicality, the respondents' were worried and asked what is the objective of obtaining long term data (for a three-year period) for the 11 items measuring organizational performance.

The feedback explained the respondents' will have difficulty giving accurate responses to the historical organizational performance questions. According on these feedback obtained the necessary changes and modifications to the instrument the final research instrument was made ready for the main survey (Appendix A1).

In sum, initial questionnaire developed and were distributed first to pilot study sample consist of 35 were used to pre-test to ensure of some statistical parameters such as reliability. Cronbach‟s Alpha coefficient values were calculated for each of the variables of the study because is an adequate test of internal consistency reliability (Sekaran, 2003). The result of the test is shown in table (4.1). The results in table 4.4 reveals that all the values of Cronbach‟s Alpha test for the variables fall above the 0.70 range suggested by Nunnally (1978). Therefore, these variables have an acceptable level of reliability (Sekaran, 2003). Following that, modifications were made to the questionnaire to reduce possible ambiguity of some question and improve general appearance of the questionnaire before sending it to respondents in the sampled firms.

Table 4.4: Instrument Reliability

Dimensions	Constructs	Number Of Items	Alpha Coefficien Values
BPR	Change Management Systems an Culture	7	.77
	Organizational Structure	8	.77
	I.T Infrastructure	6	.78
	BPR Project Management	8	.76
	Management Competence	8	.72
Learning capabilities	Learning Capabilities	11	.72
Organizational performance	Efficiency	3	.84
	Effectiveness	4	.91
	Flexibility	4	.73

Source: prepared by the researcher from empirical study data, (2016)

4.9 Survey Administration

A survey was conducted after the questionnaire was refined based on the pre-testing. Self-administrator based questionnaire targeted to the managers or director of Sudanese services firms. A total of 221 questionnaires were sent. After sending the questionnaire by hand delivery, number of attempts were made to increase the response rate such as by reminding the respondents through telephone call, SMS and self-visit (Sekaran, 2006). As a result of this efforts, 211 questionnaires responded by the firms were returned out of the 221 questionnaires distributed by hand delivery to the respondent firms (communication, educational and financial) in Sudanese service firms.

To check for non-response bias, an analysis of variance (ANOVA) test was performed. The informants were divided into two groups: the first informants, and last informants. The results of the ANOVA test revealed that there was no

significant difference (at the 5 percent significance level) between the two groups. The results did not reveal any bias in the sample.

4.10 Statistical Analysis Techniques

SPSS software was used for data analysis and hypothesis testing. The statistical method used for analyzing the survey data are described follows:

4.10.1 Descriptive Statistics

Descriptive statistics are used to summarize and describe the key feature of the sample data such as frequency, percentage, means, standard deviations, and range (Aaker et al., 2007). In this study, descriptive statistics were used to describe the characteristics of the services firms and respondents in addition to all the study variables.

4.10.2 Factor Analysis

Factor analysis is an interdependence technique, whose primary purpose is to identify the underlying structures or commonalities in the data (Hair et al., 2010). The factor analysis is used to test construct validity of items in the survey, i.e., to determine if the items actually measuring the concept supposed to measure (Sekaran, 2003). In this study, factor analysis was used to test the validity of all the study variables. Bartlett‟s test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy are used to examine the sampling adequacy of the data that assess the factorability of the matrix as a whole. The minimum

acceptable value for KMO is 0.6 and Bartleet‟s test of sphericity with p-value less than 0.05 was used to test the overall significance of correlation among items.

Extraction method used was principle component analysis with varimax rotation method, which attempts to maximize a variable-factor correlation for clearer separation of the factor (Hair et al., 2010). Kaiser's criterion was used for determining the factor to retain in the analysis. Generally, factor that had eigenvalue exceeded 1.0 were accepted, while the other were dropped (Hair et al., 2010). Furthermore, in relating an item to factor Hair et al. (2010) recommended that factor loadings of 0.5 and higher will be considered significant and appropriate for sample that range between 130 and 150. Thus, this study considered 0.5 as a minimum requirement of the factor loading.

4.10.3 Reliability Analysis

Reliability analysis was conducted to test the consistency and stability of the measurement instrument and help to assess the goodness of measure (Hair et al.2010). The internal consistency and stability can be determined by the coefficient value of Cronbach‟s alpha. The closer Cronbach‟s alpha is to 1.0, the higher the internal consistency reliability while Cronbach‟s alpha of less than 0.6 is generally considered as poor, 0.70 is considered to be acceptable, and those higher than 0.80 are to be good (Sekran, 2003). Therefore, in this study reliability analysis were done on all study variables.

4.10.4 Tests of Differences

This test was conducted to determine if there exist statistically significant differences between study variables. This study used three types of tests of differences; chi-square test, independent sample *T*-test, and one-way ANOVA. In this study, the chi-square test was used to test for non-response bias by comparing the mean values of key variables between first and last respondents in the demographic variables. The independent sample *T*-test is used to determine the mean differences between two groups (Hair et al., 2010).

On the other hand, one-way ANOVA is used to test for significant mean differences among three or more groups (Hair et al., 2010). In this study, both ANOVA and *T*-test are used to determine if there are significant differences of business process reengineering and other variables among Sudanese services firm‟s characteristics such as business age and number of employees.

If the test shows that there are significant differences ($P<0.05$) of societal marketing orientation or market-based capabilities or marketing performance among these variables then these variables will be used as control variables to control their effect. The reason for these analyses is that problems with control variables may become more common as the number of controls increases (Becker, 2005). For example, Becker (2005, p.285) mentioned that including a control variable "*that is uncorrelated with the dependent variable in analyses reduces power*".

4.10.5 Correlation

Correlation analysis was used to establish a correlation matrix between the study variables. In current study, correlation testing was done to determine any possible relationship among all study variables. Correlation coefficient of (0.10, 0.30 and 0.50), irrespective of sign, are interpreted as low, medium and strong respectively (Green, Salkin and Akey, 1997). Further assessing the strength of the link between two variables, the correlation analysis is also able to detect high multicollinearity among independent variables (Hair et al., 2010).

Multicollinearity occurs when predictor variables are correlated to the extent that the independent variables are linear combinations of one another. Multicollinearity is indicated if the correlations between variables are somewhere around 0.80 or 0.90 (Hair, et al., 2010). Further, the correlation was used to assess the construct validity (Deng & Dart, 1994) of societal marketing orientation.

Current study, bivariate correlation using Pearson correlation method was performed to determine the relationships between the independent variables, moderating variables and dependent variables.

4.10.6 Multiple Regression

Multiple regression indicates how adequate the predictors are in explaining the dependent variable. It also gives the best predictive model of the linear relationship present among the independent variables (Hair et al., 2010). This research used multiple regression to determine if the specified independent

variables were statistically significant predictors of the dependent variable. In addition, multiple regression is appropriate multivariate method for evaluating construct and relationship between constructs (Tabachnik & Fidell, 2001). Furthermore, there are several assumptions must be met to determine the appropriateness of regression analysis for the data. The assumptions are as follows:

1- Linearity of relationships between the predictor and criterion variables: In this study, linearity is examined by looking at residual plots. Standardized residual plots are plotted against the predicted value using SPSS plot.

2- Normality of the data: This assumption meant that each variable and all linear combinations of the variables are normally distributed. In this study normality is assessed by the histogram (most of the values fall in the center), and normal probability (P-P) plots (residual points should be close to the diagonal line).

3-Multicollinearity within the acceptable level: The multicollinearity refers to the degree to which the effect of a variable can be predicted or explained by other variables. Intercorrelations greater than 0.90 are considered to be evidence of high multicollinearity (Ghozali, 2005). Multicollinearity can be also diagnosed by variance inflation factor (VIF) or Tolerance values. In this study, multicollinearity is considered insignificant when correlation coefficients between predictors variables are in low to moderate range (0-0.70), VIF less than 10, and Tolerance greater than 0.10.

4- Homoscedasticity of residuals or error variances: This assumption refers to the variance of the dependent variable is approximately the same at different levels of the exploratory variables (Hair et al., 2010). In this study, Homoscedasticity is examined by visual inspection of the scatter plot of regression residuals.

5- Non-existence of outlier: Outliers were identified from the standardized residual plot; cases with standardized residual values above (3.3 or below -3.3) were considered outliers. In addition, this study was suggested three control variables of the firm characteristics as indicated in (Chapter Three), this study employed two steps of multiple regression analysis.

In the first step, control variables were regressed on dependent variables. Then, independent variables were added in the second step. This was to test whether there was a significant relationship between the independent variables and the dependent variable after controlling the control variables. In this study, multiple regression analysis was used to test the relationships between societal marketing orientation and marketing performance, and between societal marketing orientation and market-based capabilities, as well as relationships between market-based capabilities and marketing performance.

4.10.7 Hierarchical Regression Analysis

Hierarchical regression analysis was utilized to test the moderating effect of institutional context on the relationship between the societal marketing orientation and market-based capabilities and test the mediating effect of market-

based capabilities on the relationship between societal marketing orientation and marketing performance. In examining moderating effects, four steps of hierarchical regression were performed for each moderating variable (regulations, public scrutiny, and competitive intensity).

In step 1, the control variables were regressed on dependent variable. *In step 2*, the independent variables were entered in order to know the influence of independent variable on dependent variable. *In step 3*, the moderating variable was introduced in order to examine if moderating variable behaved as a predictor to the dependent variable. *In step 4,* the interaction term between the independent variables and moderating variable was entered to test the effect of the interaction term on the dependent variable. The analysis of changes in the values of R Square and F statistic was done to determine if the moderating variable had impacted the relationship between the independent and dependent variable. The impact of moderating variable exists when there is a significant relationship between the interaction term and the dependent variable.

4.11 Summary of Chapter

This chapter describe the methodology which used in the study. The study was designed to be cross-sectional focusing on analyzing individual firms at one point of time. The population of the study was services firms in Susan. The measurement of the variables was based mostly on adaption and customization of previously used measurements. The main method of data collection was a

questionnaire directed to general manager, or director, or department managers in the sample firms. The collected data were analyzed using various statistical techniques, including descriptive, factor and reliability analysis, multiple regression analysis, and hierarchical regression analysis. The next chapter presents results interpretations and research findings.

CHAPTER FIVE

Data Analysis and Interpretation

5.0 Introduction

This chapter focus on data analyzing which was collected from Sudanese large services firms and then include the results interpretation. The chapter is divided into eleven sections; the first section an Introductionof chapter, second section discusses the summery of response rate, third section profiles of sample firms. Section four cover respondent's characteristics. The section four discuss the bias test. Five goodness of measures. Section six modification of research framework and hypotheses. Seven descriptive analysis. Section eight the correlation among study variables. The section nine discuss the hypotheses test. The final section discusses summery of chapter.

5.1 Response Rate

Table (5.1) shows the response rate for this study. Current study focus on large services firms in Sudan context include financial institutions, communication and information technology firm's education firms, and other services firms. Pilot study was conducted for ensure initially of some statistical measures such as validity and reliability of study instrument. The size of pilot study 40 firms of study population frame. Based on pilot study results 221 questionnaires posted to the firm's, 4.5% of which were return a blank, 211

completed questionnaire received from respondents resulting in percentage rate 95.5%, returned questionnaires partially answered questionnaires 5 resulting in percentage rate 2%, questionnaires not returned 10 resulting in percentage rate 4.5%, overall response rate 95.5%, total usable questionnaires 196 resulting in percentage rate 88.5%. This response rate is very high and acceptable if would compared to other similar studies. The SPSS output in appendix (B1).

Table 5.1: Response Rate

	Number	Rate of percent
Total Questionnaires Posted to The Firms	221	100%
Blank Questionnaires Returned Without Participation	10	4.5%
Completed Questionnaire Received from Respondents	211	95.5%
Returned Questionnaires (Partially Answered)	5	2%
Questionnaires Not Returned	10	4.5%
Overall Response Rate	211	95.5%
Total Usable Questionnaires	196	88.5%

Source: prepared by the researcher from empirical study data, (2016)

5.2 Profiles of Sample Firms

Table 5.2 showed four characteristics of the profiles of sample firms: type of service, ownership form, and number of employees and age of the business.

The data analysis reveals (49.4%) of the respondents' firms was (financial institutions) as higher ratio and followed by (25.0%) was education firm, and lastly as lower (11.3%) was (communication and information technology) and (14.3) was (no response). As for firm's number of employees the most of the companies surveyed the number of employees were less than or equal 100

employees, (60%) of the responses and then followed by firms which their employees above 100 percentage with (40%).

Concerning the firms age, most of these companies were age less than 10 years (newer) present (63 %). Then comes firms which were ages above than 10 years (older) is (37%). In term of business age, the total percentage distributed between private sector (63%) and government sector (27%). regarding the firms' ownership, majority of the firms were owned by private firms (71%), followed by government firms (29%). The study initially suggests firm's attributes as control variables to estimate the real effect on dependent variable. The SPSS output in appendix (B2).

Table 5.2: Firm Profile

Variable Name	Categories	Frequency	Percentage %
Type of service	Financial and Banking	79	49.4
	Communication and Information Technology	18	11.3
	Education	40	25.0
	Non response	23	14.3
Business age	=< 10 years(newer)	111	63
	> 10 years(older)	49	27
Ownership form	Private sector	128	71
	Government sector	53	29
Number of employees	=< 100 Employees	107	60
	>100 Employees	74	40

Source: prepared by the researcher from empirical study data, (2016)

5.3 Respondents Characteristics

Table 5.3 show respondent's characteristics, in gander term that 59% of the respondents are male while 41% are female, followed by respondents ages almost of respondents are in the first range age less than or equal 35 are representing a rate (47%) This is considered as a greater among the frequency groups), in addition a rate of 21% their age between (36 - 45) years.

Furthermore, the respondent's ages (46 - 55) are representing a rate (15%). Last in this group have more than 55 years are few number four frequency and represented in 3%. Regarding to education level term the respondents qualifications, the table showed 5.3, that most of them studied at university as highest level of education (93.75%), this is reflected in the fact that (37.5 %) hold bachelor's degree and 56.25% hold postgraduate degrees (Masters and PhDs).

Concerning to term education back ground (82.5%) of these respondents from business studies (business management, economy and account) the remaining are less than university (3.13%) and others (3.13%). (This is considered as a few rate compared to others groups) whereas, back ground of education term the table (5.3) reveals about t the back ground of education of (34.4%) of participators are business management, economy represents (25.6%), account (22.5%) and engineering (7.2%).

Regarding term work experience (experience of managers), the table reveals the major of respondents are in the middle range (6-10) years (39.4%), and

(43%) of the responses have (less than or equal 5) years' work with firm, that means questionnaires were answered by the most experienced personnel in studied firm, while remaining rates distributed between (11-15) years (10.7%), the range (16-20) years (10.7%) last one (13%) are above 20 years. Concerning to position character the table reveal (44%) of them are managers and directors, that imply the questionnaires were answered by department managers and strategic mangers in the firms, (39.0%) are chief information officer and (11%) for others managers.

Concluded of this section overall evaluations for respondent's profile indicates that the respondents who answered the questionnaire have knowledge and capability in answering the questions measuring the study's constructs. The SPSS output in appendix (B3).

Table 5.3: Respondents Profile

Variable	Categories	Frequency	percentage
Gander	Male	100	55.2
	female	81	44.8
Ages	< 35	91	50.3
	35-45	61	33.7
	46-55	25	13.81
	> 55	4	2.2
Education level	Less Than University	1	0.6
	University	66	36.5
	Post Graduate	109	60.2
	Others	5	2.8
Back ground of education	Business Management	69	38.1

	Economy	43	23.8
	Account	36	19.9
	Engineering	13	7.2
	Others	20	11
Variable	**Categories**	**Frequency**	**percentage**
Experiences of work	< 5	55	30.4
	5-10	66	36.5
	11-15	21	11.6
	16-20	18	9.9
	> 20	21	11.6
Position	General Manager	18	9.9
	Director	71	34.2
	Chief information officer	71	39.2
	Others	21	11.6

Source: prepared by the researcher from empirical study data, (2016)

5.4 Bias Test

Non-response may cause sample bias and can create difficulty in generalizing research findings to the population (Armstrong & Overton, 1977). Response bias the potential for response bias was assessed using the methods recommended by Armstrong and Overton (1977) to determine whether non-response bias was present in the study. To identify last respondents from last respondents, each returned survey questionnaire has a date of return affixed to it.

Table 5.4: Chi-Square Test for Differences between First and Second Response

Variable	Categories	First Responses(122)	Last Response (59))	Chi-Square	Value Sig
Service type	Financial	40.4	19.6	3.506	.320
	Communications	21.6	10.4		
	Education	29.7	14.3		
	other	30.3	14.7		
Number of employees	<150	50.6	24.4	2.148	.143
	>=150	71.4	34.6		
Owner form	Government	60.7	29.3	.011	.915
	private	61.3	29.7		
Age of business	< 10	76.8	37.2	1.590	.207
	>=10	45.2	21.8		
Job title	General manager Director	12.1	5.9	1.917	.590
	Information chief officer	47.9	23.1		
		47.9	23.1		
	other	14.2	6.8		
experience	=<5	33.0	16.0	2.398	.663
	6-10	40.4	19.6		
	11-15	13.5	6.5		
	16-20	18.2	8.8		
	>20	16.9	8.1		
Age of respondent	>35	40.4	19.6	6.343	.175
	36-40	31.0	15.0		
	41-46	16.2	7.8		
	47-51	21.6	10.4		
	other	12.8	6.2		
Level of Education	Less than university.	22.2	10.8	4.888	.180
	University	37.1	17.9		
	Post graduate	44.5	21.5		
	other	18.2	8.8		
education back ground	Business management	37.7	18.3	5.251	.263
	Economy	28.3	13.7		
	Account	23.6	11.4		
	Engineering	16.2	7.8		
	other	16.2	7.8		
Sex type	Male	60.0	29.0	.912	.340
	Female	62.0	30.0		

Source: prepared by the researcher from empirical study data, (2016)

The first group was identified as the period of the first week after the survey was started, including 122 respondents. The last group was identified as the period after the follow-up procedure was carried out, including 59 respondents.

The SPSS output in appendix (B4). Comparison of the responses of first respondents against those who respond last during the data collection period helps to estimate the potential effect of non-response bias. To check non-response bias in present study, the two groups were compared, using various firm and respondent's characteristics, for their correlation with *chi_square*, including service type, owner form, number of employees, business age, sex type, back ground study, experience and job title. All of their correlations show no significant difference at 0.05 level. The outcomes indicated no non-response bias in the responding sample. Furthermore, in order to test the potential, the effect of job position in none response bias. In order to test whether this potential bias exist, this study conducted a one-way analysis of variance. (ANOVA) using the study variables. Table 5.6 showed the results of the ANOVA on the study variables. The SPSS output is presented in Appendix B3b. chi square was conducted for further quality of measure. The results of a one-way analysis of variance indicated no significant differences in mean study variables scores for all job position, except efficiency.

The SPSS output in appendix (B5).

Table 5.5: ANOVA between Job Position and Study Variables

variables	General managers (mean)	Directors (mean)	Information chie officer (mean)	F_value
Information technology	2.7305	2.8922	2.7767	2.107
Organizational change	2.7986	2.9507	3.1056	2.911
Change managemer and culture	2.546	2.728	2.645	1.907
Top managemer commitment	2.625	2.924	2.895331	1.592
Management competence	2.259	2.723	2.727	4.897
Knowledge stock	1.972	2.736	2.438	5.132
Learning flows	2.444	2.802	2.598	1.745
efficiency	1.791	2.411	2.341	8.753***
flexibility	2.569	2.602	2.651	3.397

Source: prepared by the researcher from empirical study data, (2016)

5.5 Goodness of Measures

This section, offer the results of validity and reliability tests to evaluate the goodness of measure of study constructs (Sekaran, 2003). The study used exploratory factor analysis for testing the validity and uni-dimensionality of measures of all variables of study. Whereas, the reliability of empirical measurements was obtained by internal consistency (Nunnally, 1978) using Cronbach's alpha test. The results of factor and reliability analyses are describing follows:

5.5.1 Factor Analysis

Factor analysis examines to provide clearer representation of variables in the factors. The study used factor analysis (FA) for testing construct validity of measures of all variables under study. In conducting factor analysis, this study followed assumptions that recommended by (Hair, Anderson, Black, 2010). Firstly, there must be sufficient number of statistically significant correlations in the matrix. Secondly, Kaiser-Meyer-Olkin measure of sampling adequacy should be at least 0.6. Thirdly, Bartlett's test of spherecity should be significant at 0.05. Fourthly, communalities of items should be greater than 0.50. Fifthly, the minimum requirement of factor loading 0.40 (since the sample size of this study 181) based on a 0.05 significant level, with value of cross loading exceeds 0.50. Also to provide a simple structure column for interpretation, the factors were subjected to Varimax rotation. Finally, eigenvalues should be more than 1 for factor analysis extraction. The results of factor analysis are described as follows:

5.5.1.1 Factor Analysis of BPR

BPR (independent variable) consist of five factors, in which twenty-five items which were used to measure Business process reengineering dimensions, factor analysis was used to test construct validity. Table (5.4) show the summary of results of factor analysis on business process reengineering factors. The SPSS output is shown in Appendix (B5.1).

running factor analysis had been done on BPR factors for refining and ensure all items has communalities greater than 0.50, the result of many running to factor reduction command in SPSS program number of items were dropped due their communalities value less than (0.40). In last of running, had been reached to situation on that all Hair's assumptions were satisfactory fulfilled.

Table 5.6 shows BPR factors (independent variable) loaded at five factors. Some of factor still maintaining its items such as change management systems and cultures, information technology infrastructure and management competence. while, organizational change items combine with reengineering project management items. All items achieved eigenvalues exceeding (1.0). These five factors explain (70.04%) of variance in the data (above the recommended level of 0.60). All the remaining items also had the factor loading values above the minimum values of (0.40), with value of cross loading less than 0.50. The organizational change factor became collects some items from others factors that led to rename of factor according to change in items.

This study found that BPR factors in Sudanese services firms consists of five factors, namely; organizational change, information technology infrastructure, top management commit, change management systems and culture and management competence this results of factor analysis in one line with (nwezi(2015; Khong 2012; Al_mashari and Zairi, 1999).

Table 5.6: Factor Analysis of BPR

Organizational change: in our firm:	Component				
F4_ there are integrating among management strategic programs proc change.	**.830**	.117	.209	.165	.077
E5_ Has flexible organizational structure.	**.826**	.113	.216	.164	.063
E4_ Has clear organizational structure.	**.798**	.151	-.063	.238	.152
F3_ Has process reengineering consultants	**.796**	.154	-.052	.210	.148
F1_ Has a clear process changing plan aligning to strategic plans	**.752**	.133	.086	.091	.129
F2_ Has clear visions to process reengineering.	**.679**	.266	.225	.244	.111
E1_ senior managers support the working in teams form.	**.577**	.342	.244	.081	.139
E3_has clearly work guides.	**.568**	.417	.090	.297	.002
Information Technology Infrastructure: *In Our Firm Has*:					
D4_ Information Technology Improve Firm Performance	.271	**.792**	.134	.142	.225
D3_ Information Technology Enhance The Working Practices	.249	**.775**	.182	.096	-.056
D1_ Easily Use Information Technology Systems.	.107	**.771**	.229	.057	.208
D2_ Information System Helping Us To Speed Access To Informati And Data.	.258	**.729**	.184	-.023	.061
D6_ Always The Firm Work On Revamping The Legacy Informati Systems To New Systems.	.147	**.728**	.218	.143	.039
change management systems and culture: in our firm systems a policies:					
C4 -Organize work form based on process_orientation	.067	.168	**.822**	.082	.114
C3_ Encourages Employees To _Innovations.	.227	.151	**.802**	.085	.090
C2_ Granted More Authorities To Do The Work.	.091	.245	**.740**	-.028	.041
C5_ Allows To Share In Decisions Making.	.191	.034	**.717**	.127	.174
C6_ Spreading Changing Culture Among Firm Staff.	-.056	.424	**.609**	.298	-.010
C1_ Has Effectively Motivates Systems.	.132	.409	**.538**	.250	.150
C7_ Has Clearly Training Strategic Plans.	.045	.357	**.517**	.458	.070
Top management commitment:in our firm:					
F5_ support the processes reengineering aligning to macro strate plans.	.228	.153	.025	**.880**	.082
E6_ develop work procedures based on top management.	.228	.150	.093	**.867**	.144
F6_ have clearly objectives from process redesign.	.373	.023	.264	**.732**	.160
E7_ build strong coordination among all the departments.	.397	.041	.254	**.730**	.176
Management competence : In our firm:					
G2_ firm senior managers sponsor process reengineering program.	.072	.126	.093	.154	**.876**
G1_ firm senior managers build a clear visions.	.191	.096	.132	.195	**.860**
G3_ firm senior managers designed process reengineering program.	.364	.129	.240	.061	**.617**

Eigenvalues	10.58	3.03	2.11	1.63	1.54
Percentage of variance	39.18	11.24	7.83	6.03	5.69
Total Variance Explained (%)	69.98				
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.859				
Bartlett's Test of Sphericity	4402.022**				

ote: NO. = 181, **p< 0.01
Variables loaded significantly on factor with Coefficient of at least 0.4,
* Some items deleted due to high cross loading.

Source: prepared by the researcher from empirical study data, (2016)

5.5.1.2 Factor Analysis for Organizational Performance

Factor analysis was done on the eleven items which were used to measures organizational performance constructs. Table 5.4 shows that the items were loaded on two factors as conceptualized, with eigenvalue above 1.0. The two factors cumulatively captured 68.450% of the total variance in the data. The loading values of all items are above the minimum value of 0.40. The factor effectiveness split between the efficiency factor and flexibility factor. the organizational performance became comprise just of two factors efficiency (Pi1,Pi2,Pi3,Pj1,Pj2), and flexibility (Pk1,Pk2,Pk3,Pk4,Pj3,Pj4) with eigenvalue of 7.530and1.230 respectively.

Result of factor analysis all organizational performance factors items were redistributed just on two factors that led to rename new organizational factors based on its items. According to Venkatraman and Ramanujam, (1986) organizational performance can be measured using both financial and non-financial indicators. The SPSS output in appendix (B5.2).

Table 5.7: Factor analysis for Organizational Performance

Organizational performance efficiency *in last three years our firm has achieved:*	Component	
	1	2
PI2_Return on sales (ROS).	**.913**	.270
PI3_Return on investment (ROI)	**.903**	.315
PI1_Profit margin (EPS).	**.893**	.339
PJ1 _ Good market position.	**.854**	.357
Flexibility		
PK1_ Reducing the time for market acceptance of our services.	.326	**.856**
PK2_increasing the speed at which we respond to customer requests	.316	**.828**
PK3_Tracking customer trends.	.387	**.817**
PK4_improving our relationships with our customers.	.186	**.743**
Eigenvalues	5.46	1.16
Percentage of Variance Explain	68.24	14.51
Total Variance Explained (%)	82.75	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.897	
Bartlett's Test of Sphericity Approx. Chi-Square	1426.289**	

*Note: NO. = 181, **p< 0.01*
Variables loaded significantly on factor with Coefficient of at least 0.4,
* Some items deleted due to high cross loading.

Source: prepared by the researcher from empirical study data, (2016)

5.5.1.3 Factor Analysis for Learning Capabilities

Factor analysis was conducted on eight items which measures learning capabilities. Table 5.8 Summarizes the results of factor analysis and the SPSS output is shown in Appendix (B5.3)

Table 5.8 showed that all assumptions for factor analysis have been fulfilled, namely, KMO (.867), Bartlett's test of sphericity (p=.00), communalities (>.50), eigenvalue (>1), and factor loading (>.40). The factor cumulatively explains 75.40% of data variance. In addition, factor loading for the eight items ranged from 0.719 to 0.8880. The full SPSS output is attached in Appendix.

The results of factor analysis split the learning capabilities items between two factors knowledge stock (six items) and learning flows (two items). The SPSS output in appendix (B5.3)

Table 5.8: Factor analysis of Learning Capabilities

items	Component	
	1	2
H3_Individuals share knowledge as they work within groups.	**.880**	.091
H6_Policies and procedures guide individual work.	**.872**	.086
H1_Individuals are knowledgeable and qualified about their work.	**.867**	.189
H5_Individuals share knowledge as they work within groups	**.853**	.194
H2_Individual lessons learnt are exchanged within their work group.	**.773**	.297
H4_Individuals are aware of critical issues that affect their work.	**.719**	.361
H8_Internal training and work training are provided within the organization	.171	**.879**
H9_Individuals know and put in operation group decisions	.180	**.872**
Eigenvalues	4.75	1.28
Percentage of Variance Explain	59.43	15.97
Total Variance Explained (%)	75.40	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.76	
Bartlett's Test of Sphericity Approx. Chi-Square	1862.58**	

*Note: NO. = 160, **p< 0.01*
Variables loaded significantly on factor with Coefficient of at least 0.4,
** Some items deleted due to high cross loading.*

Source: prepared by the researcher from empirical study data, (2016)

5.5.2 Reliability Analysis

All study dimensions and constructs were tested for validity and reliability to ensure the consistency. Cronbach's alpha coefficient is widely used as a measure the reliability of the study dimensions. Factor analysis was conducted to measures the construct validity. Reliability is an assessment of the degree of consistency between multiple measurements of variables (Haire et al., 2010). Cronbach's alpha coefficient is widely used to assess the internal consistency of the items. Table 5.7 shows the results of the reliability test. According to Nunnally (1978) scale items should have an alpha values greater than 0.60 are to be taken as reliable and demonstrate internal consistency.

According to Haire et al. (2010) argued that a Cronbach's alpha of 0.6 and above was considered an effective reliability for judging a scale. The generally agreed lower limit for Cronbach's alpha may decrease to 0.60 in exploratory research (Hair et al., 2010). The alphas for all the scales in this study are listed in table (5.6) explain all items in present study exceeded (0.70). Confirmed that all the scales display satisfactory level of reliability (Cronbach's alpha exceed the minimum value of 0.6). Therefore, research instrument can be considered to be reliable if the result of the study can be replicable under a similar methodology with stability of measurement over time. The Cronbach's alpha coefficients of the research instruments are shown in Table (5.6) and full SPSS output is displayed in Appendix (B5.4).

Table 5.9: Reliability Analysis for Study Variables

Construct	Variable	No. of items	Cronbach's alpha
Independent Variables BPR	Organizational change	8	0.92
	Information technology infrastructur	5	0.89
	change management systems and culture	7	0.88
	Top management commitment	4	0.92
	Management competence	3	0.82
Dependent Variables Organizational performance	Efficiency	4	0.96
	Flexibility	4	0.89
Moderating Variables Learning capabilities	Knowledge stocks	6	0.93
	Learning flows	2	.77

Source: prepared by the researcher from empirical study data, (2016)

5.6 Modification of Research Framework and Hypotheses

After executed factor analysis, number of study factors items were rearranged. That due the BPR factors partial change in factor reengineering project management items based on that should be rename the factor to senior managers' commitment instead of reengineering project management. Regarding learning capabilities and organizational performance factors were changed. However, learning capabilities items were factored into two components (knowledge stock and learning flows) while organizational performance items were factored into two components (efficiency and flexibility of performance), instead of the three

variables. Accordingly, there is a need to a modification on the theoretical framework to reflect this change. Figure 5.1 presented the modified theoretical framework.

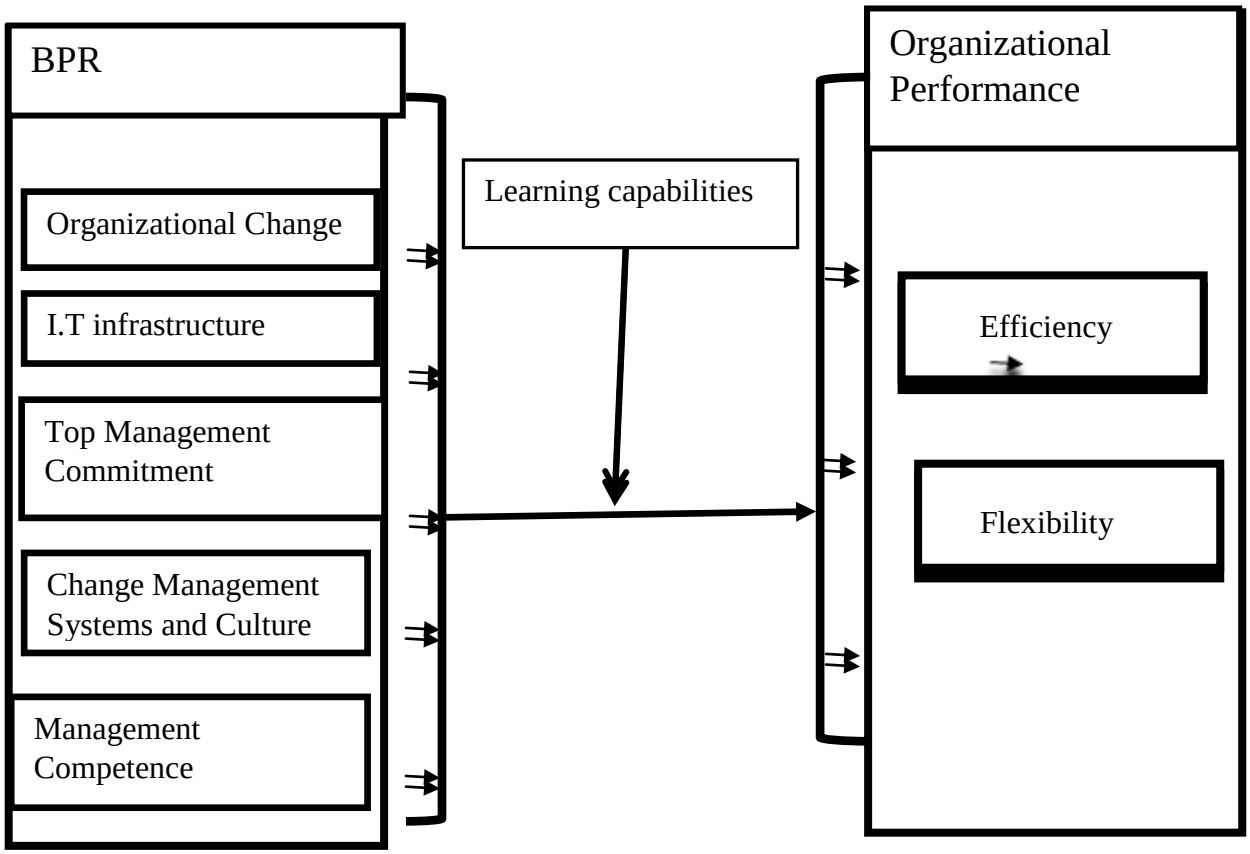

Figure 5.1: Modified conceptual frame work of the Study

Source: prepared by the researcher (2016)

Based on the Modified conceptual framework, the hypotheses related to BPR factors, learning capabilities and organizational performance need to be restated. The restated hypotheses reflect the changing in all factors and its variables. The restated hypotheses are shown below:

H1: There is a positive relationship between BPR factors (organizational change, information technology infrastructure, top management

commitment, change management systems and culture and management competencies) and organizational performance (efficiency).

H1.1: There is a positive relationship between BPR and efficiency

H1.1a There is a positive relationship between organizational structure and efficiency of performance.

H1.1b: There is a positive relationship between the information technology infrastructure and efficiency of performance.

H1.1c: There is a positive relationship between top management commitment and efficiency of performance.

H1.1d: There is a positive relationship between change management systems and culture and efficiency of performance.

H1.1e: There is a positive relationship between management competence and efficiency of performance.

H1.2: **There is a positive relationship between BPR factors and flexibility.**

H1.2a There is a positive relationship between organizational structure and flexibility of performance

H1.2b: There is a positive relationship between the information technology infrastructure and flexibility of performance.

H1.2c: There is a positive relationship between top management commitment and flexibility of performance.

H1.2d: There is a positive relationship between change management systems and culture and systems and flexibility of performance.

H1. 2e : There is a positive relationship between management competence and flexibility of performance.

H2: The effect of BPR factors on organizational performance is stronger when learning capabilities is higher.

H2.1 The effect of BPR factors on organizational performance is stronger when Knowledge stocks are higher.

H2.1.1 The effect of BPR on efficiency of performance is stronger when Knowledge stocks are higher.

H2.1.1.1a The effect of organizational structure on efficiency of performance is stronger when Knowledge stocks are higher.

H2.1.1.1b: The effect of IT infra-structure on efficiency of performance is stronger when Knowledge stocks are higher.

H2.1.1.1c: The effect of change management systems and culture on efficiency of performance is stronger when Knowledge stocks are higher.

H2.1.1.1d: The effect of top management commitment on efficiency of performance is stronger when Knowledge stocks are higher.

H2.1.1.1e: The effect of management competence on efficiency is stronger when Knowledge stocks are higher.

H2.1.2 The effect of process reengineering on flexibility of performance is stronger when Knowledge stocks are higher.

H2.1.2.1a The effect of organizational structure on flexibility of performance is stronger when Knowledge stocks are higher.

H2.1.2.1b: The effect of IT infra-structure on flexibility of performance is stronger when Knowledge stocks are higher.

H2.1.2.1c: The effect of change management systems and culture on flexibility of performance is stronger when Knowledge stocks are higher.

H2.1.2.1d: The effect of top management commitment on flexibility of performance is stronger when Knowledge stocks are higher.

H2.1.2.1e: The effect of management competence on flexibility of performance is stronger when Knowledge stocks are higher.

5.7 Descriptive Analysis

In this section descriptive statistics such as mean and standard deviation were used to describe the characteristics of surveyed firms and all variables (Independent, dependent, and moderators) under study. The study suggested some characteristics of respondent's firm as control variables, T- *test* the independent-Samples T- *test* procedure tests the significance of the difference between two sample means and One-Way ANOVA procedure produces a one-way analysis of variance for dependent variable by a single factor (independent) variable.

Analysis of variance is used to test the hypothesis that several means are equal. This technique is an extension of the two-sample *t* test. Some firm characteristics such as business age, service type, firm size and ownership status among the essential variables of the study.

5.7.1 Descriptive Analysis to BPR

Table shows the means and standard deviations of the five components of business process reengineering factors; organizational structure, IT infrastructure, top management commitment, organizational systems and culture and management competencies. The means and standard deviations of the five factors of BPR factors; data Analysis reveals the Sudanese service firms were low adopted of reengineering factors the data analysis reveals that the organizational structure (mean=3.06, standard deviation=0.86), followed by top management commitment (mean=2.93. standard deviation=0.97), and then information technology infrastructure (mean=2.9, standard deviation=1.07), and followed by change

management systems and culture (mean=2.77, standard deviation=0.93), and the lowest components of five of reengineering competencies (mean=2.74, standard deviation=0.90), Therefore those five dimensions achieved low than an average score of (3.52). Given that the scale used a 5-point scale (1=strongly disagree, 5=strongly agree), it can be concluded that Sudanese service firms are lowly adopted factors of BPR.

Table 5.10: Descriptive Analysis of BPR

Variables	Mean	Standard Deviation
Organizational Structure	3.06	0.86
Information Technology Infrastructure	2.90	1.07
Top Management Commitment	2.93	0.97
change management systems and culture	2.77	0.93
Management Competencies	2.74	0.900

Note: *All variables used a 5-point likert scale (5= strongly agree, 1= strongly disagree*)

Source: prepared by the researcher from empirical study data, (2016)

To investigate the differences in BPR factors for attributes of the firm, T-*test* were conducted on reengineering factors by business age (less than or equal 15 and above 15) years old, number of employees (less than or equal 150 and above 150). Table 5.11 describes summary of the t-test, the SPSS output is shown in Appendix (Appendix B7). Table 5.11 shows that there are significant differences between number of employees (size of firm) regarding of reengineering factors; information technology infrastructure (t-value= 5.323, $p<0.01$), organizational change (t-value= 5.060, $p<0.01$), top management commitment (t-value= 5.357, $p<0.01$) and change management systems and culture (t-value= 6.049, $p<0.01$).

While, the table shows there are no significant differences between regarding management competence. The mean and t value indicate that information technology infrastructure, organizational change, top management commitment, change management systems and culture are adopted in firms has employees <=150 compared with that has >150 employees. Furthermore, the mean and t value in general reveals low priority in applied the business process reengineering factors regardless of number of employees.

Regarding the business age, table 5.10 appears significant difference in organizational change (t-value=-3.16*, $p<0.05$), organizational systems and culture change (t-value=2.37*, $p<0.05$), and age of business (<=15 and >15. The mean and t value indicates the new business (<=15) embark and claim to implementing new management initiatives with apprehension and slowly steps.

On other hand, information technology infrastructure and top management commitment there are no significant deference in business process reengineering factors. But their mean and t value confirms the previous result.

Concerning to third attribute of firm the table 5.11 showed that there are significant differences between owner form (owner status) regarding of reengineering factors; information technology infrastructure (t-value= -3.620, $p<0.01$), organizational change (t-value= -3.395, $p<0.01$), management competence (t-value= -3.357, $p<0.01$) and change management systems and culture (t-value= -4.625, $p<0.01$).

However, the table shows there are no significant differences between top management commitments regarding of reengineering factors.

The mean and T-*value* value indicate that information technology infrastructure, organizational change, management competence, change management systems and culture are low adopted in government firms compared with private firms. Furthermore, the mean and T-*value* value in general reveals moderate priority in adopted the business process reengineering success factors regardless of owner type.

Table 5.11: T-*test* for BPR Differences for Business Age, Number of Employees and owner form

Firm Attribute	Info_tech		org_ change		top_mgt		sys _cul		mgt_com	
	M	t value	M	t value	M	t value	M	t value	M	t value
Employee number =<150	3.7	5.32**	3.7	5.06**	3.6	5.34**	3.47	6.05**	3.0	2.38 *
>150	2.7		2.9		2.7		2.5		2.7	
Business age =<15	2.9	1.34	3.16	2.03*	3.01	1.42	2.85	2.37*	2.8	1.91
>15	2.8		2.9		2.8		2.5		2.6	
Owner form: Private	2.6	-3.620**	2.86	-3.395**	2.88	-.771	2.44	-4.625**	2.54	3.357**
Government	3.20		3.29		2.99		3.06		2.99	

Note: **p<0.05, **p<0.01, M=Mean*

Source: prepared by the researcher from empirical study data, (2016)

One-way ANOVA tests were used to test for differences in reengineering factors components among attributes of firms that include more than two values. These attributes include type of service. The table 5.10describes summary of the one way ANOVA test, the SPSS output is shown in Appendix (B6).

Table 5.12: Differences in BPR by Service Type Attributes

		Sum of Squares	df	Mean Square	F	Sig.
organizational change	Between Groups	4.372	3	1.457	1.986	.118
	Within Groups	129.901	177	.734		
	Total	134.273	180			
Information Technology	Between Groups	.865	3	.288	.249	.862
	Within Groups	204.635	177	1.156		
	Total	205.500	180			
top management commitment	Between Groups	10.557	3	3.519	3.896	.010
	Within Groups	159.863	177	.903		
	Total	170.420	180			
change management systems and culture	Between Groups	7.888	3	2.629	3.098	.028
	Within Groups	150.224	177	.849		
	Total	158.112	180			
Management competences	Between Groups	27.612	3	9.204	13.770	.000
	Within Groups	118.311	177	.668		
	Total	145.923	180			

Source: prepared by the researcher from empirical study data, (2016)

The table 5.12 revealed that there are no significant differences between Service Types of firms in BPR, namely; organizational change (sig. value=118, $p>0.05$), information technology (sig. value -value=0.862, $p>0.05$). owever, the table also shows there are significant differences between service types of firms in BPR namely; top management commitment (sig. value =0.05, $p<0.05$), change management systems and culture (sig. value =0.03, $p<0.05$) and management competences (sig. value =0.00, $p<0.01$).

5.7.2 Descriptive Analysis of Organizational Performance

Table 5.13 showed means and standard deviations values of the two dimensions of organizational performance. The mean and standard deviations results the Sudanese service firms emphasized more on efficiency of performance (Mean=2.74, Standard Deviation=1.29) followed by flexibility of performance (mean=2.71, Standard Deviation=1.08). Given that the scale (Likert scale) used a 5-point scale it can be concluded that Sudanese services firms (sampled firms) in during the last three years achieved low organizational performance in term efficiency of performance compare with the average mean.

Table 5.13: Descriptive Analysis of Organizational Performance

Variables	Mean	Standard Deviation
Efficiency	2.74	1.29
Flexibility	2.71	1.08

Note: All variables used a-5 point Likert scale with (5= much better, 1= much worse)

Source: prepared by the researcher from empirical study data, (2016)

On-way ANOVA and T-*test* analysis used to test differences in organizational performance. Table (5.13) showed describes summary of the on-way ANOVA tests of differences in organizational performance of service type. Further, the table revealed that one of two of organizational performance factors namely efficiency (.00<.01) has significant differences between finance performance and service type attribute. Whereas, flexibility (.053>.05) that

indicates there is no significant differences between flexibility and service type attribute. The full SPSS output is show in Appendix (B7).

Table 5.14: Differences in Organizational Performance by Service Type Attributes

		Sum of Squares	df	Mean Square	F	Sig.
efficiency	Between Groups	45.689	3	15.230	10.469	.000
	Within Groups	257.487	177	1.455		
	Total	303.176	180			
flexibility	Between Groups	8.999	3	3.000	2.611	.053
	Within Groups	203.355	177	1.149		
	Total	212.354	180			

Source: prepared by the researcher from empirical study data, (2016)

T-*test* used to determine the means differences in Organizational Performance by business age and number of employees attributes.

The table 5.13 showed there are significant differences in organizational performance; efficiency (t-value= 7.736, M= 3.723, $p<0.01$), flexibility (t-value= 6.460, M= 3.625, $p<0.05$). The mean and t value explain the business established in number of employees =<150 years achieve high performance than which were established in number of employees >150 years.

Regarding business of age the table 5.13showed that there are significant differences between business of age (<=15 and >15) and organizational of performance dimensions; efficiency (t-value= 3.552**, M= 2.72, $p<0.01$) and

flexibility (t-value= 2.76**, M= 2.879, p<0.01). The mean and T-*test* value explain the business with in =<150 employee better organizational performance than which with in age >150 employee. Third firm attribute is owner form the table 5.13 showed that there are significant differences between two owner form private and government and organizational of performance dimensions; efficiency (t-value= -4.778**, M= 2.09, p<0.01) and flexibility (t-value= -5.211**, M= 2.35, p<0.01). The mean and t value explain the organizational performance better in government sector than the private sector.

Table 5.15: Organizational Performance Differences for Business Age, Number of Employees and owner form

Firm Attribute	Efficiency		Flexibility	
Number of employees =<150	M	t value	M	t value
>150	3.723	7.736**	3.625	6.460**
	2.88		2.47	
Business age =<15	2.72	3.553* *	2.77	2.765**
>15	2.03		2.43	
Owner form: Private	2.07	-4.778**	2.35	-5.211**
Government	2.94		3.14	

Note: **p<0.05, **p<0.01, M=Mean*

Source: prepared by the researcher from empirical study data, (2016).

5.7.3 Descriptive Analysis of learning capabilities

Table 5.16presented means and standard deviations values of learning capabilities dimensions, namely; Knowledge stocks and learning flows. The result of descriptive analysis of learning show the Sudanese services firms emphasized

more on Learning flows (mean=2.7, Standard Deviation =0.96) followed by Knowledge stocks (mean=2.6, Standard Deviation =0.99). Given that the scale used a 5-point scale it can be concluded that Sudanese services firms have lowly learning capabilities oriented above the average mean.

Table 5.16: Descriptive Analysis of Learning Capabilities

Variables	Mean	Standard Deviation
Knowledge stocks	2.6	0.99
Learning flows	2.7	0.96

Note: *All variables used a-5 point Likert scale with (5= much better, 1= much worse)*

Source: prepared by the researcher from empirical study data, (2016).

ANOVA used to determine that differences exist among the means of learning capabilities by control variable service type.

Table 5.17: Learning Capabilities Differences by service type.

		Sum of Squares	df	Mean Square	F	Sig.
learn1	Between Group	11.948	3	3.983	4.198	**.007**
	Within Groups	167.946	177	.949		
	Total	179.895	180			
learn2	Between Group	17.099	3	5.700	6.683	**.000**
	Within Groups	150.962	177	.853		
	Total	1 68.061	180			

Source: prepared by the researcher from empirical study data, (2016).

The table 5.14 described summary of ANOVA analysis there are significant differences in learning capabilities; learning stocks (Sig. values=.007 <0.05) and learning flows by service type. (Sig. values =0.00<01); the SPSS output is show in Appendix (B8). The table showed are significant differences in learning capabilities; learning stocks (Sig. values=.000 <0.01) and learning flows by owner status. (Sig. values =0.04<05); the SPSS output is show in Appendix (B8). The table 5.15 discloses the summery of means difference in learning capabilities by firm attributes such as business age, number of employees and owner form. The table show there are significant differences in two dimensions of learning capabilities; knowledge stocks (t-value= 2.829, p<0.05), learning flows (t-value= 3.402, p<0.01). The mean and T-*test* value explain firms <= 15 have the higher level of learning capabilities than which have >15 years.

Regarding term number of employees, the table 5.18 showed that there are significant differences between number of employees (<=150 and >150) and organizational of performance dimensions; efficiency (t-value= 4.905**, p<0.01) and flexibility (t-value= 7.133**, p<0.01). The mean and t value explain the business with in =<150 employees high learning flows than which with in age >150 employees.

Concerning term owner form the table 5.18 showed that there are significant differences between owner form; private and government and performance dimensions; efficiency (t-value= -3.975**, p<0.01) and flexibility (t-value= -

3.093**, p<0.01). The mean and T-*test* value explain the government sector has high knowledge stocks and learning flows than which with in private sector.

Table 5.18: Learning Capabilities Differences by business age and number of employees

Firm Attribute	Knowledge stocks		learning flows	
	M	t value	M	t value
Employee number =<150	3.25	4.91**	3.59	7.13**
>150	2.40		2.48	
Business age =<15	M	t value	M	t value
>15	2.74	2.829**	2.89	3.40**
	2.31		2.40	
Owner form: private sector	2.32	-3.975 **	2.51	-3.093**
Government sector	2.89		2.95	

Note: **p<0.05, **p<0.01, M=Mean*

Source: prepared by the researcher from empirical study data, (2016).

5.8 Correlation Analysis

Pearson correlation analysis was conducted among variables of the study in order to identify the inter-correlation among the variables of study. A high degree of correlation close to the one, it means that a strong correlation between the two variables, on other hand the lower degree of correlation and weak relationship between the two variables. In addition, the relationship value and direction may be positive or negative. In sum, there are many levels of relations based on correlation values. a weak relationship if the value of the correlation coefficient is less than (0.30) and can be considered medium relation if the value of the correlation coefficient ranged between (0.30 - 0.70), if the correlation value of more than (0.70) it is a strong relationship between the two variables.

Pearson correlation analysis test explained the correlation between independent variables (reengineering factors) and dependent variables (organizational performance). The table 5.19 showed the five variables that have been measured using a five scale. The table explains that the business process re-engineering factors have statistically high positive correlation with the organizational performance dimensions; efficiency of performance and flexibility. This result means that the overall organizational performance had been effective if the business process reengineering program successfully applied.

Table 5.19: Pearson Correlation Matrix

variables	IT	OC	TMC	SC	MC	EFF	FLEX	K	F
Information Technology(IT)	1								
Organizational Change(OC)	.548**	1							
Top management commitment(TMC)	.345**	.667**	1						
change management systems an culture (SC)	.570**	.422**	.420**	1					
management competence(MC)	.345**	.459**	.411**	.365**	1				
Efficiency(EFF)	0.477**	0.523**	0.493**	0.602**	0.415**	1			
Flexibility(FLEX)	0.53 **	0.560**	0.420**	0.531**	0.428**	.724**	1		
Knowledge Stock(K)	0.362**	.379**	.254**	.543**	.491**	0.530**	0.581**	1	
Learning Flows(F	.417**	.538**	.481**	.471**	.501**	0.613**	0.531**	.448**	1

Source: prepared by the researcher from empirical study data, (2016)

Further, the table correlation matrix revealed strong relation (.667) between organizational change and management commitment and medium relation (.345) between information technology top management commitments, in general all relations rate over (.30) this result explained there are strong and positive relation between all present study variables.

SPSS output in appendix (B9).

5.9 Hypotheses Testing

This section discusses the results of hypotheses of the study. The hypotheses were tested with the hierarchical regression that discloses the effect of control variables. Three control variables considered in this study were firm age (new and old firms), number of employees and owner form since they had been found to have effect on the essential variables of the study (reengineering factor, learning capabilities and organizational performance). There are 22 hypotheses in this study after run the factor analysis to dimensions' reduction.

5.7.1 The Relationship between BPR and organizational Performance

- The first main hypotheses in the study which predicts that five business process reengineering factors (organizational change, information technology infrastructure, top management commitment, change management systems and culture and management competence) have positive relationship with the two dimensions of organizational performance; efficiency and flexibility.

As shown in figure 5.2 follows:

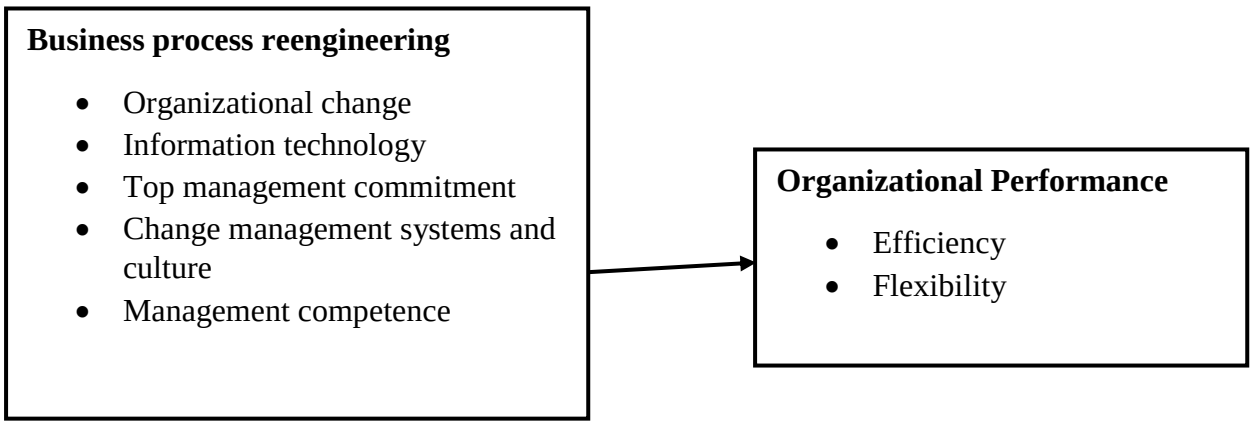

Figure 5.2: The Relationship between BPR and Organizational Performance. Source: prepared by the researcher (2016).

The hierarchical regression n analysis done in order to identify the effect of BPR (independent variables) on the organizational performance of firms (dependent Variables). furthermore, Beta coefficient was conducted to determine and estimate the expected change in dependent variables due to the change in one unit of the independent variable, also was used R^2 value to identify and know the ability of model to explain the relationship between the independents variables and dependent variables, In addition ،was used F test to identify the moral regression model then compare calculated value with the moral level if the level of significance calculated value is less than the significance level of (0.05) then statistically significant effects found. To test these hypotheses, a two-step hierarchical regression analysis was carried out (Haire et al., 2010):

First step, the analysis tests the impact of control variables (business age and number of employees) on Organizational Performance.

Second step: BPR was introduced to test the impacts on Organizational Performance. The results of two hierarchical regression analyses were discussed in following subsections.

5.9.1 The Relationship between BPR and Efficiency

Table 5.20 presented the results of two-step regression analysis of three control variables and BPR factors on efficiency. In the first model, two control variables have significant effect on organizational performance.

Table 5.20: Regression Analysis: The Relationships between BPR and Efficiency

Variables	Efficiency of Performance	
Control variables:		
Owner form	.303***	.157**
Number of Employees	-.458***	-.234***
Business Age	-.110*	-.084
Model variables:		
Organizational Change		0.107
Information Technology Infrastructure		0.042
Top Management Commitment		0.147*
Change Management Systems and Culture		0.273**
Management Competence		0.121
F value	33.089***	25.832***
R^2	0.359	0.546
Adjusted R^2	0.348	0.525
R^2 change	0.359	0.186
F change	33.089***	14.120***
Note: Level of significant: *p<0.10, **p<0.01.		

Source: prepared by the researcher from empirical study data, (2016)

Firstly: The three control variables together explain about (35%) of the total variation in organizational performance. The additions of the five BPR factors in model two explain additional (19%) of organizational performance variance. This means that control variables and BPR factors cumulatively explain (54%) of the variance in organizational performance. Also the results explained the two regression models were significant ($F= 32.657$, $p<0.01$; $F= 27.381$, $p<0.01$). Secodly: the results showed that all factors of BPR were positive influenced organizational performance. This signifies that all predictor variables put together (that is BPR factors variables) is statistically significant. Therefore, we do not accept null hypothesis that there is no significant relationship between BPR and organizational performance.

Moreover, these results showed that the hypothesis was supported, i.e. *there is a positive and significant relationships between BPR and efficiency of performance*.

Add to that, the results also showed that change management systems and culture (ß=0.273, $p<0.01$), has high significant effect on efficiency of performance, followed by top management commitment (ß=0.147, $p<.10$). While there is no evidence on significant effect between BPR following dimensions namely; Organizational Change, Information Technology Infrastructure and Management Competence and efficiency of performance. The results give support to hypotheses:

H1.1c (*There is a positive relationship between top management commitment and efficiency of performance).*

H1.1d (There is a positive relationship between change management systems and efficiency of performance).

Based on these results provide the effort to identify and explore the most critical success factors of BPR factors for fully and successful implementation of BPR strategy ultimate to improve efficiency of performance, while all the dimensions of (BPR) have significant relation with efficiency of performance. The full SPSS output is displayed in Appendix (B10).

5.9.2 Regression analysis for BPR factors and flexibility of performance.

Table 5.17 presented the results of two-step regression analysis of three control variables and five factors of BPR factors on flexibility of performance.

In the first step, three control variables have significant effect on organizational performance. The three control variables together explain about (31%) of the total variation in flexibility of performance. In addition, five business process reengineering factors in step two explain additional (19%) of flexibility of performance variance. This means that control variables and business process reengineering factors cumulatively explain (50%) of the variance in flexibility of performance. Also the results disclosed the two regression models were significant ($F= 32.657$, $p<0.01$; $F= 27.381$, $p<0.01$). As well as, the results show that all the five actors of BPR factors were positive influenced organizational performance.

Through regression analysis had been reached there is a significant relationship between the four of reengineering factors and performance flexibility, in more details clear in individual relation start from first component information technology infrastructure has a significant relationship and flexibility of performance (Beta=.148 ,Sig. = .05), followed by a significant relation between the organizational change and flexibility of performance (Beta=.231, Sig. = .05), and then a significant relation between change systems and couture and flexibility (.158, Sig. = .05) and last one a significant relation between management competence and flexibility (Beta=.128, Sig. = .05). Whereas in the results reveals there is no evidence to a significant relationship between top management commitment and flexibility of performance.

These results give support to following sub hypotheses:

H1.2a There is a positive relationship between organizational structure and flexibility of performance

H1.2b: There is a positive relationship between the information technology infrastructure and flexibility of performance.

H1.2d: There is a positive relationship between change management systems and culture and systems and flexibility of performance.

H1. 2e : There is a positive relationship between management competence and flexibility of performance.

Thus, these results provide support for the assertion that the effort to become BPR leads to great enhancement in flexibility of performance, while all the dimensions of BPR have significant relation with flexibility of performance except top management commitment.

Table 5.21: Regression Analysis the Relationships between BPR and Flexibility

Variables	Flexibility	
Control variables:		
• Owner form	.337***	.171**
• Number of employees	-0.402***	-.187**
• Business age	-.066	-.066
Model variables:		
• Organizational change		0.231*
• Information technology infrastructure		0.148**
• Top management commitment		.012
• Change management systems and culture		0.158**
• Management competence		0.128*
F value	26.542***	21.838***
R^2	.310	.504
Adjusted R^2	.229	.481
R^2 change	.310	.194
F change	26.542***	13.426***
Note: Level of significant: *p<0.10, **p<0.05, ***p<0.01		

Source: prepared by the researcher from empirical study data, (2016)

Table 5.22: Summary of Hypotheses Testing Results for the Relationship between BPR and Organizational Performance

Item	Statement of Hypothesis: There is a positive relationship between	Remark
H1.	Business process reengineering factors and efficiency.	Partially Supported
H1.1	Business process reengineering factors and efficiency.	Partially Supported
H1.1a	Organizational structure and efficiency.	Not supported
H1.1b	Information technology infrastructure and efficiency.	Not supported
H1.1c	Top management commitment and efficiency.	supported
H1.1d	Change Organizational systems and culture and efficiency.	supported
H1.1e	Management competence and efficiency.	Not supported
H1.2	Business process reengineering factors and flexibility	Partially supported
H1.2a	Organizational structure and flexibility	supported
H1.2b	Information technology infrastructure and flexibility.	supported
H1.2c	Top management commitment and flexibility.	Not supported
H1.2d	Organizational systems and culture and flexibility.	supported
H1.2e	Management competence and flexibility.	supported

5.9.2 The Moderating Role of Learning Capabilities

The second main hypotheses hypothesis suggest that learning capabilities which consist of two dimensions (knowledge stocks and learning flows) moderate the relationship between BPR and Organizational Performance, as shown in Figure 5.3 follows.

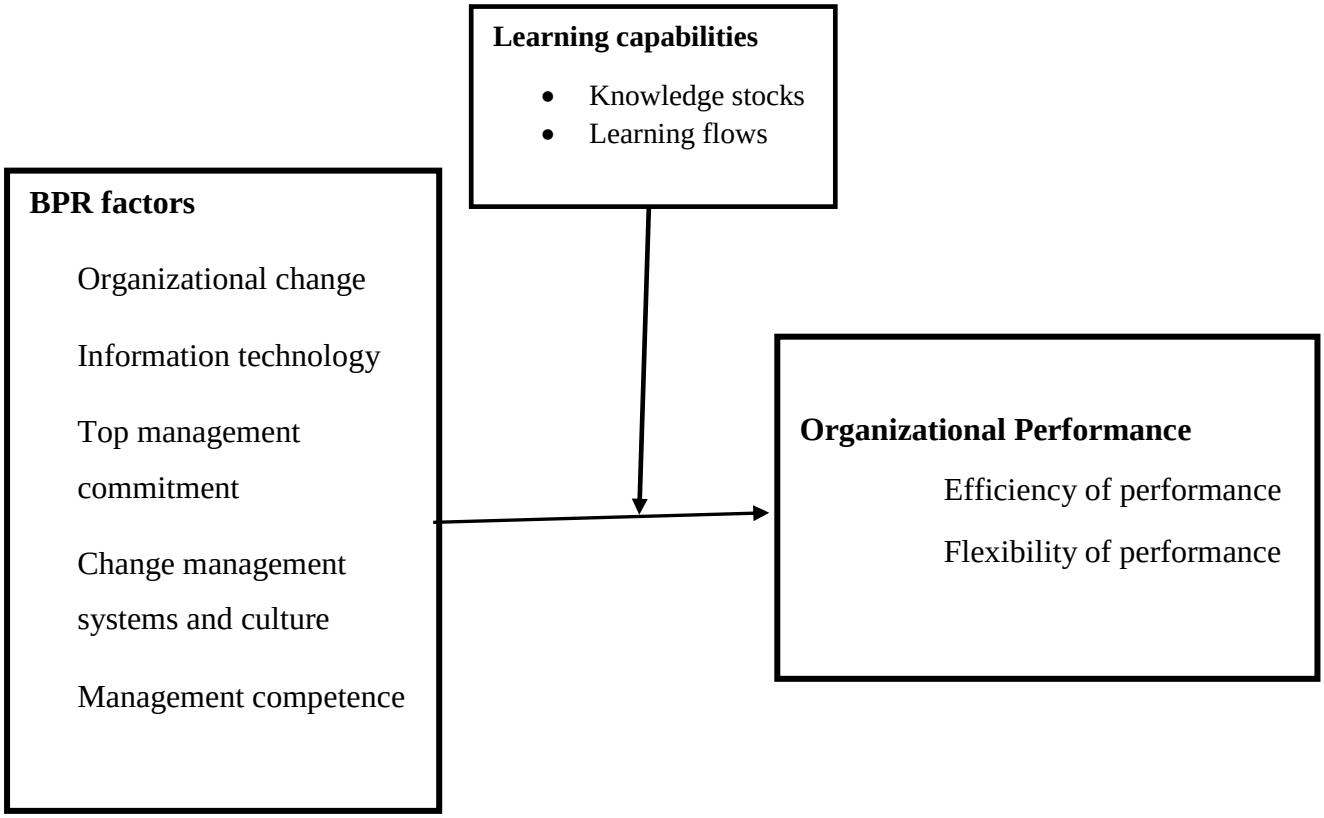

***Figure 5.3*:** Moderating Effect of Learning Capabilities
Source: prepared by the researcher (2016).

To test these hypotheses a four-step hierarchical regression analysis was conducted. Hierarchical regression or moderator regression has been suggested by many authors as statistical technique for analyzing the moderating effect (Baron & Kenny, 1986; Sharma et al., 1981; Frazier et al., 2004). In this study, three levels

of significance (1%, 5% and 10%) were used to detect the moderating effect of learning capabilities on the relationship between business process reengineering and organizational performance. According to rnold & Evans A study conducted in 1979 suggested that the hierarchical regression analysis provides an unambiguous conclusion with regard to the existence of moderator effects.

To test the moderator, effect a four (4) steps hierarchical was conducted to determine what ratio to the variance in a particular variable is explained by other variables when these variables are entered into the regression analysis in a certain order. In the first step, the control variables are entered, in the second step the predictor variables entered in the regression equation. In the third step, moderating variable was entered into the regression equation to test its isolated effect on the criterion variable. While in step four, the process requires the introduction of a multiplicative interaction term into the regression equation. Accordingly, four multiplicative interaction terms were created by multiplying the values of business process reengineering factors by the values of hypothesized learning capabilities.

To demonstrate if the moderator effect is present on the proposed relationship, three maximum conditions were used. First, the final model is significant. Second, the F change is significant. Third multiplicative interaction term is also statistically significant. Additionally, in order to establish whether moderator is a pure or a quasi-moderating this research applied the criteria

mentioned by Sharma et al (1981). If the coefficients of both the multiplicative interaction term and the moderator variable are significant, the moderator is a quasi-moderator. However, if the coefficient of the multiplicative interaction term was significant and the coefficient of the moderator variable effect was not significant, the moderator is a pure moderator. A pure moderator effect implies that the moderator variable (learning capabilities) modifies the relationship between the predictor variable (business process reengineering factors) and criterion variable (organizational performance).

Moreover, understanding the nature of moderator effect, a graphical representation was carried out for each significant effect. This process was carried out for testing the moderating effect of each of the two variables (knowledge stocks and learning flows) on each of the relationship that link the five factors of BPR (Organizational Change, Information Technology Infrastructure, Top Management Commitment, Organizational Systems and Culture and Management Competence) with the four Organizational Performance (Efficiency and Flexibility). This study also splits each BPR and learning capabilities into two groups (low, high) by using percentiles to see how the moderator has change the relationship. The analysis began with knowledge stocks, followed by learning flows and SPSS output in appendix (B12).

5.9.2.1 The Moderating Effect of Knowledge Stocks on the Relationship between BPR s and Organizational Performance

At first, the results of its direct and moderating effects of knowledge stocks on the relationship between BPR and organizational performance, are as follows:

5.9.2.1.1 The Moderating Effect of Knowledge Stocks on the Relationship between BPR and Efficiency

Table 5.23 summarized the results of moderating effect of knowledge stocks on the relationship between BPR and performance efficiency. This table helps to assess the statistical significance of the results. The results showed that the F change was significant in all four steps. The results showed that the knowledge stocks moderate the relationship between three components of business process reengineering factors. In model and table, the term organizational change :(ß= 1.426, $p<0.01$), has a negative and significant effect on relationship between BPR factors and efficiency of performance, whereas the effect is significant and positive when it is moderated by knowledge stocks**.**

Further, the model reveals an interest result in term top management commitment **(**ß= -0.910, $p<0.05$) has a positive and significant effect on relationship between BPR factors and efficiency of performance, whereas the effect is still significant but it is negative when it is moderated by knowledge stocks. In addition, the introduction of the interaction terms in step four increase R square about 3% and the model as a whole is significant.

This implies that the model (model 4) was able to explain 59.6% (expressed as a percentage, multiply by 100, by shifting the decimal point two places to the right). The SPSS output is shown in Appendix (B11.a**).**

Table 5. 23: Effect of knowledge stocks on the Relationship between BPR and Efficiency

Variables	Efficiency			
Control variables:				
Owner form	0.303***	0.157**	.147**	.113*
Number of employees	-0.458***	-0.234***	-.207***	-0.205***
Business age	-.110*	-.084	-.075	-.065
predictor variables:				
Organizational change		0.107*	0.082	-0.607**
Information technology		0.042	0.053	0.275
Top management commitment		0.147*	0.179	0.689***
change management systems an culture		0.273***	0.206	0.338*
Management competence		0.101*	0.043	-0.004
Moderator variable				
Know			0.173**	0.051
Interaction terms:				
Korg				1.426***
Kinfotech				-0.313
Ktopmgt				-0.910**
Ksyschang				-0.194
kmgtcomptence				0.057
F value	33.089***	25.832***	24.444***	17.471***
R^2	0.559	0.546	0.563	0.596
Adjusted R^2	0.348	0.525	0.540	0.562
R^2 change	0.359	0.186	0.017	0.033
F change	33.089***	14.120***	6.624**	2.711**
Note: Level of significant: , *p<0.10**p<0.05, ***p<0.01				

Source: prepared by the researcher from empirical study data, (2016)

However, knowledge stocks show moderating effect of remaining BPR factors were not significant namely; Information Technology Infrastructure, Change Management Systems and Management Competence on Efficiency. Further inspection revealed that the coefficient of the knowledge stock effect was not significant, which indicate that it is a pure moderator (full interaction).

The figure 5.4 showed the moderating effect of knowledge stocks on the relationship between organizational change and efficiency of performance. This result indicates that firms which are have high level of knowledge stocks has clearly and extremely positive impact of Organizational Change on efficiency of performance at a high level of organizational change. Furthermore, the results disclosed that firms which has low of knowledge stocks has also positive and significant effect on relationship between Organizational Change and Efficiency if comparing between the two effects of knowledge stocks level.

Furthermore, Organizational Change was found to influence continuously efficiency of performance at all levels of Organizational Change. These indicate that there is a lower limit and higher limit to what top management commitment can improve and enhance the Efficiency for firms that has high level of knowledge stocks, on the other hand, Top Management Commitment was found to influence continuously efficiency of performance at a high levels of Organizational Change. Based on above results it can possible derived a mathematical equation which

state: "*while organizational change rate increased through of high knowledge stocks that will lead to improve and enhance the efficiency of performance*".

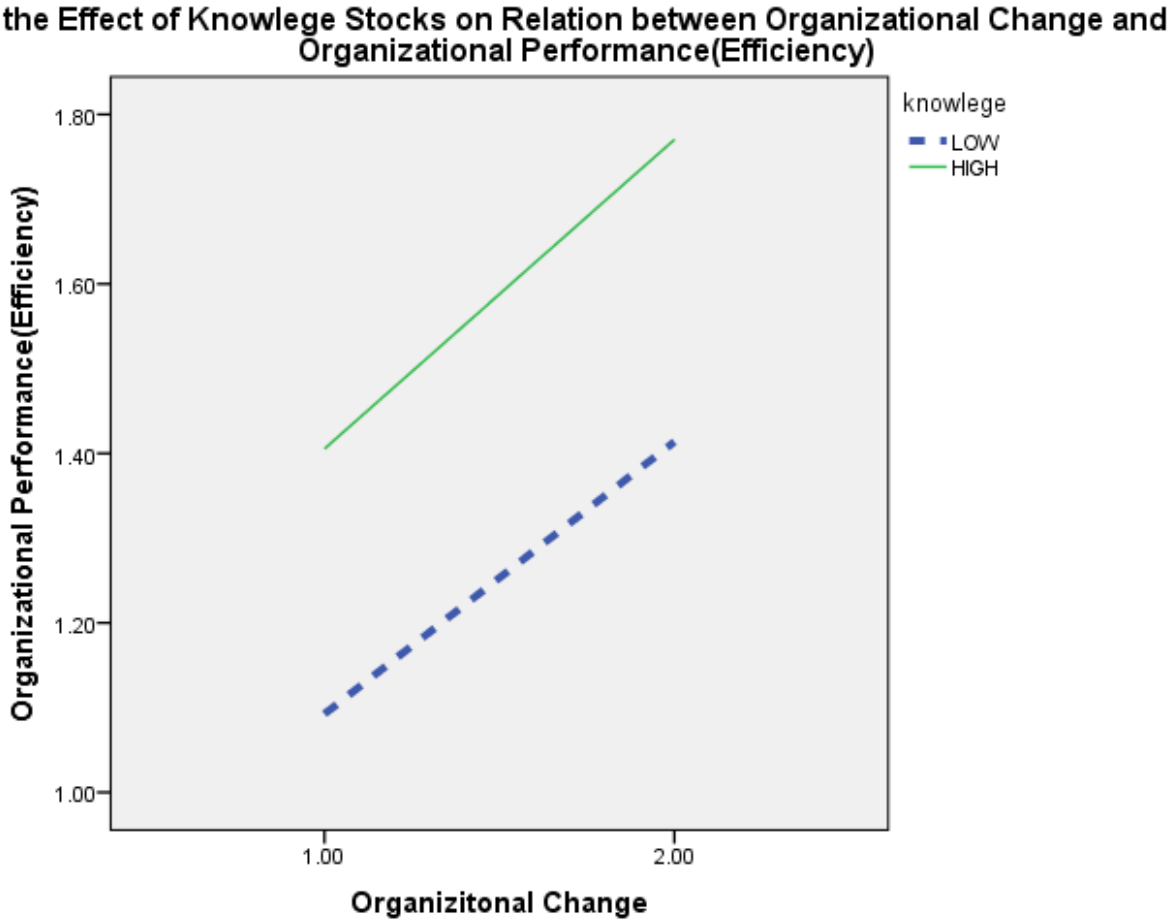

Figure 5.4: The Moderating effect of Knowledge Stocks on relationship between Organizational Change and Efficiency
Source: prepared by the researcher from empirical study data, (2016).

Concerning the moderating effect of knowledge stocks on the relationship between top management commitment and efficiency of performance to Figure (5.6) shows the moderating effect of knowledge stocks on the relationship between top management commitment and efficiency of performance. This result indicates that firms which have high level of knowledge stocks has positive impact of top

management commitment on efficiency of performance at a high level of organizational change. Furthermore, the results revealed that firms which has low of knowledge stocks has clearly and strong positive effect on relationship between top management commitment and efficiency of performance if comparing between the two effects of knowledge stocks level. These indicate that there is a lower limit and higher limit to what top management commitment can improve and enhance the efficiency of performance for firms that has high level of knowledge stocks, on the other hand, top management commitment was found to influence continuously efficiency of performance at a low levels of organizational change.

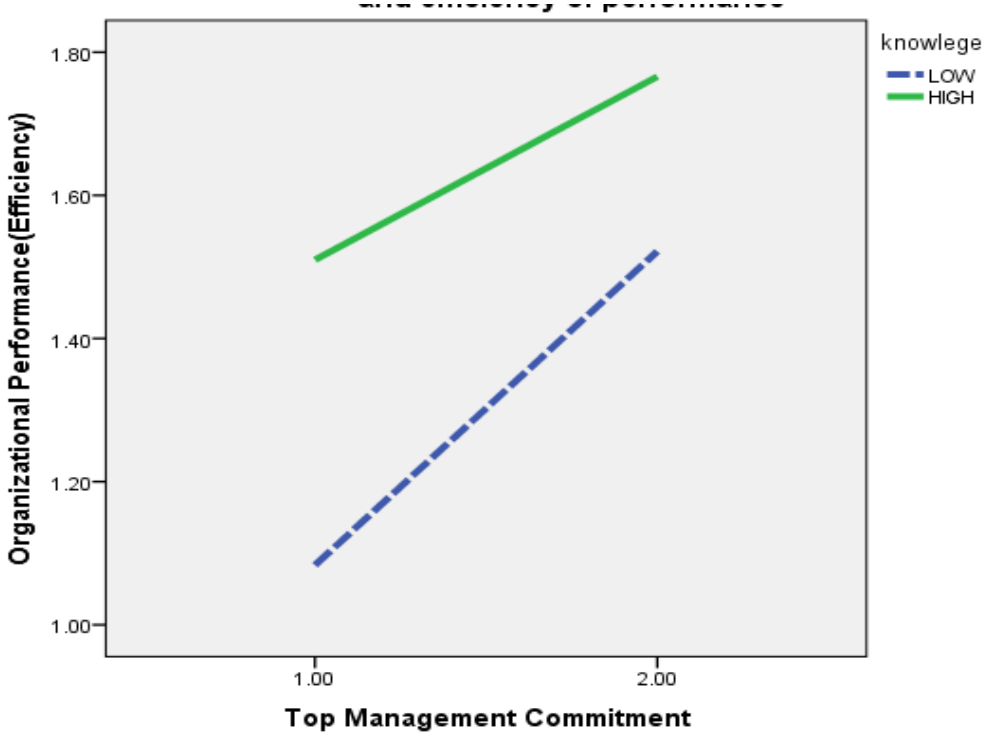

Figure 5.5: The moderating effect of knowledge stocks on the relationship between Top Management Commitment and Efficiency

Source: prepared by the researcher from empirical study data, (2016).

Based on above results it can possible derived a mathematical equation which state: "while top management commitment rate increased through of low range of

knowledge stocks that will lead to great improve and enhance the efficiency of performance".

5.9.2.1.2 **The Moderating Effect of Knowledge Stocks on the Relationship between BPR and Flexibility.**

Table 5.24: Effect of knowledge stocks on the Relationship between BPR and Flexibility

Variables	Flexibility			
Control variables:				
Owner form	.337***	.171**	.154**	.144**
Number of employees	-0.402***	-0.187**	-0.142**	-0.168**
Business age	-0.066	-0.041	-0.026	-0.015
predictor variables:				
Organizational Change		0.148*	0.188**	-0.109
Information Technology		0.231**	0.167**	0.049
Top Managemer		0.012	0.067	0.203
Commitment		0.158**	0.045	0.744***
Change Organizationa				
Systems and Culture		0.128**	0.029	0.012
Management Competence				
Moderating variable				
Know			0.296***	0.743**
Interaction terms:				
Korg				0.565
Kinfotech				0.323
Ktopmgt				-0.205
Ksyschang				-1.466***
kmgtcomptence				-0.007
F value	26.542***	21.838***	23.536***	18.426***
R^2	0.310	0.504	0.553	0.608
Adjusted R^2	0.299	0.481	0.530	0.575
R^2 change	0.310	0.194	0.049	0.055
F change	26.542***	13.426***	18.920***	4.675***
Note: Level of significant: , *p<0.10**p<0.05, ***p<0.01				

Source: prepared by the researcher from empirical study data, (2016)

Table 5.24 summarized the results of moderating effect of knowledge stocks on the relationship between business process reengineering factors and flexibility of performance. The data in the table indicates an interesting results disclosed that the F change was significant in all four steps, implies the four model are significant. The results also show that the knowledge stocks moderate the relationship between just. The introduction of the interaction terms in step four increase R square about 5% and the model as a whole is significant.

Furthermore, knowledge stocks show no moderating effect between rest components of business process reengineering; information technology infrastructure, change organizational systems and culture and management competence on efficiency. More inspection reveals that the coefficient of the knowledge stock effect was significant, which indicate that it is a quasi-moderating. The SPSS output is shown in Appendix (B11.a).

Figure 5.6 shows the moderating effect of knowledge stocks on the relationship between BPR and Flexibility. This result indicates that firms which have high level of knowledge stocks has positive impact of change management systems and culture on flexibility of performance at a high level of organizational change. Furthermore, the results revealed that firms which has low of knowledge stocks has clearly and strong positive effect on relationship between change management systems and culture and Efficiency if comparing between the two effects of knowledge stocks level.

These indicate that there is a lower limit and higher limit to what Change Management Systems and Culture can improve and enhance the Efficiency for firms that has high level of knowledge stocks, on the other hand, change management systems and culture was found to influence continuously Flexibility at a low levels of change management systems and culture.

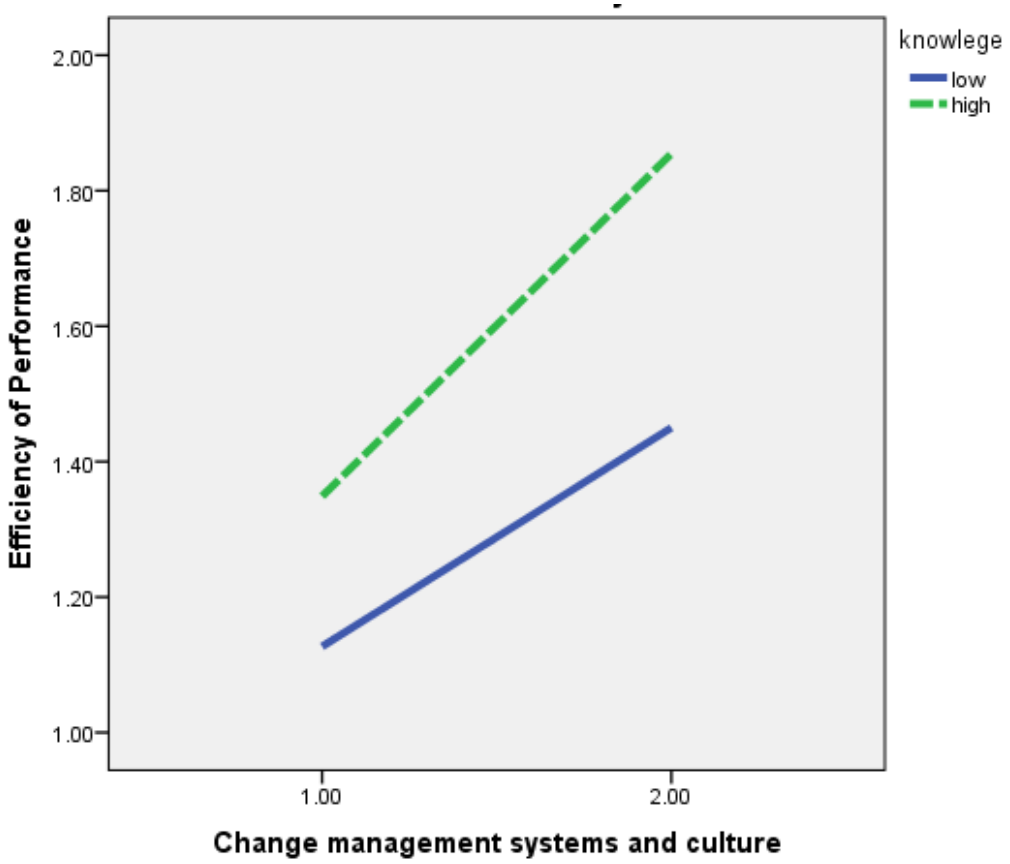

Figure 5.6: Effect of knowledge stocks on the relationship between Change management systems and culture, and flexibility.
Source: prepared by the researcher from empirical study data, (2016).

5.9.2.2 The Moderating Effect of Learning Flows on the Relationship between BPR and Organizational Performance.

Table 5.25: The Moderating Effect of Learning Flows on the Relationship between BPR and Efficiency

Variables	Efficiency			
Control variables:				
Owner form	0.303***	0.157**	0.146**	0.105*
Number of employees	-.458***	-0.234***	-0.175**	-0.146**
Business age	-.110	-0.084	-0.065	-0.046
predictor variables:				
Organizational change		0.121*	0.039	-0.619**
Information technology		0.042	0.062	0.240
Top management commitmen		0.147**	0.126*	0.708***
Change management system and culture		0.273***	0.244***	0.283
Management competence		0.101	0.038	-0.092
Moderating variable flows			0.237***	0.223***
Interaction terms:				
orgachngmod				1.377***
infotechmod				-0.262
topmgtmod				-0.983**
systemchgmod				-0.117
mgtcommod				0.117
F value	33.089***	25.833***	25.670***	19.399***
R^2	0.359	0.546	0.563	0.596
Adjusted R^2	0.348	0.525	0.540	0.596
R^2 change	0.359	0.186	0.017	0.033
F change	33.089***	14.120***	6.624***	2.711***
Note: Level of significant: , *p<0.10**p<0.05, ***p<0.01				

Source: prepared by the researcher from empirical study data, (2016)

5.9.2.2.1 The Moderating Effect of Learning Flows on the Relationship between BPR and Efficiency.

The table 5.25 summarized the results of moderating effect of Learning Flows on the relationship between BPR and efficiency.

The results showed that the F change was significant in all four models. The results showed that the learning flows moderates the relationship between two of BPR factors (Change Management Systems And Culture: (ß= -0.619, $p<0.05$) and Organizational Change (ß= -0.708, $p<0.05$).

The introduction of the interaction terms in model four increase R square about 6% and the model as a whole is significant. However, learning flows show there are no evidence to significant moderating effect between remain BPR factors (Information; Technology Infrastructure, Top Management Commitment and Management Competence). Additional inspection revealed that the coefficient of the learning flows effect was significant effect, which indicate that it is a quasi-moderating. The SPSS output is shown in Appendix(B11.b).

In terms of the moderating effect of learning flows on the relationship between business process reengineering factors and efficiency of performance. Figure (5.7) shows the moderating effect of learning flows on the relationship between business process reengineering factors and efficiency of performance. This result indicates that firms which have high level of learning flows has positive impact of organizational change on efficiency of performance at a high level of organizational change. Furthermore, the results reveal that firms which has low

level of learning flows has clearly low positive effect on relationship between organizational change and efficiency of performance, if comparing between the two effects of learning flows level.

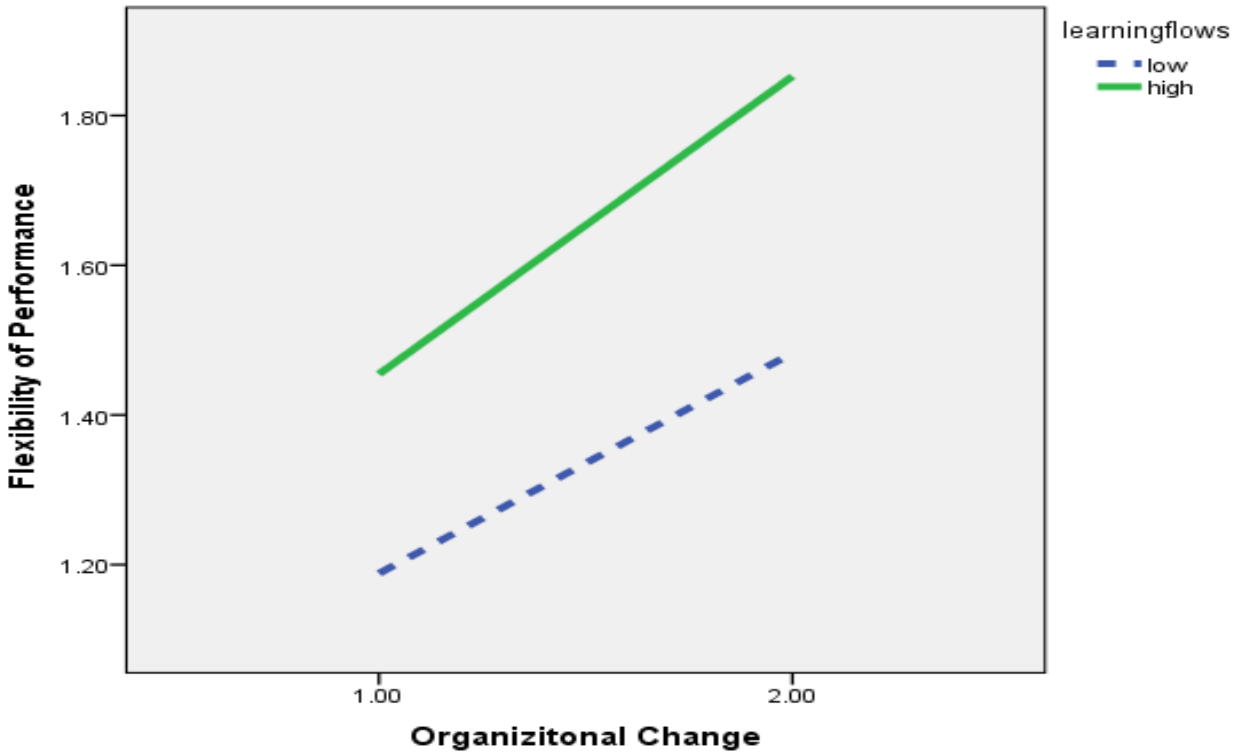

Figure 5.7: The moderating effect of learning flows on the relationship between Organizational change and flexibility.
Source: prepared by the researcher from empirical study data, (2016).

These indicate that there is a lower limit and higher limit to what Organizational Change can improve and enhance the efficiency for firms that has high level of learning flows, on the other hand, organizational change was found to impact influence flexibility at a low levels of Organizational Change.

Concerning moderating effect of learning flows on the relationship between top management commitment and efficiency of performance. Figure (5.6) shows the moderating effect of learning flows on the relationship between top management

commitment and efficiency of performance. This result indicates that firms which have high level of learning flows has positive impact of top management commitment on efficiency of performance at a high level of organizational change.

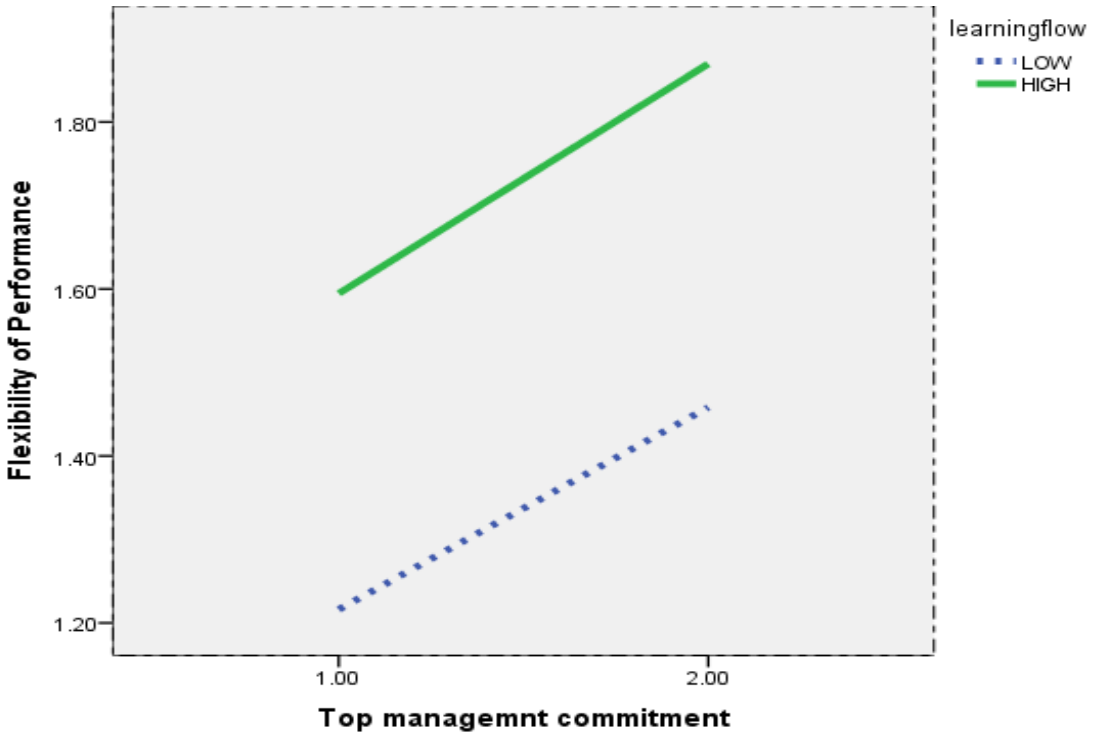

Figure 5.8: Moderating effect of learning flows on the relationship between Top Management Commitment and Efficiency
Source: prepared by the researcher from empirical study data, (2016).

Moreover, the results showed that firms which also has low of learning flows has positive and significant effect on relationship between Top Management Commitment and Efficiency if comparing between the two effects of knowledge stocks level. These indicate that there is a lower limit and higher limit to what Top Management Commitment can improve and enhance the Flexibility for firms that has high level of learning flows, on the other hand, Top Management Commitment

was found to influence continuously efficiency at a low levels of Organizational Change.

5.9.2.2.2 The Moderating Effect of Learning Flows on the Relationship between BPR and Flexibility

Table 5.26 summarized the results of moderating effect of Learning Flows on the relationship between business process reengineering factors and flexibility.

The results showed that the F change was significant in all four steps.

The results showed that the learning flows moderates the relationship between two of five factors of BPR namely; Organizational Change: ß= 1.074, $p<0.05$ and Change Management Systems and Culture: ß= -1.126, $p<0.05$. The introduction of the interaction terms in step four increase R square about 6% and the model as a whole is significant. However, learning flows show no moderating effect between remaining factors of BPR Information Technology Infrastructure, Top Management Commitment and Management Competence on Flexibility. Further analysis revealed that the coefficient of the learning flows effect that there was no significant evidence, which indicate that it is pure-moderating. The SPSS output is shown in Appendix (B11.b)

Table 5.26: The Moderating Effect of Learning Flows on the Relationship between BPR and Flexibility

Variables	Efficiency			
Control variables:				
Owner form	0.337***	0.171**	0154**	0.144**
Number of employees	-0.402***	-0.187**	-0.142**	-0.168**
Business age	-0.066	-0.041	-0.026	-0.015
predictor variables:				
Organizational change		0.273***	0.246**	-0.280*
Information technology		0.154**	0.153**	0.311
Top management commitment		-0.033	0.043	-0.078
Change management systems an culture		0.210**	0.192**	0.600**
Management competence		0.150**	0.113*	0.317*
Moderating variable flows			0.135*	0.208
Interaction terms:				
orgachngmod				1.060*
infotechmod				-0.261
topmgtmod				0.050
systemchgmod				-0.728*
mgtcommod				-0.359
F value	26.542***	21.838***	19.910***	17.068***
R^2	0.310	0.504	0.553	0.603
Adjusted R^2	0.299	0.481	0.530	0.575
R^2 change	0.310	0.194	0.049	0.055
F change	26.542***	13.426***	18.920***	4.675***
Note: Level of significant: , *p<0.10**p<0.05, ***p<0.01				

Source: prepared by the researcher from empirical study data, (2016)

Concerning the moderating effect of learning flows on the relationship between Top Management Commitment and Flexibility.

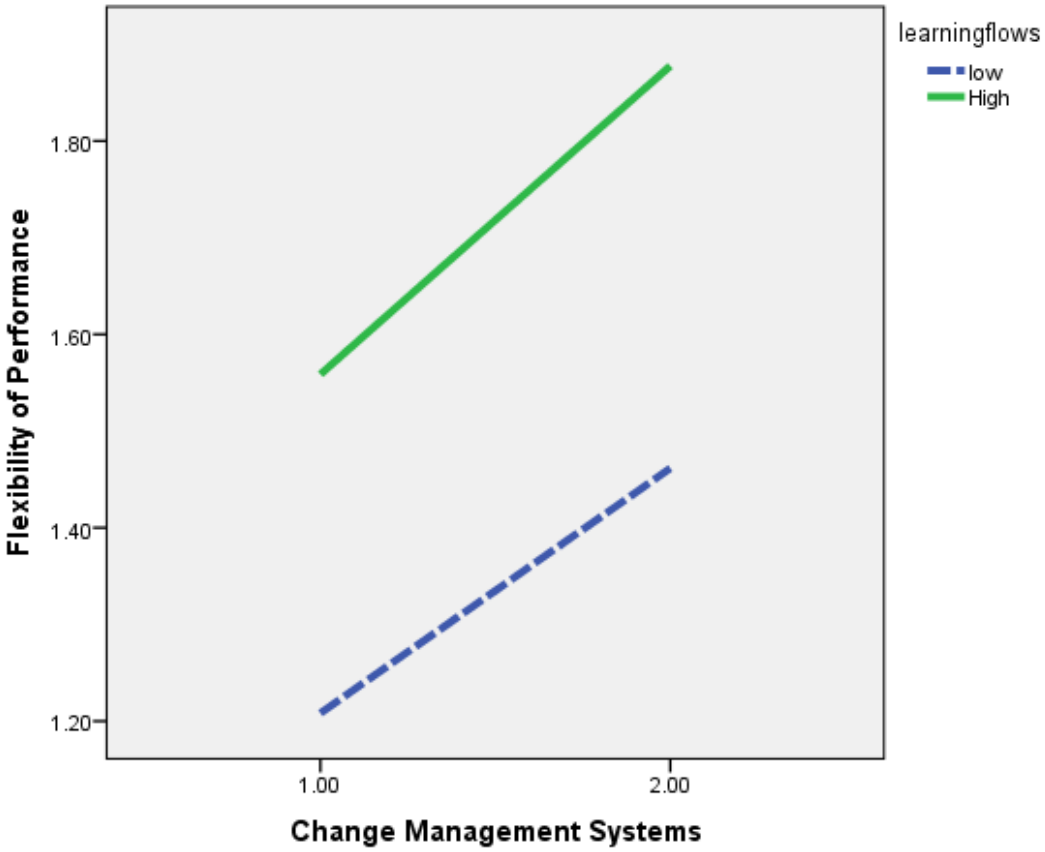

Figure 5.9: The moderating effect of knowledge stocks on the relationship between Change management and flexibility.
Source: prepared by the researcher from empirical study data, (2016).

Figure 5.10 showed the moderating and significant effect of learning flows on the relationship between Top Management Commitment and Flexibility. This result indicates that firms which have high level of learning flows capability has positive impact of Top Management Commitment on Flexibility of Performance at a high level of organizational change. Furthermore, the results also reveal that firms which has low level of learning flows capability has positive

effect on relationship between top management commitment and flexibility of performance if comparing between the two effects of learning flows level. These indicate that there is a lower limit and higher limit to what top management commitment can improve and enhance the efficiency of performance for firms that has high level of learning flows, on the other hand, Top Management Commitment was found to influence continuously flexibility at any levels of organizational change.

Regarding the moderating effect of learning flows on the relationship between Top Management Commitment and Flexibility.

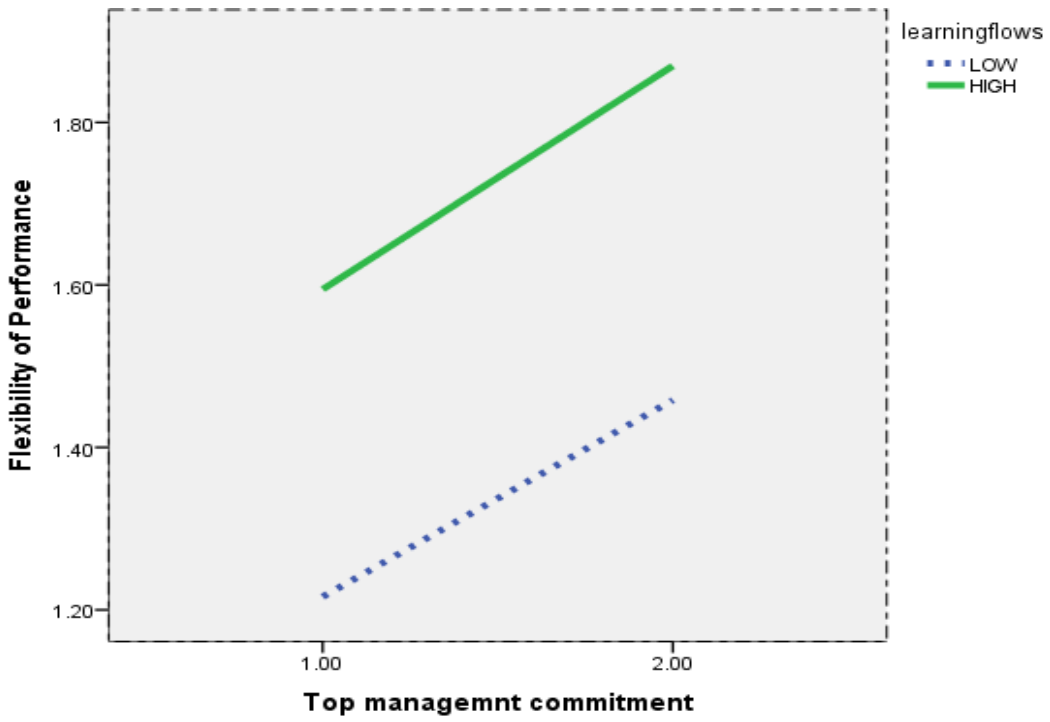

Figure 5.10: The moderating effect of learning flows on the relationship between Top Management Commitment and flexibility.

Source: prepared by the researcher from empirical study data, (2016).

Figure 5.10 showed the moderating effect of learning flows on the relationship between Top Management Commitment and Flexibility. This result indicates that firms which have high level of learning flows has positive and significant impact of Top Management Commitment on Flexibility at a high level of learning flows.

Table 5.27: Summary of Hypotheses Testing Results for Moderated Effects of learning capabilities

Item	Statement of Hypothesis	Remark
H2	The effect of Business Process Reengineering Factors on Organizational Performance is stronger when Learning Capabilities is higher.	Partially Supported
H2.1	The effect of Business Process Reengineering Factors on Organizational Performance is stronger when knowledge stocks are higher.	Partially Supported
H2.1.1	The effect of Business Process Reengineering Factors on Efficiency is stronger when knowledge stocks are higher.	Partially Supported
H2.1.1.1a	The effect of Organizational Change on Efficiency is stronger when knowledge stocks are higher	Supported
H2.1.1.1b	The effect of Information Technology Infrastructure on Efficiency is stronger when knowledge stocks are higher	Not supported
H2.1.1.1c	The effect of Top management commitment on Efficiency is stronger when knowledge stocks are higher	Supported
H2.1.1.1d	The effect of change Organizational Systems and Culture o Efficiency is stronger when knowledge stocks are higher	Not supported
H2.1.1.1e	The effect of Management Competence on Efficiency is stronger when knowledge stocks are higher	Not supported
H2.1.2	The effect of Business Process Reengineering Factors on Flexibility is stronger when knowledge stocks are higher	Partially Supported
H2.1.2.1a	The effect of organizational change on Flexibility is stronger when knowledge stocks are higher	Not supported
H2.1.2.1b	The effect of information technology infrastructure on Flexibility is stronger when knowledge stocks are higher	Not suppor

H2.1.2.1c	The effect of top management commitment on Flexibility is stronger when knowledge stocks are higher	supported
H2.1.2.1d	The effect of organizations systems and culture change on Flexibility is stronger when knowledge stocks are higher	Not supported
H2.1.2.1e	The effect of management competence on Flexibility is stronger when knowledge stocks are higher	Not supported
H2.2	The effect of Business Process Reengineering Factors on Organizational Performance is stronger when Learning flows stocks are higher	Partially support
H2.2.1	The effect of Business Process Reengineering Factors on Efficiency is stronger when Learning flows are higher	Partially support
H2.2.1.1a	The effect of Organizational Change on Efficiency is stronger when Learning Flows are higher	Supported
H2.2.1.1b	The effect of information technology infrastructure on Efficiency is stronger when Learning Flows are higher	Not supported
H2.2.1.1c	The effect of Top Management Commitment on Efficiency is stronger when Learning Flows are higher	Not supported
H2.2.1.1d	The effect of Organizational Change systems and culture on Efficiency is stronger when Learning Flows are higher	Supported
H2.2.1.1e	The effect of Management Competence on Efficiency is stronger when Learning Flows stocks are higher	Not supported
H2.2.2	The effect of Business Process Reengineering Factors on Flexibility is stronger when Learning flows are higher	Partially support
H2.2.2.1a	The effect of organizational change on flexibility is stronge when Learning flows are higher	Supported
H2.2.2.1b	The effect of information technology infrastructure on flexibility is stronger when Learning flows are higher	Not supported
H2.2.2.1c	The effect of top management commitment on flexibility is stronger when Learning flows are higher	Not supported
H2.2.2.1d	The effect of change organizational systems and culture on flexibility is stronger when Learning flows are higher	Supported
H2.2.2.1e	The effect of management competence on flexibility is stronger when Learning flows are higher	Not supported

5.10 **Summary of Chapter**

This chapter presented the results of analyzing data, which was generated from Sudanese service firms. The data was analyzed using various statistical analysis techniques. The first part, chi-square test was conducted to test for nonresponse bias followed by the validity and reliability test on the items used to measure the study variables. Then, descriptive analyses were utilized to identify the characteristics of responding firms and respondents and all variables under study. Correlations Analysis was conducted to identify interrelationships among all study variables. Finally, multiple hierarchical regression and moderated hierarchical regressions were used to test the research hypotheses. The next chapter reviews the findings and discusses the results and their implications as well as limitations and conclusions of the study.

CHAPTER SIX

DISCUSSION AND CONCLUSION

6.0 Introduction

This chapter provides a summary of the key findings of the dissertation in a manner that answers the research questions and outlines the contributions, limitations and areas for further research. Finally, an overall conclusion of study. The chapter is organized into six sections.

6.1 Recapitulation of the Study Findings

The study aimed at investigating the relationship between the BPR and organizational performance. The study as well examined the relationship between BPR and organizational performance. Furthermore, this study tried to determine the moderating role of learning capabilities between the relationship between the BPR and organizational performance.

Two main study questions were outlined to achieve the objectives of the study. The questions are as follows:

1. What is the relationship between BPR and organizational performance?
2. Does learning capabilities moderate the relationship between BPR and organizational performance?

Based on literature review, the study identified effective variables to be focused on, and to including main five factors of BPR (organizational change, information technology infrastructure, reengineering project management,

organizational systems and culture change and management competence) and three components of organizational performance (effectiveness, flexibility and efficiency). In addition to two components of learning capabilities (learning stocks and learning flows).

The primary data for this study was obtained from a cross-sectional survey on 221 large service firms in Sudan. The purposive sampling technique was used in selecting a sample for this study (judgment) due the importance information for this study available in strategic managers and departments mangers. Data collection was done through a structured questionnaire survey directed to either the top managers, or director, or department's managers in each firm. The response rate achieved from the survey was 96%, which was considered appropriate for the study purposes comparing with other studies and researches were conducted in Sudanese context and developing countries.

To determine whether non-response bias was present in the study early respondents were compared with late respondents along all the descriptive response items in the survey The Chi-square tests (x^2) showed no significant differences between the early and late respondents. Furthermore, ANOVA results indicated that there was no significant difference between the three-job position (Chief executive officer, Chief financial officer and Operational executive) and the rest of study variables. Thus, it can be concluded that non-response bias was not a serious problem in this study.

Before running the analyses for hypothesis testing, Factor Analysis and reliability test were conducted to ensure goodness of measures. Factor analysis was used to test for validity of the measures on all the study variables. Particularly, varimax rotation was utilized to identify the dimensionality of the research variables. Two of five BPR factors components coincide with their original conceptualization. The other component was elements of re-engineering project management that has restructuring with in new items by the varimax rotated factor analysis had led to rename this factors by Top Management Commitment based on literature review.

Regarding organizational performance the results of factor analysis showed that two of three organizational performance components coincide with their original conceptualization namely flexibility and rest factors effectiveness and efficiency had emerged as compared with one conceptualized factor called efficiency. Whereas, learning capabilities was split in two factors; learning stocks and learning flows. The reliability of empirical measurements was obtained by internal consistency method using Cronbach‟s alpha test. The results of the reliability analysis confirmed that all the scales display satisfactory level of reliability.

The results of Descriptive Analysis showed that most of the responding firms were from financial and banking services followed by firms from communication and information technology services and other service firms. However, the rest of the firms were distributing between education services and others services. The

ownership status for the almost of the studied firms are public limited corporation. In addition, a large percentage of the respondents firms has the great number of employees also the age of business for studied firm ranged in new business.

To describe the characteristics of surveyed firms and all variables under study, the study used descriptive statistics such as T-test and ANOVA. The results showed that the studied firms emphasized more on organizational structure followed by top management commitment, information technology infrastructure, organizational systems and culture and the lowest components of reengineering factors was the management competencies. The result of the T-*test* shows that there are significant differences between numbers of employees regarding of reengineering factors; information technology infrastructure, organizational change, top management commitment and organizational systems and culture change. The results also regarding the business age, table 5.8 appears significant difference in reengineering factors; organizational change, change organizational systems and culture by business age attribute. The last suggest control variable owner statius to determine the differences used T- *test* analysis on reengineering factors components among attributes of firms. These attributes include type of ownership status. T- *Test* analysis revealed there are significant difference on components of reengineering factors across the firms' attributes.

ANOVA analysis used on attributes that has more than two namely: service types of firms. The ANOVA analysis revealed there are no significant differences on components of reengineering factors across the firms' attributes.

Descriptive analysis was also conducted for other variables on the study namely: learning capabilities and organizational performance. These results indicated that studied firms have low learning capabilities (the mean values for two dimension of learning capabilities are less than the median score on the 5-point likert scale). Furthermore, the results indicated that sample firms have low performance (the mean values for two dimension of organizational performance; efficiency and flexibility) are less than the median score (on the 5-point likert scale) the mean value for organizational performance dimensions are close.

Moreover, to test the correlations between study variables dimensions, the Pearson correlation analysis test was executed to determine the correlation between independent variables (BPR dimensions) and dependent variables (Organizational Performance). The results bivariate correlations between the constructs incorporated in both the measurement and theoretical framework shows that all the correlations are in the hypothesized positive relationship. The results exposed that all the five dimensions of BPR factors are significantly correlated with the two dimensions of organizational performance.

On other hand, three firms attribute namely (owner form, business age and number of employees) showed significant effects on the essential main variables of the study. These three characteristics were adopted as control variables. For that, the Hierarchical Regression Analysis was executed to test the hypotheses of the study. The first hypothesis predicts that there is a positive relationship between BPR dimensions and Organizational Performance. In more details the main

relationship decomposition in sub relationships to clarify the relationship. First sub relationship is a positive relationship between BPR dimensions and efficiency. The results showed that change management systems and culture has high significant effect on efficiency, followed by organizational change. As well as The results showed that there is a positive relationship between the BPR and flexibility namely; the relationship between essential component of BPR components information technology infrastructure has a positive relationship with flexibility followed second relationship between the organizational change and flexibility, then relationship between change management systems and couture and flexibility finally, relationship between management competence and flexibility. Furthermore, the result revealed there is no relationship between top management commitment and flexibility.

The second main hypothesis of this study regarding moderating effect of learning capabilities and its dimensions. The focusing on predicts that the two dimensions of learning capabilities (knowledge stocks and learning flows) moderates the relationship the relationship between BPR dimensions (organizational change, information technology infrastructure, top management commitment, change management systems and culture and management competence) and organizational performance dimensions (efficiency and flexibility). The results showed that the knowledge stocks moderate the relationship between two of five components of BPR; top management

commitment, organizational change the beta value indicates the organizational structure change has stronger effect than the top management commitment.

Furthermore, the result revealed there are not any statistical evidence show the knowledge stocks were moderate the relationship between the remaining BPR components and efficiency. While the remaining factors; BPR dimensions; change management systems and culture and efficiency. Knowledge stocks were found moderate the relationship between just one of components of BPR; top management and flexibility. Likewise, the results showed there are not any statistical evidence explained the knowledge stocks were moderate the relationship between the remaining BPR and flexibility.

Concerning to second dimension of learning capabilities is learning flows. The results revealed learning flows moderate the relationship between two of five BPR dimensions relationship and efficiency namely; the relationship between organizational change and efficiency and the relationship between change management systems and culture and efficiency. Add to that, the result indicated the learning flows moderate two the relationship between BPR dimensions confirm that by beta values. In general statements the learning flows moderate the relationship between organizational change and flexibility as well as the relationship between the change systems and culture and flexibility of performance. While rest BPR dimensions there are not any evidence appeared about moderating the learning capabilities; the learning flows and knowledge

stocks on the relationship between them and performance dimensions (efficiency and flexibilities).

6.2 Discussion

This section discusses the study findings. The discussion is based on theoretical perspective, empirical evidence and conceptual studies that are considered to be appropriate for this study. The discussion covers the relationship between business process reengineering factors and organizational performance. The discussion also covers the moderating effect of learning capabilities on relationship between business process reengineering factors and organizational performance, further include the control variables of model.

6.2.1 **The Relationship between BPR and Organizational Performance**.

The first study's objective was to look into the relationship between the relationship between business process reengineering factors and organizational performance. Based on literature results of present study revealed that business process reengineering factors has strong positive and significant association with organizational performance.

Furthermore, the results revealed and identified different factors that contribute in successful business process reengineering implementation. These results importance to researchers, managers, and policy makers of how business process reengineering effect on organizational performance, there is ambiguity about BPR phenomenon .

A review of the literature which focused on BPR revealed that studies examining the association between business process reengineering and organizational performance are divergent in how they conceptualize key constructs and their interrelationships. Furthermore, some of the findings are consistent with previous researches while some are contrast. These results are discussed in the following subsections.

6.2.1.1 BPR and Efficiency.

The results of the study showed that two components of BPR; top management and change management systems and culture they have positive relationship with efficiency which measured by return on sales(ROS), return on investment (ROI) and profit margins in comparison with that of competitors. Nevertheless, the results of study revealed rest component of business process reengineering such as information technology infrastructure, top management commitment and management competence has no significant relationship with efficiency of performance.

The results of the study showed that Change Management Systems and Culture has a significant effect on efficiency. This result implies the sample firms need for change their Management Systems and Culture to successful implantation to BPR strategy and improve efficiency of firms, this result is strongly supported by the results in the dataset. This result is in line with prior research showed that organizational management systems leads to increased organizational efficiency (Ramezan and other, 2013). Furthermore, the evidence here and elsewhere that

change management systems and culture which consider one of a great challenges when applied and implemented reengineering process project in business firms, likewise it consider one of the essential factors in the success of the application reengineering so organizations need to transform the organizational culture of the old to the new culture based on a change in the principles, core values and concepts and beliefs to suit the principles reengineering (Al-Otaibi, 2009).

The relationship between change management system and culture was in line with study conducted by Ahmed, Zbib, Arokiasamy, Ramayah & Chiun, (2006) a study findings that reported, resistance to change was negatively related to achievement of predetermined goals and user satisfaction. Furthermore, a change management initiative was found to moderate the relationship between resistance and user satisfaction.

When Change management is high, it means that the users are not very happy with the changes imposed on them. This in turn will lead to lower performance. This indicates that managing the change effectively by acknowledging resistance as natural and expected, giving importance to employees concern, having regular and open communication, get everyone's participation, and promote skills and development are some of the ways to lower the organizational resistance.

Employees are not really resisting the change, but rather they may be resisting the loss of jobs, loss of pay, or loss of comfort. In addition, a strong appropriate

culture should be developed in the organization, and should start from the adoption of organizational core values, which should be done through various innovative activities. This is because culture plays an important role to enable successful change implementation and avoid stress and resistance to change among employees which is a fundamental block to change (Ahmad and other, 2007).

The results of the study also revealed that the coefficient of top management commitment is positive and statistically significant and had a positive significant relationship with organizational efficiency. This indicates that management commitment has a significant influence on the redeployment, and distribution organizational resources, and integration of IT within the organization (Smaltz, Sambamurthy & Agarwal, 2006). This finding consistent with the result of Efa Yonnedi, (2010). The key finding of his study is cross-sectional analysis shows that there had been a statistical significant relationship between organizational change and organizational efficiency.

Regard to the regression coefficient of organizational change carries a positive sign. The finding is also consistent with Debela and Hagos‟s (2011) finding that organizations that implemented flatter organizational structures with more empowerment showed significant improvement in reducing customer waiting time and customer satisfaction. Rifai in (2006) suggested the organizational change plays a key role in the application of process reengineering. Reengineering practices and activities reveals the fact there is does not mean the reorganization and reduction or expand regulations horizontally, although it may

result in a horizontal expansion. Likewise, Lawson (2000) explored there is relationship between organizational change and performance efficiency. While, this study does not find any statistical evidence that link between the remaining factors of reengineering; top management commitment, information technology infrastructure and management competence and organizational performance or efficiency.

On the other hand, the results collectively indicate that organizational change and organizational culture and system are part of essential reengineering factors which should be taken in account if Sudanese services firms are trying to improve the organizational efficiency by applying the process reengineering. This result support the Charles, (2005) view;

In addition, Shin and D.F. Jamella, (2002) were found the interest findings; the reengineering processes should lead to great improve in organizational performance and would lead to an increase in the return on short-term and long term, as well as their application would lead to the provision of the completion time of processes and thus gain increased rates of performance. However, the model indicated that information technology infrastrucure and BPR project management has no effect on business performance.

6.2.2.2 BPR and Flexibility

BPR has significant and positive effect on flexibility. The concept of flexibility has attracted the attention of numerous scholars and practitioners from various disciplinary perspectives, which is measures business firms' response to

change in business environment and market success of a farm's new products, product differentiation, first to market with new applications, and reduce products life cycle.

Moreover, flexibility define as a key source of sustainable competitive advantage that organizations can use to withstand the rapidly changing business environment. The results of present study indicate that four of business process reengineering components (information technology infrastructure, organizational change, change management systems and culture and management competence) have positive effect on flexibility. However, the result showed there is no significant positive relationship between the top management commitment and organizational flexibility.

The findings of current study in line with the views of Davis (2009), Hammer (2010), Prahalad and Krishnan (2008) A study which suggested that if business processes are not consciously adapted to the changing environment, they become impediment.

The coefficient of IT infrastructure shows a positive relationship with performance flexibility results show that there is a significant path relationship of IT infrastructure towards customer service management (*Beta* value = 0.148 at p = 0.05). Results show that it is statistically significant. This implies that the application of IT facilitates operational activities, completion of tasks within required time frame and reduce service life cycle.

The result gives support to the views of Hesson (2007), That IT supports business processes and that the only way of achieving the improvement of methods to ensure speedy service delivery and efficiency is through well-built technological system . In addition, finding, which revealed that the information technology infrastructure developed to automate and support the redesigned business processes brought a significant reduction in process time, work-steps involved and processing cost while also improving customer satisfaction. This result shows that information technology infrastructure in combination with other reengineering factors enhance an organization's ability to rapidly develop and deploy more innovative, customer-focused, focused techniques or processes to enhance performance (Clark, Cavanaugh, Brown & Sambamurthy, 1997). An empirical study by Said, Hui, Taylor and Othman (2009) also were stated, that a high level of the information technology infrastructure capability enables organizations to perform services with greater speed, more accuracy and more convenient ways for customers. Furthermore, this finding is consistent with the argument put forward by Barney, Wright, and Ketchen (2001) who suggested that the integration between two or more resources will create a sustainable competitive advantage.

Confirm to the hypothesis, this result shows that relationship between change management systems and culture and flexibility. The results agree with previous research. Archer and Bowker (1995) summarized that markets changed rapidly and drastically and these changes are insisting change in management systems,

production, innovation, adaption of modern technology with a view to enhance growth and to adjust business according to the markets trends and global needs. Businesses that don't adopt change and hesitate to change their approaches are going out from competitive zone. Zinser et al. (1998) argued that main reason for change is to satisfy, attract and delight customers. Another reason is bringing innovation and utilization of advanced technology to maintain and gain competitive position. Organization adopt change management with an innovative view to cost reduction, quality leadership, gain competitive edge and to maximize the profitability and growth of business.

The results of the study also revealed that hat the management competences has effect on flexibility. This consistent with prior studies, which presented the important role of management competences as essential factor to build competitive advantages through flexibility. This result may be due to the fact that as management competences provide the basis for sustainable competitive advantage to the organizations operating in the present business environment. This finding in line with studies suggested competitive advantage depends largely on the ability to activate and use organizational resources (Maria and other, 2007) (McLeod, 2006, p: 75). Furthermore, Results show that it is statistically significant.

Clearly, the findings of this study converge to support the previous findings that state organizational change has a great effect on flexibility.

6.2.2 **The Moderating Effects of Learning Capabilities on the Relationship Between BPR and Organizational Performance**

One of the main research objectives of present study concerning on the moderating effect of learning capabilities (knowledge stocks and learning flows) on the relationship between business process reengineering and organizational performance. The hypothesis stated the effect of business process reengineering factors on organizational performance is stronger when learning capabilities is higher.

Results were analyzed using multiple regression analysis technique. The study finding found that two dimension of the learning capabilities; knowledge stock and learning flows moderates the relationship between of business process reengineering factors and organizational performance. This finding indicates that business process reengineering factors have both a direct and indirect significant effect on the organizational performance of firms. The indirect effect is via learning capabilities.

Further, this finding also explore that firms that have successful and fully implementing the process reengineering project with a high learning capabilities that would lead to a higher level of organizational performance. This finding extend the earlier literature which established the importance of the relationships among reengineering factors, learning capabilities, and organizational performance. The importance of both knowledge stocks and learning flows to overall business performance has long been acknowledged. The knowledge-based

view of the firm, which emerges as an extension of the resource-based view of the firm, argues that heterogeneous knowledge bases among firms, and the ability to create and apply knowledge, are the main determinants of performance differences (Grant, 1996).

Past research into this topic has provided some relevant insights. The link between organizational learning and organizational performance. This study convergent with past studies in part of relation between knowledge stock and organizational performance. Further, one of much interest findings of this study explore the impact of business process reengineering on organizational performance via the learning capabilities. Accordingly, several interesting findings were discussed in subsections follow:

6.2.2.1 **The Moderating Effects of knowledge stocks on the Relationship Between BPR and Organizational Performance**

The first sub-section discussed the moderating effect of the first dimensions of learning capabilities (knowledge stocks). The results reveal that knowledge stocks moderating the relationship between business process reengineering and organizational performance. These results are discussed in more details follows:

6.2.2.1.1 The Moderating Effects of Knowledge Stocks on the Relationship between BPR and Efficiency

The results showed that the knowledge stocks a pure moderator (full interaction) the relationship between three factors of business process

reengineering factors; top management commitment, organizational change and change management systems and culture. The firms which were full successfully implemented of process re-engineering factors (top management commitment, organizational change) with a high knowledge stocks was found positively influencing efficiency at high levels of knowledge stocks.

These finding indicates that Top Management Commitment has both a direct and indirect significant effect on the organizational performance of firms. The indirect effect is via learning capabilities. This finding also confirm that firms that have flexible management and clearly work values would have a high learning capabilities that would ultimate to a higher level of organizational performance. This study finding in line with theoretical and empirical progress has also been made from the knowledge management literature in identifying the direct link between knowledge stocks and firm performance (Choi and Lee, 2003; Chuang, 2004).

Furthermore, the study finding consist with study conducted by Al-Baghdadi and et al. (2008), the study had try to identify the causes of low efficiency in business organizations and then try to re-engineer its operations through the use of a new entrance in the administration, namely (knowledge stocks management) and was of the most important conclusions that organizations can achieve financial and operational performance of a distinct and competitive position to survival, growth and expansion when taking variables (knowledge

stocks management, business process reengineering) and the combined study and attention and regularly and continuously.

However, this study does not find any statistical evidence that information technology capability moderates the relationship between project management and overall performance or its dimensions.

6.2.2.1.2 The Moderating Effects of Knowledge Stocks on the Relationship between BPR and Flexibility

The results showed that the knowledge stocks a quasi-moderating the relationship between just one components of business process reengineering; top management commitment. The moderating effect of knowledge stocks on the relationship between change management and organizational performance was in line with study conducted by Al-Baghdadi And others(2008), which entitled "the impact of knowledge management in re-engineering operations of the business".

This study had try to identify the causes of low efficiency in business organizations, and then try to re-engineer its operations through the use of a new entrance in the administration, namely (knowledge stocks management) and was of the most important conclusions that emerged from the study: that there is a correlation between knowledge of the phenomenon and the implicit and the BPR.

6.2.2.2 The Moderating Effects of learning flows on the Relationship Between BPR and Organizational Performance

6.2.2.2.1 The Moderating Effects of learning flows on the Relationship Between

BPR and efficiency

The results showed that the learning flows a quasi-moderating the relationship between one factors of business process reengineering; organizational change and change management systems and culture. Key challenges for successful BPR implementation are changing attitudes and culture, ensuring extensive communications and dealing with resistance to change from middle management. This study finding in line with (Terziovski and Others, 2003; Dennis et al, (2003); James and He, (2005).

6.2.2.2.2 The Moderating Effects of learning flows on the Relationship Between

BPR and flexibility

The results showed that the learning flows pure moderating the relationship between two of components of business process reengineering; organizational change and change management systems and culture.

6.3 Implications of the study

After developing and validating the theoretical model and measurement instrument for assessing the effect of BPR on organizational performance in Sudanese service firm's context. This study contributes to research, theory and practice in several ways. Which will be highlighted in the following sections:

6.3.1 Theoretical implications:

The study contributes to research and theory in many aspects:

First, this study was conducted on service sector firm in Sudanese context. As indicated in the literature review, there have only been a handful of BPR studies that address these aspects of the issue (service sector and/or Sudanese context).

Second, this study also contributed by the development and validation of the integrated theoretical model and measurement instrument to assess effect of BPR on the organizational performance is also a great contribution to service sector and management thought. The integrated model is integrated insights from the theories of RBV and its complementary competence perspective, BPR, learning capabilities and service sector organizational performance. From the BPR literature, the model adopted BPR success factors.

Regarding the service sector literature, service sector has specific performance measures and indicators. From the organizational performance literature, organizational performance has specific performance. From the learning capabilities literature, the model adopted learning capabilities dimensions. The RBV theory provided the underlying logic to integrate the various BPR factors and service sector performance perspectives into a single framework and to theorize the linkage among modal component; BPR factors, service sector, organizational performance and moderating effect of learning capabilities.

Third, this study contributes to research and theory by providing further empirical evidence for the application of the RBV theory and its complementary

competencies perspective to the domain of BPR. RBV theory provided the theoretical base to integrate the various BPR views and to theorize the linkage between BPR and organizational performance.

Fourth, almost of Prior studies of BPR in the service sector have mainly been based on models derived from critical success factors. As such, they have lacked a cogent theory that links BPR with organizational performance. In this regard, the current study addressed an important research gap by using RBV and its complementary competency perspective in the domain of BPR.

Fifth, this study provide the first empirical evidence that BPR gains positively contribute to the overall performance of Sudanese a services sector firms direct and indirect via learning capabilities.

Finally, even though the empirical data come from Sudan, the integrated model can be generalized for all service firms outside from Sudan subject to refine and fine-tuning of some items of the measurement instrument.

6.3.2 Managerial implications

current study contributes to BPR practices and management practices in many ways follow: One of most study contributes to BPR project success, as it reveals to the BPR practitioners the safe methods by which service sector completing the BPR in service firms and the factors to take into consideration in their business process reengineering practice. Understanding these methods and factors enables practitioners to become more successful in their business process reengineering

undertaking. The study recommends for BPR practitioners who undertake BPR implementation in Sudanese context to ensure that:

1. Top management commitment is offering full sponsor and continuing support to business process reengineering project by allocating and channeling the necessary resources.
2. There are sufficient financial resources and competent personnel for the required changes, including: staff training and retraining, organizational restructuring, upgrading the information systems already developed during the business process reengineering, providing ongoing training on the system to users, integrating information systems with the organization strategic plan.
3. The business process reengineering human resources to be deployed have adequate knowledge and skill on change management, performance measurements and management and communication.

The results of this study indicated that learning capabilities (knowledge stock and learning flows) moderate the relationship between BPR and organizational performance. Concerning Knowledge stock, it can be mentioned it moderate the relationship between business process and organizational performance. Likewise, the learning flows moderate the relationship between BPR and organizational performance. This results implies that the effects of BPR on organizational performance will only increase under a high knowledge stock and a high learning flows and will lead to high learning capabilites.

To real estimate effect on organizational performance must introduced moderate factor to examine the relationship under some conditions most such as learning capabilities (high or low) has significant positive impact on relationship between the BPR factors and the organizational performance.

6.4 Limitations of the Study:

This study encounters many limitations should be acknowledged which causes some barriers in conducting this study. In general, the limitation restricted in two main aspects (variables constructs and interpretation).

1. This study focuses only on an effect of BPR on organizational performance and moderating role of learning capabilities on the relationship.
2. Current study is limited to Sudanese service firm, particularly those which works and operates in Khartoum state and also include these has head quarter in Khartoum. The study's selected sample focused on service sectors (finance, education and information and communication) only, a situation that may to the intended sample. Thus limit the generalizability of the results of the study.
3. Using only one respondent per firm, which might be a cause of possible response bias, caution should be taken in results interpreting.
4. This study addressed the process re-engineering through five dimensions (organizational structure, infrastructure of information technology, top management commitment of change, change management systems and work culture and management competence), these dimensions may not represent

all elements of BPR that have been mentioned in many previous studies and researches on the BPR.

5. The present study addressed the organizational performance through two dimensions efficiency and flexibility. These dimensions might not represent all various organizational performance dimensions that were mentioned in the literature review.
6. The current study addressed the learning capabilities through two dimensions' knowledge stocks and learning flows. These dimensions may not represent the various dimensions of the learning capabilities that were mentioned in the literature review.
7. The perceived biasness may occur if a manager strongly believes that their management practices are more advanced compared to other organizations. This point constituted one of the main challenges to present study.
8. The primary data for this study was obtained from a cross-sectional survey on 221 large service firms in Sudan at one-point time due limit generalizationability.

6.5 Directions for Future Research

Based on the limitations of the study mentioned above, this study provides some suggestions for future research. The sample from the study is limited to Sudanese service firms. Future research should consider replicating this study in other cultures or countries especially on the moderating effect of learning capabilities dimensions. In addition, further research should be conducted in other

sector or industry besides service sector such as manufacturing, or construction sector it must be emphasized.

the current study explained only almost of 60% of the variance in the dependent variable, therefore there are a significant variable should be known to explain the rest of variation in Organizational Performance was not included in the current study. This research would help to generalize the findings of this study in a broader context. Alternatively, a cross-cultural comparative analysis would further enhance the understanding of BPR and learning capabilities of different cultures.

6.6 Conclusion

The present study was investigated the association between BPR dimensions and organizational performance. Beside explored the moderating effect of learning capabilities on relationship between BPR and organizational performance.

This study survey was covered (221) Sudanese large service firms. This study has unique from its empirical findings that BPR consists of five main dimensions correspond to Almashari and Zarri (2006), namely are organizational structure, infrastructure of information technology, top management commitment of change, change management systems and work culture and management competence) and can be measured using (35) questionnaire items, which demonstrate internal consistency, its construct validity (factor analysis).

In addition, the results found that an important role of learning capabilities towards competitive advantage and organizational enhancement. Knowledge

stocks and learning flows are the most important dimensions of learning capabilities for firms which seeking to improve their process and organizational performance. Furthermore, the top management commitment will provide the right culture for organizational excellence since learning capabilities has the necessary capabilities to drive strategic competitive advantage and performance. The role of the learning capabilities is not only to improve the skills and training but also to provide competitive advantage for organizational profitability performance and growth.

The overall findings from the study have proven that the relationship between business process reengineering factors, learning capabilities on organizational performance have been established in the study. This study provides new empirical contribution to academic knowledge and practitioners. Regarding the academicals field, more research on multi-disciplines need to be conducted to establish the relationship beneficial to the service industry and society in general. To the practitioners, the search for high organizational performance and sustainable competitive advantage should not be dependent on a classical management technique but by adopting multiple management initiatives, which are important for survival and success.

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APPENDICES

1. APPENDIX A: Questionnaire Design
2. APPENDIX A: SPSS Out Put

APPENDIX A: Questionnaire Design

- A1: Questionnaire in English language
- A2: Questionnaire in Arabic language.

A1: **Questionnaire in English language**

PART (1)

GENERAL PROFILE OF YOUR FIRM

This section seeks the general information about your firm. Please tick in best response:

1.1 Type of service: ☐

1.1.1 Finance

1.1.2 communication ☐

1.1.3 education ☐

1.1.4 others ☐

1.2 Type of firm ownership:

1.2.1 Corporation ☐

1.2.2 Individual ☐

1.2.3 Partnership ☐

1.2.4 others ☐

1.3 Number of employees (firm size):

1.3.1 ☐ =<50

1.3.2 ☐ 51=<100

1.3.3 ☐ 101=<200

1.3.4 ☐ >200

PART (2):

Business process reengineering (independent variables)

Business process reengineering (BPR) consist of following variables (organizational change, information systems infrastructure, change management systems and Cultures, BPR project management, management competence).

S\No	Questions	Strongly Agree	Agree	neutral	Disagree	Strongly Disagree
2.1	**Information technolog infrastructure(IT):**					
2.1.1	In our firm, there are adequate I investments.					
2.1.2	Employees in our firm use software too effectively.					
2.1.3	Our firm has integrated information system					
2.1.4	Always the firm work on revamping th legacy information systems to new systems					
2.1.5	In our firm the IT function designed into a Flexible structure.					
2.2	**Management competence**					
2.2.1	In our firm, senior manageme Commitment to change through a busines process reengineering program.					
2.2.2	In our firm, top management always wor to Overcome change problems.					
2.2.3	In our firm, top management continuall push the change efforts throughout the firm					
2.2.4	In our firm, top management planning fo risk handling.					
2.2.5	In our firm, top management work to Overcome organizational resistance t change.					

	Questions	Strongly Agree	Agree	neutral	Disagree	Strongl Disagre
2.3	**Change of management system an culture**					
	top MGT support working in teams					
2.3.1	Our firm has motivation systems					
2.3.2	The firm grants the employee mo responsibilities to work (self-management)					
2.3.3	The firm owns a clear training plan.					
2.3.4	The firm consult all staff member at a stages on the process.					
2.3.5	Our firm creating culture for organization change.					
2.3.6	Our firm has organizational readiness fo change by business process reengineering.					

S\No	Questions	Strongly Agree	Agree	neutral	Disagree	Strongly Disagree
2.4	**Organizational change**					
2.4.1	In our firm, there are adequate job integration Approach.					
2.4.2	In our firm, there are appropriate jobs definition.					
2.4.3	In our firm, there are clear responsibilities and allocation					
2.5	BPR Project Management					

2.5	**BPR Project management** our firm**:**					
2.5.1	Possess sufficient resources to re-change operations					
2.5.2	A clear approach to re-design the process in line with the firm's strategy.					
2.5.3	A clear vision to re-design process.					
2.5.4	Has consultants and advisers in the re-design process programs.					
2.5.5	There is integration between reengineering process and other strategies change programs such as TQM.					
2.5.6	Process change is applying accordance with the strategic vision of the firm.					
2.4.7	Has clear goals of business process reengineering project.					

2.4.8	Re-engineering project operations are highly disciplined process.					

PART (3)

Learning Capabilities (Moderator Variable)

s\NO	Questions	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
3.1	**learning capabilities in our firm:**					
3.1.1	Individuals are knowledgeable and qualified about the work.					
3.1.2	Individual lessons learnt are exchanged within the work group.					
3.1.3	Individuals share knowledge as they work with groups.					
3.1.4	Individuals are aware of critical issues that affect the work.					
3.1.5	Individuals share knowledge as they work within group					
3.1.6	Policies and procedures guide individual work.					
3.1.7	Successes and failures are shared within the groups					
3.1.8	Internal training and work training are provided with the organization					

PART (4)

Organizational Performance (dependent variables)

The following sections to the satisfaction with business performance areas of your firm, please review each of the following and select a number between 1 and 5 that best represents your views. Selecting a 1 indicates that you are highly dissatisfied with the performance of your firm, selecting a 5 indicates that you are highly satisfied with the performance of your firm, and a selection of 3 indicates neutrality. Relative to your firm's stated objectives, how is your firm performing on:

S\No	Questions	Strongly Agree	Agree	neutral	Disagree	Strongly Disagree
4.1	**Effectiveness of Performance:** *During the last three years relative to our majo competitors, this firm has achieved*					
4.1.1	Results in market share.					
4.1.2	Results in market share growth.					
4.1.3	Growth in sales.					
4.1.4	Market position.					
4.2	**Efficiency of Performance** *During the last three years relative to our major competitors, this firm has achieved*					
4.2.1	Profit margin.					
4.2.2	Return on Sales (ROS).					
4.2.3	Return on investment (ROI)					
4.3	**Flexibility** **Our firm is continuously:**					
4.3.1	Reducing the time for market acceptance of ou services.					
4.3.2	increasing the speed at which we respond to custome requests					
4.3.3	Tracking customer trends.					
4.3.4	improving our relationships with our customers					

Part (5):

A2: Questionnaire in Arabic language

Profile of Respondents:

Please provide us some information about yourself. The information is not compulsory, but it will

Extend our knowledge and help us in our survey.

A. Demographic Profile

5.1 Age

5.1.1 25-35 ☐

5.1.2 36-45 ☐

5.1.3 46- 55 ☐

5.1.4 Above ☐

5.2 Educational Level

5.2.1 Primary Education ☐

5.2.2 Secondary ☐

5.2.3 Diploma ☐

5.2.4 Degree (BSC, MSC, PHD) ☐

5.3 Experience

5.3. 1 1-5 years ☐

5.3.2 6-10 years ☐

5.3.3 11-20 years ☐

5.3.4 Above 10

5.4 Gander

5.4.1 Male ☐

5.4.2 Female ☐

The end

القسم الاول:

بيانات عامة عن المؤسسة:

تقدم الاسئلة الاتية وصفا لمكان عملك، فكر من منطق معلوماتك الشخصية، ثم اختر الاختيار الذي تراه مناسبا بوضع علامة (√) في المكان المخصص لذلك.

1. مجال الخدمات التي تقدمها المؤسسة:

مجال الخدمات	المالية والمصرفية	الاتصالات وتكنولوجيا المعلومات	التعليم	غير ذلك
الاختيار(√)				

2. ملكية المؤسسة (الوضع القانوني):

الملكية	تضامنية	مساهمة عامة	ملكية فردية	مسؤولية محدودة	حكومي
الاختيار(√)					

3. عدد الموظفين بالمؤسسة:

الفئات	اقل من 50	99-50	149-100	199-150	أكثر من 200
الاختيار (√)					

4. عمر المؤسسة بالسنوات:

الفئات	اقل من 10	20-10	30-21	اكثر من 30
الاختيار (√)				

القسم الثاني:

عبارات الاستبانة:

تقدم الاسئلة الاتية وصفا لكيفية ممارستك لحياتك في مكان عملك، فكر من منطق تجربتك اليومية، وما تنجزه في العمل، ثم اختر الخيار المناسب لك في المكان المخصص.

لاي مدي توافق على كل عبارة من العبارات الاتية؟ استخدم مقياس ليكرت المدرج الخماسي (اوافق بشدة, أوافق, محايد, لا اوافق, لا اوافق بشدة) لتوضيح اجابتك .

1. تغيير النظم والثقافة الإدارية Change of management systems and culture

تهدف العبارات التالية للوقوف على مشاكل الاتصالات الإدارية، مقاومة التغيير، نظام الحوافز، نشر ثقافة التغيير، التدريب والتعليم.

م	العبارة	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة
1.	تقدر المؤسسة جهود موظفيها في العمل.					
2.	تفوض المؤسسة موظفيها بسلطات كافية لإنجاز مهام وظائفهم.					
3.	يشجع نظام العمل في المؤسسة على الابداع.					
4.	يشجع نظام العمل في المؤسسة على العمل الجماعي.					
5.	يشجع نظام العمل في المؤسسة على المشاركة في اتخاذ القرارات.					
6.	تعمل المؤسسة دائما علي نشر ثقافة التغيير التنظيمي.					
7.	توفر المؤسسة التدريب الكافي لموظفيها.					

2. البنية التحتية لتكنولوجيا المعلومات Information technology infrastructure

العبارات التالية توضح الاستثمار في تكنولوجيا المعلومات (الانظمة والبرمجيات الحاسوبية) , ومدي الاستفادة منها اداء الاعمال ورفع الاداء.

م	العبارة	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشد
1.	تمتلك المؤسسة استثمارات كافية في تكنولوجيا معلومات.					
2.	نظم المعلومات المستخدمة بالمؤسسة سهلة الاستخدام.					
3.	توفر نظم المعلومات بالمؤسسة المعلومات على نحو سريع للموظفين.					
4.	تساعد نظم المعلومات بالمؤسسة على اداء العمل بشكل سهل.					
5.	تساعد تكنولوجيا المعلومات في المؤسسة علي تغيير العمليات الادارية بشك فعال.					

3. التغيير التنظيمي Organizational Change

العبارات التالية توضح العلاقة بين وحدات المؤسسة، وتحديد المهام لكل وحدة، والتعرف على مدي مرونة انسيابية البيانات والمعلومات

م	العبارة	أوافق بشد	أوافق	محايد	لا أوافق	لا أوافق بشدة
1.	تدعم ادارة المؤسسة تشكيل فرق عمل.					
2.	الهيكل التنظيمي بالمؤسسة واضح من ناحية التسلسل الاداري					
3.	المهام بالمؤسسة محددة بشكل دقيق.					
4.	الهيكل التنظيمي بالمؤسسة واضح من ناحية اللوائح.					
5.	الهيكل التنظيمي بالمؤسسة مرون يتكيف مع الظروف.					
6.	النمط الاداري لدي المؤسسة يعتمد بشكل اساس علي الادارة العليا.					
7.	لا يوجد تنسيق بين الوحدات الادارية داخل المؤسسة.					
8.	لا يوجد داخل المؤسسة وحدات ادارية ذات مهام متشابهة					

4. ادارة مشروع اعادة تصميم العمليات Process Reengineering Project Management

تهدف العبارات التالية لمعرفة الاستعدادات الكاملة لإدارة برنامج اعادة تغيير العمليات داخل المؤسسة.

م	العبارة	أوافق بشد	أوافق	محايد	لا أوافق	لا أوافق بشدة
1.	تمتلك المؤسسة موارد كافية لإعادة تغيير عملياتها					
2.	لدي المؤسسة منهج واضح لإعادة تغيير العمليات يتماشى م استراتيجية المؤسسة.					
3.	لدي المؤسسة رؤية واضحة لإعادة تغيير عملياتها.					
4.	تمتلك المؤسسة مستشارين متخصصين في اعادة تصميم العمليات.					

.5	يوجد داخل المؤسسة تكامل بين برنامج اعادة تغيير العمليا واستراتيجيات التغيير الأخرى.					
.6	التغيير داخل المؤسسة يتم وفق الرؤية الاستراتيجية للمؤسسة.					
.7	لدي المؤسسة اهداف واضحة من عملية اعادة تغيير العلميات.					
.8	تتم عملية اعادة تغيير العمليات بانضباط عال.					

5. الكفاءة الادارية Management Competence

العبارات التالية تقيس مهارات وامكانيات القيادات العليا بالمؤسسة لإدارة التغيير بشكل امن.

م	العبارة	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة
.1	لا تتمتع قيادة المؤسسة بقدرتها على رسم رؤي مستقبلية واضحة لادا التغيير.					
.2	تؤمن الادارة العليا بالمؤسسة بضرورة تغيير العمليات من خلال اعادة تصم العمليات.					
.3	ادارة المؤسسة لديها برنامج واضح لبرنامج اعادة تصميم العمليات.					
.4	تعمل القيادات العليا في المؤسسة دائما علي تجاوز العقبات التي تواجه التغي داخل المؤسسة.					
.5	ادارة المؤسسة لديها اهداف واضحة من عملية اعادة التصميم العمليات دا المؤسسة.					
.6	تتبني القيادات العليا في المؤسسة التغيير داخل المؤسسة.					
.7	يتمتع قيادات المؤسسة بالجدارة الكاملة.					

6. القدرات التعليمية Learning Capabilities: العبارات التالية تعني بالقدرات المعرفية، والتدريبية، لموظفي المؤسسة والتي بدورها تمكن المؤسسة من اداء المهام الادارية بكفاءة وفعالية.

م	العبارة	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة
.1	جميع الأفراد داخل الموؤسسة على دراية بعملهم ومؤهلين علميا.					
.2	يتم تبادل الدروس المستفادة الفردية ضمن فريق عملهم.					
.3	الأأفراد داخل المؤسسة يتبادلون المعرفة و يعملون ضمن مجموعات.					
.4	الأفراد داخل المؤسسة يدركون جميع القضايا الهامة التي تؤثر على عملهم.					
.5	توجد فرصة جيدة للتواصل بين الموظفين خلال ساعات العمل.					
.6	ويجري مشاركة النجاحات والإخفاقات داخل المجموعات.					
.7	يتم توفير التدريب الداخلي والتدريب على العمل داخل المنظمة.					
.8	معرفة الأفراد تستخدم في القرارات العملية.					

.7

م	العبارة	جيد جدا	جيد	محايد	سيئ	سيئ جدا
	كفاءة الاداء The Efficiency: أرجو حسب معلوماتكم تقييم كفاءة وفاعلية مرونة أداء المؤسسة مقارنة بأقرب منافس في القطاع					
1.	حققت المؤسسة هامش في الارباح في الثلاث سنوات الاخيرة.					
2.	حققت المؤسسة عائد علي المبيعات في الثلاث سنوات الاخيرة.					
3.	حققت المؤسسة عائد علي الاستثمار في الثلاث سنوات الاخيرة.					
	الفاعلية The Effectiveness					
4.	حققت المؤسسة مركز جيد في السوق في الثلاث سنوات الاخيرة.					
5.	حققت المؤسسة نمو في المبيعات في الثلاث سنوات الاخيرة.					
6.	حققت المؤسسة ناتج في حصتها السوقية في الثلاث سنوات الاخيرة.					
7.	حققت المؤسسة نمو في ناتج حصتها السوقية في الثلاث سنوات الاخيرة.					
8.	حققت المؤسسة مركز جيد في السوق في الثلاث سنوات الاخيرة.					
	المرونة :flexibility **: تهدف العبارات التالية لمعرفة قدرة المؤسسة لاستجابتها للمتغيرات في البيئة التي تعمل بها المؤسسة.**					
9.	لدي المؤسسة القدرة على الاستجابة السريعة لحاجات العملاء.					
10	تستجيب المؤسسة بسهولة لرغبات العملاء في الوقت المحدد.					
11	تستجيب المؤسسة بشكل فعال للتغييرات في الاسواق.					
12	لدي المؤسسة القدرة علي الوفاء تلبية حاجات ورغبات مختلف عملائها.					

القسم الثالث:

البيانات الديمغرافية للمشاركين Demographic Profile

نظرا لأهمية البيانات الديمغرافية في شرح القرارات التي يتخذها الافراد, فان الاسئلة الاتية مهمة لهذه الدراسة وسيتم المحافظة علي سرية الاجابة عليها مثل بقية بيانات الاستبيان. من فضلك اختر الخيار الذي يمثل حالتك في المكان المخصص.

.1 **النوع**:

1- ذكر ☐ 2- انثي ☐

.2 **العمر** (بالسنوات):

الفئة العمرية	اقل من 35	40-36	46-41	51-47	اخري (اذكرها)
الاختيار(√)					

.3 **التعليم**:

التعليم	ثانوي	اقل من بكالوريوس	بكالريوس	دبلوم عالي	ماجستير	دكتوراة	أخرى(أذكرها)
الإختيار(√)							

.4 **التخصص:**

التخصص	ادارة اعمال	اقتصاد	محاسبة	هندسة	غير ذلك (اذكرها)
الاختيار(√)					

.5 **الخبرة (سنوات):**

الفئات	اقل من 5	10-6	15-11	20-16	اكثر من 20 (اذكرها)
الاختيار(√)					

.6 **المستوي الوظيفي:**

المركز الوظيفي	الادارة العليا	الادارة الوسطي	المشرفون	غير ذلك (اذكرها)
الاختيار (√)				

الخاتمة:

اشكركم، من فضلكم شاكرا مراجعة الاستبانة للتأكد من عدم ترك سؤال دون اجابة .

Appendix A3:Details of Questionnaire Referees

Name	Qualification	Institutions
Dr. Amenh Mohammad Omar	Assistant Prof.	SUST
Dr. Mohammad Hafiz Mustafa	Assistant Prof.	SUST
Dr. nor Huda Mohammed	Assistant Prof.	SUST
Dr. Mohamed Nour	Assistant Prof.	Gezira College
Dr. Ali Al_djaafarh	Assistant Prof.	Shaqra University
Dr. Mohamed Ahmed Hamdto	Assistant Prof.	Shaqra University

APPENDIX B

SPSS OUTPUT

- Appendix B1: Response Rate
- Appendix B2: Profile of Responding Firms
- Appendix B3: Profile of Respondents
- Appendix B4: Tests for Response Bias

Appendix B4a: Chi-Square Test for Differences between Early and Late Responses

Appendix B4b: ANOVA Tests for Differences between Job Position and Study Variables

Appendix B5: Factor Analysis

Appendix B5.1: Factor Analysis for Business Process Reengineering

Appendix B5.2: Factor Analysis for Organizational Performance

Appendix B5.3: Factor Analysis for Learning Capabilities

Appendix B5.4: Reliability and Descriptive Statistics of study variables

Appendix B6: Tests for Business Process Reengineering Differences

Appendix B7: Test for Organizational Performance Differences

Appendix B8: Test for Learning Capabilities Differences

Appendix B9: Person Correlations between All the Variables

Appendix B10: Regression of Business Process Reengineering on Organizational Performance

Appendix B11: Moderating Effect of leaning capabilities between Business Process Reengineering and Organizational Performance

Appendix B11.a: Moderating Effect of knowledge stock on Business Process Reengineering and Organizational Performance

Appendix B11.b: Moderating Effect of learning flows relationship between Business Process Reengineering and Organizational Performance

Appendix B1: Response Rate

B1_type of sevice

		Frequency	Percent	Valid Percent	Cumulative Perce
Valid	finance	85	47.0	47.0	47.0
	IT and comm	19	10.5	10.5	57.5
	eduction	47	26.0	26.0	83.4
	others	30	16.6	16.6	100.0
	Total	181	100.0	100.0	

B2_type of owner

		Frequency	Percent	Valid Percent	Cumulative Perce
Valid	private sector	99	54.7	54.7	54.7
	goverment sector	82	45.3	45.3	100.0
	Total	181	100.0	100.0	

B3_size of firm

		Frequency	Percent	Valid Percent	Cumulative Perce
Valid	<=150	38	21.0	21.0	21.0
	>150	143	79.0	79.0	100.0
	Total	181	100.0	100.0	

B4_business age

		Frequency	Percent	Valid Percent	Cumulative Perce
Valid	<= 15	114	63.0	63.0	63.0
	>15	67	37.0	37.0	100.0
	Total	181	100.0	100.0	

Appendix B3: Profile of Respondents

A1_sex

		Frequency	Percent	Valid Percent	Cumulative Perce
Valid	male	100	55.2	55.2	55.2
	fmale	81	44.8	44.8	100.0
	Total	181	100.0	100.0	

A2_age of the respondents

		Frequency	Percent	Valid Percent	Cumulative Perce
Valid	less than 35	91	50.3	50.3	50.3
	36-40	36	19.9	19.9	70.2
	41 - 46	25	13.8	13.8	84.0
	47-51	25	13.8	13.8	97.8
	other	4	2.2	2.2	100.0
	Total	181	100.0	100.0	

A3_level of education

		Frequency	Percent	Valid Percent	Cumulative Perce
Valid	less than University	1	.6	.6	.6
	university	66	36.5	36.5	37.0
	post graduate	109	60.2	60.2	97.2
	others	5	2.8	2.8	100.0
	Total	181	100.0	100.0	

A4_Education background

		Frequency	Percent	Valid Percent	Cumulative Perce
Valid	business management	69	38.1	38.1	38.1
	econmy	43	23.8	23.8	61.9
	account	36	19.9	19.9	81.8
	Eng	13	7.2	7.2	89.0
	others	20	11.0	11.0	100.0
	Total	181	100.0	100.0	

A5_experience

		Frequency	Percent	Valid Percent	Cumulative Perce
Valid	=< 5	55	30.4	30.4	30.4
	6-10	66	36.5	36.5	66.9
	11-15	21	11.6	11.6	78.5
	16-20	18	9.9	9.9	88.4
	> 20	21	11.6	11.6	100.0
	Total	181	100.0	100.0	

A6_job title

		Frequency	Percent	Valid Percent	Cumulative Perce
Valid	top mangement	18	9.9	9.9	9.9
	mid admin	71	39.2	39.2	49.2
	supervisors	71	39.2	39.2	88.4
	others	21	11.6	11.6	100.0
	Total	181	100.0	100.0	

Appendix B4: Tests for Response Bias

Appendix B4a: Chi-Square Test for Differences between first and last Responses

Services type

B1_type of sevice * first_last Crosstabulation

Expected Count

		first_last		Total
		first	last	
B1_type of sevice	finance	40.4	19.6	60.0
	IT and comm	21.6	10.4	32.0
	eduction	29.7	14.3	44.0
	others	30.3	14.7	45.0
Total		122.0	59.0	181.0

Chi-Square Tests

	Value	df	Asymp. Sig. sided)
Pearson Chi-Square	3.506[a]	3	.320
Likelihood Ratio	3.449	3	.327
Linear-by-Linear Association	1.406	1	.236
N of Valid Cases	181		

a. 0 cells (.0%) have expected count less than 5. The minimum expec count is 10.43.

Owner form

B2_type of owner * firstand last Crosstabulation

Expected Count

		firstand last		Total
		first	last	
B2_type of owner	private sector	60.7	29.3	90.0
	goverment sector	61.3	29.7	91.0
Total		122.0	59.0	181.0

Chi-Square Tests

	Value	df	Asymp. Sig. sided)	Exact Sig. (2-side	Exact Sig. (1-side
Pearson Chi-Square	.011[a]	1	.915		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.011	1	.915		
Fisher's Exact Test				1.000	.521
Linear-by-Linear Association	.011	1	.915		
N of Valid Cases	181				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 29.34.
b. Computed only for a 2x2 table

Number of employees

B3_size of firm * firstand last Crosstabulation

Expected Count

		firstand last		Total
		first	last	
B3_size of firm	<=150	50.6	24.4	75.0
	>150	71.4	34.6	106.0
Total		122.0	59.0	181.0

Chi-Square Tests

	Value	df	Asymp. Sig. sided)	Exact Sig. (2-side	Exact Sig. (1-side
Pearson Chi-Square	2.148[a]	1	.143		
Continuity Correction[b]	1.702	1	.192		
Likelihood Ratio	2.135	1	.144		
Fisher's Exact Test				.151	.096
Linear-by-Linear Association	2.136	1	.144		
N of Valid Cases	181				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 24.45.
b. Computed only for a 2x2 table

Business age

B4_business age * firstand last Crosstabulation

Expected Count

		firstand last		Total
		first	last	
B4_business age	<= 15	76.8	37.2	114.0
	>15	45.2	21.8	67.0
Total		122.0	59.0	181.0

Chi-Square Tests

	Value	df	Asymp. Sig. sided)	Exact Sig. (2-side	Exact Sig. (1-side
Pearson Chi-Square	1.590[a]	1	.207		
Continuity Correction[b]	1.203	1	.273		
Likelihood Ratio	1.615	1	.204		
Fisher's Exact Test				.251	.136
Linear-by-Linear Association	1.581	1	.209		
N of Valid Cases	181				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 21.84.
b. Computed only for a 2x2 table

Sex type

A1_sex * first_last Crosstabulation

Expected Count

		first_last		Total
		first	last	
A1_sex	male	60.0	29.0	89.0
	fmale	62.0	30.0	92.0
Total		122.0	59.0	181.0

Chi-Square Tests

	Value	df	Asymp. Sig. sided)	Exact Sig. (2-side	Exact Sig. (1-side
Pearson Chi-Square	.912[a]	1	.340		
Continuity Correction[b]	.634	1	.426		
Likelihood Ratio	.914	1	.339		
Fisher's Exact Test				.347	.213
Linear-by-Linear Association	.907	1	.341		
N of Valid Cases	181				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 29.01.
b. Computed only for a 2x2 table

Age of respondents

A2_age of the respondents * first_last Crosstabulation
Expected Count

		first_last		Total
		first	last	
A2_age of the respondents	less than 35	40.4	19.6	60.0
	36-40	31.0	15.0	46.0
	41 - 46	16.2	7.8	24.0
	47-51	21.6	10.4	32.0
	other	12.8	6.2	19.0
Total		122.0	59.0	181.0

Chi-Square Tests

	Value	df	Asymp. Sig. sided)
Pearson Chi-Square	6.343[a]	4	.175
Likelihood Ratio	6.448	4	.168
Linear-by-Linear Association	3.683	1	.055
N of Valid Cases	181		

a. 0 cells (0.0%) have expected count less than 5. The minimum expec
count is 6.19.

Education

A3_level of education * first_last Crosstabulation
Expected Count

		first_last		Total
		first	last	
A3_level of education	less than University	22.2	10.8	33.0
	university	37.1	17.9	55.0
	post graduate	44.5	21.5	66.0
	others	18.2	8.8	27.0
Total		122.0	59.0	181.0

Chi-Square Tests

	Value	df	Asymp. Sig. sided)
Pearson Chi-Square	4.888[a]	3	.180
Likelihood Ratio	4.956	3	.175
Linear-by-Linear Association	.787	1	.375
N of Valid Cases	181		

a. 0 cells (0.0%) have expected count less than 5. The minimum expec count is 8.80.

Background

A4_Education background * first_last Crosstabulation

Expected Count

		first_last		Total
		first	last	
A4_Education background	business management	37.7	18.3	56.0
	econmy	28.3	13.7	42.0
	account	23.6	11.4	35.0
	Eng	16.2	7.8	24.0
	others	16.2	7.8	24.0
Total		122.0	59.0	181.0

Chi-Square Tests

	Value	df	Asymp. Sig. sided)
Pearson Chi-Square	5.251[a]	4	.263
Likelihood Ratio	5.108	4	.276
Linear-by-Linear Association	.021	1	.885
N of Valid Cases	181		

a. 0 cells (0.0%) have expected count less than 5. The minimum expec count is 7.82.

Experience

A5_experience * first_last Crosstabulation

Expected Count

		first_last		Total
		first	last	
A5_experience	=< 5	33.0	16.0	49.0
	6-10	40.4	19.6	60.0
	11-15	13.5	6.5	20.0
	16-20	18.2	8.8	27.0
	> 20	16.9	8.1	25.0
Total		122.0	59.0	181.0

Chi-Square Tests

	Value	df	Asymp. Sig. sided)
Pearson Chi-Square	2.398[a]	4	.663
Likelihood Ratio	2.392	4	.664
Linear-by-Linear Association	.409	1	.523
N of Valid Cases	181		

a. 0 cells (0.0%) have expected count less than 5. The minimu expected count is 6.52.

Job title

A6_job title * first_last Crosstabulation

Expected Count

		first_last		Total
		first	last	
A6_job title	top mangement	12.1	5.9	18.0
	mid admin	47.9	23.1	71.0
	supervisors	47.9	23.1	71.0
	others	14.2	6.8	21.0
Total		122.0	59.0	181.0

Chi-Square Tests

	Value	df	Asymp. Sig. sided)
Pearson Chi-Square	1.917[a]	3	.590
Likelihood Ratio	1.938	3	.585
Linear-by-Linear Association	.931	1	.335
N of Valid Cases	181		

a. 0 cells (0.0%) have expected count less than 5. The minimum expec count is 5.87.

Appendix B4b: ANOVA Tests for Differences between Job title and Study Variables

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
infotech	General Manager	18	2.7305	.97482	.22977	2.2458	3.2153
	Director	71	2.8922	1.07852	.12800	2.6369	3.1475
	chief inormation officer	71	2.7767	1.07616	.12772	2.5220	3.0314
	others	21	3.4118	.99410	.21693	2.9593	3.8643
	Total	181	2.8911	1.06849	.07942	2.7344	3.0478
organizational_change	General Manager	18	2.7986	.82931	.19547	2.3862	3.2110
	Director	71	2.9507	.88072	.10452	2.7422	3.1592
	chief inormation officer	71	3.1056	.82420	.09781	2.9105	3.3007
	others	21	3.5012	.84914	.18530	3.1146	3.8877
	Total	181	3.0602	.86369	.06420	2.9335	3.1869
topmanagement	General Manager	18	2.6250	.77768	.18330	2.2383	3.0117
	Director	71	2.9248	.89741	.10650	2.7124	3.1372
	chief inormation officer	71	2.8953	1.03124	.12239	2.6512	3.1394
	others	21	3.3427	1.09510	.23897	2.8442	3.8411
	Total	181	2.9319	.97302	.07232	2.7892	3.0746
systemschange	General Manager	18	2.5463	1.02709	.24209	2.0355	3.0571
	Director	71	2.7289	.94036	.11160	2.5063	2.9515
	chief inormation officer	71	2.6455	.90410	.10730	2.4315	2.8595
	others	21	3.1111	.91944	.20064	2.6926	3.5296
	Total	181	2.7224	.93723	.06966	2.5849	2.8598
mgtcomference	General Manager	18	2.2593	.70066	.16515	1.9108	2.6077
	Director	71	2.7230	.94279	.11189	2.4999	2.9462
	chief inormation officer	71	2.7277	.84197	.09992	2.5284	2.9270
	others	21	3.3175	.85294	.18613	2.9292	3.7057
	Total	181	2.7477	.90038	.06692	2.6156	2.8798
know	General Manager	18	1.9722	.50569	.11919	1.7208	2.2237
	Director	71	2.7366	1.13612	.13483	2.4677	3.0055
	chief inormation officer	71	2.4390	.81125	.09628	2.2469	2.6310
	others	21	3.0476	1.11198	.24265	2.5415	3.5538
	Total	181	2.5799	.99971	.07431	2.4333	2.7266
flows	General Manager	18	2.4444	.82049	.19339	2.0364	2.8525
	Director	71	2.8028	1.03675	.12304	2.5574	3.0482
	chief inormation officer	71	2.5986	.88890	.10549	2.3882	2.8090
	others	21	3.0238	1.03049	.22487	2.5547	3.4929
	Total	181	2.7127	.96627	.07182	2.5710	2.8544
mean_efficy	General Manager	18	1.7917	1.13840	.26832	1.2256	2.3578
	Director	71	2.4120	1.22044	.14484	2.1231	2.7008
	chief inormation officer	71	2.3415	1.26225	.14980	2.0428	2.6403
	others	21	3.6548	1.14421	.24969	3.1339	4.1756
	Total	181	2.4669	1.29781	.09647	2.2765	2.6572
mean_fl	General Manager	18	2.5694	1.12396	.26492	2.0105	3.1284
	Director	71	2.6021	1.09020	.12938	2.3441	2.8602
	chief inormation officer	71	2.6514	1.06694	.12662	2.3989	2.9039
	others	21	3.4048	.90649	.19781	2.9921	3.8174
	Total	181	2.7113	1.08616	.08073	2.5520	2.8706

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
	Between Groups	7.087	3	2.362	2.107	.101
infotech	Within Groups	198.412	177	1.121		
	Total	205.500	180			
	Between Groups	6.313	3	2.104	2.911	.036
organizational_change	Within Groups	127.960	177	.723		
	Total	134.273	180			
	Between Groups	5.337	3	1.779	1.907	.130
topmanagement	Within Groups	165.083	177	.933		
	Total	170.420	180			
	Between Groups	4.154	3	1.385	1.592	.193
systemschange	Within Groups	153.958	177	.870		
	Total	158.112	180			
	Between Groups	11.183	3	3.728	4.897	.003
mgtcomptence	Within Groups	134.739	177	.761		
	Total	145.923	180			
	Between Groups	14.395	3	4.798	5.132	.002
know	Within Groups	165.500	177	.935		
	Total	179.895	180			
	Between Groups	4.829	3	1.610	1.745	.159
flows	Within Groups	163.232	177	.922		
	Total	168.061	180			
	Between Groups	39.168	3	13.056	8.753	.000
mean_effecincy	Within Groups	264.008	177	1.492		
	Total	303.176	180			
	Between Groups	11.562	3	3.854	3.397	.019
mean_flex	Within Groups	200.792	177	1.134		
	Total	212.354	180			

Appendix B5: Factor Analysis

Appendix B5.1: Factor Analysis for business process reengineering factors

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.859
Bartlett's Test of Sphericity	Approx. Chi-Square	4402.022
	df	351
	Sig.	.000

Communalities

	Initial	Extraction
c1_motovate	1.000	.560
c2_more autherities	1.000	.618
c3_innivation and creatives	1.000	.733
c4team work	1.000	.728
c5_share in decition made	1.000	.598
c6_proads change culure	1.000	.642
c7_training plan	1.000	.612
d1_deasly useage of IT	1.000	.708
d2_easly access to info.	1.000	.636
d3_IT support doing the work	1.000	.705
d4_IT support the wo development	1.000	.789
d6_modern IT	1.000	.621
E1_top mgt support team wor	1.000	.536
E3_clear task and work	1.000	.593
E4_clear organizional strucur	1.000	.744
E5_flexibile organizio strucure	1.000	.772
E6_adminstartion based on mgt	1.000	.856
E7_accordaion among depts	1.000	.788
F1_our firm has aclear char plan aliging to stratic plan	1.000	.616
F2_our firm has clear vistion process change	1.000	.653
F3_our firm has B conslatants	1.000	.726
F4_our firm try to merage mgt stratigic process change	1.000	.779
F5_in our firm the proc change aliging to stratigic pla	1.000	.858
F6_our firm has clear objecti from process redisgn	1.000	.771
G1_firm leaders has ago visitions to change mgt.	1.000	.842
G2_top mgt in our firm agood belevies to proc change through BPR	1.000	.820
G3_top mgt in our firm agood process change progra	1.000	.592

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

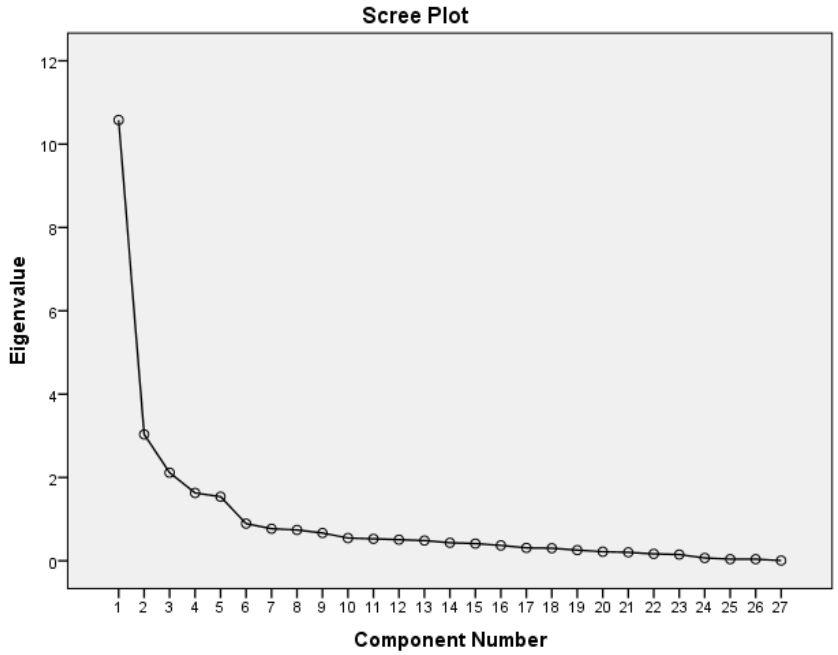
	Component				
	1	2	3	4	5
F4_our firm try to merage mgt stratigic process change	.830	.117	.209	.165	.077
E5_flexibile organizio strucure	.826	.113	.216	.164	.063
E4_clear organizional strucur	.798	.151	-.063	.238	.152
F3_our firm has B conslatants	.796	.154	-.052	.210	.148
F1_our firm has aclear char plan aliging to stratic plan	.752	.133	.086	.091	.129
F2_our firm has clear vistion process change	.679	.266	.225	.244	.111
E1_top mgt support team wor	.577	.342	.244	.081	.139
E3_clear task and work	.568	.417	.090	.297	.002
d4_IT support the wo development	.271	.792	.134	.142	.225
d1_deasly useage of IT	.249	.775	.182	.096	-.056
d3_IT support doing the work	.107	.771	.229	.057	.208
d2_easly access to info.	.258	.729	.184	-.023	.061
d6_modern IT	.147	.728	.218	.143	.039
c4team work	.067	.168	.822	.082	.114
c3_innivation and creatives	.227	.151	.802	.085	.090
c2_more autherities	.091	.245	.740	-.028	.041
c5_share in decition made	.191	.034	.717	.127	.174
c6_proads change culure	-.056	.424	.609	.298	-.010
c1_motovate	.132	.409	.538	.250	.150
c7_training plan	.045	.357	.517	.458	.070
F5_in our firm the proc change aliging to stratigic pla	.228	.153	.025	.880	.082
E6_adminstartion based on mgt	.228	.150	.093	.867	.144
F6_our firm has clear objecti from process redisgn	.373	.023	.264	.732	.160
E7_accordaion among depts	.397	.041	.254	.730	.176
G2_top mgt in our firm agood belevies to proc change through BPR	.072	.126	.093	.154	.876
G1_firm leaders has ago visitions to change mgt.	.191	.096	.132	.195	.860
G3_top mgt in our firm agood process change prograi	.364	.129	.240	.061	.617

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squa Loadings			Rotation Sums of Squared Loadings		
	Total	% Variance	Cumulative %	Total	% Variance	Cumulative	Total	% of Variance	Cumulative %
1	10.579	39.183	39.183	10.579	39.183	39.183	5.258	19.475	19.475
2	3.035	11.239	50.422	3.035	11.239	50.422	4.011	14.856	34.331
3	2.114	7.831	58.252	2.114	7.831	58.252	3.943	14.602	48.933
4	1.629	6.032	64.285	1.629	6.032	64.285	3.424	12.683	61.616
5	1.538	5.695	69.980	1.538	5.695	69.980	2.258	8.364	69.980
6	.893	3.307	73.287						
7	.769	2.847	76.133						
8	.741	2.745	78.879						
9	.666	2.468	81.347						
10	.545	2.019	83.366						
11	.528	1.956	85.322						
12	.505	1.872	87.194						
13	.486	1.801	88.995						
14	.432	1.601	90.596						
15	.413	1.529	92.125						
16	.369	1.368	93.493						
17	.311	1.151	94.644						
18	.302	1.119	95.763						
19	.255	.945	96.709						
20	.218	.806	97.515						
21	.202	.750	98.265						
22	.166	.616	98.880						
23	.150	.555	99.435						
24	.068	.253	99.688						
25	.040	.148	99.836						
26	.039	.143	99.979						
27	.006	.021	100.000						

Extraction Method: Principal Component Analysis.



Appendix B5.2: Factor Analysis for organizational Performance

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.897
Bartlett's Test of Sphericity	Approx. Chi-Square	1426.289
	df	28
	Sig.	.000

Communalities

	Initial	Extraction
PI1_our firm has pro margins in last three three yea	1.000	.913
PI2_our firm has agood sa income in last three years	1.000	.907
PI3_our firm has ago investment income in last th years	1.000	.914
PJ1_our firm has ago position in markets in last th years.	1.000	.857
PK1_our firm response change in context	1.000	.840
PK2_our firm response customers demands	1.000	.817
PK3_our firm effective response to markets changes.	1.000	.785
PK4_our firm has agood abil to satisfied the costumers nee in demand time	1.000	.587

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

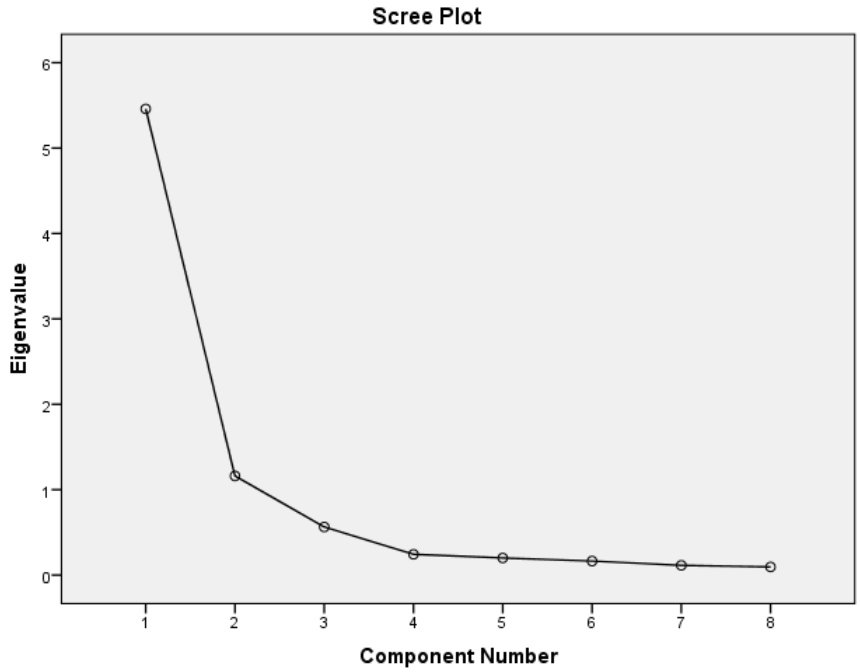
	Component	
	1	2
PI2_our firm has agood sa income in last three years	.913	.270
PI3_our firm has ago investment income in last th years	.903	.315
PI1_our firm has pro margins in last three three yea	.893	.339
PJ1_our firm has ago position in markets in last th years.	.854	.357
PK1_our firm response change in context	.326	.856
PK3_our firm effective response to markets changes.	.316	.828
PK2_our firm response customers demands	.387	.817
PK4_our firm has agood abil to satisfied the costumers nee in demand time	.186	.743

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization
a. Rotation converged in 3 iterations.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Varian	Cumulative %	Total	% of Varian	Cumulative %	Total	% of Variance	Cumulative %
1	5.459	68.238	68.238	5.459	68.238	68.238	3.566	44.581	44.581
2	1.161	14.510	82.747	1.161	14.510	82.747	3.053	38.167	82.747
3	.563	7.041	89.788						
4	.243	3.042	92.830						
5	.201	2.507	95.336						
6	.164	2.051	97.387						
7	.114	1.428	98.816						
8	.095	1.184	100.000						

Extraction Method: Principal Component Analysis.



Appendix B4.3: Factor Analysis for learning capabilities Capability

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.760
Bartlett's Test of Sphericity	Approx. Chi-Square	1862.581
	df	28
	Sig.	.000

Communalities

	Initial	Extraction
H1_Individuals knowledgeable and qualif about their work.	1.000	.788
H2_Individual lessons lea are exchanged within their wo group.	1.000	.687
H3_Individuals sh knowledge as they work wit groups.	1.000	.783
H4_Individuals are aware critical issues that affect th work.	1.000	.647
H5_Individuals sh knowledge as they work wit groups	1.000	.765
H6_Policies and procedu guide individual work.	1.000	.768
H8_Internal training and wo training are provided within organization	1.000	.802
H9_Individuals know and put operation group decisions	1.000	.792

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

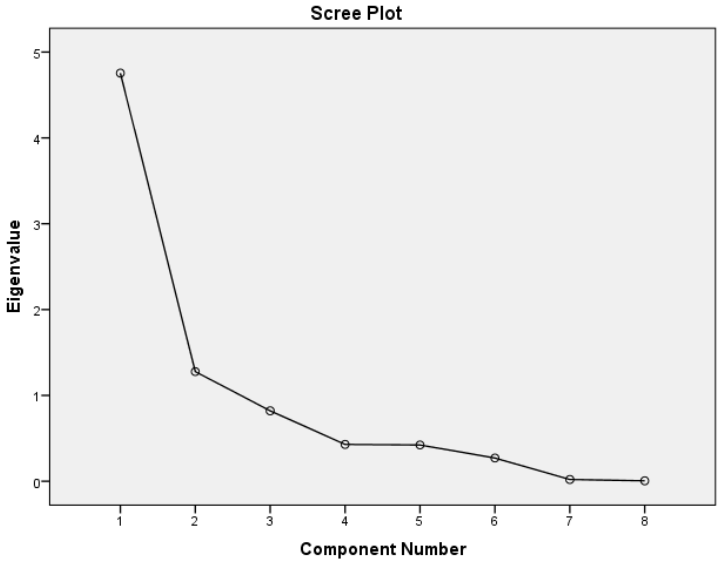
	Component	
	1	2
H3_Individuals sh knowledge as they work wit groups.	.880	.091
H6_Policies and procedu guide individual work.	.872	.086
H1_Individuals knowledgeable and qualif about their work.	.867	.189
H5_Individuals sh knowledge as they work wit groups	.853	.194
H2_Individual lessons lea are exchanged within their wo group.	.773	.297
H4_Individuals are aware critical issues that affect th work.	.719	.361
H8_Internal training and wo training are provided within organization	.171	.879
H9_Individuals know and put operation group decisions	.180	.872

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization
a. Rotation converged in 3 iterations.

Total Variance Explained

Componen	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Varianc	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.755	59.433	59.433	4.755	59.433	59.433	4.192	52.402	52.402
2	1.277	15.965	75.399	1.277	15.965	75.399	1.840	22.997	75.399
3	.821	10.258	85.657						
4	.429	5.361	91.018						
5	.422	5.281	96.299						
6	.271	3.382	99.681						
7	.021	.258	99.939						
8	.005	.061	100.000						

Extraction Method: Principal Component Analysis.



Appendix B5.4 : Reliability and Descriptive Statistics for variables of study

Information technology infrastructure

Reliability Statistics

Cronbach's Alpha	Cronbach's Alp Based Standardized Item	N of Items
.885	.885	5

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum Minimum	Variance	N of Items
Item Means	2.891	2.762	3.022	.260	1.094	.010	5

Organizational change

Reliability Statistics

Cronbach's Alpha	Cronbach's Alp Based Standardized Item	N of Items
.897	.900	8

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum Minimum	Variance	N of Items
Item Means	3.041	2.773	3.193	.420	1.151	.025	8

Change management systems and culture

Reliability Statistics

Cronbach's Alpha	Cronbach's Alp Based Standardized Item	N of Items
.856	.856	6

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum Minimum	Variance	N of Items
Item Means	2.721	2.483	2.828	.344	1.139	.015	6

Top management commitment

Reliability Statistics

Cronbach's Alpha	Cronbach's Alp Based Standardized Item	N of Items
.858	.857	4

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum Minimum	Variance	N of Items
Item Means	2.987	2.914	3.150	.236	1.081	.012	4

Management competence

Reliability Statistics

Cronbach's Alpha	Cronbach's Alp Based Standardized Item	N of Items
.817	.816	3

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum Minimum	Variance	N of Items
Item Means	2.748	2.597	2.928	.331	1.128	.028	3

Knowledge stock

Reliability Statistics

Cronbach's Alpha	Cronbach's Alp Based Standardized Item	N of Items
.925	.925	6

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum Minimum	Variance	N of Items
Item Means	2.573	2.467	2.717	.250	1.101	.012	6

Learning flows

Reliability Statistics

Cronbach's Alpha	Cronbach's Alp Based Standardized Item	N of Items
.766	.766	2

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum Minimum	Variance	N of Items
Item Means	2.782	2.691	2.873	.182	1.068	.017	2

Efficiency

Reliability Statistics

Cronbach's Alpha	Cronbach's Alp Based Standardized Item	N of Items
.962	.962	4

Item Statistics

	Mean	Std. Deviation	N
PI1_our firm has pro margins in last three three yea	2.49	1.393	181
PI2_our firm has agood sa income in last three years	2.54	1.344	181
PI3_our firm has ago investment income in last th years	2.43	1.383	181
PJ1_our firm has ago position in markets in last th years.	2.40	1.361	181

Flexibility

Reliability Statistics

Cronbach's Alpha	Cronbach's Alp Based Standardized Item	N of Items
.890	.889	4

Item Statistics

	Mean	Std. Deviation	N
PK1_our firm response change in context	2.71	1.368	181
PK2_our firm response customers demands	2.80	1.204	181
PK3_our firm effective response to markets changes.	2.73	1.229	181
PK4_our firm has agood abi to satisfied the costumers ne in demand time	2.60	1.205	181

Appendix B6: Tests for Business Process Reengineering Differences

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
infotech	Between Groups	.865	3	.288	.249	.862
	Within Groups	204.635	177	1.156		
	Total	205.500	180			
organizational_change	Between Groups	4.372	3	1.457	1.986	.118
	Within Groups	129.901	177	.734		
	Total	134.273	180			
topmanagement	Between Groups	10.557	3	3.519	3.896	.010
	Within Groups	159.863	177	.903		
	Total	170.420	180			
systemschange	Between Groups	7.888	3	2.629	3.098	.028
	Within Groups	150.224	177	.849		
	Total	158.112	180			
mgtcomptence	Between Groups	27.612	3	9.204	13.770	.000
	Within Groups	118.311	177	.668		
	Total	145.923	180			

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
know	Between Groups	11.948	3	3.983	4.198	.007
	Within Groups	167.946	177	.949		
	Total	179.895	180			
flows	Between Groups	17.099	3	5.700	6.683	.000
	Within Groups	150.962	177	.853		
	Total	168.061	180			

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
mean_effecincy	Between Groups	45.689	3	15.230	10.469	.000
	Within Groups	257.487	177	1.455		
	Total	303.176	180			
mean_flex	Between Groups	8.999	3	3.000	2.611	.053
	Within Groups	203.355	177	1.149		
	Total	212.354	180			

Appendix (7) correlations among variables of study

Descriptive Statistics

	Mean	Std. Deviation	N
infotech	2.8911	1.06849	181
organizational_change	3.0602	.86369	181
topmanagement	2.9319	.97302	181
systemschange	2.7224	.93723	181
mgtcomptence	2.7477	.90038	181
know	2.5799	.99971	181
flows	2.7127	.96627	181
mean_effecincy	2.4669	1.29781	181
mean_flex	2.7113	1.08616	181

Correlations

		infotech	organizational_change	topmanagement	systemschange	mgtcompten e	know	flows
infotech	Pearson Correlation	1	.548**	.345**	.570**	.345**	.363**	.417**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000
	N	181	181	181	181	181	181	181
organizational_change	Pearson Correlation	.548**	1	.667**	.422**	.459**	.379**	.538**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
	N	181	181	181	181	181	181	181
topmanagement	Pearson Correlation	.345**	.667**	1	.420**	.411**	.254**	.481**
	Sig. (2-tailed)	.000	.000		.000	.000	.001	.000
	N	181	181	181	181	181	181	181
systemschange	Pearson Correlation	.570**	.422**	.420**	1	.365**	.543**	.471**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000
	N	181	181	181	181	181	181	181
mgtcomptence	Pearson Correlation	.345**	.459**	.411**	.365**	1	.491**	.501**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000
	N	181	181	181	181	181	181	181
know	Pearson Correlation	.363**	.379**	.254**	.543**	.491**	1	.448**

	Sig. (2-tailed)	.000	.000	.001	.000	.000		.000
	N	181	181	181	181	181	181	181
flows	Pearson Correlation	.417**	.538**	.481**	.471**	.501**	.448**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
	N	181	181	181	181	181	181	181
mean_effecincy	Pearson Correlation	.477**	.523**	.493**	.602**	.415**	.531**	.613**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
	N	181	181	181	181	181	181	181
mean_flex	Pearson Correlation	.531**	.560**	.420**	.532**	.428**	.581**	.531**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
	N	181	181	181	181	181	181	181

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix B10: Regression of Business Process Reengineering on Organizational Performance

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Change Statistics			
					R Square Change	F Change	df1	df
1	.599[a]	.359	.348	1.04757	.359	33.089	3	17
2	.739[b]	.546	.525	.89479	.186	14.120	5	17

a. Predictors: (Constant), B4_business age, B2_type of owner, B3_size of firm

b. Predictors: (Constant), B4_business age, B2_type of owner, B3_size of firm, mgtcomptence, infotech, topmanagement, systems

c. Dependent Variable: mean_effecincy

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	108.937	3	36.312	33.089	.000[b]
	Residual	194.239	177	1.097		
	Total	303.176	180			
2	Regression	165.463	8	20.683	25.832	.000[c]
	Residual	137.713	172	.801		
	Total	303.176	180			

a. Dependent Variable: mean_effecincy

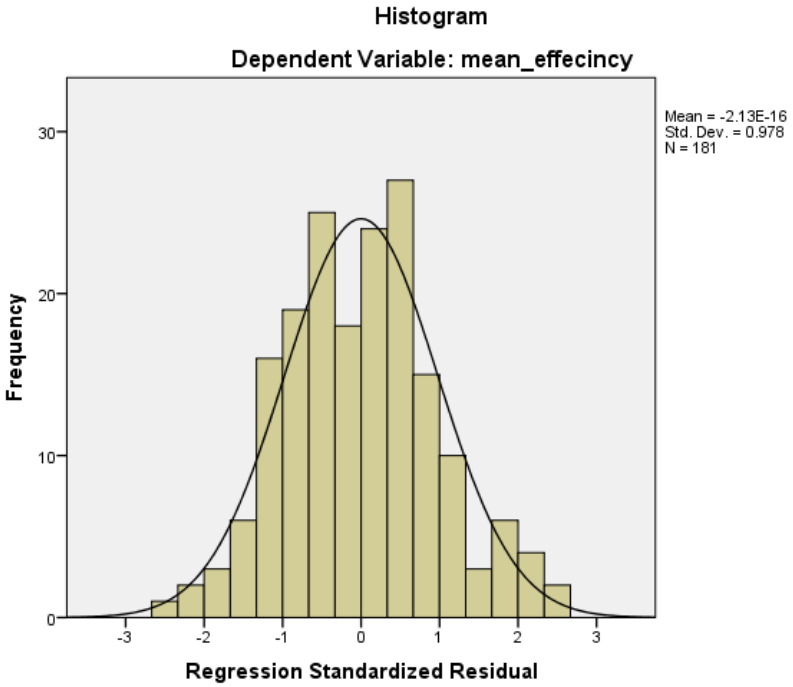
b. Predictors: (Constant), B4_business age, B2_type of owner, B3_size of firm

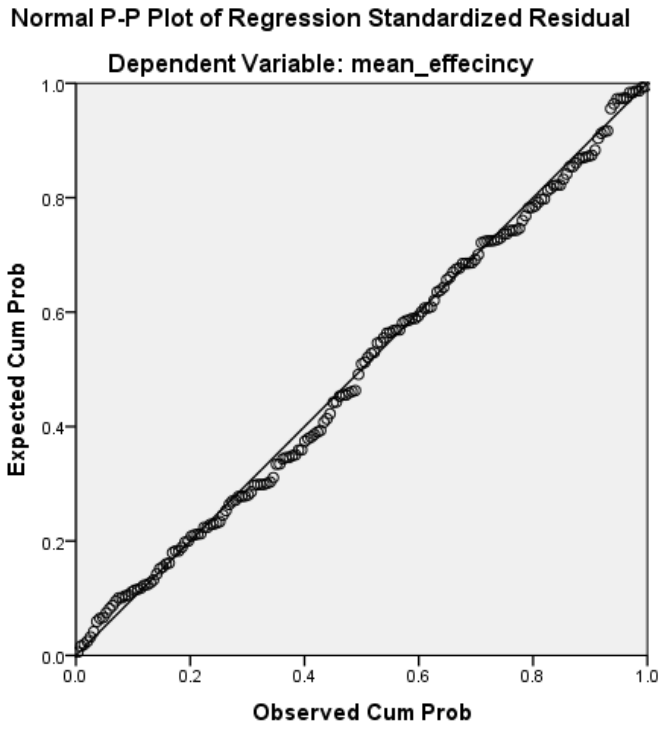
c. Predictors: (Constant), B4_business age, B2_type of owner, B3_size of firm, mgtcomptence, infote topmanagement, systemschange, organizational_change

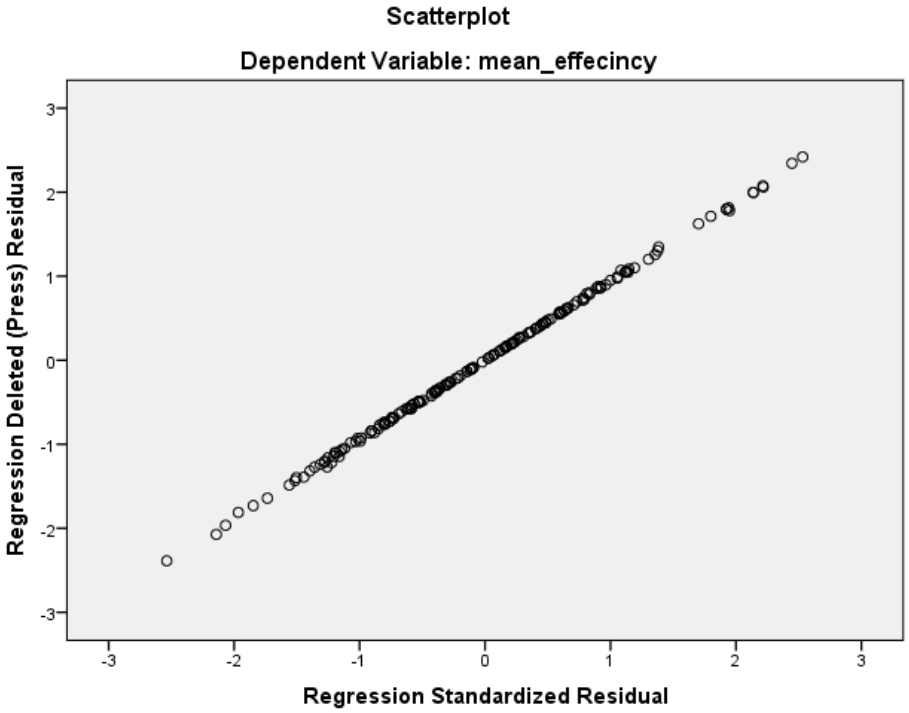
Coefficients[a]

odel		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
	(Constant)	2.580	.293		8.802	.000		
	B2_type of owner	.788	.157	.303	5.011	.000	.989	1.011
	B3_size of firm	-1.455	.198	-.458	-7.358	.000	.935	1.070
	B4_business age	-.294	.167	-.110	-1.756	.081	.927	1.078
	(Constant)	-.097	.411		-.235	.814		
	B2_type of owner	.409	.148	.157	2.763	.006	.815	1.227
	B3_size of firm	-.743	.193	-.234	-3.852	.000	.717	1.394
	B4_business age	-.225	.144	-.084	-1.561	.120	.913	1.095
	infotech	.051	.085	.042	.596	.552	.534	1.871
	organizational_change	.161	.121	.107	1.329	.186	.407	2.455
	topmanagement	.196	.099	.147	1.971	.050	.476	2.102
	systemschange	.377	.097	.273	3.899	.000	.540	1.851
	mgtcomptence	.145	.087	.101	1.663	.098	.721	1.388

Dependent Variable: mean_effecincy







Model Summary[c]

Model	R	R Square	Adjusted Square	Std. Error of Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.557[a]	.310	.299	.90966	.310	26.542	3	177	.000
2	.710[b]	.504	.481	.78262	.194	13.426	5	172	.000

a. Predictors: (Constant), B4_business age, B2_type of owner, B3_size of firm

b. Predictors: (Constant), B4_business age, B2_type of owner, B3_size of firm, mgtcomptence, infotech, topmanagement, systemschan organizational_change
c. Dependent Variable: mean_flex

ANOVA[a]

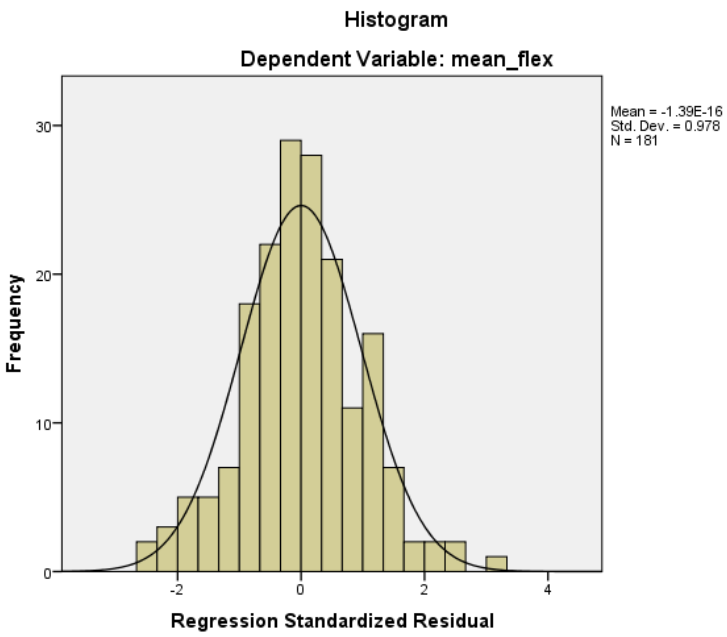
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65.889	3	21.963	26.542	.000[b]
	Residual	146.465	177	.827		
	Total	212.354	180			
2	Regression	107.006	8	13.376	21.838	.000[c]
	Residual	105.349	172	.612		
	Total	212.354	180			

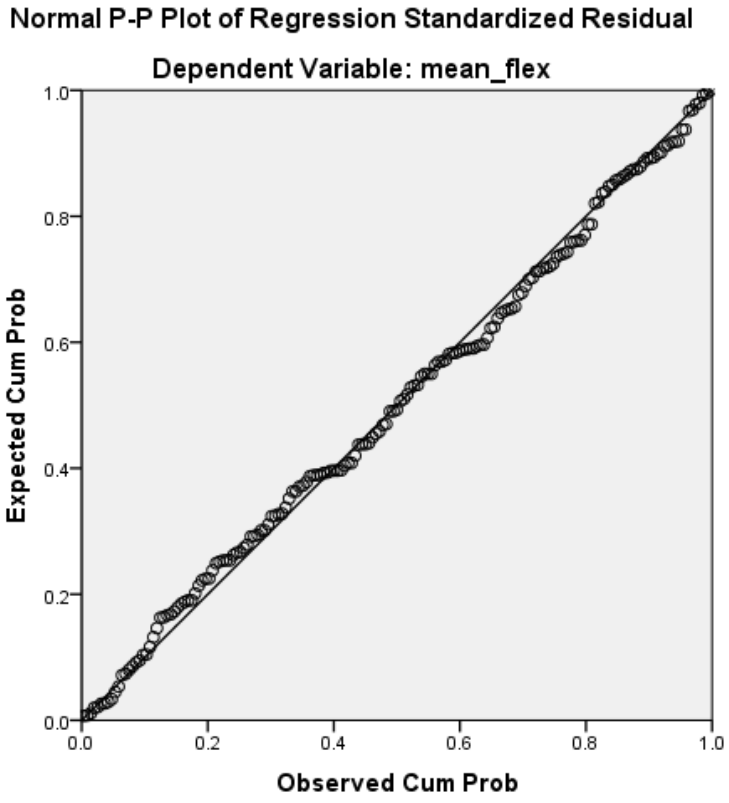
a. Dependent Variable: mean_flex
b. Predictors: (Constant), B4_business age, B2_type of owner, B3_size of firm
c. Predictors: (Constant), B4_business age, B2_type of owner, B3_size of firm, mgtcomptence, infote topmanagement, systemschange, organizational_change

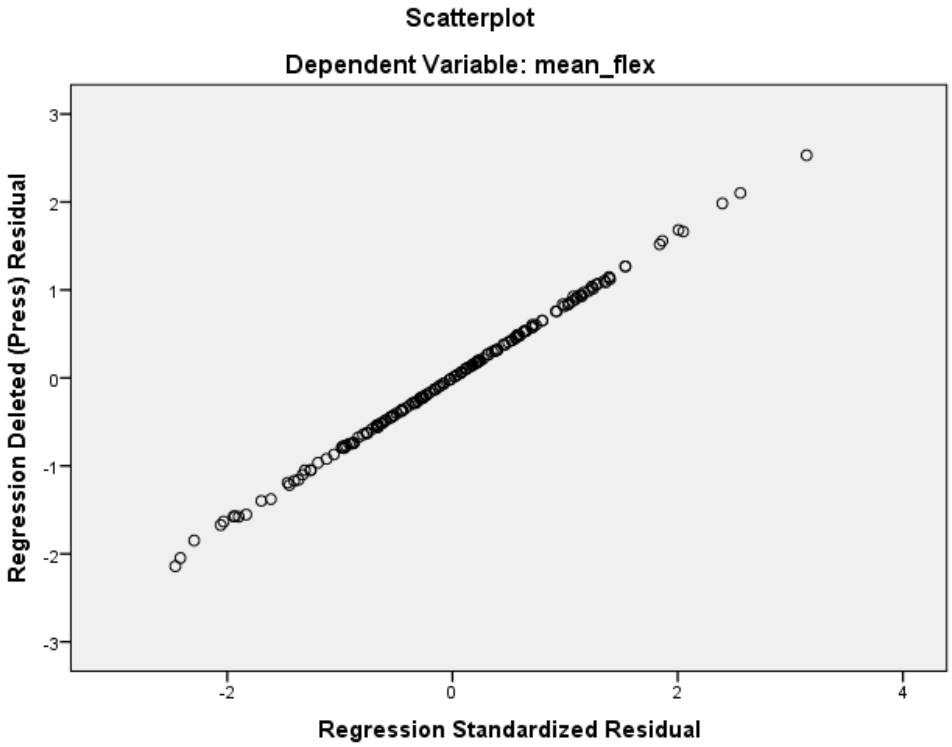
Coefficients[a]

Model		Unstandardized Coefficients		Standardize Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.545	.255		9.998	.000		
	B2_type of owne	.733	.137	.337	5.366	.000	.989	1.011
	B3_size of firm	-1.068	.172	-.402	-6.219	.000	.935	1.070
	B4_business age	-.149	.145	-.066	-1.024	.307	.927	1.078
2	(Constant)	.313	.360		.870	.386		
	B2_type of owne	.371	.129	.171	2.870	.005	.815	1.227
	B3_size of firm	-.499	.169	-.187	-2.956	.004	.717	1.394
	B4_business age	-.093	.126	-.041	-.735	.463	.913	1.095
	infotech	.151	.075	.148	2.020	.045	.534	1.871
	organizational_ch ge	.290	.106	.231	2.744	.007	.407	2.455
	topmanagement	.014	.087	.012	.156	.876	.476	2.102
	systemschange	.183	.085	.158	2.162	.032	.540	1.851
	mgtcomptence	.154	.076	.128	2.020	.045	.721	1.388

a. Dependent Variable: mean_flex


Histogram
Dependent Variable: mean_flex
Mean = -1.39E-16
Std. Dev. = 0.978
N = 181
Frequency
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: mean_flex
Expected Cum Prob
Observed Cum Prob



Appendix B11: Moderating Effect of leaning capabilities between Business Process Reengineering and Organizational Performance

Appendix B11.a: Moderating Effect of knowledge stock on Business Process Reengineering and Organizational Performance

Model Summary[e]

Model	R	R Square	Adjusted Square	Std. Error of Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.518[a]	.268	.260	1.11626	.268	32.657	2	178	.000
2	.725[b]	.526	.506	.91179	.257	18.756	5	173	.000
3	.738[c]	.545	.524	.89547	.019	7.366	1	172	.007
4	.765[d]	.586	.554	.86701	.041	3.295	5	167	.007

a. Predictors: (Constant), B4_business age, B3_size of firm
b. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanagement, systemschan organizational_change
c. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanagement, systemschan organizational_change, know
d. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanagement, systemschan organizational_change, know, ktopngt, kmgtcomptenence, kinfotech, ksyschange, korg
e. Dependent Variable: mean_effecincy

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	81.383	2	40.692	32.657	.000[b]
	Residual	221.793	178	1.246		
	Total	303.176	180			
2	Regression	159.349	7	22.764	27.382	.000[c]
	Residual	143.827	173	.831		
	Total	303.176	180			
3	Regression	165.256	8	20.657	25.761	.000[d]
	Residual	137.920	172	.802		
	Total	303.176	180			
4	Regression	177.641	13	13.665	18.178	.000[e]
	Residual	125.535	167	.752		
	Total	303.176	180			

a. Dependent Variable: mean_effecincy

b. Predictors: (Constant), B4_business age, B3_size of firm

c. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanageme systemschange, organizational_change

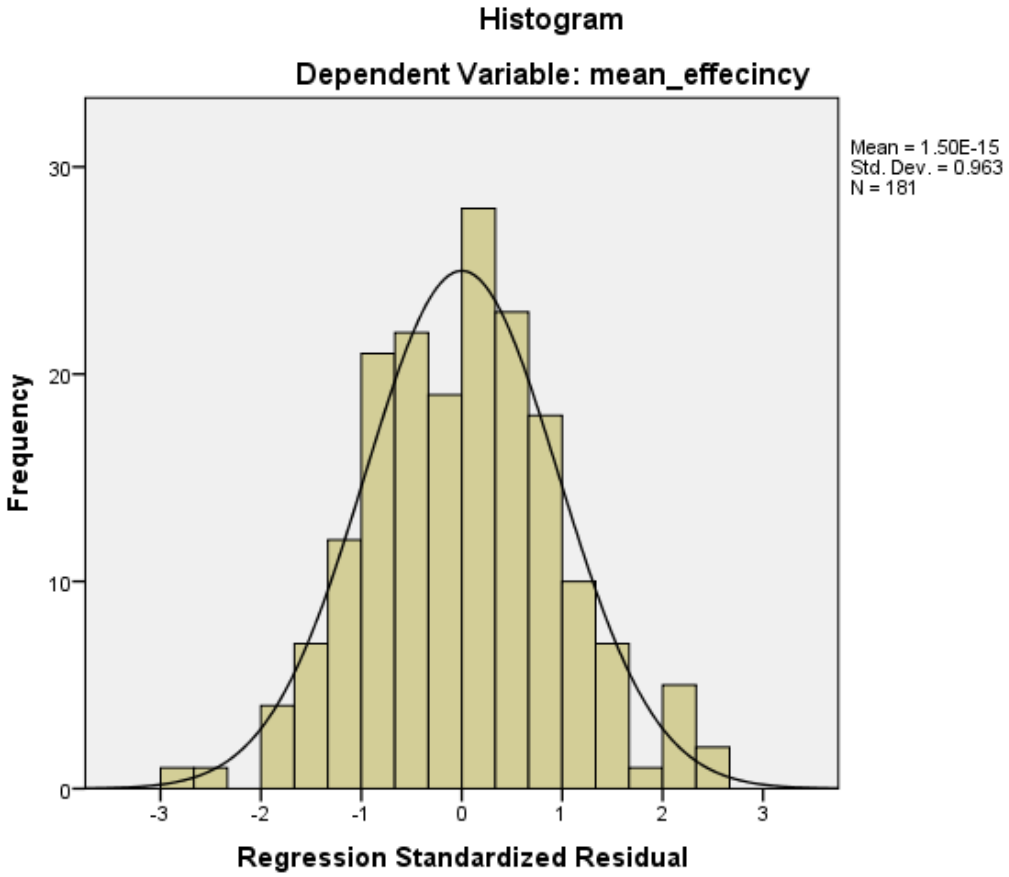
d. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanageme systemschange, organizational_change, know

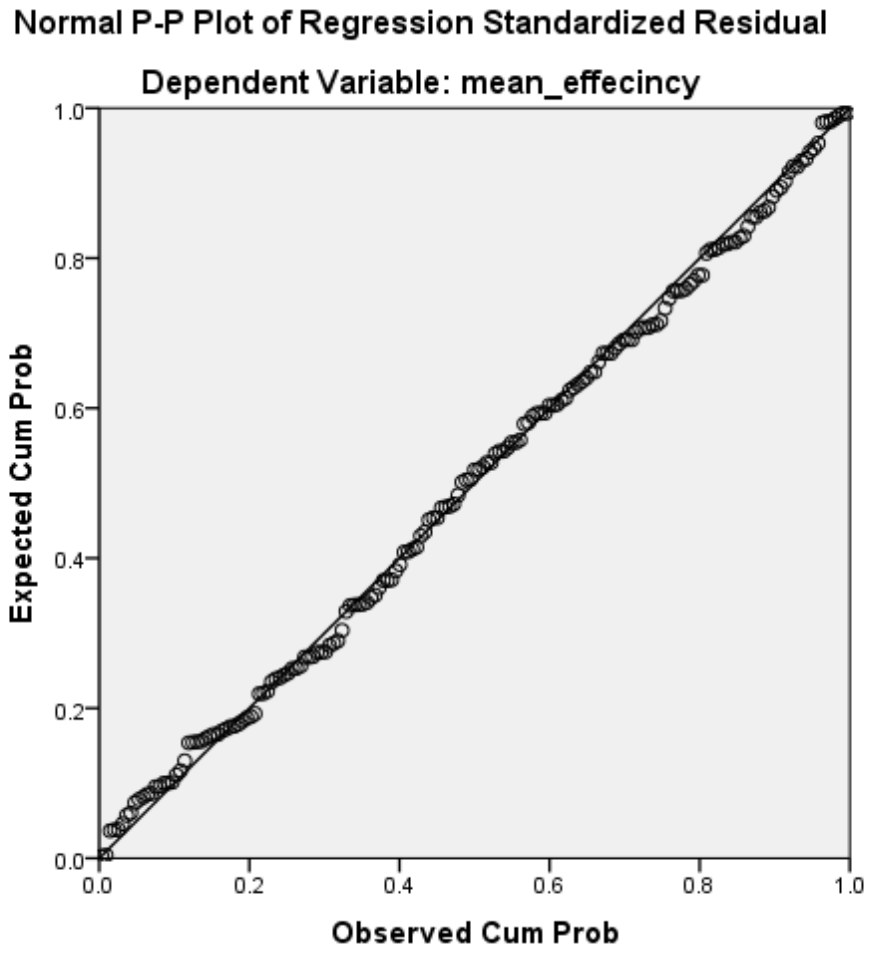
e. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanageme systemschange, organizational_change, know, ktopngt, kmgtcomptenence, kinfotech, ksyschange, korg

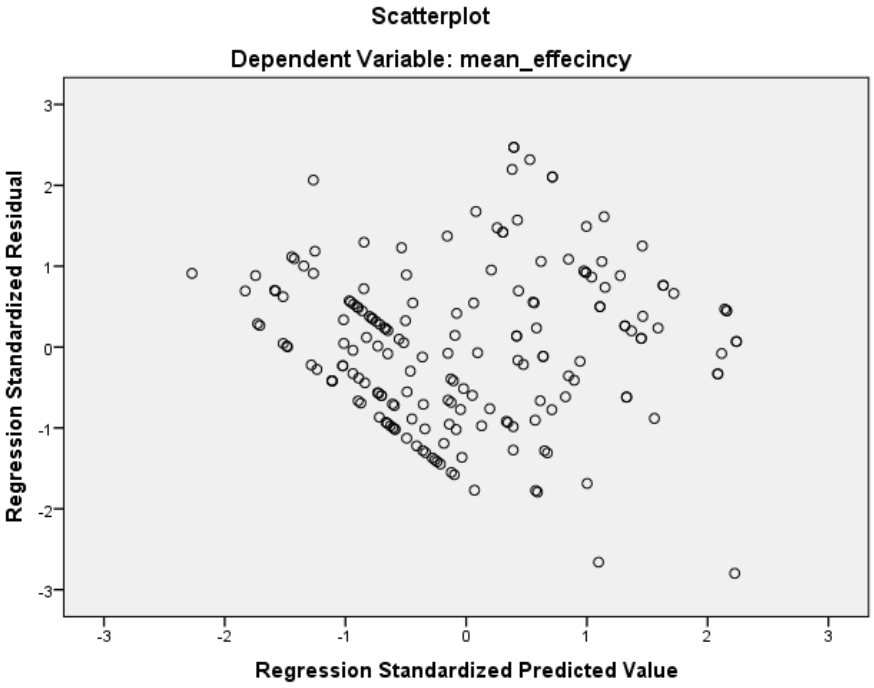
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.772	.183		20.661	.000		
	B3_size of firm	-1.479	.211	-.465	-7.021	.000	.935	1.069
	B4_business age	-.370	.178	-.138	-2.083	.039	.935	1.069
2	(Constant)	.162	.408		.396	.692		
	B3_size of firm	-.686	.195	-.216	-3.511	.001	.725	1.378
	B4_business age	-.244	.147	-.091	-1.663	.098	.915	1.093
	infotech	.058	.087	.047	.663	.508	.535	1.870
	organizational_chang	.220	.121	.146	1.810	.072	.420	2.379
	topmanagement	.141	.099	.105	1.417	.158	.496	2.016
	systemschange	.444	.096	.320	4.643	.000	.576	1.737
	mgtcomptence	.174	.088	.121	1.972	.050	.731	1.368
3	(Constant)	-.055	.409		-.135	.893		
	B3_size of firm	-.600	.194	-.189	-3.085	.002	.706	1.416
	B4_business age	-.217	.144	-.081	-1.500	.135	.911	1.098
	infotech	.072	.086	.059	.836	.404	.533	1.876
	organizational_chang	.175	.120	.116	1.453	.148	.412	2.425
	topmanagement	.190	.099	.142	1.917	.057	.479	2.087
	systemschange	.341	.101	.246	3.369	.001	.495	2.020
	mgtcomptence	.083	.093	.058	.892	.374	.636	1.573
	know	.241	.089	.185	2.714	.007	.566	1.766
4	(Constant)	.325	.781		.417	.677		
	B3_size of firm	-.611	.196	-.192	-3.120	.002	.652	1.533
	B4_business age	-.186	.141	-.069	-1.320	.189	.896	1.116
	infotech	.419	.282	.345	1.484	.140	.046	21.739
	organizational_chang	-1.022	.358	-.680	-2.856	.005	.044	22.852
	topmanagement	.931	.286	.698	3.252	.001	.054	18.595
	systemschange	.497	.279	.359	1.785	.076	.061	16.315
	mgtcomptence	.020	.242	.014	.082	.935	.088	11.391
	know	.021	.319	.016	.066	.948	.041	24.304
	korg	.444	.125	1.626	3.544	.001	.012	84.881
	kinfotech	-.109	.105	-.425	-1.039	.300	.015	67.539
	ktopngt	-.276	.104	-.975	-2.646	.009	.018	54.811
	ksyschange	-.043	.106	-.164	-.403	.688	.015	66.768
	kmgtcomptenence	.013	.079	.049	.170	.865	.030	33.026

a. Dependent Variable: mean_effecincy


Histogram
Dependent Variable: mean_effecincy
Mean = 1.50E-15
Std. Dev. = 0.963
N = 181
Frequency
30
20
10
0
-3
-2
-1
0
1
2
3
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: mean_effecincy
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Scatterplot
Dependent Variable: mean_effecincy
Regression Standardized Residual
Regression Standardized Predicted Value
-3
-2
-1
0
1
2
3

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Er of Estimat	Change Statistics				
					R Square Chan	F Change	df1	df2	Sig. F Change
1	.393[a]	.155	.145	.46349	.155	16.292	2	178	.000
2	.660[b]	.436	.413	.38405	.281	17.251	5	173	.000
3	.680[c]	.462	.437	.37615	.026	8.338	1	172	.004
4	.700[d]	.490	.451	.37160	.028	1.849	5	167	.106

a. Predictors: (Constant), B4_business age, B3_size of firm

b. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanagement, systemschan organizational_change

c. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanagement, systemschan organizational_change, know

d. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanagement, systemschan organizational_change, know, ktopngt, kmgtcomptenence, kinfotech, ksyschange, korg

e. Dependent Variable: flexmod

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.000	2	3.500	16.292	.000[b]
	Residual	38.238	178	.215		
	Total	45.238	180			
2	Regression	19.721	7	2.817	19.102	.000[c]
	Residual	25.516	173	.147		
	Total	45.238	180			
3	Regression	20.901	8	2.613	18.465	.000[d]
	Residual	24.336	172	.141		
	Total	45.238	180			
4	Regression	22.177	13	1.706	12.354	.000[e]
	Residual	23.060	167	.138		
	Total	45.238	180			

a. Dependent Variable: flexmod

b. Predictors: (Constant), B4_business age, B3_size of firm

c. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanageme systemschange, organizational_change

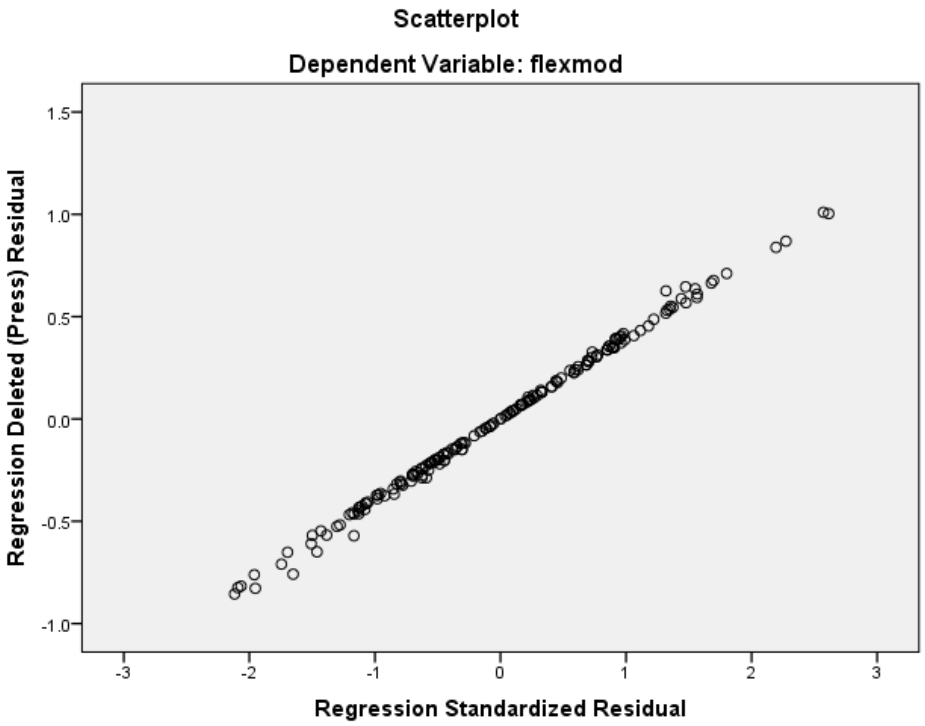
d. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanageme systemschange, organizational_change, know

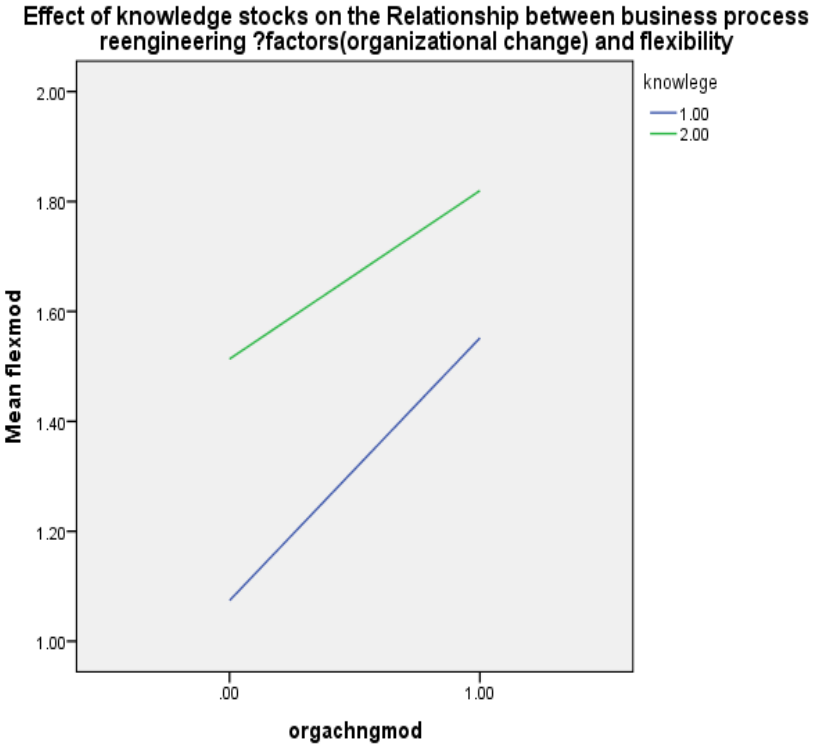
e. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanageme systemschange, organizational_change, know, ktopngt, kmgtcomptenence, kinfotech, ksyschange, korg

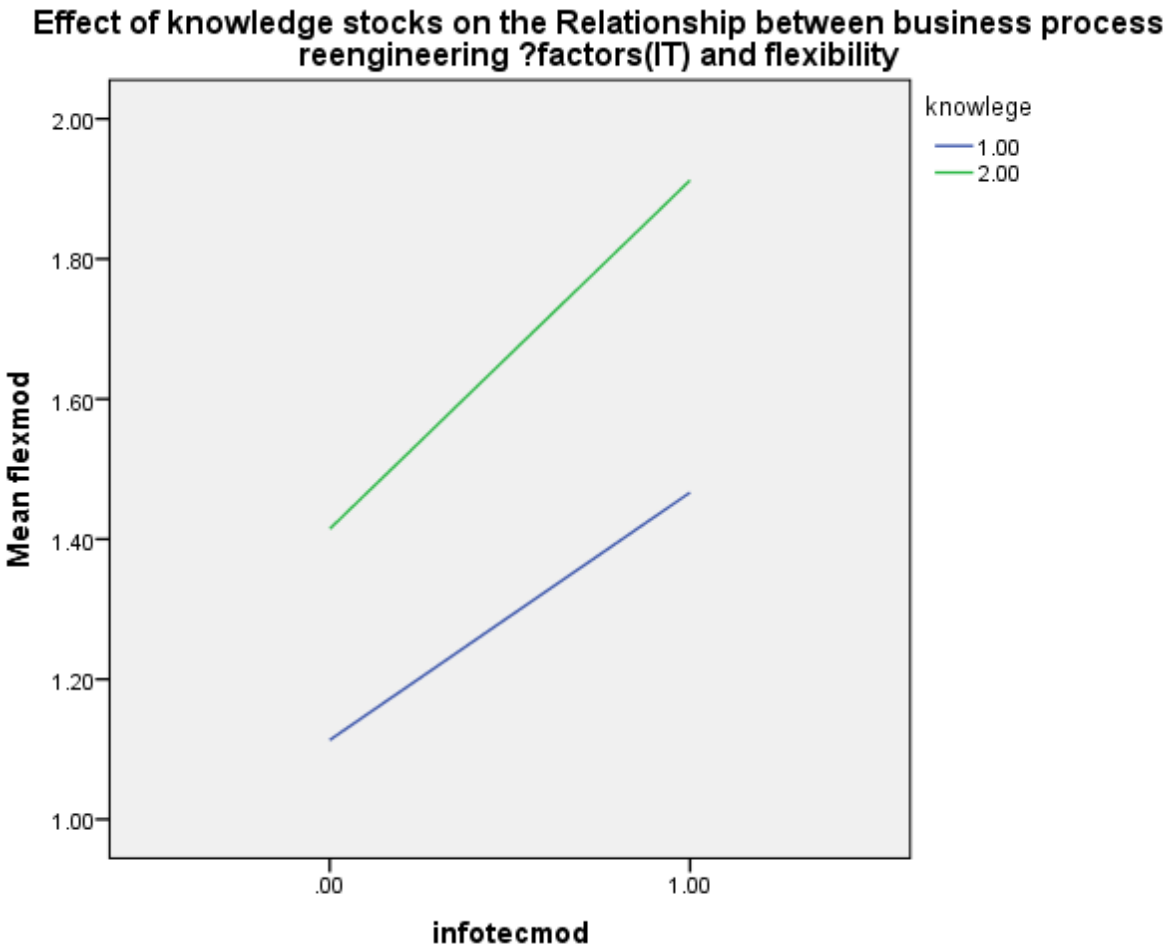
Coefficients[a]

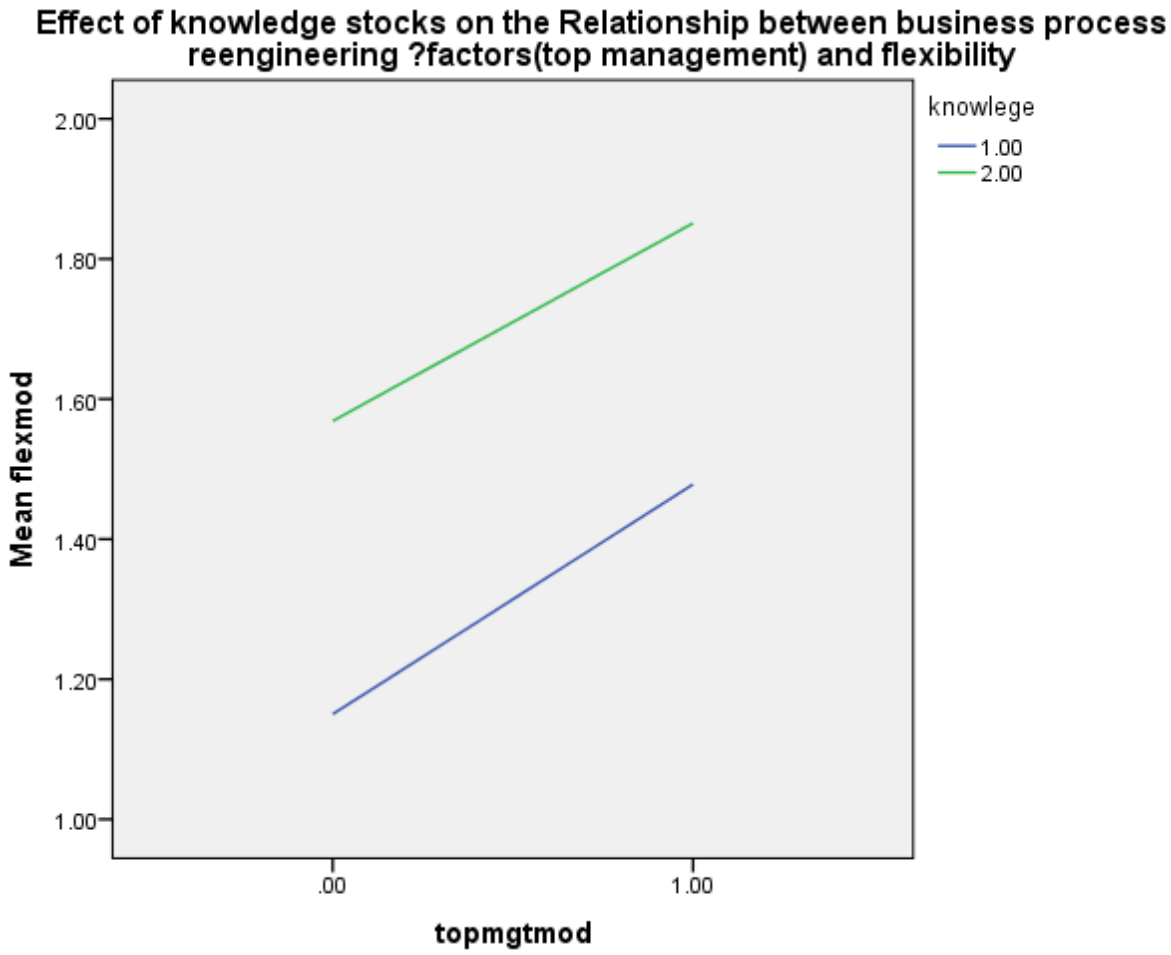
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.877	.076		24.761	.000		
	B3_size of firm	-.457	.087	-.372	-5.221	.000	.935	1.069
	B4_business age	-.066	.074	-.064	-.900	.369	.935	1.069
2	(Constant)	.460	.172		2.678	.008		
	B3_size of firm	-.158	.082	-.129	-1.926	.056	.725	1.378
	B4_business age	-.022	.062	-.021	-.353	.724	.915	1.093
	infotech	.108	.037	.231	2.954	.004	.535	1.870
	organizational_change	.121	.051	.209	2.372	.019	.420	2.379
	topmanagement	.001	.042	.002	.022	.983	.496	2.016
	systemschange	.086	.040	.161	2.135	.034	.576	1.737
	mgtcomptence	.089	.037	.160	2.389	.018	.731	1.368
3	(Constant)	.363	.172		2.116	.036		
	B3_size of firm	-.120	.082	-.098	-1.470	.143	.706	1.416
	B4_business age	-.010	.061	-.009	-.159	.874	.911	1.098
	infotech	.114	.036	.244	3.184	.002	.533	1.876
	organizational_change	.101	.051	.174	2.003	.047	.412	2.425
	topmanagement	.023	.042	.045	.552	.581	.479	2.087
	systemschange	.040	.043	.075	.941	.348	.495	2.020
	mgtcomptence	.048	.039	.086	1.232	.220	.636	1.573
	know	.108	.037	.215	2.888	.004	.566	1.766
4	(Constant)	.007	.335		.020	.984		
	B3_size of firm	-.139	.084	-.113	-1.651	.101	.652	1.533
	B4_business age	-.003	.060	-.003	-.054	.957	.896	1.116
	infotech	.004	.121	.007	.029	.977	.046	21.739
	organizational_change	.141	.153	.242	.917	.361	.044	22.852
	topmanagement	-.040	.123	-.078	-.327	.744	.054	18.595
	systemschange	.348	.119	.651	2.917	.004	.061	16.315
	mgtcomptence	.002	.104	.003	.015	.988	.088	11.391
	know	.272	.137	.542	1.991	.048	.041	24.304
	korg	-.019	.054	-.177	-.347	.729	.012	84.881
	kinfotech	.048	.045	.486	1.070	.286	.015	67.539
	ktopngt	.029	.045	.269	.657	.512	.018	54.811
	ksyschange	-.126	.046	-1.244	-2.756	.006	.015	66.768
	kmgtcomptenence	.015	.034	.140	.440	.660	.030	33.026

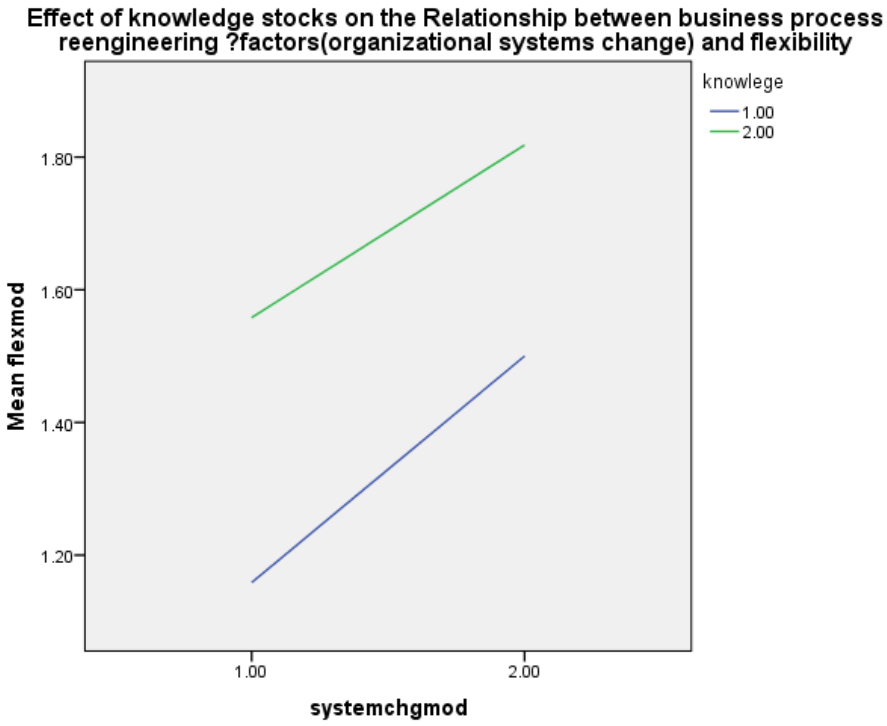
a. Dependent Variable: flexmod


Scatterplot
Dependent Variable: flexmod
Regression Deleted (Press) Residual
Regression Standardized Residual
1.5
1.0
0.5
0.0
-0.5
-1.0
-3
-2
-1
0
1
2
3


Effect of knowledge stocks on the Relationship between business process reengineering ?factors(organizational change) and flexibility
knowlege
1.00
2.00
Mean flexmod
orgachngmod
2.00
1.80
1.60
1.40
1.20
1.00
.00
1.00


Effect of knowledge stocks on the Relationship between business process reengineering ?factors(IT) and flexibility
Mean flexmod
2.00
1.80
1.60
1.40
1.20
1.00
.00
1.00
infotecmod
knowlege
1.00
2.00


Effect of knowledge stocks on the Relationship between business process reengineering ?factors(top management) and flexibility
knowlege
1.00
2.00
Mean flexmod
2.00
1.80
1.60
1.40
1.20
1.00
.00
1.00
topmgtmod


Effect of knowledge stocks on the Relationship between business process reengineering ?factors(organizational systems change) and flexibility
knowlege
1.00
2.00
Mean flexmod
1.80
1.60
1.40
1.20
1.00
2.00
systemchgmod

Appendix B11.b: Moderating Effect of learning flows relationship between Business Process Reengineering and Organizational Performance

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error the Estima	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.445[a]	.198	.189	.97812	.198	21.981	2	178	.000
2	.693[b]	.480	.459	.79882	.282	18.775	5	173	.000
3	.731[c]	.534	.512	.75840	.054	19.933	1	172	.000
4	.770[d]	.593	.561	.71982	.058	4.786	5	167	.000

a. Predictors: (Constant), B4_business age, B3_size of firm

b. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanagement, systemschang organizational_change

c. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanagement, systemschan organizational_change, know

d. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanagement, systemschang organizational_change, know, ktopngt, kmgtcomptenence, kinfotech, ksyschange, korg

e. Dependent Variable: mean_flex

Coefficients[a]

odel	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	3.654	.160		22.839	.000		
B3_size of firm	-1.090	.185	-.410	-5.905	.000	.935	1.069
B4_business age	-.220	.156	-.098	-1.412	.160	.935	1.069
(Constant)	.548	.358		1.532	.127		
B3_size of firm	-.447	.171	-.168	-2.611	.010	.725	1.378
B4_business age	-.110	.129	-.049	-.855	.394	.915	1.093
infotech	.157	.076	.154	2.061	.041	.535	1.870
organizational_change	.344	.106	.273	3.234	.001	.420	2.379
topmanagement	-.037	.087	-.033	-.421	.674	.496	2.016
systemschange	.243	.084	.210	2.907	.004	.576	1.737
mgtcomptence	.180	.077	.150	2.334	.021	.731	1.368
(Constant)	.245	.346		.709	.479		
B3_size of firm	-.327	.165	-.123	-1.986	.049	.706	1.416
B4_business age	-.072	.122	-.032	-.587	.558	.911	1.098
infotech	.176	.072	.174	2.434	.016	.533	1.876
organizational_change	.281	.102	.224	2.761	.006	.412	2.425
topmanagement	.032	.084	.029	.384	.702	.479	2.087
systemschange	.100	.086	.086	1.169	.244	.495	2.020
mgtcomptence	.053	.079	.044	.679	.498	.636	1.573
know	.335	.075	.309	4.465	.000	.566	1.766
(Constant)	-.717	.648		-1.106	.270		
B3_size of firm	-.406	.163	-.153	-2.496	.014	.652	1.533
B4_business age	-.047	.117	-.021	-.405	.686	.896	1.116
infotech	.140	.234	.138	.599	.550	.046	21.739
organizational_change	-.254	.297	-.202	-.855	.394	.044	22.852
topmanagement	.240	.238	.215	1.009	.314	.054	18.595
systemschange	.893	.231	.771	3.862	.000	.061	16.315
mgtcomptence	.042	.201	.035	.209	.834	.088	11.391
know	.759	.265	.698	2.868	.005	.041	24.304
korg	.188	.104	.820	1.802	.073	.012	84.881
kinfotech	.039	.087	.180	.444	.657	.015	67.539
ktopngt	-.068	.087	-.288	-.787	.432	.018	54.811
ksyschange	-.313	.088	-1.427	-3.536	.001	.015	66.768
kmgtcomptenence	-.004	.066	-.018	-.062	.951	.030	33.026

Dependent Variable: mean_flex

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.059	2	21.029	21.981	.000[b]
	Residual	170.296	178	.957		
	Total	212.354	180			
2	Regression	101.961	7	14.566	22.827	.000[c]
	Residual	110.393	173	.638		
	Total	212.354	180			
3	Regression	113.426	8	14.178	24.651	.000[d]
	Residual	98.929	172	.575		
	Total	212.354	180			
4	Regression	125.824	13	9.679	18.680	.000[e]
	Residual	86.530	167	.518		
	Total	212.354	180			

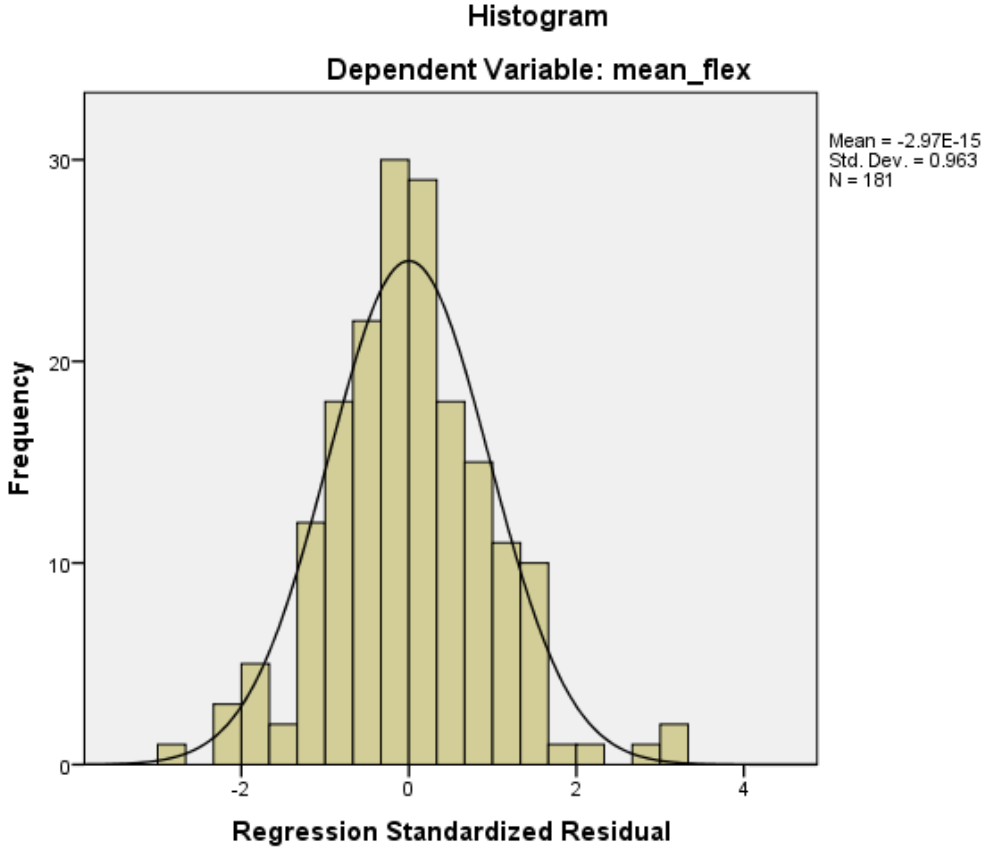
a. Dependent Variable: mean_flex

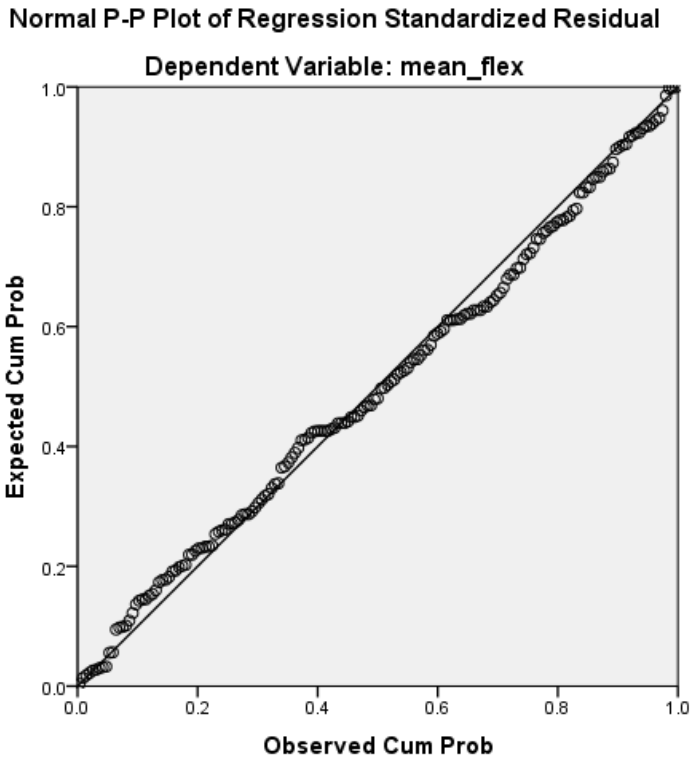
b. Predictors: (Constant), B4_business age, B3_size of firm

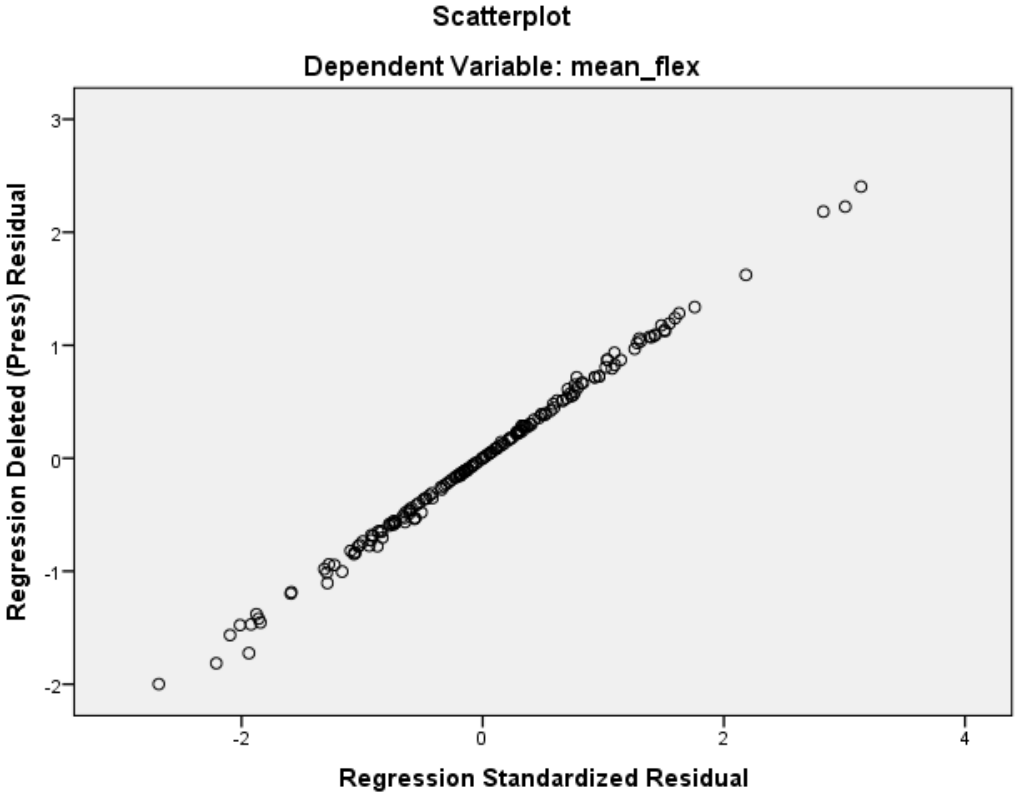
c. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanageme systemschange, organizational_change

d. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanageme systemschange, organizational_change, know

e. Predictors: (Constant), B4_business age, B3_size of firm, mgtcomptence, infotech, topmanageme systemschange, organizational_change, know, ktopngt, kmgtcomptenence, kinfotech, ksyschange, korg




Normal P-P Plot of Regression Standardized Residual
Dependent Variable: mean_flex
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Scatterplot
Dependent Variable: mean_flex
Regression Deleted (Press) Residual
Regression Standardized Residual
-2
-1
0
1
2
3
4