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BUSINESS PROCESS AUTOMATION AND OPERATIONAL PERFORMANCE OF FUNCTIONAL AREAS OF SEED COMPANIES IN WESTERN REGION, KENYA

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Abstract

Business Process Reengineering practices has been considered to help organizations fundamentally rethink how they do their work in order to dramatically improve production, quality, operational efficiency, flexibility and customer focus in developing and changing business world. The purpose of the study was to establish the effect of Business process automation on operational performance of the functional areas of the seed companies in Western region, Kenya. A descriptive and causal correlational research design was used to determine the cause-effect relationship of the study. The study considered two seed companies in Western region, Kenya with a total targeted population of 50 managers. A census study was adopted because of the small population. Key informant was chosen from each functional area. Questionnaires were adopted for the purpose of the research. Data was analyzed by use of descriptive and inferential statistics. The research findings revealed that F test was greater than the level of F-significant in the hypotheses tested. F-test was 2.730 greater than F- statistic

0.018 for hypothesis on process automation is significant to operational performance. The study revealed that process automation, contributed greatly to the improvement of operational performance in the units of production, operational efficiency, production flexibility and quality of the products as well as services. The study will be of benefit managers in providing customers with products and services that satisfy their needs and academicians in filling the knowledge gap and laying foundation for further studies. Companies should embrace the process automation to build a sustainable business in terms of operational performance.

Keywords: Business Process, Process Automation, Reengineering Practice, Operational Performance, Functional Areas

INTRODUCTION

The business environment in any industry has a lot of challenges resulting from competitive pressure which is growing at an ever faster pace due to growing customer expectation, globalization and technological development. For organizations to remain in business competitively there is need for them to consider performance improvements in their work processes. Organizations need to undergo radical changes in the way they work as steady products and services improvement is not sufficient to survive in the business environment. There are many business performance improvement techniques which have been developed over the years and they include; quality management, process improvement, balanced scorecard, Benchmarking and process reengineering methodologies and among others all focusing on improvement of existing process (Macdonald, 1995). Business process reengineering (BPR) focuses on radical changes resulting in complete new processes for dramatic improvements in critical, contemporary measures of performance, such as cost, quality, services, flexibility and speed which guarantee the performance of the organization in the world of competition (Hammer,1990), (Hammer and Champy 1993)

BPR has been implemented in both service and manufacturing firms in different countries around the world. Successful implementation of BPR brings many benefits to the organization and it increases customer satisfaction, increased productivity, higher flexibility, increased employees and improved coordination, and improved competitive advantage are the main benefits of successful BPR implementation. These benefits were realized in Chase Manhattan bank, New York, USA (Shin and Jemella 2002). While Hedley, Ojiako, Johansen &Maguire (2010), stated that about 70% failure rate in UK banking sector was recorded during change process and mostly it fails while implementing BPR objectives. Degu, Matiwo, and

Krishna (2013), stated that successful BPR implementation in bureau of finance and economic development Ethiopia had major improvements on speed of service provision, cost, quality, efficiency and productivity which increased customer satisfaction and operation performance, employees gained work satisfaction, reduced work load and service time because of their empowerment and utilization of BPR practices. Time and quality were some of the best measurement to evaluate operational performance. According to Magutu; Nyamwange & Kaptoge (2010), the Wrigley Company in Kenya managed to achieve competitive advantage by implementing business process reengineering, the key improvement was in the areas of process improvement and organizational alignment towards the customer satisfaction, which lead to overall improved company performance.

The seed industry development in Kenya started in the early 20th century, when the government of Kenya realized the importance of high quality seed in agricultural production. This was supported by research on food, industrial and export crops, which supplied seeds and planting material, for the farming community. This resulted in the formation of Kenya Seed Company in 1956 to initially produce pasture seeds to serve the then dairy farmers. Later, the company diversified to other crops. The seed industry in Kenya comprises of the formal and informal seed sector. The Seed industry is governed by the Seeds and Plant Varieties Act (Cap 327) of 1972, which became operational in 1975.

Seed and planting materials are no doubt the most important inputs in agricultural production. However much a farmer puts to use other productive inputs (land, fertilizer, labor etc.), seed still determines whether an output will be realized or not. The government of Kenya has been pursuing strategies aimed at increasing agricultural productivity as this has been seen to be central to accelerating economic growth and improving the wellbeing of both rural and urban people in Kenya. Seed has been recognized as a core component to realizing this strategy. Compared to other agricultural inputs, seed has been shown to have the greatest potential to increase on-farm productivity and enhance food security (Muyanga; Ayieko and Gem 2005). Improved seed thus plays pivotal role in increasing agricultural productivity and thereby reduces production costs inherent in our production systems. Two seed systems exist in Kenya, the formal and informal seed systems. While the formal seed system is an important source of high quality certified seed, it is not able to meet the farmers' demand. Majority of farmers therefore rely on the informal seed system for seed and planting material for most agricultural commodities, and often recycle seed that has been exhausted through generations of cultivation. The result has been persistently low yields. The challenge in the Kenyan agriculture sector today is to develop seed production and delivery systems that encourage wider use of quality seed throughout the marketing chain (GOK, MOA, 2004). The seed industry

in Kenya is better developed compared to other countries within the region, high cost of seed relative to other purchased inputs, coupled with the inability of the formal seed system to meet the demand by farmers have been cited as bottlenecks to the seed industry (Nyoro and Ariga 2004). Since the liberalization of the seed industry in 1996, private sector participation has increased, with a number of private seed companies being registered to produce seed, thus reducing the monopoly that the Kenya Seed Company has enjoyed for a long time. While it was widely expected that this would lead to improved accessibility to quality seed and hence increased efficiency, agricultural productivity has generally been low and shown declining trends. In addition, mechanisms to protect farmers from malpractices by the seed producers and traders have not been adequately put in place. Farmers, therefore have no fallback position when faced with seed crisis. Poor accessibility to information regarding demand, supply and general performance in seed companies, were also among other constraints identified (Kamau, 2002). According to Funk and Wamache, (2012), Kenya as a country has many ICT services that can improve the efficiency of certified and quality seed distribution, production supply chains and general information but meaningful application have yet to be developed and implemented. Therefore, this study intends to critically assess the effect of BPR practices for operational performance in the functional areas of the seed companies in western Kenya.

Statement of the Research Problem

The challenge in the Kenyan agriculture industry today is to develop seed production and delivery systems that encourage wider use of quality seed throughout the marketing chain (GOK, MOA, 2004). The seed industry in Kenya is better developed compared to other countries within the region, high cost of seed relative to other purchased inputs, coupled with the inability of the formal seed system to meet the demand by farmers have been cited as bottlenecks to the seed industry (Nyoro and Ariga 2004). There are many companies in the seed industry and this has not lead to improved accessibility to quality seed and hence increased efficiency, agricultural productivity has generally been low and shown declining trends. Similarly, Poor accessibility to information regarding demand, supply and general performance in seed the market, were also among other constraints identified (Kamau, 2002). Similarly, Funk and Wamache (2012), stated that the seed industry in Kenya at present embraces many practices which are not consistent with a mature well-functioning industry. The net result of many of these practices is the low rate of product innovation, a sluggish supply response to seed demand, and high costs for seed production, processing and distribution entities. Although BPR practices have been applied in various Companies. Many problems are related to the evolution of business processes and their variability. This means that business

process management is not a one-time project but should be continuous effort within organization with constant improvement in business processes (Trkman, 2010). The seed companies in Kenya are faced with challenges of being competitive in terms of providing quality product, meeting the market demand and operating their functional units efficiently Therefore, the study sought to establish the effect of Business Process Automation on operational performance of the functional areas of Seed Companies in Western region, Kenya.

Research Objective

To assess the effect of process automation on the operational performance of the functional areas of seed companies in Western Region, Kenya.

Hypothesis

There is no significant effect of process automation on operational performance of the functional areas of seed companies in Western Region, Kenya

Significance of the Study

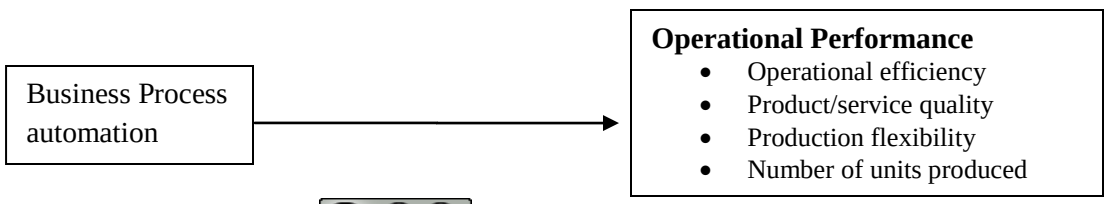
This finding will assist the managers on BPR application in terms of process automation which increases unit of production and operational efficiency, process renovation increases production flexibility and quality of the products, also process networking improves operational efficiency of their companies. The findings, therefore would act as a reference point for the government in matters of BPR application on operational performance.

The finding of the study will be source of knowledge to the scholars in the field of application of information in relation to BPR as concerns process automation, process renovation and process networking on operational performance and also forms a base for more research.

Conceptual framework

The business process automation is the independent variable. The dependent variable is operational performance having quality, speed and flexibility as the constructs. The Relationship between Independent and Dependent Variables on business process automation for performance in seed Companies in Western Kenya is outlined in the diagram below:

Figure 1. Conceptual framework



LITERATURE REVIEW

Theoretical framework

This study used the theory of reengineering which states that reengineering is nothing short of a revolution (Hammer, 1990). To reengineer properly a company must radically redesign its processes into cross functional ones and change its organization structure, culture, incentives and information technology. And also, reengineering is 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 and Champy, 1993).

Originally, BPR was a technique designed to introduce radical changes in improving business operation and competitiveness. World economies are undergoing transformation that require substantial adjustments in the way and manner public and private organizations operate. Thus, new, elaborate techniques in managing organizations have emerged to help mediate this transition and reengineering has been offered as among the more prominent systems of mapping and adapting to the realities of this new and complex order. The proponent emphasizes three factors that changed todays practices of doing business. Customers -seller relationship has changed. Customers tell sellers what they want, when they want it and how they want it. Competition and technological changed industry. Technologies and innovation have provided breakthroughs so as to modify tastes and product life cycles which produce more competitors with the ability and ambition to readily respond to customized consumer needs. Change should occur by way of discarding old fashioned procedures and linking business processes a cross sectional functional perspectives (Hammer & Champy,1993)

This study also, used the theory of discontinuous thinking by Handy (1990). The theory stipulates that in an era when change is constant, then it is necessary to break out of old ways of thinking in order to use change to our advantage. Handy (1990) examines how dramatic changes are transforming business and nature of work. The proponent of this theory, emphasized that discontinuous change requires upside down thinking, and discusses the need for new kinds of organizations, new approaches to work and new ideas about the nature of our society.

These theories were preferred for this study because they employ a process approach to change style of doing work in order to yield a positive change. The purpose of reengineering is to make all the operational processes the best in terms of the feature of organization such as responsiveness, efficiency, flexibility and customer focus to be achieved in new perspective shift to the approach of work from task based to process based thinking. Now, the conclusion above

tells us that any organization which hopes to thrive in today's world must shift the approach to work and organization process.

Process Automation

It is the mechanization of business processes in order to improve efficiency of the process by using ICT (Shin, et, al, 2002; Debela, 2009). IT plays a major role in BPR as it provides processes automation. It allows the business to be conducted in different locations and permits quick delivery to customers and support rapid service provision and paperless transactions. In general, it allows an efficient and effective change in the manner in which work is performed (Zygiaris, 2000). According to Hammer, (1990), the computerization is the use of IT in order to automate the renovated business processes. Automation involves the use of IT, the allocating of customer information from the database, facilitation of information flow and programming a device or machine to function without frequent interaction of an operator (Mile; Titzpatrick & O'neill 2002, HE, 2005). Information technology (IT) has been developing very quickly, and nowadays it offers very good solutions for executing and implementing BPR, such as: database, expert systems, simulation, telecommunication networks and extremely powerful computers. In addition to IT, BPR requires consideration of organizational and managerial issues and structures, because re-engineering projects involve cross-functional processes. The application of a new IT often enables reengineering projects to be successful, (Davenport, et, al 1990); Hammer, et, al, 1993).

BPR research findings demonstrated the critical role of information technology in business process restructuring (Broadbent; Weill and St. Clair, 1999). There is a strong correlation between the quality of information systems within an organization, and the improvement of an overall corporate culture and the organizations' strategies. The contributions of IT in BPR could be categorized in two different ways (Chang, 2000). Firstly, IT contributes heavily as a facilitator to the process of reengineering. Secondly, IT contributes in the reengineering process as an enabler to master the new process in the most effective way (Davenport and Short, 1990). IT should be the enabler, but not the initiator of BPR projects. It must be stressed that the application of IT has the strongest impact on standardization or elimination of process variations. But it cannot be introduced before the workflow process improvement has been successfully implemented. For that reason, BPR and IT infrastructure strategies, which both derive from an organizational strategy, need an effective alignment to ensure the success of the BPR initiative through process automation. (Al-Mashari & Zairi,1999).

Many routine tasks can be automated while others may still need human involvements. In general, tasks can be fully/semi-automated or manual. Business process modeling and their automation improve the performance of business activities and enables enterprise-wide monitoring and coordination (Nikolaidou et al., 2001). BPR as a modernizing tool for the public administration increasing the scope of automation has the knock-on effect of eliminating intermediate data entry tasks between processes, reducing the number of process tasks, process duration and the manpower involved thus increasing process efficiency (Malenje, Otanga and Wabwoba, 2014) Process Automation has attracted public's attention in recent years due to its significant effects on companies. Business process automation, is the strategy a business uses to automate processes in order to contain costs. It increases business productivity, reduce manual errors and accelerate in the IT service delivery, improve service quality and enforce compliance policies. With process automation, it is possible to manage various, complex environment through reducing business expenses and speeding up business processes. Many companies have automated their business processes and have shared their information in distributed information systems (Noel, 2006; Monay. 2013).

However, Process automation is dynamic and has many challenges which need further analysis. Due to their dynamic nature, it is not advisable to create a fixed model for processes. (Monay, 2013). This study sought to assess the effects of process automation on operation performance of seed company because of the ever-changing business environment.

Operational Efficiency

Efficiency Measures relationship between inputs and outputs or how successfully the inputs have been transformed into outputs (Low, 2000). To maximize the output Porter's Total Productive Maintenance system suggests the elimination of six losses, which are: (1) reduced yield –from start up to stable production; (2) process defects; (3) reduced speed; (4) idling and minor stoppages; (5) set-up and adjustment; and (6) equipment failure. The fewer the inputs used to generate outputs, the greater the efficiency.

According to Pinprayong and Siengthai (2012) there is a difference between business efficiency and organizational efficiency. Business efficiency reveals the performance of input and output ratio, while organizational efficiency reflects the improvement of internal processes of the organization, such as organizational structure, culture and community. Excellent organizational efficiency could improve entities performance in terms of management, productivity, quality and profitability.

In order to create a dramatic increase in efficiency, productivity, or profitability, a drastic change in the design of the organization's processes is required. That is why reengineering is a

useful tool that has been adopted by and hailed as one of the current major drivers of change within many organizations (Graham, 2010). Business Process Reengineering is playing a vital role in the enhancement of productivity and efficiency of many organizations. A crowd of interrelated tasks that creates value is called a business process (Habib & Wazir, 2012). Reengineering primary goals aims at reducing wastage, improve efficiency and ultimately reduce costs. Reengineering also helps organizations to throw away their old-fashioned processes to achieve new heights of success (Lotfollah, Ziaul , Seyed, and Saeedreza (2012). An increase in consumer requirements for both product and service efficiency and effectiveness has resulted in Business Process Reengineering (Al-Mashari et al., 2001). Hammer and Champy, (1993) also stated that BPR focuses on processes and not on tasks, jobs or people. It endeavors to redesign the strategic and value-added processes that transcend organizational boundaries.

Viswanadham, (2000) defined process time as the period during which one or more inputs are transformed into a finished product by a manufacturing procedure. A business will typically seek to minimize its process time for a particular manufactured good without compromising quality to the point where consumers would purchase less of it. Process Time is vital as it will help free resources, reduce cost and improve quality. Process time strategies therefore include reduction of interface lead times, removal on non-value-adding activities and use of new technologies in ways that improve product quality. Marek and Jones, (2012) suggest that one method of reducing the process time is that a product can be re-designed so that a fewer operations need to be carried out and or that the time per operation is reduced. They also pointed out that the process time can be minimized by reducing the level of scrap. This can be achieved by improving the quality of raw materials and components coming in from external suppliers. According to Bitok, (2013) One of the major benefits of BPR implementation and adoption in large manufacturing organization is improved efficiency in the production process hence leading to massive saving.

METHODOLOGY

Research Design

This research adopted a descriptive and causal correlational research design. The study targeted Kenya Seed Company and Western Seed Company in Western Kenya. The target population of this study comprised of one senior manager, one middle manager and two junior managers in the functional areas in Kenya seed and six managers in western seed company totaling to 50 respondents. The study used a census study. Data was obtained from the respondents through questionnaires.

Hypotheses were tested by the use of F-test to prove or disapprove the relationship between the independent and dependent variables.

The multiple regression equation of Y is given by:

$$Y= a +b_1x_1+b_2x_2+b_3x_3+ \varepsilon$$

Where,

Y is the operational performance dependent

a is the regression constant

b_1, b_2, b_3 are regression coefficients

ε is the error coefficient

X_1 is the independent variables in this case process automation

X_2 is the independent variables in this case process renovation

X_3 is the independent variables in this case process networking.

ANALYSIS

Demographic Profile of Respondents

Table 1: Respondents' Demographic Data (N=50)

Category	F	%
Senior managers	15	30
Middle managers	10	20
Junior managers	20	40
Total	**45**	**90.0**

Table 1 shows that majority 20(40%) of the respondents involved in the study were Junior managers. This was owed to their high population. Senior managers and middle managers were represented by 15(30%) and 10(20%) respectively in the sample. For the purpose of this analysis, since Junior managers, middle managers and Senior managers were subjected to the same questionnaires, they were generally referred to as 'managers'. The respondents constituted a response rate of 90%. This response rate was excellent and representative. This conforms to Mugenda and Mugenda (1999) stipulation that a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent. In this regard, a response rate of 90% was adequate for the purpose of this study.

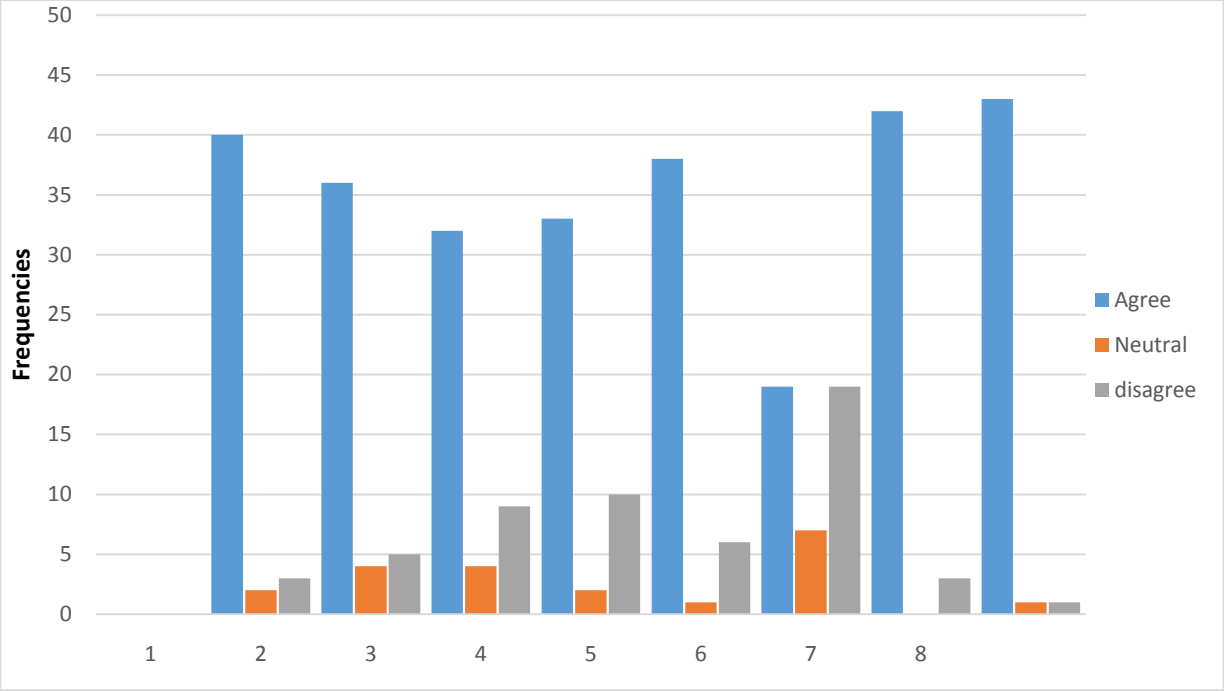
Table 2: Managers' Gender (N=50)

Gender	M/P	%
Male	30	60
Female	15	30
Total	45	90

Table 2 shows that majority 30(60%) of the respondents involved in the study were males. This was an indication in the two seed companies of the seed there were more male managers than female ones because of the nature of operation.

Descriptive Analysis

Figure 1: Frequencies on process automation and operational performance from respondents



KEY

1	Increased Production volumes after automation.
2	Improved Production levels per machine /Field.
3	Reduction in Waste materials during processing.
4	Increased Machine utilization in operational areas.
5	Production is more aligned with customer requirements
6	Increased level of use of Information technology infrastructure.
7	The products processed are always conforming to the set standards.
8	There is always quick response about customers' needs and requirements.

According to the study in Figure 1 showed 40 respondents agreed to the statement that Production volumes increased after automation. The 36 respondents involved in the study acknowledged to the statement that Production levels per machine improved and also, the results of the study revealed that 38 of the respondents agreed to the statement that there was reduction in waste materials during processing. The products processed was conforming to the set standards. With regard to this statement 42 respondents involved in the study agreed with it. Furthermore, 43 respondents agreed with the statement that there was always quick response about customers' needs and requirements. The results obtained from the findings indicated that process automation improved operational performance of the functional areas in terms of increased production, products processed were conforming to the set standards and also increased efficiency. However, Zygiaris (2000) stated that automation allows an efficient and effective change in the manner in which work is performed.

Test of Hypothesis

There is no significant effect of process automation on operational performance of the functional areas of seed companies in western region, Kenya

Table 3: Model Summary [b] process Automation

					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.609[a]	.371	.235	.340	.371	2.730	8	37	.018	1.800

a. Predictors: process automation

b. Dependent constructs: units of production and operational efficiency

Table 4: ANOVA[b] Process Automation

Model		Sum of Squares	Df	Mean Square	F	Sig. F
1	Regression	2.526	8	.316	2.730	.018[a]
	Residual	4.279	37	.116		
	Total	6.804	45			

a. Predictors (constant): process automation.

b. Dependent constructs: units of production and operational efficiency

The regression analysis was performed at alpha = 0.05 level and 95% confident interval to test the relationship between process automation and operational performance of the functional areas of seed companies in order to make decision on the hypothesis. In table 4, Since the F test 2.730 is greater than the level of F-significant -0.18 then there is no enough evidence to accept the first hypothesis, that there was no significant relationship between process automation and operational performance of the functional areas of seed companies. This first null hypothesis was retained since the F test> F-significant. The research findings pointed out that there was significant effect of process automation on operational performance of the functional areas. This is in line with Graham, (2010) who observed that in order to create a dramatic increase in efficiency, productivity, or profitability, a drastic change in the design of the organization's processes is required. That is why reengineering is a useful tool that has been adopted by and hailed as one of the current major drivers of change within many organizations. Debela (2009) shared similar views that process automation helped improve production and efficiency.

Table 5: Coefficients[a] Process automation

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.495	.847		1.764	.084
	process automation	.738	.007	.998	108.143	.000

a. Dependent Variable: Operational performance

From the coefficient table 5, beta value was 0.738 which shows a positive relationship of 0.738 between process automation and operational performance. This shows that process automation has a positive impact on the operation performance of the functional areas. The findings are also in line with Bitok, (2013), who stated that BPR implementation and adoption in large manufacturing organization improved efficiency in the production process hence leading to massive saving. Other researchers had different opinions on BPR implementation, stating that there was no improvement in firm performance after implementation of BPR, this was in line with Hedley, et, al, (2010) who stated that about 70% failure rate was recorded during change process and mostly it fails while implementing objectives.

CONCLUSION AND RECOMMENDATIONS

The study analyzed the effect of process automation on the operational performance of the functional areas of seed companies and the findings there was improved operational performance in terms of increased production and improved efficiency. Products that were processed conformed to the set standards. The study revealed that process automation contributed greatly in the improvement of operational performance in the units of production and operational efficiency of the functional areas of the seed companies. Companies should embrace the Process automation practices for effectiveness and efficient operation of the functional areas. With automation production level per machine increases and minimal waste is realized, hence high units of production achieved. The study was done only on two seed firms in Western Region Kenya. Further studies need to be done on the other related agricultural firms based on Business process automation in their firms because processes are dynamic and many challenges exists due the rapid business changing environment

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