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AN INVESTIGATION INTO THE EFFECTIVENESS OF BUSINESS PROCESS MANAGEMENT SYSTEMS AT INSURANCE COMPANY IN JOHANNESBURG, SOUTH AFRICA

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Abstract

Purpose: The purpose of the study was to investigate the relevance and effectiveness of the Business Process Management System (BPMS) solution that is used at a major insurance service provider in Johannesburg.

Problem: The management at the insurance company is considering the decommissioning of the BPMS solution due to management claims of ineffectiveness and low relevance to business operations. Making this decision has become necessary so as to restructure, optimise and cut the maintenance cost of the company's collection of information technology. However, there are arguments from within management that the tool is still relevant and useful to business operations.

Methodology: A quantitative approach was taken to measure user perception of BPMS at the company. A survey was conducted and data collected through an online questionnaire. The result from survey was used to test hypotheses about the BPMS solution.

Findings: The outcomes of the study indicated that although the current BPMS solution has technical challenges, it is rated as useful and relevant to business operations by majority of users.

Recommendations: It was recommended that the tool should not be decommissioned but rather the technical problems should be resolved and it should be upgraded and additional training should be provided to users.

Key Words: Investigation, Effectiveness, Business Process, Management Systems, Company. Insurance**, Information Technology, Training**

Introduction

The organisation under study is one of the top four short-term insurance service providers in South Africa and was established over 100 years ago. The company operates branches all over Southern Africa and is a major player in the provision of business risk management products - where it commands a substantial share of the market.

In the year 2003, due to loss of market share and pressures on profitability, the company decided to implement a Business Process Management System (BPMS) to change the way of work and as a result gain better efficiencies and improve customer satisfaction.
Insurance companies, as well as other financial institutions invest seriously in Information Technology (IT) products with the aim of advancing business effectiveness and value (Kung and Hagen, 2007:477; Reijers, 2006:398). Business Process Management Systems (BPMS – also called BPM) are becoming popular as one of the IT products that can enable operational excellence and give a financial organisation competitive edge in the market.
However, the failure of many IT initiatives due to lack of tangible returns to display does create doubts on the effectiveness of many IT products like BPMS in the management world (Wang, Liang, Zhong, Xue and Xiao, 2012:326).

Research Objectives
The objectives of this study are as follows:

- To assess the effectiveness of BPMS on work efficiency
- To assess the effectiveness of BPMS on job satisfaction
- To assess the effectiveness of BPMS on business control
- To assess the effectiveness of BPMS on business agility

Literature Review
Conceptual Framework
According to Khan (2008:10), the conceptual framework is the position and approach taken by a study. The framework of BPMS as an Information Technology tool, including its related management concept and generic impacts are discussed in this section to define an approach to the study.

Conceptualising BPMS
A BPMS is typically described as a type of application software that supports activities such as the modelling, analysis and roll-out of business processes (Reijers, 2006:390). While a business process is a "socio-technical system, fulfilled by humans and machines, a BPMS is purely a technical system" (Shaw, Holland, Kawalek, Snowdon and Warboys, 2007:92). Reijers (2006:390) also added that BPMS primarily takes care of the programmed distribution of work to qualified and authorised resources – humans and/or application systems – in harmony with a predefined schema of the process, the accessible resources, and their dependencies.
On the other hand, Business Process Management (BPM) is described as a process centric method for improving performance that merges information technologies with business processes and governance practices. BPM is a partnership between business people and information technologists to adopt effective, transparent, and agile business processes. BPM stretches across people, systems, functions, businesses, locations, customers, suppliers, and strategic partners (Garimella, Lees and Williams, 2008:5).
Although, BPMS is mostly viewed as the technology that drives Business Process Management (BPM), in most literatures reviewed, the term is used interchangeably to represent a single concept of using technology as enabler of business process excellence.
In addition, BPM is a concept that promotes a process centric attitude in enterprises. Using a set of software tools, enterprises can conduct a set of activities to either enhance their business processes or adjust them to new organisational needs. These activities include business process

design or redesign, business process execution and business process monitoring (Pantazi and Georgopoulos, 2006:425).

The BPM concept requires that an enterprise selects an approach and standard for modelling and redesigning business processes. There is a glut of graphical tools available on the market for representing business processes and many standards are available. According to Ofner, Otto and Osterle (2012:1037), the most popular and well established among these modelling standards are Business Process Management Notation (BPMN), Unified Modelling Language Activity Diagrams (UML AD), Process Chain Diagrams (PCD) and Event-Driven Process Control (EPC). Deciding on which approach to take depends on an organisation's process leadership, expertise of its consultants, process maturity level and information management viewpoint.

After the existing business processes have been modelled and improved upon, they are coded into systems that convert the static process maps into live process engine maps that can be executed in a runtime environment. The users of the process will interact with the executed processes using graphical user interfaces (Shaw et al., 2007:98). The solution provides reports and dash boards that management can use to monitor business process for reviews and interventions where necessary (Garimella et al., 2008:45).

Using BPMS, business processes can be modelled, optimised and tested through manual or automated simulations and then deployed in a live system environment for usage.

Users of BPMS can access features of the system through Graphical User Interfaces (GUI) that allow them to view works tasks and take action on those work tasks. The solution allow managers and supervisors to have a transparent view of what is happening in their business domains (Garimella et al., 2008:16).

BPMS allows a business unit or organisation to coordinate process combination better and also optimise and dispatch business processes faster (Mahmoodzadeh, Jalalinia and Yazdi, 2009:861).

Information technology and business

Information Technology has arguably been one of the most central determinants of economic and social value in the last fifty years, enabling transformational change in practically every aspect of society (Lucas, Agarwal, Clemons, El Sawy and Weber, 2013:371). Organisations use IT to automate and optimise their business operations with the aim of cutting cost and gaining efficiency. The usage of IT has pervaded many aspects of businesses, ranging from communication, decision making, transaction processing, record keeping, to automated work handling and security.

Additionally, the recent trends in IT have allowed many organisations of different sizes to develop capacities that would normally have been very difficult to achieve before the 1990s. According to Masli, Richardson, Sanchez and Smith (2011:190), it has become possible and easier for companies to match or even surpass the IT competences of their competitors.

Information and data is exchanged at greater speed, more intuitive business decisions are taken and business operations run with greater precision with more data than ever being collected about customers and clients. Pavlou and El Sawy (2011: 241) found that firms develop dynamic abilities when IT is proficiently leveraged in business operations.

Business value of information technology

Presently, IT has become requisite to modern organisations with global IT spending been reported to have sky rocketed to a remarkable amount of $3.7 trillion in 2011. Implying that businesses do derive or do anticipate considerable value from IT investments. The Business Value of Information Technology (BVIT) has long been recognised as one of the key issues for Information Systems (IS) researchers and practitioners. Despite some studies suggesting that IT

has little impact or even negative effects on firm performance, many researchers have found a positive relationship between IT tools and business performance (Wang et al., 2012:326).

When evaluating business value as a result of IT utilisation, previous research has predominantly focused on IT resources and IT capabilities and investigated their effects on organisational performance. Firm performance is found to be augmented by both IT resources and IT capabilities. Yet it is revealed that IT does not always result in positive outcomes (Wang et al., 2012:327).

However, there is some degree of academic consensus about the presence of a positive relationship between IT and performance (Setia, Venkatesh and Joglekar, 2013:567). Some authors do argue categorically that the application of IT provides higher productivity, added satisfaction for the customer, and additional value creation. While other authors still claim to have found null or adverse IT effects on benefits, financial returns and share value (Gargallo-Castel and Galve-Górriz, 2007:43).

Negative IT returns are usually experienced when the outcomes of IT investment and corresponding business expectations and returns are not commensurate. Business stakeholders judge impact of IT through first hand perception of how meaningful or relevant a technology is and how it has impacted business processes and results (Trkman 2010:127).

In a 2007 longitudinal study conducted by Chae, Koh and Prybutok (2014:326) into the performance of the top five hundred IT saturated firms in the world, adequate evidence was not discovered to confirm the existence of a relationship between IT usage and firms' improved performance. While in a similar, but earlier study, conducted in year 2000 by Bharadwaj (2000:196) there was indication of linkage between better performance and IT investments. In contrast, Chae et al. (2014:323) concluded that such a link is almost non-existent.

Companies like the firm under study spend a lot on IT with the expectation of valuable returns to its operational capability. This expectation is almost assured in the past but recently the diminishing effects of IT bring questions about the impact of different IT systems on business.

Integrating business processes with information technology

Recent IT advances have swiftly transformed the ways firms operate their businesses, thus enabling firms to redesign business processes, strengthen their customer relationship management, and develop new business models (Lee, 2004:214).

In many of the businesses that have developed high process maturity, there is high usage of IT in operations and management. Many of such businesses have invested in Enterprise Resource Planning (ERP) systems, BPMS and other various types of systems for their operations (Reijers, 2006:390).

Financial companies use business process redesign initiatives to improve their processes and integrate technology. Business process redesign is one area where business strategy and IT have played a crucial role. In many firms, redesigning key business processes has been a major motivation for new IT investment (Pantazi and Georgopoulos, 2006:426; Lee, Cullier and Cullen, 2007: 214).

Businesses optimise available business opportunities through the use of IT in cutting cost, building customer relations, increasing teamwork and improving collaboration with value chain partners. Insurance companies benefit from less paper use and manage the cost of claims through integration to suppliers (Lee, 2005:32).

Furthermore, IT on its own is of little value to businesses without a strong link to business processes. Business-IT alignment is both an internal and external process across an organisation or organisations. Firms can create sustainable competitive advantages through external alignment

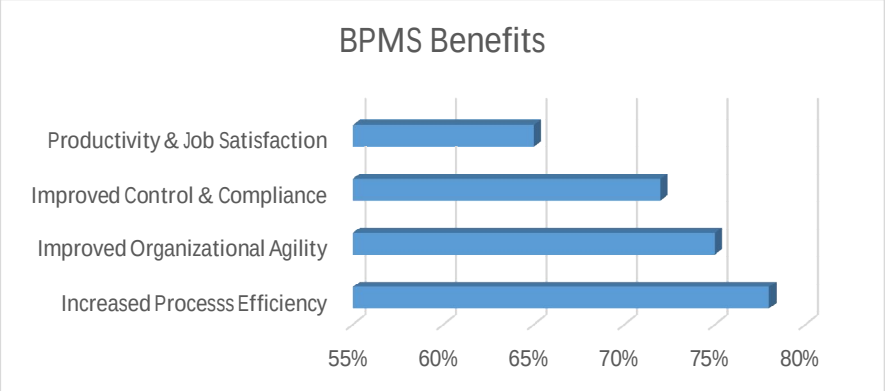
with business environment and internal alignment with resources and infrastructure (Lee, Kim, Paulson and Park, 2008:1168).

Information technology holds the best opportunity for realising new levels of efficiency in business processes (Yen, 2009:865). This section indicates that to improve process maturity level, IT plays a significant role in process redesign, execution and monitoring. Companies that are aiming for process excellence and competitive advantage need to explore effective IT usage.

The impact of BPMS on business

A survey conducted in 2008 by Frappaolo and Keldsen (2008:11) found that between 65% and 78% of employees across multiple organisations worldwide agreed (Figure 2.5) that process efficiency/staff productivity, process improvement, quality/control and agility were the top four benefits of BPMS in organisations.

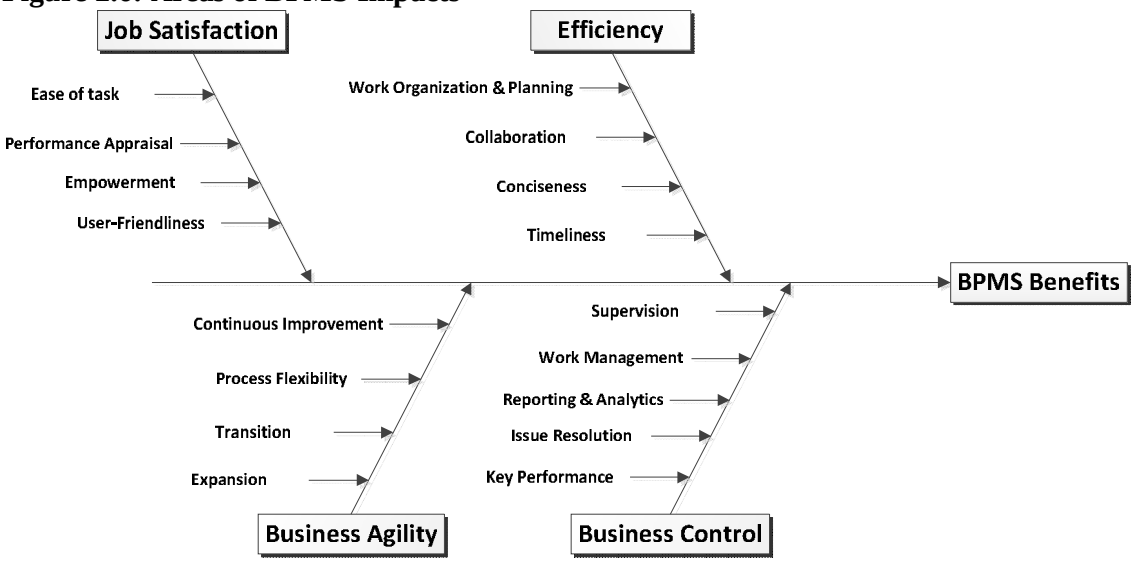
Figure 2.5: Benefits of BPMS



Source: Adapted from Frappaolo and Keldsen (2008:11)

The four major areas; efficiency, job satisfaction, business control and agility can be further analysed into the key components that make up those benefits (Figure 2.6). Ray, Muhanna, and Barney (2007:88) suggest that to understand the value of IT, it should be assessed bottom-up or gauged at lower levels of granularity.

Figure 2.6: Areas of BPMS Impacts



Source: Based on Frappaolo and Keldsen (2008:11)

The primary benefits listed in figure 2.6 are based on a critical assessment of the four main benefits which are work efficiency, job satisfaction, business control and agility.

BPMS impact on business control

Having effective control of business processes and being able to spot issues and troubles before they get out of hand is one critical function that managers cannot take for granted. According to Abd El Aziz and Fady (2013:583), business control is vital in directing an enterprise towards its goals and vision. BPMS tools can enable this capability better than other IT tools (Storch, Nara and Kipper, 2013:760). BPMS can quickly notify a supervisor or manager of bottlenecks or hot spots in the execution of a particular business process. This notification is more valuable when received earlier than later in the process. BPM not only encompasses the discovery, design and deployment of business processes, but also the executive, administrative and supervisory control over them to ensure that they remain compliant with business objectives for the pleasure of customers (Smith and Fingar, 2003:12).

Controlling and managing risk can be more pragmatic and less based on chance by having a BPMS that gives triggers of events that are classified as exceptional and risky. Managers can quickly dive in when these events occur without waiting for manual updates or formal request from staff (Vanderfeesten and Reijers, 2006:659).

Setting budgets and running them effectively is enhanced using BPMS because an organisation can track capacity against output by KPI accounting (Bucher and Gerike, 2009:413). Pan, kuo and Bretholt (2010:823), highlight that KPI plays an important role in ensuring service quality, since it provides a quantitative measure of service quality. Business process measures are of great importance in business process management because they help to control, estimate and improve processes in organisations. Using BPMS, work items budgeted against employee times can be simulated beforehand for refinement before they are accepted and implemented. (Gonzalez, Rubio and Velthuis, 2010:124).

Quality is obviously an important and indispensable item as far as customers are concerned (Carlsen, 2011:273). Quality management eradicates waste and improves customer satisfaction and loyalty. Automated business processes through BPMS are very useful for achieving this objective. Advanced business rules logic can be used to manage quality automatically or the business logic can select completed work task for quality assurance reviews.

Keeping control over operational expenses takes a new dimension with BPMS. The system allows real-time assessment of time spent on tasks and can also indicate the cost of resources that were used. Companies can no longer rely on standardised approaches to the management of working time and will have to take account of an increasing variety of temporalities when scheduling flexibility (Leopold and Karsten, 2003:403). Financial cost is one big area of business control, if managers cannot cost their business processes then it becomes impossible to identify sub-optimal performance and efficiency gaps. A well implemented BPMS can provide dash board analytics for measuring and tracking process cost (Kung and Hagen, 2007:483).

Research Methodology

Target Population and Sample

According to Singh (2007:88), a population is a group of individuals, objects, or items from among which samples are selected for measurement.

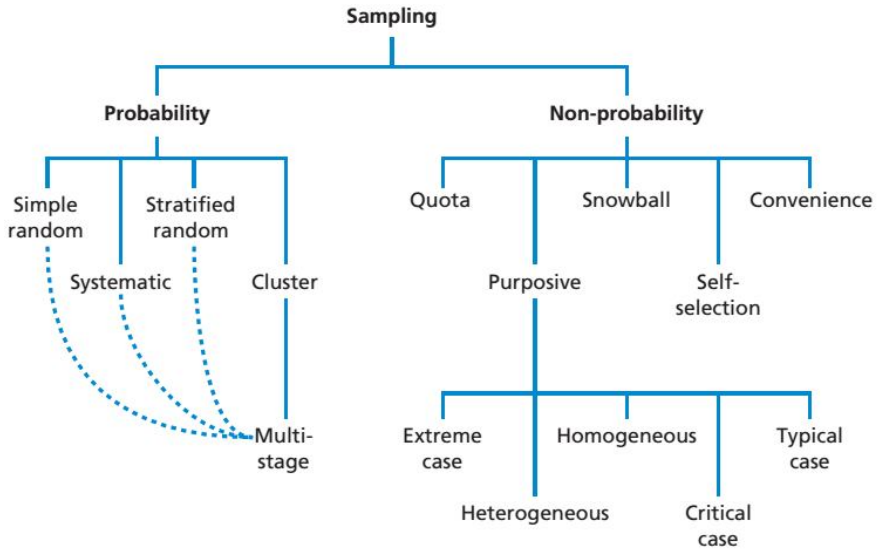
The population of BPMS users at the main branch of the insurance company was estimated at 185 users in total and it consists of two groups of users working either in insurance claims or policy administration.

Sampling strategy

A sample constitutes a section of the main population that was selected for research activities (Bryman, 2012:186). Dul and Hak (2008:46) recommended that to perform a population study, a subgroup of elements from the population domain can be selected.

The sample selection method or strategy (Figure 3.1) can be probabilistic or non-probabilistic in nature (Saunders et al., 2009:212).

Figure 3.1: Sampling Techniques



Source: (Saunders et al., 2009:213)

Using probability sampling, a researcher aims to make inference about the overall population hence it is necessary to give all element equivalent exposure to selection. Thus making it is possible to answer research questions and to achieve objectives that require statistically estimation of characteristics of a population from a sample. Accordingly probability sampling is often associated with survey and experimental research strategies (Saunders et al., 2009:213).

Table 3.3: Population Sampling

User Groups	Population	Sample Size	Percentage
Claims	102	38	54%
Policy Administration	83	32	46%
Total	185	70	100%

The total sample size that was used in the survey was 70. This number was determined after discussion with supervisor and with consideration given to resource constraint, limitation of support from host organisation and Regent Business School.

Limitations of the Research

The study did experience some limitations. Prominent amongst them was poor access to BPMS users because managers and other gatekeepers were scarcely available and demonstrated very limited time commitment to the study. This resulted mainly in the lack of opportunity to increase the survey sample that was allocated for the study.

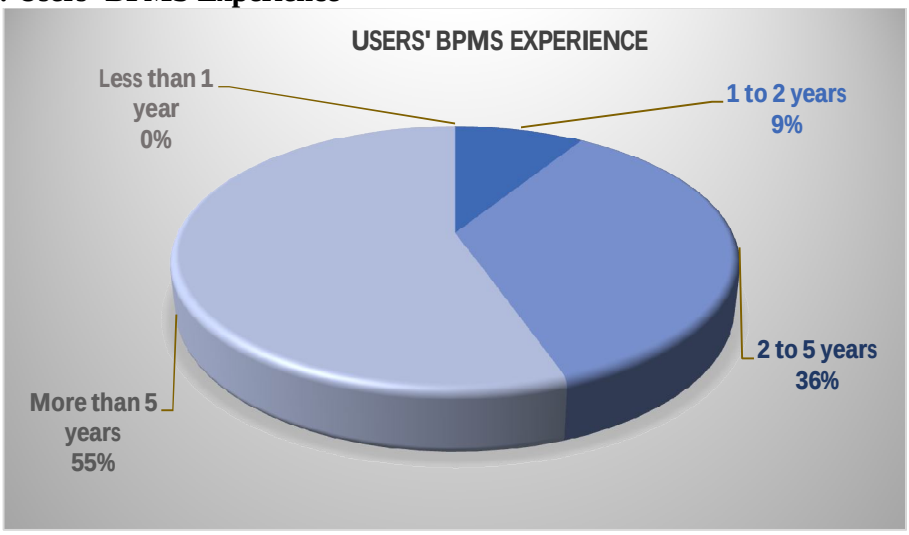
The legal department of the company delayed the start of data collection because of concerns about the legal issues related to a research outcome that may be negative towards the vendor of their current BPMS solution.
It was requested that intermediaries in the company be used to send out the survey email and link to online questionnaires. As a result the researcher did not have control over follow-ups with participants.
Also BPMS users being busy due to work backlogs and their perception of lack of incentives to answer the questionnaire did slow down the progress of the survey.
The survey was conducted at the main headquarters of one insurance company and as a result cannot be generalised to other companies operating BPMS solutions. In addition, the BPMS solution involved in the study is obsolete and may not be compared to modern alternatives that may be currently used by other firms.

FINDINGS

Section One: Demographic Analysis

Limited demographic data was collected from the users to have insight into their duration of BPM usage.

Figure 4.1: Users' BPMS Experience

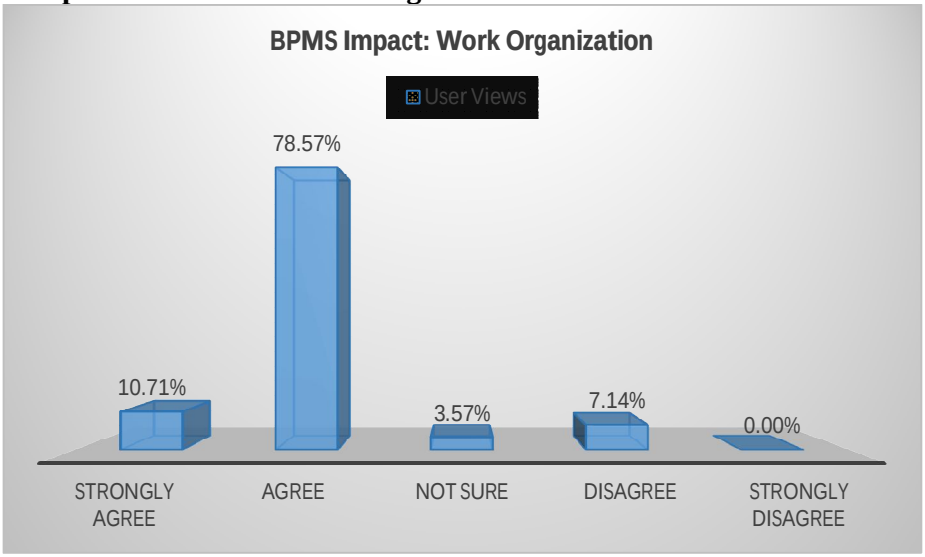


Participants were asked to indicate their experience with BPMS in years. The Majority of the respondents (55%) have used BPMS for over 5 years, another 36% of users have experience in BPMS ranging from 2 to 5 years and all others have used BPMS for at least 1 year. Gallivan, Spitler and koufaris (2005:176) found that there is a relationship between users' prior experience in IT usage and their perception of IT usefulness. Thus indicating the experience of majority of our sample which ranges from 2 to over 5 years is adequate for evaluating the effectiveness of the BPMS solution at the insurance company.
In addition, the users' work duration at the company has most likely exposed them to many tasks and work scenarios that involved BPMS use and other tasks that does not relate to BPMS use and as result they would have decent perception of impact of BPMS on work tasks.

Section Two: Questionnaire Result
Part A: BPMS impact on work efficiency
Impact of BPMS on work organisation

In this question, users of BPMS were asked to quantify their perception of BPMS as being effective for improving work efficiency.

Figure 4.2: Impact of BPMS on Work Organisation

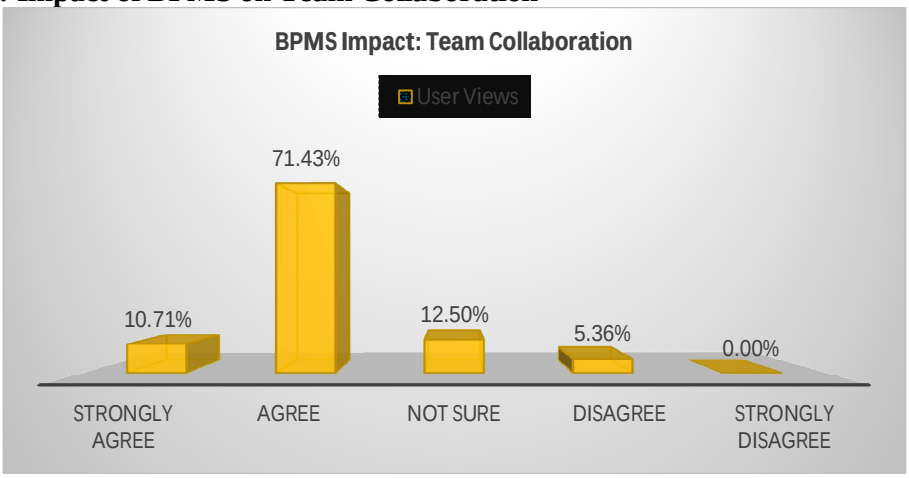


As depicted in figure 4.2, 89.29% of the users agreed that BPMS does impact on their ability to organise work tasks better. Only 7.14% disagreed and 3.57% were not sure of how BPM impacts their organisation of work tasks. Olivella, Cuatrecasas and Gavilan (2008:799) found that organisation that use self-directed teams with quality circles and adequate task coordination become high-performance organisations. A cluttered and disorganised work environment is more prone to errors and poor quality. Users of BPMS do agree that the system does provide them with the ability to organise their work better.

Impact of BPMS on team collaboration

This question measured respondents' perception of the impact of BPMS on improving their collaboration with other team members at work.

Figure 4.3: Impact of BPMS on Team Collaboration

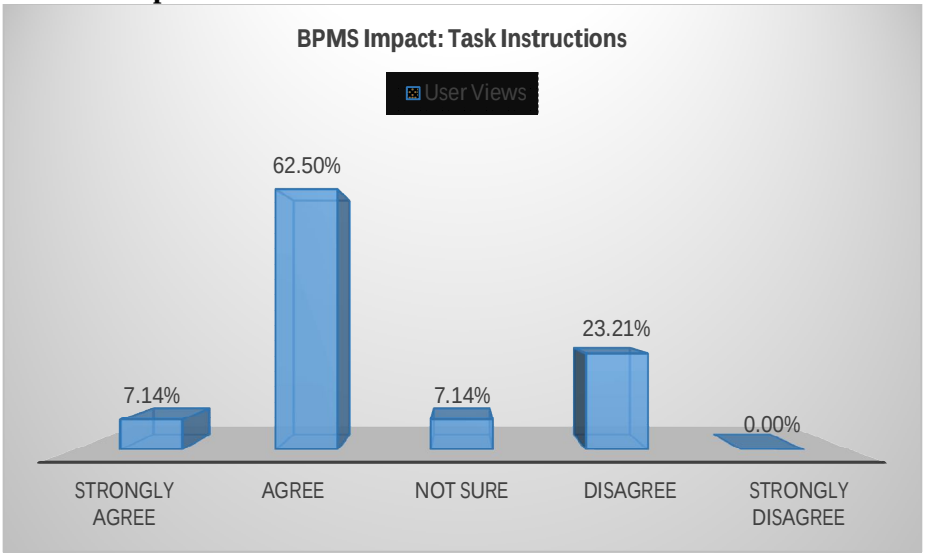


As shown in figure 4.3 82.14% of respondents agreed that BPMS has a positive impact on collaboration with co-workers. Another 5.36% disagreed with this statement and 12.5% were not sure. The majority of BPMS users clearly identify the importance of good communication and collaboration with other workers. Garimella et al. (2004:40) pointed out that the greatest barrier to change and high performance is communication. BPMS lowers this barrier by increasing the direct and immediate lines of communications and collaboration among all process participants. Walker and Khoshafian (2012:10) also indicated that resolving a single business transaction or case always requires collaboration between multiple participants and when this collaboration is not smooth and efficient there is likelihood of process problems and poor quality of service.

BPMS impact on task instructions

This question is aimed at understanding BPMS impact on the conciseness and quality of task instructions.

Figure 4.4: BPMS Impact on Task Instructions

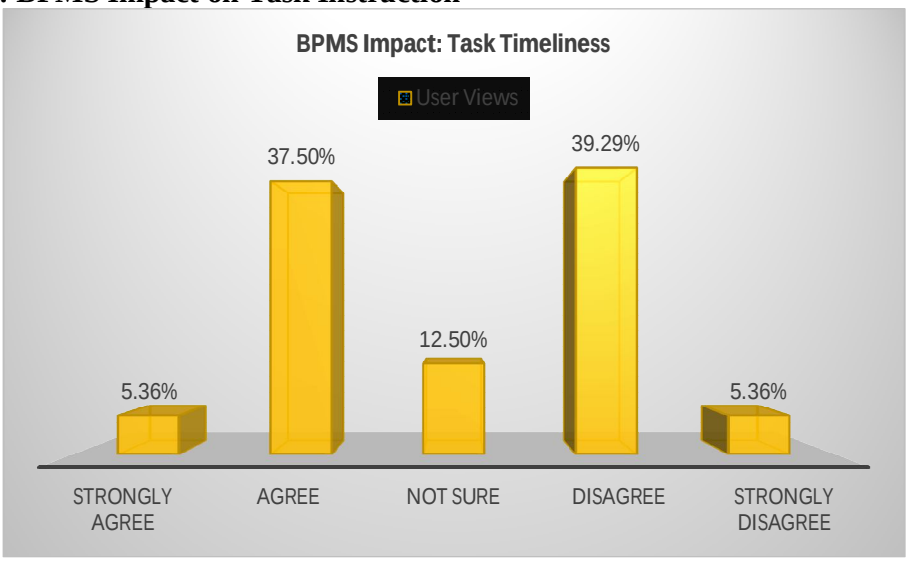


As illustrated in figure 4.4, a combined 69.64% of respondents agreed that BPMS does have positive impact on the quality of task information that is received, while 23.21% of users disagree and the other 7.14% are not sure of BPMS impact on task instructions. Adequate technology ensures that successful task outcomes are possible through the use of less supervision and limited instructions that provide quick directives to solving a task problem in a generic way (Zellner, 2012:615; Cordes, 2008:189). The ability to perform straight through processing on client requests without having to brainstorm or seek any guidance except in special cases is one of the key advantage of the BPMS solution.

BPMS impact on task completion

This question aimed to establish that BPMS has a positive impact of the timeliness of allocated work tasks.

Figure 4.5: BPMS Impact on Task Instruction



As depicted in figure 4.5, a combined 42.86% of users disagreed that BPMS assists in completing tasks on time, 44.64% agreed that it does and a further 12.5% were not sure if it does. Reijers (2006:391) analysed cases where users of BPM and workflow related systems did not feel the system supported the way they worked. Thus implying that although the technology may be effective for automating process, the business processes themselves may be inefficient and as a result the BPMS solution cannot really help to fast track the work. Reijers and Poelmans (2007:161) also found out that it may be necessary to assess the feasibility of technology for solving a process problem. The users of BPMS may have other problems which are unrelated to technology that limit their ability to complete tasks on time.

Part B: BPMS impact on job satisfaction

BPMS impact on ease of tasks

This question is aimed to establish if BPMS make work tasks easier to handle for the respondents.

Figure 4.6: BPMS Impact on Ease of Tasks

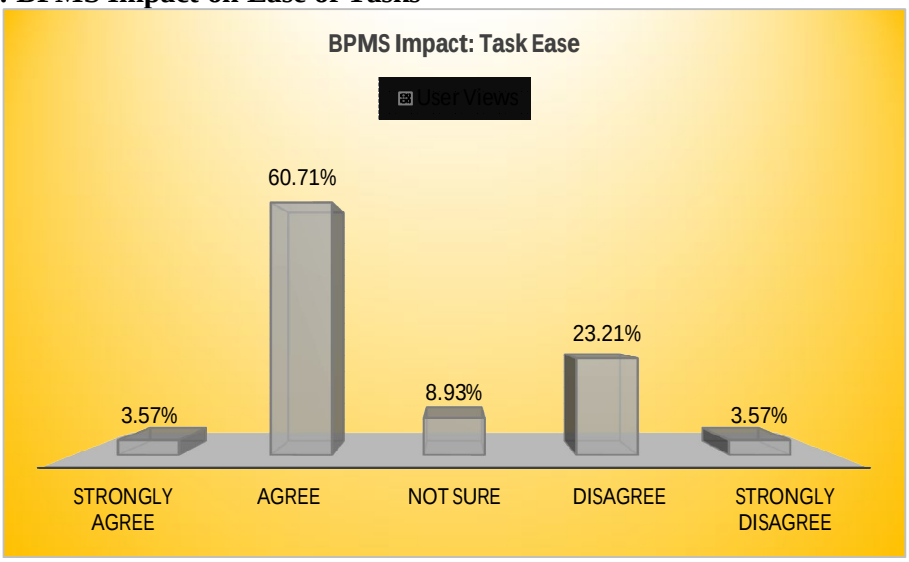
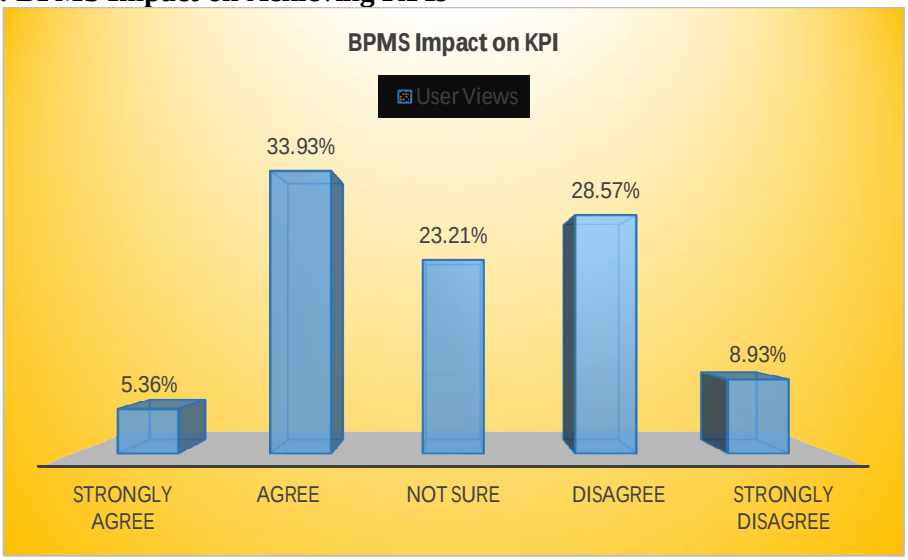


Figure 4.6 indicate a combined 64.29% of users agreed that BPMS does make it easier to complete tasks while 26.79% disagree and 8.93% were not sure of this item. Reijers (2006:391) reviewed case studies into user experience, perception of BPMS and good fit with task and agrees that it is a very important factor for the success of BPMS. The solution should normally provide access to all documents and information that is required to complete work and as a result create a pleasant experience for the users. The majority of respondents do agree with the ease and good-fit of BPMS for tasks. Tiwari, Turner and Majeed (2008:17) suggested that adoption of technology tools gains momentum when novice can use the tools with relative ease.

BPMS impact on achieving KPIs

This item aimed to ascertain BPMS impact on the ability of respondents to reach key performance targets.

Figure 4.7: BPMS Impact on Achieving KPIs

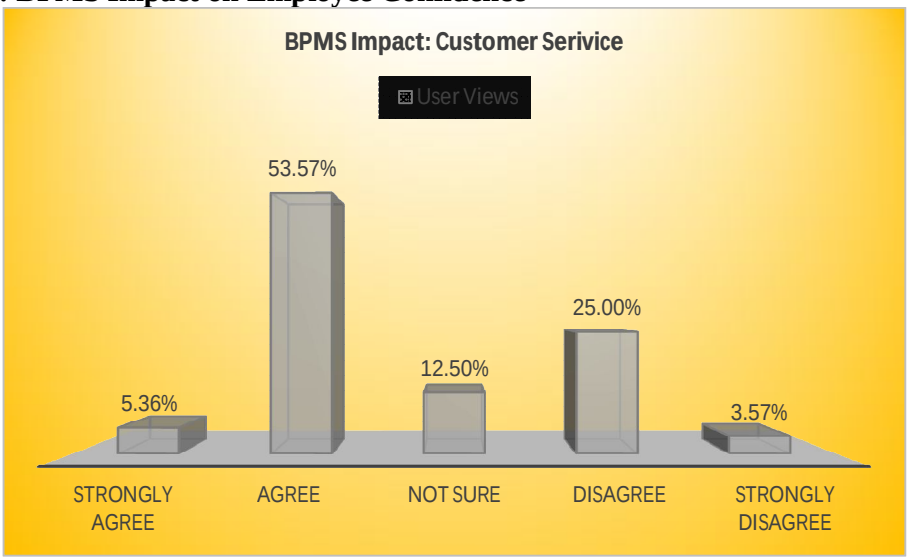


The findings in figure 4.7 indicate that users are almost indifferent about the impact of BPMS on KPIs with 39.29% and 37.5% respectively agreeing and disagreeing, while 23.21% of respondents were not sure of this item. The process of evaluating one's own performance can help to increase employee's commitment to the appraisal process, perceptions of appraisal fairness, and satisfaction with the appraisal process (Khan, 2013:71). BPMS users should have better visibility of their key performance targets through the BPM system dashboards and as a result should derive job satisfaction with the transparency of the appraisal process. However, users at the insurance company are indifferent about this impact on reaching key performance targets and this could be a deficiency in the BPMS solution at the insurance company.

BPMS impact on employee confidence

The respondents were requested to rate the impact of BPMS of their ability to serve customers better.

Figure 4.8: BPMS Impact on Employee Confidence

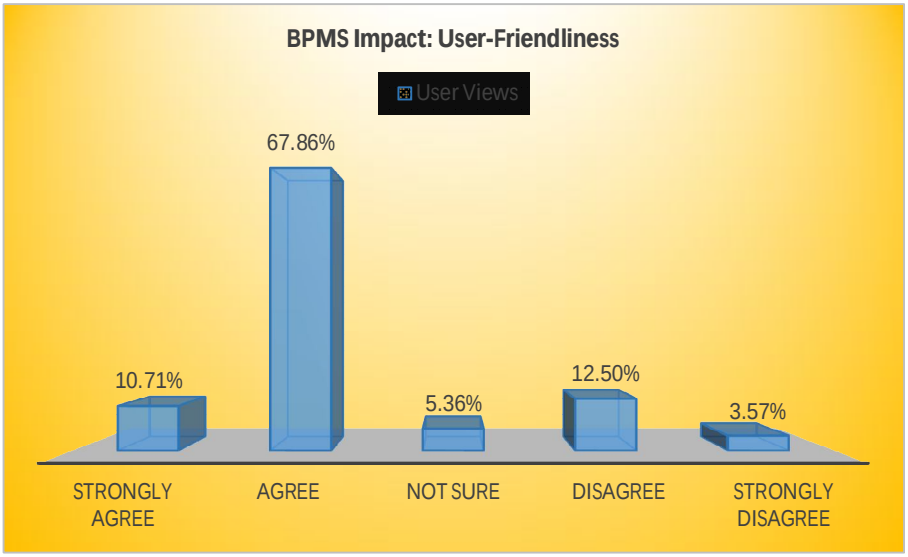


This findings in figure 4.8 report that a joint 58.93% of respondent agree that BPMS has impact positively on their confidence when serving customers, while 28.57% of users disagree and the remaining 12.5% are not sure. Sharma and Baoku (2013:349) said that the usage of IT leads to insightful and competent work environments where productivity, satisfaction and employee confidence are enhanced. Having adequate information at staff disposal helps build their confidence to respond to client queries and requests for services.

User-friendliness of BPMS features

This questioned is intended to establish if respondents find the BPMS system user-friendly and easy to use.

Figure 4.9: User-friendliness of BPMS Features



As indicated in figure 4.9, 78.57% of respondents agreed that the BPM system is user-friendly to use and navigate around, whereas 16.07% disagreed and an additional 5.36% are not sure if BPMS is user-friendly. Vanderfeesten and Reijers (2006:654) concluded that a user-friendly design of the technical system can contribute to the success of information systems, particularly by improving an employee's experience of the work that they perform. In addition, Vuori and Rytkonen (2005:65) discovered that typical users wanted more user-friendly technology, easy-to-use applications for day-to-day services, better-quality contents, more consistent language and clearer contents that are easier to use. A quality BPMS solution should feature this attributes.

Part C: BPMS impact on business control

BPMS impact on task control and supervision

This is intended to measure BPMS impact on the control of business activities and supervision of staff.

Figure 4.10: BPMS Impact on Task Control and Supervision

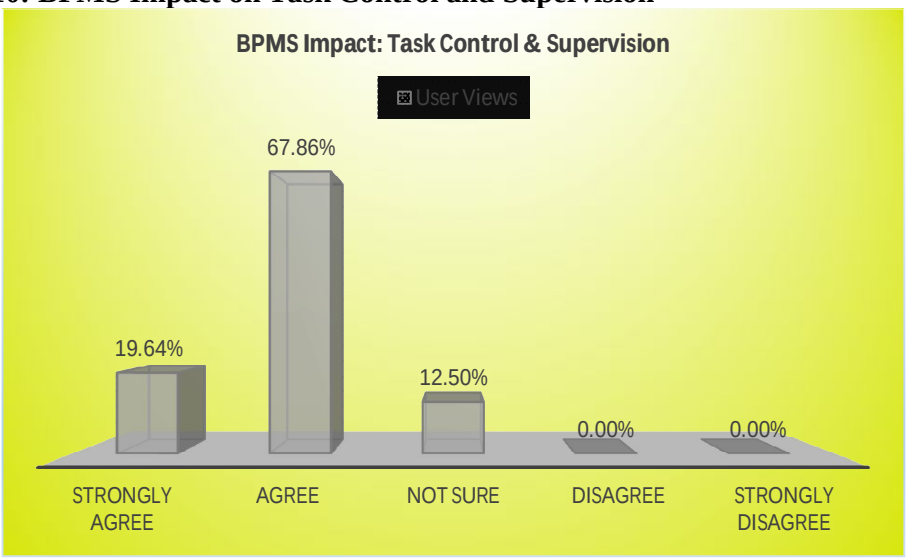
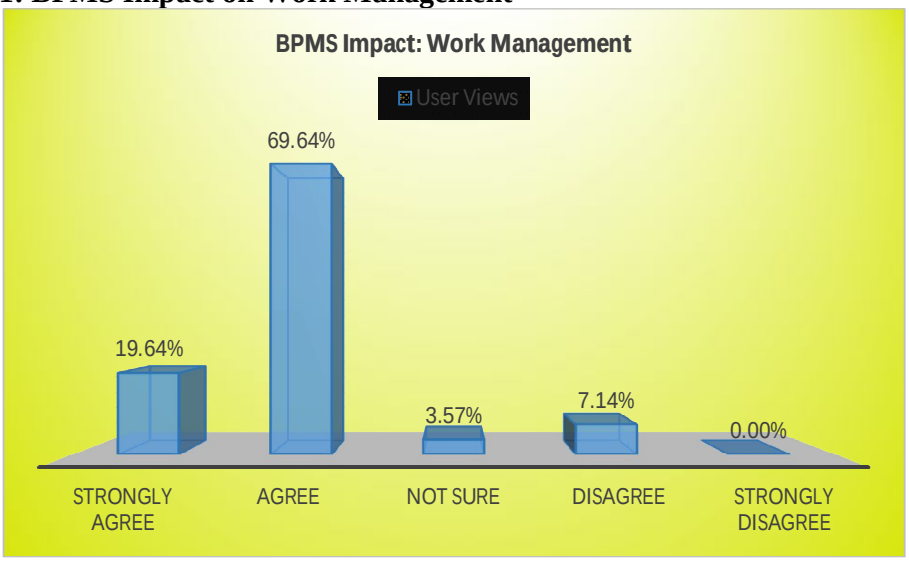


Figure 4.10 demonstrate that a majority of the respondents at 87.5% agree that BPMS does facilitate better task control and supervision. Only 12.5% were not sure and none of the respondents disagreed with this view. As indicated by Miers (2006:17), a successful BPMS solution should enable administrative and supervisory control over business processes to ensure that they remain compliant with business objectives to the satisfaction of customers. Business control is a very important business function that is seriously enhanced by a BPMS solution hence most users at the insurance company agree to this fact while a few others may lack adequate knowledge to answer this question.

BPMS Impact on work management

This question measures the impact of BPMS on work management and task coordination.

Figure 4.11: BPMS Impact on Work Management

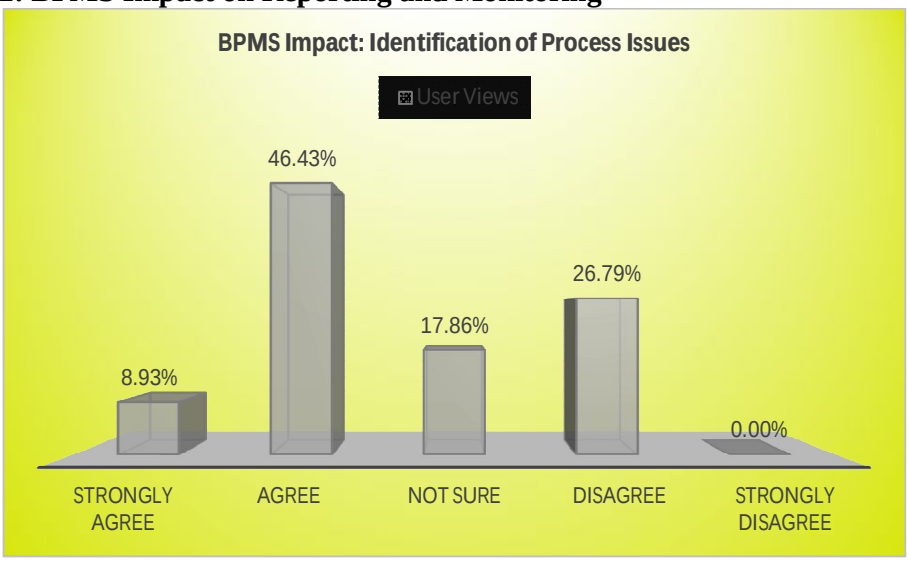


As demonstrated in figure 4.11, about 89.29% of user agreed that BPMS has a very positive impact on work management while only 7.14% disagree and 3.57% were not sure of the question. Kohlbacher and Reijers (2013: 248) linked proper management of business processes to financial performance, product quality, customer satisfaction, timeous delivery and quick market response. BPMS allows users to manage their work environments by providing real-time information of tasks for coordination and tracking. It should provide users the ability to manage processes for better business outcomes.

BPMS impact on identifying process issues

This question aimed to establish the effect of BPMS on identifying process bottlenecks and problems.

Figure 4.12: BPMS Impact on Reporting and Monitoring

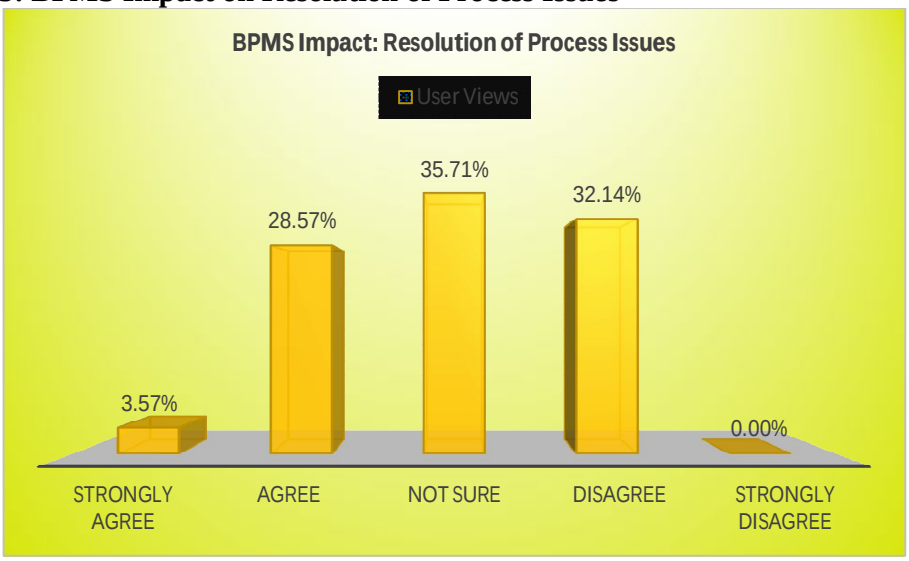


As illustrated in figure 4.12, 55.36% of respondents agree that BPMS does provide data to identify issues in business processes. However 26.79% of the respondents disagree with this position and the remaining 17.86% are not sure. According to Walker and Khoshafian (2012:3), BPMS allows business stakeholders to have a role-specific, strategic, key-performance perspective on their operations where things really matter and be able to drill down and potentially act on any detected bottlenecks or process issues. Ability to identify process issues real-time or receive early warnings about them is one of the key values of BPMS data and analytics.

BPMS impact on resolution of process issues

This question looks at the impact of BPMS on resolving the process bottleneck and issues discovered through data from the system.

Figure 4.13: BPMS Impact on Resolution of Process Issues



The finds in figure 4.13 indicate that about 32.14% agree and 32.14% disagree on the ability of the BPM system to resolve process issues and bottlenecks while an additional 35.71% are not sure of this item. Hence when it comes to resolving bottlenecks with BPMS, majority of users may not be aware of this feature in the current BPMS solution or have mixed opinions about it. This could imply that BPMS is not adequately used in resolving process bottlenecks. According to Van Greunen, Van Der Merwe and Kotze (2010:52), a BPM system is meant for improving internal processes but many organisations miss this point and only focus on using it to manage general work while not paying attention to feedback data about how work is efficiently performed.

BPMS impact on reporting process effectiveness

This question queried the ability of BPMS to provide accurate information on the effectiveness of business processes.

Figure 4.14: BPMS Impact on Reporting Process Effectiveness

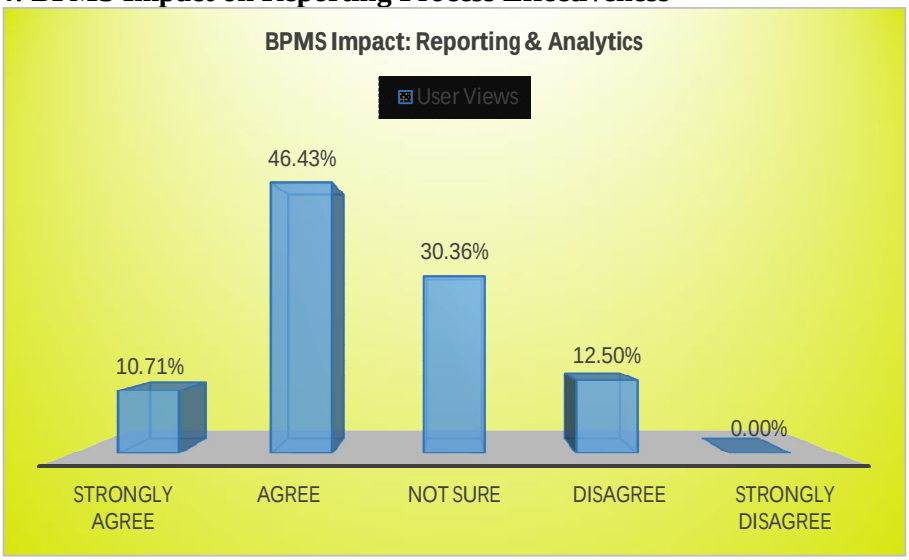


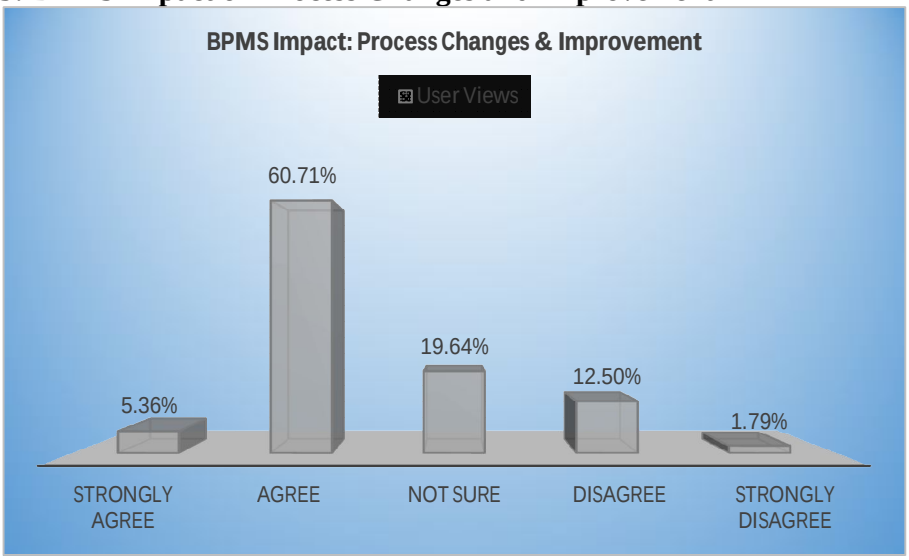
Figure 4.14 illustrate that 57.14% of respondents agree with impact of BPMS on reporting process effectiveness whereas 12.5% disagreed and 30.36% were not sure of the question. Brudan (2010:117) stated that integrated reporting should be a preferred approach to performance management because isolated reporting is not effective. Hence a typical BPMS should provide integrated reporting dash boards and analytics that includes barometers on process effectiveness and tracking of service level agreements.

Part D: BPMS impact on business agility

BPMS impact on process changes and improvement

This question gauged the impact of BPMS on facilitating continuous changes to business processes.

Figure 4.15: BPMS Impact on Process Changes and Improvement

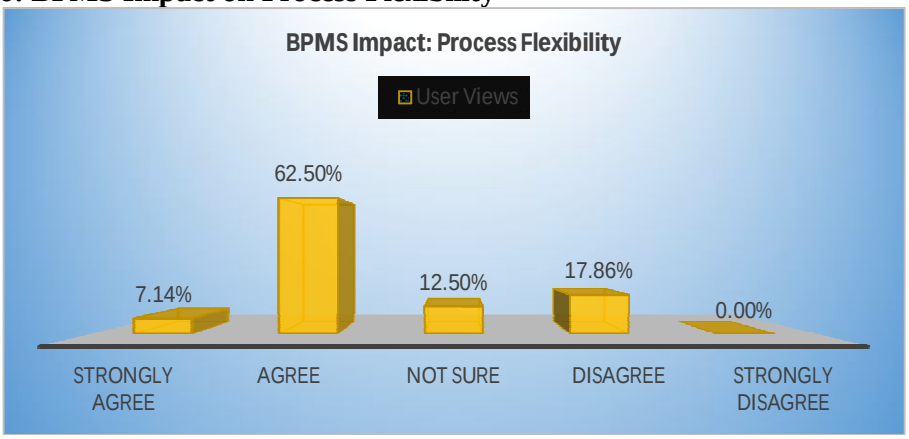


The findings in figure 4.15 disclose that 66.07% of respondents agree that BPMS does facilitate changes to business processes while 14.29% disagree and 19.64% specified not sure. BPMS provides the ability to make process changes and boost organisational ability at initiating continuous process improvement and getting better performance (Kohlbacher and Gruenwald, 2011:711; Shaw et al., 2007:91).

BPMS impact on process flexibility

This question weighed the impact of BPMS on enabling process flexibility and agility.

Figure 4.16: BPMS Impact on Process Flexibility

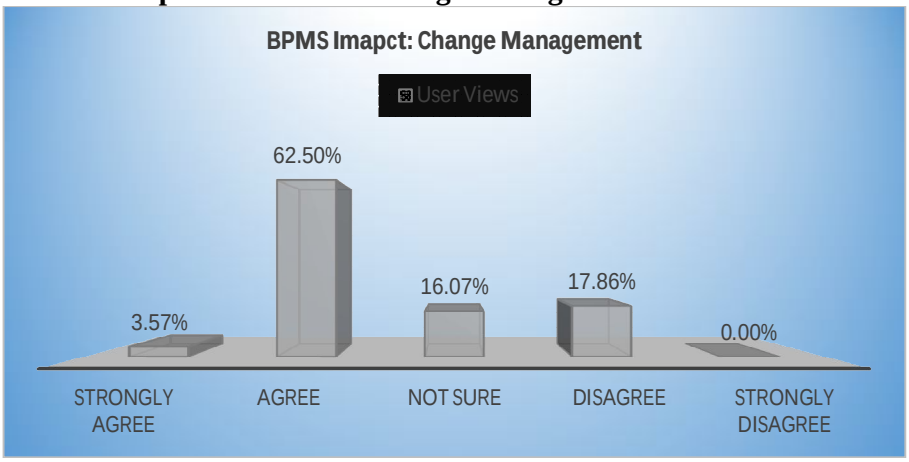


The findings in figure 4.16 disclose that 69.64% of the users do agree that BPMS enables process flexibility while 17.86% disagree and 12.5% are unsure. This is one of the most important feature of BPMS solutions allowing companies to quickly and easily change business process thus gaining operational flexibility and process competence (Pantazi and Georgopoulos, 2010:430). In addition, Van Der Aalst (2004:3) stated the relevance of BPMS is evident because it can be used to integrate existing applications and it supports process changes simply by reconfiguring existing process diagrams.

BPMS impact on process change management

This question aimed to establish relationship between the usage of BPMS and the managing change related to business processes in terms of informing staff and introducing the changes.

Figure 4.17: BPMS Impact on Process Change Management



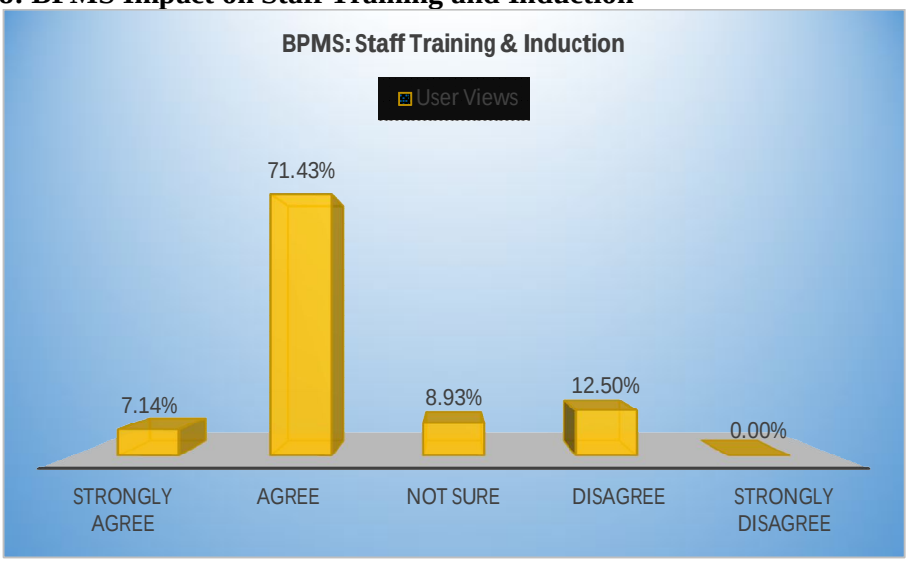
The findings in figure 4.17 indicate that 66.07% of the users do agree that BPMS impacts positively on the management of process changes while 17.86% disagree and 16.07% are not

sure. Kung and Hagen (2007:477) discussed the attribute of BPMS as a framework for change and system implementation that facilitates interaction between stakeholders and assist in understanding process dynamics and operations. The ability to quickly change processes and deploy them, makes BPMS very useful in volatile business environment where time to market is forever shrinking and competition is widespread.

BPMS impact on staff training and induction

This question aimed to establish the impact of BPMS on the flexibility of introducing new employees into the work environment.

Figure 4.18: BPMS Impact on Staff Training and Induction



The findings in figure 4.18 disclose that 78.57% of the users do agree that BPMS enhances the process of training and inducting new staff while 12.5% disagree and 8.93% are not sure. Adequate process training can empower employees, improve their understanding of business operations and increase efficiency at work (Abdolvand, Albadvi and Ferdowsi, 2008:506). Sharma (2014:75) emphasised the importance of using training and development functions to channel the collective effort of employees toward achieving organisational goals. Once users have learnt the basic of business processes on BPMS, it becomes easier for them to quickly understand any new changes to those processes because of the structure provided by BPMS (Trkman 2010:125; Garimella et al., 2008:28).

Hypothesis Testing

According to Wegner (2012:187), hypothesis testing is a process that checks the relative position of a sample statistic to the hypothesised population mean so as accept or reject a claim.

The aim of the test is to verify if more than half of the entire population of BPMS users agree that the system is associated with improved work efficiency, job satisfaction, business control and agility. The hypotheses were tested using the z-test statistics to compare the hypothetical mean of the population of BPMS users to the sample mean for each of the research questions.

A population mean for the hypotheses was set at 3 as an indication of the central measure of Likert scale coding of 1, 2, 3, 4, and 5. This value lies in the region of agree and unsure. Therefore to test if there is association or no association between BPMS and the four listed benefits, the population mean must be higher than 3 and the calculated Z score must lie within the region of acceptance.

Based on the Likert scale data, the combined mean and standard deviation of each part of the questionnaire was calculated as is in table 4.1 below.

Table 4.1: Sample Means and Standard Deviation

Research Questions	Combined Sample Mean	Combined Std. Deviation
Work Efficiency Questions	2.42	0.61
Job Satisfaction Questions	2.65	0.83
Business Control Questions	2.39	0.58
Business Agility Questions	2.40	0.71

Statistical testing approach

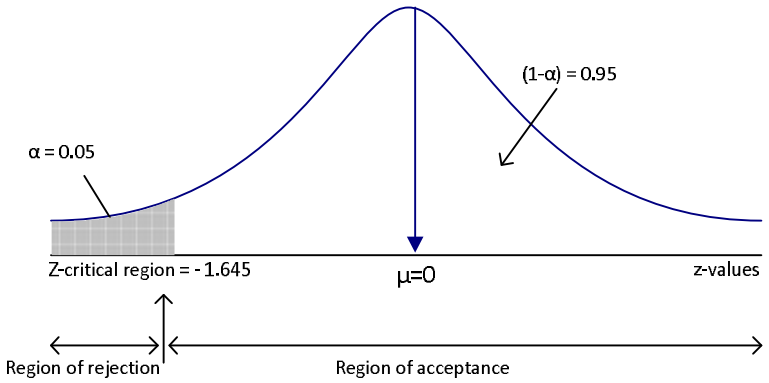
The statistical hypotheses were defined as follows:

H_0: $\mu \geq 3$

H_a: $\mu < 3$ ← represents the research question

Based on the null and alternative hypotheses that were formulated, a one sided lower-tailed hypothesis test was conducted. According to Wegner (2012:188), such a test is applied when a claim or research question states that the population parameter is less than a specified value. The one sided lower tailed test was conducted at 95% level of significance (figure 4.19).

Figure 4.19: One Sided Lower Tailed Test



Adapted from Wegner (2012:199)

1.1.1.1 Test BPMS association with improved work efficiency

This z-test computation of this research question is provided in table 4.2 and 4.3:

Table 4.2: Work Efficiency Sample Statistics

One Sample Statistics				
Research Question	N	Mean	Std. Deviation	Std. Error Mean
There is association between BPMS and work efficiency	56	2.42	0.6126	0.0819

Table 4.3: Work Efficiency z-test

One Sample z-Test				
Research Question	Test Value = 3			
	z Score	df	Alpha	Lower Limit
There is association between BPMS and work efficiency	-7.0898	55	0.05	-1.645

The results in table 4.2 and 4.3 indicate a z score of -7.0898 that lies within the region of rejection hence there is not enough evidence to accept the null hypothesis and this implies that the alternative hypothesis that there is association between BPMS and improved work efficiency is valid. The users of BPMS do associate remarkable improvement in overall work efficiency with the utilisation of the BPMS solution. This result corroborates the findings related to work efficiency in section 4.2.1.

Test BPMS association with increased job satisfaction

This z-test computation of this research question is provided in table 4.4 and 4.5:

Table 4.4: Job Satisfaction Sample Statistics

One Sample Statistics				
Research Question	N	Mean	Std. Deviation	Std. Error Mean
There is association between BPMS and job satisfaction	56	2.65	0.8350	0.1116

Table 4.5: Job Satisfaction z-test

One Sample z-Test				
Research Question	Test Value = 3			
	z Score	df	Alpha	Lower Limit
There is association between BPMS and job satisfaction	-3.1075	55	0.05	-1.645

The results in table 4.4 and 4.5 indicate a z score of -3.1075 that lies within the region of rejection hence there is not enough evidence to accept the null hypothesis and this implies that the alternative hypothesis stating there is association between the utilisation of BPMS and increased job satisfaction is valid. The users of BPMS do associate improvement in overall job satisfaction with the utilisation of the BPMS solution. This result supports the findings related to job satisfaction in section 4.2.2.

Test BPMS association with improved business control

This z-test computation of this research question is provided in table 4.6 and 4.7:

Table 4.6: Business Control Sample Statistics

One Sample Statistics				
Research Question	N	Mean	Std. Deviation	Std. Error Mean
There is association between BPMS and business control	56	2.39	0.5827	0.0779

Table 4.7: Business Control z-test

One Sample z-Test				
Research Question	Test Value = 3			
	z Score	df	Alpha	Lower Limit
There is association between BPMS and business control	-7.8433	55	0.05	-1.645

The results in table 4.6 and 4.7 indicate a z score of -7.8433 that is within the region of rejection hence there is not enough evidence to accept the null hypothesis and this implies that the alternative hypothesis stating there is association between BPMS and improved business control is valid. The users of BPMS do associate improvement in overall business control with the utilisation of the BPMS solution. This result corroborates the findings related to business control in section 4.2.3.

Test BPMS association with improved business agility

This z-test computation of this research question is provided in table 4.8 and 4.9:

Table 4.8: Business Agility Sample Statistics

One Sample Statistics				
Research Question	N	Mean	Std. Deviation	Std. Error Mean
There is association between BPMS and business agility	56	2.40	0.7114	0.0951

Table 4.9: Business Agility z-test

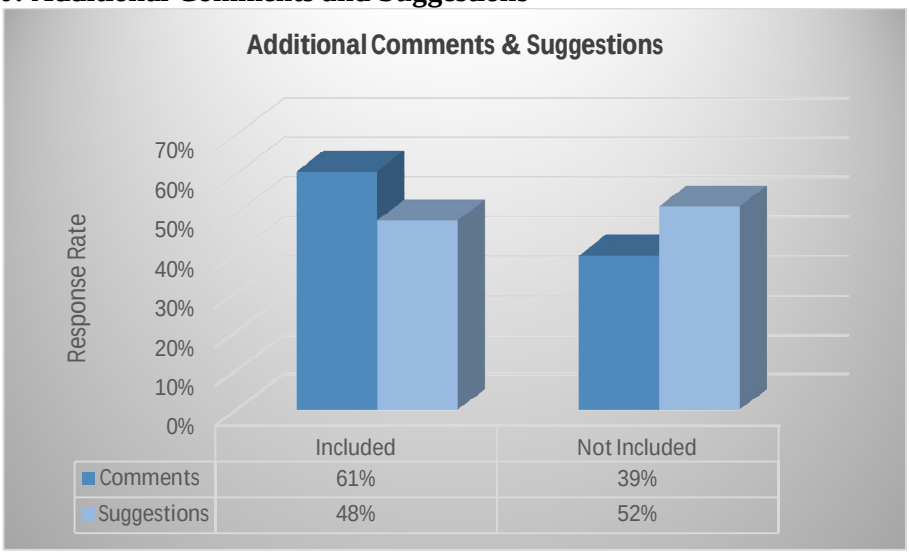
One Sample z-Test				
Research Question	Test Value = 3			
	z Score	df	Alpha	Lower Limit
There is association between BPMS and business agility	-6.2927	55	0.05	-1.645

The results in table 4.8 and 4.9 indicate a z score of -6.2927 that is within the region of rejection hence there is not enough evidence to accept the null hypothesis and this implies that the alternative hypothesis that there is association between BPMS and improved business agility is valid. The users of BPMS do associate remarkable improvement in overall business agility with the utilisation of the BPMS solution. This result substantiates the findings related to business agility in section 4.2.4.

Additional comments and suggestions

In section 3, some of the users added additional comments and suggestions according to figure 4.20

Figure 4.20: Additional Comments and Suggestions



Most of the users (61% of participants) had comments to include and a lesser group (48% of participants) had some suggestions to include after answering all the research questions. The additional comments received were analysed and summarised into the points below;

- The BPMS is a good system except for slow response of system and consistent downtimes.
- Document storage and viewing on the BPMS is problematic.
- Work scheduling and allocation has shortcomings that affect task transparency and visibility.
- Employee do require additional training for using some of the features of BPMS.
- Process changes and configuration does get cumbersome due to system architecture.
- Reports and analytics do not provide enough information about tasks.
- Management does not understand the issues and reality faced by system users.

Amongst all these comments, the most popular was BPMS downtimes, slow responses and poor document viewing. These issues are very likely to impact negatively on the experience of users. System failure and problems could represent significant losses to productivity and create weaknesses (Caldeira and Dhillon, 2010:17). In addition a strong comment was made about the fact that the management at the insurance company did not understand the challenges that system users have to contend with daily. Reijers (2006:391) found that low support from top management is one of the issues causing the failure of BPMS initiatives and this is more evident when management is not paying adequate attention to the problems that system users may be experiencing.

Furthermore, some of the users provided suggestion on how they think BPMS can be improved. Amongst these are;

- BPMS slow responses and downtimes should be fixed.
- Better reports, dashboard and task prioritization should be provided.
- Users should be trained on more features of BPMS like document indexing.

- Work allocation should be more flexible such that users can push or pull at same time.
- The duplication of work items and documents should be reduced.

A successful business application should meet user requirements and expectation (Caldeira and Dhillon, 2010:12). This is evident in the fact that users think there are many maintenance issues that need to be resolved for the BPMS solution to become more effective. Some of these issues might be linked to the fact that the BPMS solution at the insurance company was rolled out close to ten years ago. Daim, Dash, Monalisa and Justice (2011:515) identified that the installation of new software and hardware does improve the efficiency of a computing environment. The solution may be very outdated and require significant upgrades.

For the purpose of this study, the comments and suggestions received from participants were incorporated into the recommendations that were given in chapter 5.

RECOMMENDATIONS

Findings of the Study

Findings from the literature review

The literature review explored the relationship between information technology and business processes and gave detailed explanation of the BPMS solution concept. In particular the major benefits of BPMS were discussed and an analysis of literature related to IT failure was also provided. A critical summary of these findings is presented in the next sub sections.

Information technology and business processes

The literature review explored the importance of the relationship between IT and business processes and found that IT technology plays a significant role in assisting an organisation to enhance and improve its business processes (Reijers, 2006:389). However, past studies reported in literature indicate difference in academic opinions about the real value of IT on business performance (Wang et al., 2012:327; Setia et al., 2013:327). Some scholars believe the impact of IT entered the diminishing return zone since the last 1990s because most of the new technology does not really have any effect or impact on business operations.

In addition, literature expressed that although IT has become very critical to many organisations, IT on its own cannot add any value to a company except when it is well aligned to business processes (Lee et al., 2008:1168). The BPMS technology is generally accepted as one key enabler of the alignment between IT and business processes and it has become popular amongst businesses as being very useful for enhancing business processes to gain better efficiency, performance and quality.

The BPMS technology

The literate indicated that BPMS is mainly implemented by organisations as a software platform for analysing, designing, and implementing structured and semi-structured business processes. In operation, it makes the allocation, management, quality control of work smoother and well-coordinated (Reijers, 2006:390).

According to the literature, the technology consists of a unified workspace for users, a process engine for execution and others functionalities for modelling processes and storing data relationships (Garimella et al., 2008:36).

Impact of BPMS on business efficiency

The literature review suggests a strong relationship does exist between the use of BPMS and business efficiency. The primary selling point of BPMS is to reduce process waste and reduce the time it takes for task completion (Reijers 2006:389). Many firms aim to reduce delivery times on business processes with the aim of reducing cost and improving customer satisfaction. Most

importantly, a firm stands to gain a competitive edge if it can deploy fast and efficient business processes.
Cases of successful BPMS implementation found in literature claim that efficiency was gained from the technology through better routing of work assignments and reduction of backlogs.

Impact of BPMS on job satisfaction
Sources from literature identified job satisfaction as an attribute of high performance organisations. Job satisfaction is linked back to employee perception of work environment and quality of task instructions (Vanderfeesten and Reijers, 2006:654). The BPMS solution provides standardised work instructions and easy coordination between the different parties involved in business process execution.
Users of BPMS are expected to find their work instructions much clear and less confusing compared to an environment where there are more verbal or manual instructions that can misinterpreted.

Impact of BPMS on business control
Literature accessed revealed that BPMS has a powerful solution for maintaining business control on operations because it monitors and tracks the execution of job tasks. The availability of dashboards and warning triggers allow management to quickly identify and manage risks.
Literature sources show that by using BPMS, operational budgets can be tracked with real-time data and reliable metrics and quality can be better quantified and controlled (Pan et al., 2010:823).
Impact of BPMS on business agility
Reijers (2006:389) emphasised the business flexibility that is gained from using BPMS through the ease of changing existing processes and installing them into operation. Strategic changes always carry the need for operational change in business processes that results in process re-engineering initiatives that can be daunting without automation of business processes. Literature suggest that BPMS automation provides valuable information for applying changes to processes and to continuously measure those processes.

Findings from the primary research
Outcomes of the primary research are discussed in the next sections.
Section 1 – Demographic data
The objective of this section was to understand the level of BPMS experience of the respondents. The majority at 55% have used BPMS for over five years and 45% have experience ranging from at least one to five years. This demography indicates many of the respondents have adequate exposure to the BPMS solution.
Section Two
Section two covered all the research questions.
Part A – BPMS impact on efficiency
The objective of this part of the primary research is to measure the effect of BPMS on work efficiency based on work organisation, team collaboration, task instructions and timeliness.

- A collective of 89% agreed and 7% disagree that BPMS is useful for organising work items.
- A collective of 82% agreed and 5% disagree that BPMS improves collaboration between staff members.

- A collective of 70% agreed and 23% disagreed that BPMS improves the quality of task instructions.
- A collective of 43% agreed and 45% disagreed that BPMS impacts on their ability to complete task in the time frame that is predefined.

Apart from lack of consensus on the impact of BPMS on timeliness, majority of the respondent do agree on the overall positive impact of BPMS on improving work efficiency. Indicating that the absence of BPMS might create issues related to inadequate task coordination and task organisation that might lead to reduced work efficiency.

Part B – BPMS impact on jobs satisfaction

The objective of part B is to quantify how BPMS is perceived in relationship to job satisfaction along the lines of task ease, performance targets, ease of usage and employee empowerment. The results were:

- A combined 64% agreed and 27% disagreed that BPMS makes it easier to handle work tasks.
- A combined 39% agree and 38% disagreed that BPMS does provide the capability to track and work towards key performance targets.
- A combined 59% agreed and 29% disagreed that BPMS is empowering when it comes to serving customers.
- A combined 79% agreed and 16% disagreed with the user-friendliness of the BPMS application.

From the findings, users displayed indifference about the ability to track performance on BPMS but in the overall they do agree that the application does add some value to gaining satisfaction on the job through ease of usage and ability to provide customer service.

Part C – BPMS impact on business control

Part C aimed to measure the impact of BPMS on controlling business activities. The outcome was as follows:

- Majority of respondents at 88% agreed that BPMS does impact positively on control and supervision of work and none of the respondents disagreed.
- Majority of respondents at 89% agreed that BPMS assist in managing work better compared to 7% of respondents who disagreed.
- Majority of respondents at 55% agreed that BPMS is useful identifying business process issues where they exist while 27% of respondent differ with this viewpoint.
- A combined 32% of respondents agreed that BPMS assists in resolution of process issues and the same percentage disagreed with this question.

Majority of users agree that BPMS does improve task control, management and discovery of process problems during execution. However when it comes to resolving those problems, BPMS is not of much use.

Part D – BPMS impact on business agility

This section assessed the impact of BPMS on business change and flexibility based on the following:

- A joint 66% of respondents agreed and 14% disagreed that BPMS does facilitate continuous process improvement and evolution.
- A joint 70% of respondents agreed and 18% disagreed that BPMS does enable process flexibility.
- A joint 66% agreed and 18% disagreed that BPMS does enhance process change management and transition within the work environment.

- A joint 79% agreed and 13% disagreed that BPMS does have impact on ease of training and inducting new staff members about business processes.

In general, BPMS users agree that the solution increases the capacity of the business to change and to adapt itself to change.

Conclusions from Study Findings

The management at the insurance company intends to make a decision on decommissioning or continuing to operate the BPMS solution at the company. This study investigated if there is significant impact of the BPMS solution on the operation of the company.

Users of the BPMS solution generally perceive the solution as being effective through its impact on work efficiency, jobs satisfaction, business control and agility. This impact is evaluated as statistically significant at 95%. However additional comments and suggestions from respondents endorse initial management findings that the system is seriously impacted by technical issues like downtime and speed.

It is also evident that users do not directly compare the BPMS solution to other IT solutions at the insurance company and as a result the company might not be able to replicate the attributes of BPMS in any other IT software that the company operates at the moment.

The study suggested that the management debate at the insurance company about the relevance of BPMS is based on managerial opinion without empirical data analysis. The overall research results that were examined indicate that despite the indication that the BPMS solution at the insurance company is old and poorly maintained, the concept of BPMS is still relevant at the organisation and a decision to decommission the systems may be premature and not well considered.

There is strong likelihood that the current problem of BPMS is more of a technical one than a conceptual one. The concept can be very effective if well applied and maintained. A decision on the relevance of the solution must not be based on a dysfunctional solution but rather on a well-functioning solution that is properly implemented.

Recommendations

Based on this study, the following recommendations are made:

Resolve technical issues affecting BPMS

The technical issues like downtime and slow responses should be eradicated from the current solution with the aim of improving performance. Lee, Olson, Trimi and Rosacker (2005:203) recommended comparing alternative solution with the aim of identifying the best options for improving system performance. This resolution will assist in creating better user experience with the BPMS solution and is likely to reduce the complaints about the BPMS solution.

Increase user control

The control that users have over the BPMS should be increased such that they can use the solution in more creative ways than currently possible. Some of the comments from users related to limitation of functionalities that were designed into system privileges but are becoming hurdles that impact on work efficiency. Reijers (2006:389) mentioned how lack of user need for some of the “nice to have” functionalities could hinder work and be detrimental to user experience.

Users can benefit more from a solution that is more robust in terms of business rules that enhance straight through processing of work transactions and at same time still apply some level of privileges and security controls.

Upgrade existing BPMS

The existing solution at the insurance company has been in operation for over ten years and is quiet old in terms of architecture and implementation. This is evident in many of the issues experienced with BPMS downtime, poor document viewing, missing transactions and slow response. According to Khoshafian (2014:100), maintaining an old application can be very expensive and prohibitive, hence to get the most out of BPMS, a modernisation effort is necessary.

Currently there many new products and vendors of BPMS solutions on the market that can be explored to find a more suitable, modern and effective BPMS solution for the firm. The new solution should be assessed against the existing one to identify new functionalities and requirements for existing issues.

Train BPMS users

Staff also require training on some features of BPMS so as improve their ability to use the solution effectively and as a result the business can also gain multi-skilled staff and enriched jobs. According to Helquist, Deokar, Cox and Walker (2012:17), such training should be designed to specifically target areas of weaknesses and specific functionalities in the solution.

Improve staff communications

Reijers (2006:386) discovered that user acceptance of BPMS increased due to their involvement in applying new updates to the solution. Therefore, any changes to BPMS should involve users who work on the system on an average day. Some users commented that managers are not aware of the challenges that users experience on the system, hence management decisions may not be based on effective insight into the real issues.

In this light, it is recommended that senior management should pay more critical attention to staff needs and also use factual data in assessing BPMS and other IT solution problems before making recommendations or decisions.

Further Research

During the study observations was made about phenomenon that require further research:

- The study was conducted on a single organization in Johannesburg. A larger research can be undertaken to target multiple financial organizations that use BPMS with the objective of investigating the overall effectives of BPMS in the financial industry.
- Research can be directed to assess other organizational factors that may impact directly on the usage and effectiveness of the BPMS solution
- The study focused on four main benefits that are expected to accrue from using a BPMS solution. Further research could look at additional benefits that may have impact on how users perceive the BPMS solution.
- Additional research can also look at the influence of managers on the survival or demise of business application systems in financial organizations.

Conclusion

This study has revealed the relevance of the BPMS solution at the insurance company. The literature review provided a theoretical framework that attributed positive benefits to the usage of a BPMS and findings from the primary research confirms the presence of some of these benefits.

Based on the outcomes, it was determined that the debate about the BPMS solution is more related to unresolved technical problems and obsolesce rather than conceptual solution relevance or effectiveness. As a result, recommendations were made to the management of the insurance company on how to handle the firm's BPMS solution going forward.

In conclusion, a decision to decommission the BPMS solution without finding an alternative solution that provides the current BPMS functionalities or benefits favoured by users may have a negative impact on their productivity in the long term.

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