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Research Article

Analysis of Qualitative and Quantitative Study of Business Process Management

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Abstract

Business process represent a resource of business organization. The Business Process Management (BPM) have a direct effect on the attraction of product and service as supposed by market. Processes identify the potential of an organization to adapt and comply with fats growing requirements. BPM enables common understanding and business process analysis. The comprehensive understanding of business process is analyzed using the process model. The fundamental concepts of BPM are process model which is utilized to improve, analyze and understand the process. BPM enable important productivity and fast development over the last decade is analyzed for business organization.

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Introduction

Due to the emerging concerns around the effectiveness of industries in global market, the competitive posture of nation's firm is enhanced by undertaking several initiatives. The productivity, operation and product quality is improved by engaging many companies in assessing ways. Total quality Management (TQM), Total quality control (TQC), Continuous Quality Improvement (CQT) etc., are the effort that are generally under quality (Brocke and Rosemann 2015). The quality of products and service tuned to view industries to address the enhancement of the process which generate the product and service. The process is oriented by the significant

theme of ISO 9000 values and personified in Malcolm Baldrige National Award. The definition of the process is very encompass and broad in manufactured product and the product's physical assembly and process the design, maintenance and market of the product and process the enterprise strategical plan (Van der Aalst 2013). The movement provide careful attention for improving the quality of product and service. The analysis of process can be stated as process improvement, process simplification and reengineering.

Throughout the 2000s automating and enhancing business process become significance for information tools directors and chief information officers (CIO). By offering many technique, methods and principle of management, business process management (BPM) has become valuable field for business practitioner to achieve higher business results, long-term competitiveness and compliance. BPM is challenged by the chances of developing technologies such as cloud computing, social media, radio-frequency identification, internet of things, sensor, smart device etc (Laguna and Marklund 2013). BPM requires process agility, innovation and flexibility and traditionally focused on automation, continuous process improvement and standardization. The combination of exploitative BPM and explorative BPM provide an executive ambidexterity which focus on traditional and innovation process.

BPM is the art and skill of controlling the effort executed in the business association to confirm reliable result and taking the improvement of enhancing the prospects (Recker and Mendling 2016). The improvement depends on the objective of the business organization which includes reducing execution time, reducing cost and reducing error rate. The improvement in BPM is not based on the enhancing the individual activities but also based on managing the total chain in the business organization, their activities, decision which improves the values of business organization (Dumas, La Rosa, Mendling, and Reijers 2013).

BPM utilize may approached to model, discover, measure, analyze, improve and optimize business processes. The business process can be repeatable and structure or variable and unstructured which require the enabling technologies with BPM. BPM process significant source of the organization which manage and develop and deliver value products and service to customer. It often includes automatic tasks with the business process of organization and BPM is not a technology which utilize to enhance the efficiency of the business process.

Many organization experience in business process because of the fast developing technologies which need fast transformation of business in today's environment (Harmon 2010). The new

technologies are incorporating in business process which become crucially especial for business organization for to persist in current market and these technologies become competitive and user friendly. BPM, by aligning business process create customer values with diverse customer needs and focus on internal business (Trkman et al. 2015). The new research stream such as value-driven BPM, case-driver BPM, agile BPM, collaboration BPM, customer process management, intelligent BPM is recognized using BPM discipline.

BPM is the discipline which associates knowledge from management and information technology and relates to operating business processes. It enhance the operational business process without the use of emerging technologies. Business process can be modelled by analyzed using simulation and enhancing service level can be reduced. The software is associate with BPM to control, support and manage operational processes (Meidan et al. 2017).

BPM techniques such as process mining can be utilized to analyze and discover the emerging processes which support the system which are not aware of the process they utilized.

Research Background

BPM have several background in management science and computer science and predict the starting point of BPM is difficult (Schulte et al. 2015). The productive is enhanced because of innovative techniques, improvement in the work of organization and utilization of information technology in industrial revolution. Business process is influenced by the infrastructure of computer and digital communication which result in the intense change in the work of organization and enable new emerging technique to perform business in organization. Business process become heavily rely on information, span multiple organization and more complex. By providing insight and documenting procedure, process model contribute in managing complexity in business organization. The BRM focus on the processes while managing and organizing the work in business organization.

Phase		Time	Focus	Business
Industrial Age		1750-1960	Labor specialization Productivity task Reduction cost	Hierarchical functioning Control and command
	1st wave BPM	1970-1980	Quality management Efficient task	Mergers and acquirement

Information Age				Line of organization of business
	2nd wave BPM	1990	Innovative process Faster, cheaper, Better	End-to-end processes Customer intimacy Flat organization
	3rd wave BPM	2000	Adaptability, Assessment	Process efficiency over resource Organizational effectiveness
	4th wave BPM	2010	24X7 Global business	Hyper competition Networked organization Multi-Industry Enterprises

Figure 1: Process evolution of business process management

BPM timeline provide the process evolution. The range form smaller changes to radial enhancement is iterate the life cycle of process optimization. Due to globalization and IT opportunities in 1980s and 1990s, latter was introduced (Gábor and Szabó 2013). The trigger grew intensely after 2000s which result in developing of e-business. BPM is applied in business organization because of its positive link with long-term competitive success and performance. BPM adaptation depends on the specific business context of organization and external business layer of the organization is based on IT trends. The context aware or contingent is relates BPM maturity and adoption of process related studies. The market competitive organization have higher BPM adaptation compared to public organization sector. The higher innovation related to low BPM because business organization needs flexibility, agility and innovation. The traditional BPM focus on uninterrupted development, standardization and automation. The business organization select custom-made methods and standards-based methods within the organization for more adaptation of BPM (Recker and Mendling 2016).

Methods for BPM

BPM starts with goal of the business organization in which mission, vision and aim of the organization is expressed and success factor is determined. The presentation of BPM is designated for process and evaluated in organization. The opportunities are identified for the process improvement after the selection of BPM (Elzinga et al. 1995). The continuous improvement is

achieved by repeating the process of cycle selection, quantification, description after implementation process which make easy for update and provide great benefit. The entire effort of BPM is guide by the valuable benchmarking tool.

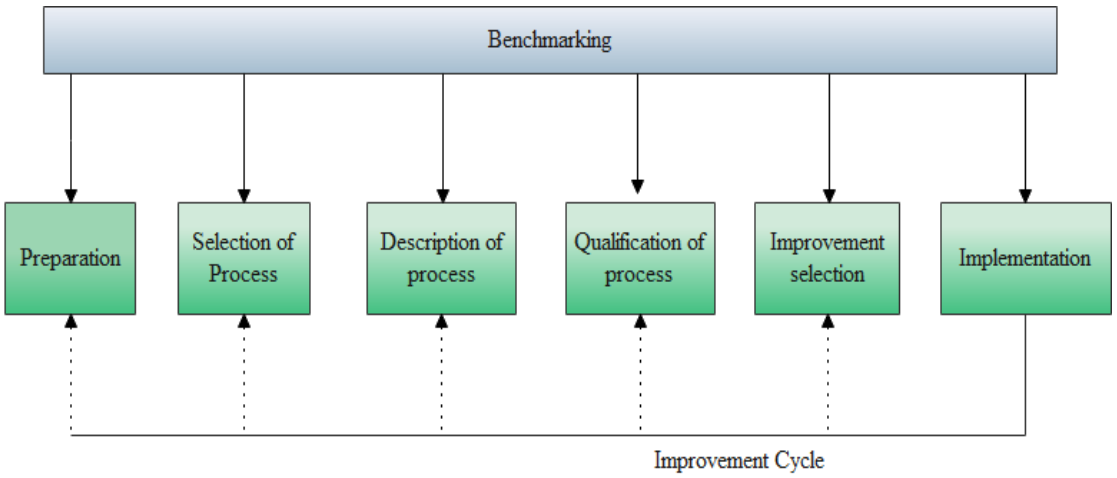

Figure 2: Methods of BPM

BPM Preparation

BPM process can be directed by the principles for guiding the organization by the statement of mission, vision and objectives. The top management of the organization should provide the statement of mission and vision. The mission of the statement is achieved by creating special goal which help to deduce the mission statement. If the organization previously formulated the mission, vision and goal which is accomplished by the higher authority of the management in a meeting. The specific mission, vision and goal is developed by the subdivision which concert the development of entire organization.

A set of critical success factor (CFS) is formulated to enable the mission, vision and goal of the organization (Trkman 2010). The action that are necessary for the achieving the mission, vision and goal of the organization is identified by the systematical methodology called CFS. It identifies the limited area of the organization to achieve the goal. CSF is based on the interview of high authority of management which review the mission and vision, establish and record goals and the management review the goal to monitor and measure of the performance. The CSF are established for the customer satisfaction, marketing, return on investment and methodical flexibility.

Process Selection

After preparation of BPM, process selected from the alternative of study, analysis and development. The top management select the particular process for coordinating the quality and quality council based on the organization. The application of the BPM is depends on the prioritization process of CSF. The decision making process is established which aid by benchmarking and provide methods and techniques. The BPM process is responsible for process owner which share the success and failure of the exertion (Harmon 2019).

The BPM study is carried out in the form of cross functional team formed by the process owner. The operation of process is responsible by the team which is composed by the employee and facilitator with experience in BPM. The selection of process is supported, sometimes previously the process preparation step when the problem focus on the specific process then immediate responsiveness is provided to the problematic process that something is being done. The initial perception of CSF can mislead when there is no clear understanding of organization's mission, vision and goal. To focus the activities of BPM, preparation step is carried out before the selection of process step to improve the accomplishment of BPM exertions. The value of the process is assessed which is important before selecting the process for improvement and it is difficult to estimate the process value.

The decision making process includes informal techniques such as brainstorming and formal techniques such as multi-attribute utility technique and analytic hierarchy process (AHP) (Sum 2015). The value of process can be estimated by using AHP technique. The process is combined to CSF and alternative is ranked using AHP. Each process is assigned with value based on the ranking which is utilized to measure the significance of the process to the business association.

Process Description

The detailed description of process which is selected in previous step is necessary to establish the definition. The arguments are happened among the team members and management using the systematic description of process. The process of description is accomplishes with the support of traditional, simple methods and tools like cause-and-effect diagram and flowchart. The process description is effectively update for continuous enhancement and the computerized process description provide more advantage. There are various SADT (structured analysis and design techniques) is available based on the process description methods (Vykhovanets and Yatsutko 2013). The complex system id described by proposing SADT through modelling. The

graphic language is utilized to provide structure and specific sematic by the system description of SADT for the natural language controlled in the model. The SADT system has goal, purpose and a viewpoint. The viewpoint of the model which is designated and purpose is the question to be answered by the process model.

Process Quantification

The potential opportunities for the development of BPM is based on describing procedure and agreeing on the process. The process qualification is necessary to predict resources and target for the process improvement (Rohloff 2011). The activities of the process is characterized as non-value-add activities and value-add activities. The resource requirement information, time, cost and the value obtained for more precise quantification. The quantified understanding of the process if facilitate profile, cost-time, pie chart, bar graph, pareto charts, histogram using simple visual data representation.

The traditional accounting and activity based costing (ABC) are used for the cost accounting of the process. The ABC tools predict the activities that are performed cost of each activity is established, activity cost of the product is traced. The ABC tool, identifies the performed activity and cost of each activity is established. The purpose of ABC tool is providing more accurate information for cost object and product and facilitate the decision making for process management and investment justification.

The process activities are consumed by the product to comprehensive measure is produced size or consumed work which is assumed by the traditional coat accounting system and it is suitable with few variety of product for mass production. The product complexity is enhanced. The product ranges are wider, production process are more complex and product life cycle is shorter. The major manufacturing companies directs work has minimized as a measurement of total cost. The function such as customer service quality control, product design, sales order and production planning processing are significant to the customer. The cost training is not accurate as decision makers for the traditional cost. The precise characterization of the process id obtained by the computer simulation of the process which is obtained in detailed process description.

Process Improvement Selection

The opportunities for improvement is selected after the process description. The process of decision-making is based on process information and confirmed in quantification process and process description steps (Röglinger, Pöppelbuß, and Becker 2012). CFS established in the

preparation step is significantly guides for process of decision making and mission, vision and goal is also implemented. The BPM team provide presentation during decision making process by assembling all accessible knowledge and information. The information available in process is used to enable the process of decision which must be accessible concisely and clearly. The process selection step is recognized crucially which is important for the success of BPM study and the decision activity is difficult. The analytic hierarchy process (AHP) is used as a documentation decision aid for process improvement and conventional brainstorming session is accomplished as it is possible to structure the process. To assess the potential for elimination and reduction, nonvalue add activities is focused. Qualitative assessment for the process value of value add activities is obtained using AHP approach (Cho and Lee 2011). The cost reduction is target based on the high cost and low value process. The cost reduction opportunities is explored and maintained with specific attention in which the activities are based on high cost and high value of process. The major changes are directed by the process enhancement opportunities selection which highlight the incremental improvement of process.

Continuous Improvement Cycle

The selection process step is repeated after improved process is implemented for selecting process in BPM study. A new BPM team is formed and process owner is identified after selecting a new process. The BPM team and process owner repeat the method for improved process which look for improvement opportunities and begin with process description step

Research Analysis

Qualitative Study

The qualitative analysis is the inventive side of business process management. It present principles which aim at making process by determining the unnecessary parts of the process for elimination (Dumas, La Rosa, Mendling, Reijers, et al. 2013). The qualitative analysis identify the weak part of the process the effect of the problem in order to prioritize redesign efforts.

Value-Added Analysis

The value-added analysis is a method to identify excessive steps in the process and eliminate it. It is categorized into two stage such as value classification and waste elimination.

Value Classification

The checklist are used to document the step used in the task. The process participants needed to place before a task is provided by the checklist which is considered for completing a process. The

process can be decomposed into steps, if the detailed description of the process is available in the checklist. An implicit understanding of step in the process occur which is not documented in the checklist and by means of interviewing and observation the step in task is decomposed.

The value-added analysis identifies the customer of process and the positive result of the customer who is waiting for the process. The positive outcomes of the process is identified and analyzed using the value added in the process. Value-added analysis is a technique in which a process model can classifies each step into three categories such as

Value-adding (VA): The process value and satisfaction of the customer in business process is provided in this step

Business Value-Adding (BVA): The business process is essential to run smoothly using this step which require regulatory environment for business.

Non-Value Adding (NVA): The business process does not fall into any supplementary classifications.

Waste Elimination

The waste elimination step is need to eliminate the unnecessary step in value add analysis. NVA step is eliminated by automation by considering the goal, elimination on BVA step is based on trade off and play important role in business. BVA step must prior to eliminate the requirement of business goal such as regulation which the company must conform risk in which the company pursue to minimize.

Root Cause Analysis

The root cause analysis is processed base on the errors, misunderstanding, unnecessary step, incidents and other form of waste while performing business process. The root cause analysis is used to recognize and appreciate the root cause issue of the process event. It analyze, predict and document the issue which cause plague in process. The data form multiple source is collected and interview is taken among the stakeholders, process owners and organizational manager. The stakeholder has the tendency to raise the issue from their perspective and they have several view on business process. In context of business process analysis, it helps to recognize and appreciate the issue which avoid a process from having enhanced performance.

Issue Documentation and Impact Assessment

The documentation in business process is built to understand the issue which impact the process and prioritize the issue which need to provide more attention to the process owner and participants

and focus on the problem of organization. The impact assessment is based on the concern register which supplements the outcomes of root cause analysis and give comprehensive analysis of problems and impacts in business process.

Quantitative Study

The Quantitative study based on the business process is recognized. Some of the quantitative measure are reliability measure, temporal measure and cost measure. Performance to cost ration is a derived measure which is the combination of reliability measure with temporal measure (Dumas, La Rosa, Mendling, Reijers, et al. 2013). The temporal measure includes any quantity related to time to broad a certain business process. The business process result in diverse performance which can viewed form different perspectives

User Perspective

In business processes, the time between the instant of customer attains and instant of accomplishment of service. The time among distributing a request and receiving the consequence is response time which is the sum of the waiting time and processing time.

Process Perspective

The time essential to complete one request of a process which probably involves multi customer, products, order etc., which is opposed to response time as the time to widespread one request. The accomplishment time defined as the time essential to complete a process.

Product Perspectives

The quantity of time required to perform concrete work in realization of certain product. The product perspectives defines the product in terms of stakeholders requirements that describe the explicitly and availability of the process sensibly.

System Perspective

The system perspective describe the number of transaction completed by a system in certain time. The throughput of the system influenced on the number of accessible source and capability of the system.

Resource Perspective

The utilization of business process is defined in resource perspectives which is the measure of effectiveness in which the resource is utilized. The potential bottleneck resource indicate the fact of high utilization and the capacity of the resource increase which leads to high performance improvement.

The high throughput makes the productivity high and resource utilization which leads to descent of response time. The conflicts of interest are created by different perspectives.

Quantitative Analysis Techniques

The performance measure of business process with quantitative analysis id based on three methods such as measurement method, simulation method and analytical method.

The measurement method is carried if the system interest is in operational condition. The process design has limited use for guidance since they are not used to obtain the performance prediction (Herbert and Sharp 2013). The benchmark prediction is obtained to calibrate model parameter using the measurement method.

The direct execution of model is performed using simulation methods which is communicated in a special perseverance simulation language. It allows the learning of system aspects to desire level and it is a powerful tool. The simulation rum is required for each parameter selection which result in more time consuming.

The performance of analytical method is derive in mathematical way and ca be divided into numerical technique and symbolic technique. The class model are analytically tractable is limited which is the drawback in analytical technique.

Conclusion

This paper focus on survey of some area and quantitative analysis and assessment of business process management. The business analysis aid to manage and design the process. The methods for BPM process is analyzed and critical success factor (CSF) is formulated to enable the mission, vision and goal of business owner. The changes are directed by the selection of process improvement opportunities which emphasize the process improvement. The qualitative and quantitative analysis of business process management is based on the perspectives of different business process model.

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