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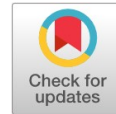


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BUSINESS PROCESS IMPROVEMENT CONCEPTUAL MODELS TO IMPROVE THE EFFICIENCY OF POWER CONSUMPTION ON COMPUTER USE FROM THE PERSPECTIVE OF HUMAN RESOURCE PERFORMANCE

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Abstract. While demanding responsibility of organization towards the environment, environmental awareness has now appeared in the IT (information technology) department. The concern on environmental impacts resulted from human activities that are increasing has triggered a particular party to make global efforts to reduce energy consumption and, at the same time to improve efficiency. Improvement of business process is one of the efforts to improve the efficiency. One form of energy consumption is the use of power on the computer. In this term, human resource plays a significant role in reducing the number of resources used. This paper describes the conceptual model to improve the efficiency of power consumption on computer use from human resource performance. The tools and techniques used in this research are the mapping techniques. This model is expected to serve as one alternative solution in improving the business process.

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INTRODUCTION

Currently, the way in which organizations do businesses is represented and implemented in business processes. Therefore, business process is an integrated part of the modern organization. However, due to the policies on environmental regulation, improved competitiveness, better investment, higher operational effectiveness in the organization, and competitive environmental strategy, the organization needs to consider the environmental issues of the designed business processes.

Business process structures and manages different business services in order to achieve the goal of the business. In fact, the current business processes are greater in number and more complex; therefore, process optimizing has become an integral part of the organization. In addition to improved business processes, business that is based on the aspects of cost, quality, time and flexibility (Reijers & Mansar, 2005) the management of the business processes must relate with the new cross-sector issues; such as obedience of regulation and environmental impacts of the process.

Improved business process is a technique to monitor the business process and to meet the goal of the business. It also controls and optimizes the operation in order to comply with the business goal. In addition, it allocates the resources as required, prioritizing and selecting the best service provider for the processes. The implementation of business process requires energy. The energy itself relates to the process and the

energy required to operate the business process itself (Morrison, Ghose, Dam, Hinge & Hoesch-Klohe, 2012). The connectivity and interaction between the resources and business process may influence significantly the use of energy. On the other hand, the use of resources depends on the kind of the resources used, how they are used, and the intensity of the resources (Vom Brocke, Seidel & Recker, 2012).

The main goal of every process improvement, apart from the method used, is to reduce waste, improve efficiency, and eventually reduce cost (Lotfollah najjar, Huq, Aghazadeh & Hafeznezami, 2012). The improvement of business process is to make changes or adjustments over particular process to yield a better result.

The improvement of business process focuses on the ways to improve the process in the existing structure. Therefore, the improvement of business process is a preventive technique to avoid business from the possibility of barriers or disadvantages. In order to improve the process in the existing structure, human resource is an integral part since it is the important element within an organization. Failure in managing human resources may result in disruption in goal achievement of efficiency improvement, productivity, and competitiveness. Human resource plays a role to reduce the resource used, energy consumption, and loss (Vera & langlois, 2007; Angheluta, margina, zaharia & arionesei, 2014). Froehlich (2009) reveals the behavior of

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human resources in relation to energy consumption. Serve (2010) states the performance matching with the requirements of performed duty may lower the cost and improve efficiency. Based on the above description, the model of process improvement can be offered in order to improve power consumption efficiency in using computer from the perspective of human resource performance.

LITERATURE REVIEW

Business process management is an approach of an organization to improve the effectiveness and efficiency through developing automation process and intelligence to manage the changes. These changes continuously improve the processes. Business process management frequently represents significant proportion of cost. In general, business process management relates to continuous improvement and innovation on the fundamental of

business process in order to improve organization efficiency and effectiveness (Pernici, Aiello, Donnellan, Gelenbe & Kretsis, 2011; DeToro & McCabe, 1997; Smith & Fingar, 2004). Business process management employs the information technology; however, it eventually means to design the socio-technical working system (Bostrom & Heinen, 1977). Since it involves business issues and designs related with human capital, the business process management has been established as a comprehensive management approach (VomBrocke & Rosemann, 2010) that helps the organization to operate and achieve its goals.

Six elements are put into consideration for achieving the success of business process management (Rosemann & Brocke, 2015). The following table illustrates the six elements of the business process management.

FIGURE 1
The Elements of Business Process Management

Strategic alignment	Governance	Methods	Information Technology	People	Culture
Process improvement planning	Process management decision making	Process design and modelling	Process design & modeling	Process skills & expertise	Responsiveness to process change
Strategy & process capability linkage	Process roles and responsibilities	Process implementation & execution	Process implementation & execution	Process Management Knowledge	Process values & beliefs
Enterprise process architecture	Process metric & performance linkage	Process monitoring & control	Process monitoring & control	Process education	Process attitude & behavior
Process Measures	Process related standards	Process improvement & innovation	Process improvement & innovation	Process collaboration	Leadership attention & process
Process customer & satisfaction	Process management compliance	Process program & project management	Process program & project management	Process management leader	Process management social network

Business process management must comply with the organizational strategies. The process must be designed, executed, managed, and measured in accordance with the priority and strategy of the organization (Burlton, 2010; Kaplan & Norton, 2004; Spanyi, 2010; Vom Brocke & Rosemann, 2010). Governance decides transparent and proper accountability in terms of role and responsibility for various level of business process management. The next focus is the design in decision-making process. The methods in the context of business process management can be defined as a series of instruments and techniques that support the activities of the ongoing cycle of the

process (Conger, 2010). IT-based solution is prominent to the initiative of business process management by focusing on the process analysis and process modelling supports proses (Dumas, Aalst & Hofstede, 2005; Van der Aalst, Nakatumba, Rozinat & Russell, 2010). People as the core element of the business process management can be defined as individuals or groups who continuously improve and employ the skill and knowledge in order to improve the business performance (Karagiannis & Woitsch, 2010). Culture of business process management combines the values and collective beliefs in the process of the organization. A comparative case study shows strong impacts

of culture on the success of business process management. Culture creates environmental facilitators that complete various initiatives of the business process management (Wesely, 1976; Vom Brocke & Rosemann, 2010). This research is included in the element of information technology (process design and modelling). This step is the IT solution as a toll to support analysis and modelling of the business process (example: animation and simulation) (Aalst et al., 2010).

RESEARCH FRAMEWORK

The research method adopts the framework from (Hevner, March, Park & Ram, 2004). This method represents the issues and the ways to solve them. The information system is implemented in an organization in order to improve the effectiveness and efficiency of the organization. The capability of information system, organizational characteristics, work system, development, and employed method determine the achievement of the goal (Silver, 1995).

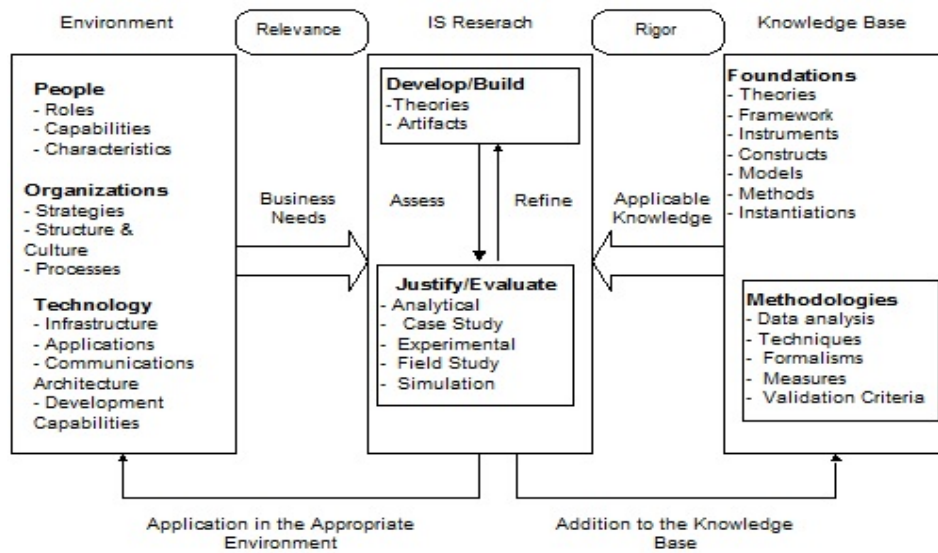
Hevner et al., (2004) argue that acquiring knowledge involves two different paradigms; behavioral science and design science (March & Smith, 1995). Behavioral science is the root of

the research method, whereas natural science is the research paradigm that develops and justifies the theories. The theories can be said as the principles and laws that describe or predict the phenomena in the organization and the human behavior.

The research framework of information system (Hevner et al., 2004) connects information system research with environment in terms of business needs. It also connects information system research with knowledge base in the form of applicable knowledge. Environment defines the issues (Simon, 1996) where the phenomena are located. Research on information system consists of people, organization (business), and/or the technology plan (Silver, 1995).

Within the research, there are goals, tasks, problems, and opportunities defining the needs of the people in the organization. This perception is built by the role, ability, and characteristics of the people in the organization. Business needs are assessed and evaluated within the contexts of strategy, structure, culture, and the existing business process. Business needs are positioned relatively towards the existing technology infrastructures, communication architectures, and capability development.

FIGURE 2
Framework of Information System Research



DISCUSSION

Understanding Business Needs

In order to see the success of improvement made, three indicators can be used; structure, process, and outcome of the improvement.

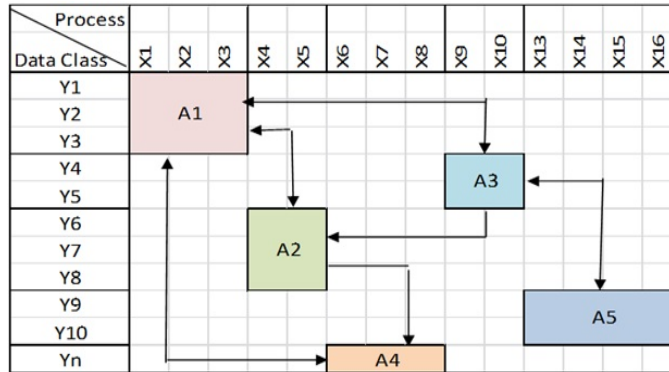
Understanding Process

This part describes the ways to understand the existing processes in the organization. By adopting the tools used (by IBM corporation, 1986) a diagram is made to define the architecture of information system. The information architecture (or the architecture of information technology, architecture of infor-

mation system, and infrastructure of information technology) is a mapping or planning on the needs of information within an organization (Turban, McLean & Wetherbe, 1999). This architecture is useful since it may serve as guidelines for current operation or become blueprint for future directions. The aim of

this architecture is to make information technology cover the needs of business of the organization. Therefore, information architecture combines the information needs, the component of information system, and the supporting technology. The following diagram illustrates the architecture of information.

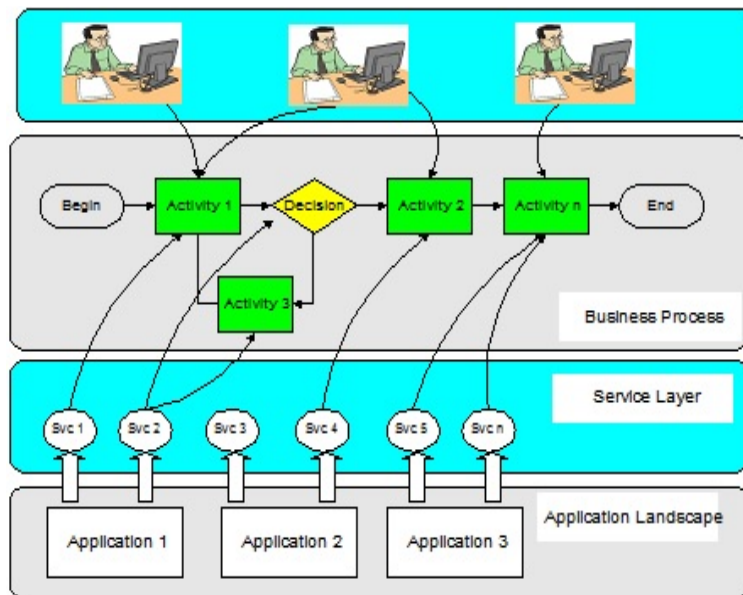
FIGURE 3
Defining the Architecture of Information



The second step is to identify the service on business processes involving the top-down and bottom-up approach; adopting the research of (Behara & Inaganti, 2007).

The following pictures illustrate the mapping between business activities and service at the application level and the mapping between human resources and business activities.

FIGURE 4
Identification of the Business Processes



The third step is the process of mapping the performance indicator of human capital. The processes related with human resource management are planning, selection, placement, train-

ing and development, and performance assessment. The scope of business process improvement is limited only to the variable of human resource placement within the business process,

whereas the management factor is the rotation (Sutan, Pontianak & Koresponden, 2012).

The mapping process can be illustrated in the following diagram: Performance is the result achieved by individuals by performing the given tasks based on their capability, experience, willingness, and time (Hasibuan, 2001). Performance is

the result or output from a process (Widiyanti, 2015). According to behavioral approach in management, performance is the quantity or quality of something resulted from services given by individual doing the job (Kakinsale, 2015). Performance is work achievement, the comparison between work results and the given standard (Horwitz & Heng, 2006).

FIGURE 5
Mapping Process

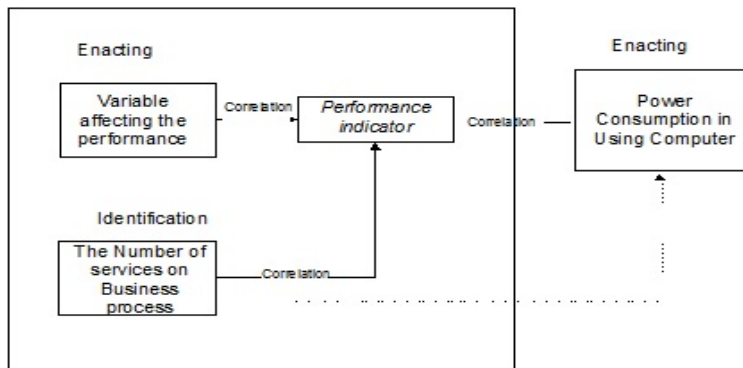
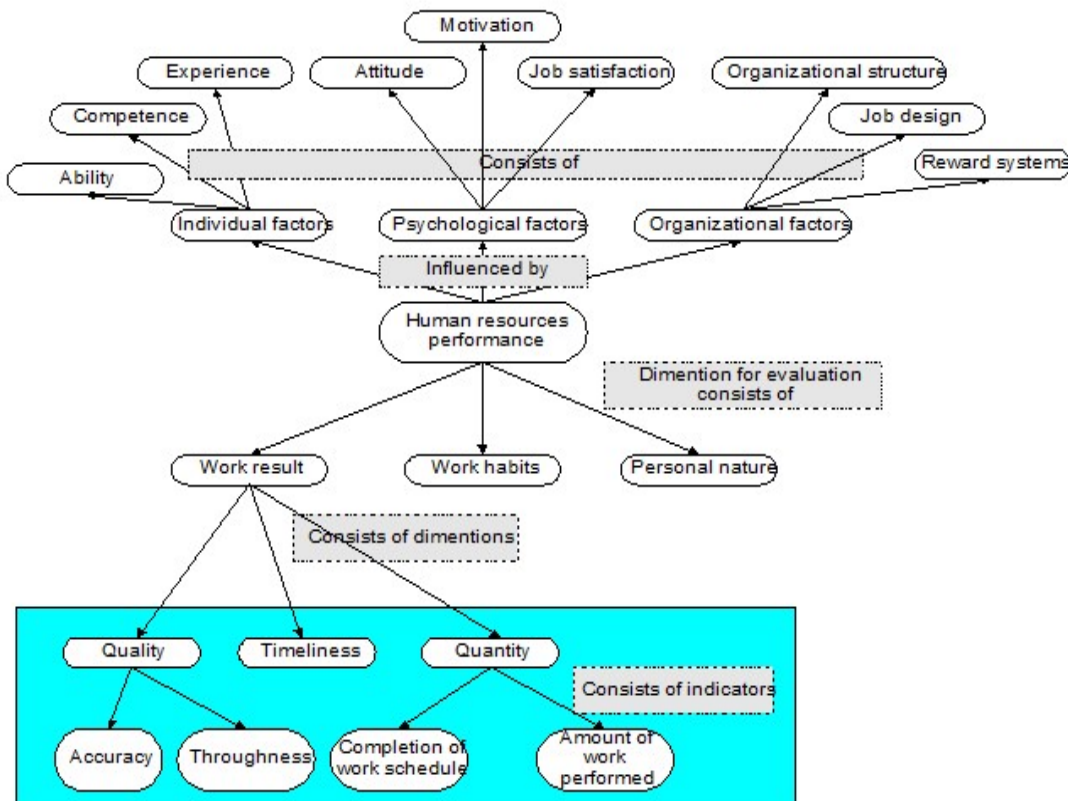


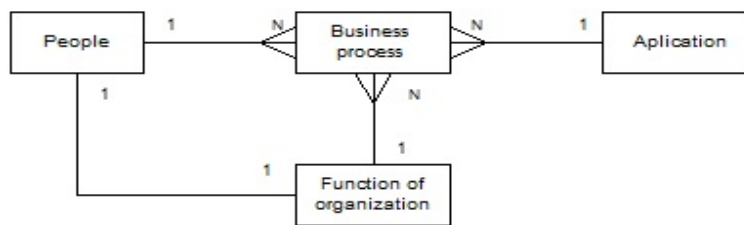
FIGURE 6
The Dimension of Work Result



The factors affecting the performance are capability (Aisha & Hardjomidjojo, 2013), competence (Setyaningdyah & Thoyib, 2013) experience (Durisko, Shipp & Dukas, 2011) attitude (Shahab & Nisa, 2014) motivation (Kiruja & Mukurum, 2013) work satisfaction (Pushpakumari, 2008) organizational structure (Folami & Jacobs, 2011) work design (Aroosiya & Ali, 2010) and reward system (Aktar, Sachu & Ali, 2012). Wirawan (2009) and Ayun (n.d.) describe the dimension of development and instrument indicators. First, the dimension of work result consists of indicator on quality of work result (quality), quantity of work result (quantity), and time precision (timeliness) in performing the given tasks. In addition, the dimension of work attitude consists of the indicators on work discipline, initiative, and carefulness. The last is the dimension of personal character

consisting of three indicators; leadership, honesty, and creativity. In this research, the instrument of performance evaluation is limited only to the dimension of work result; quantity, quality, and timeliness. The next step is to set the relation between objects. Relation is the connection represented between the objects. The relation built may consist of three kinds of relation; one to one, one to many, and many to many. On the other hand, object is things, issues, or individuals working on the business process, the business process itself, and the application used in the business process, that is a program built to perform particular function. The functions within an organization are a group of activities included in similar kind based on the characteristics or implementation. The following picture shows the relation between objects in the research.

FIGURE 7
Mapping Process

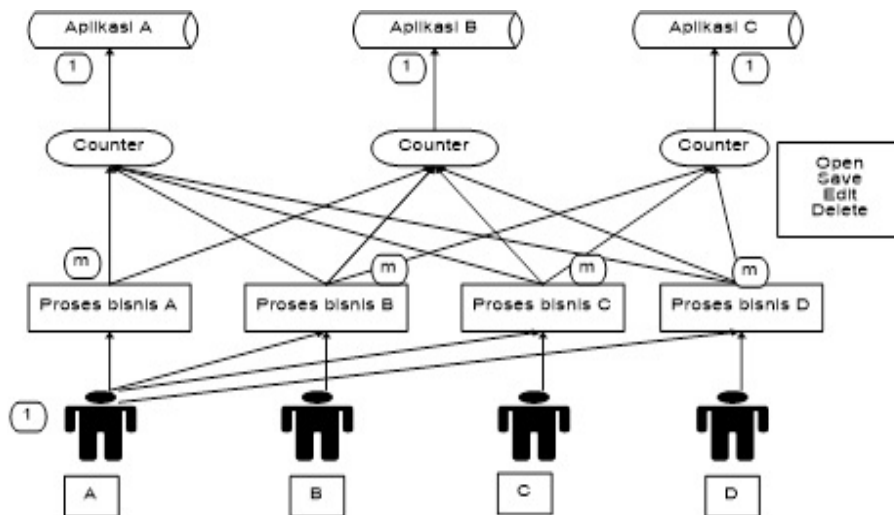


CONCLUSION

Every organization has particularly different model of business processes. Similarly, the business process within particular model has different number and volume transaction. The fol-

lowing figure illustrates the conceptual model to improve business processes by focusing on the performance of the human resources to increase efficiency.

FIGURE 8
Conceptual Model



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