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A Conceptual Model for the Use of Social Software in Business Process Management and Knowledge Management

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Abstract

Companies are required to have good management, systems and performance in order to survive in today's competitive business. BPM (Business Process Management) and KM (Knowledge Management) implementation can help organizations improve their capabilities through the use of individual knowledge resources and better organizational collective knowledge. In unstructured and constantly changing processes, traditional BPM often encounters problems because of the deviation between the model process and the reality of its implementation, as well as failure to improve ideas and innovation to the end user of the BPM process. This problem can be solved by encouraging various stakeholders to participate actively to BPM implementation. Using social software on BPM initiatives can actively involve all relevant stakeholders and assist in the knowledge management process. This research follows several steps i.e. reviewing the literature, formulation problems, analyzing results from the literature and finally proposing a conceptual model. The results of this paper are the conceptual model for using social software that will affect Business Process Management and Knowledge Management. This conceptual model is expected to open opportunities for further research in the field of social software, BPM and KM.

Keywords: Social Software; Business Process Management; Knowledge Management; Business Process; Conceptual Model

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1. Introduction

In order to remain profitable in global competition, reduce costs and several obstacles, companies must continue to review and enhance the business practices [1,2]. It is very important to pay close attention to the design and implementation of business processes in the company because they are the core of the company [3]. Business processes describe how the company can operate, therefore business processes can influence how the company performs [4]. The business process concept itself can be described as a set of activities carried out in such a coordinated manner in an organizational and technical environment that presents the achievement of business goals [2]. A business process must also have (1) specific objectives, (2) input, (3) output, (4) resource utilization, (5) multi-stage activity, (6) more than one unit in an organization, and (7) quality or value for consumers [5]. If managed properly, it is proven that business processes are needed so that organization performance will be better [6, 7].

Business Process Management (BPM) is a methodology to maintain the performance of business processes [8]. BPM is a series of methodologies, techniques and tools for analysing, designing and improving a company's processes [9]. BPM intends to maintain high cost and efficiency of business operations, accuracy and flexibility. When BPMs are successfully carried out by companies, they can create a higher performance process, which operates at a much lower cost, higher speed, greater accuracy, reduced set of problems and increased flexibility.

The BPM's efforts are carried out by method experts and IT developers in accordance with the requirements of the primary experts and end users with IT support [10]. BPM's traditional value proposals are limited in environmental conditions requiring very complex conversations and unpredictable process performance. In unstructured and constantly changing processes, traditional BPM often encounters problems because of the deviation between the model process and the reality of its implementation, as well as failure to improve ideas and innovation to the end user of the BPM process [11, 12]. This problem can be solved by involving stakeholders in BPM initiatives so that they actively participate in the implementation of the BPM.

To include different stakeholders, there is a new paradigm that is not interrelated and whose initial structure is irregular, known as social software. Social software is rapidly spread in society, organizations and the economy. Social software can sustain a more efficient and humane strategy to BPM, social software can design agile concepts for software development and support a gradual and collaborative design of processes [13]. The use of social software and the basic principles of BPM initiative to actively involve all relevant stakeholders is known as the BPM social approach [14]. There are benefits that the organization can gain from implementing social BPM and BPM, including centralized repository, knowledge management, increased collaborative effort or communication, integration of processes, involvement of the BPM community in process improvement and faster decision making [15]. Because of its benefits in increasing the organization's stability and response time, Social BPM could play a key role in risk reduction.

By implementing BPM and optimizing processes, data and information, a knowledge inventory needs to be developed throughout the process to shape the organization process with the resources needed [16]. The strategic management concept, which relates to the use of knowledge resources and implementing company goals and developing strategies for how knowledge can be promoted and used in a resource-oriented way that can increase value is called Knowledge Management (KM) [17]. The purpose of KM is to identify knowledge sources within the company, uncover knowledge deficits, store and use knowledge and also to regulate and evaluate the company's internal knowledge processes in improved knowledge practices, improved organizational behaviour, better decision making and improved organizational performance. By implementing KM and BPM in organizations, it can improve organizational capabilities through the use of individual knowledge resources and organizational collective knowledge [16].

There are not many studies that discuss the relationship between the use of Social Software and KM on the implementation of BPM. Previous study only explained the relationship of KM in managing knowledge that supports the process of implementing BPM in the Organization. This paper aims at filling this gap and analyse the impact of social software use in organizations on BPM and KM practices. The final result of this paper is a conceptual model that can be used in the field of social software, BPM and KM as a reference for further research.

2. Theoretical background

Business process management

BPM is a process-oriented management discipline which includes techniques to support process design, application process, management and analysis of business processes involving human resources, organisations, apps, documentation and other information sources [18]. BPM is a management technique that includes methods and tools for business processing and optimization to support, design, analyse and implement [19]. BPM includes strategic processes for process design, process modelling, process execution, process monitoring and process optimization [20]. The process found in BPM is summarized in Table 1.

Table 1. BPM Process [20].

Process	Definition
Design	Stages process where each process is defined, identified, and in the process and discusses future processes among stakeholders.
Modelling	Stages process where the results of the design phase are accepted and modelling the possibility of business processes being operated in different scenarios.
Execution	Stages in which new business processes are implemented and business processes developed.
Monitoring	Stages process where business processes are monitored, and the value of process metrics is collected.
Optimization	Stage process where the monitoring process data is analyzed and how well the process has an effect on actual business conditions.

Knowledge management

Without a concrete idea of knowledge, certainly there is no KM project that can succeed [16]. Knowledge is often interpreted as "personal beliefs or someone justified" [21]. In general, the term knowledge refers to the merge of data and information. It can also be said that knowledge is information with guidance for an activity based on views and mix of experiences, principles, relevant information, expert perspective and intuition that offers an environment and structure by evaluating and combining new possibilities and info [22]. Furthermore, knowledge is classified and characterized by three different specifications [23], as follows :

- ***Explicit*** or ***codified knowledge*** is knowledge that can be conveyed in formal and systematic language and there are physical forms, both print and digital. It is possible to express explicit knowledge in the form of data, scientific formulas, requirements, manuals and others [24].
- ***Tacit knowledge*** is knowledge we realize or understanding, but expressing it clearly and completely is difficult. Tacit knowledge is very difficult to move to others because the knowledge is stored in the organization's minds of each individual [25].
- ***Embedded Knowledge*** refers to knowledge locked in processes, products, cultures, routines, artefacts, or structures. knowledge is embedded both formally, such as through management initiatives to formalize certain beneficial routines, or informally when organizations use and apply two other types of knowledge [26].

KM is part of the organization's planning, organizing, motivation and control of people, processes and systems to ensure that assets related to their knowledge are improved and used effectively [21]. KM is a method for achieving company goals by collecting, creating and disseminating information, insights, ideas and experiences [27]. KM is a process of identifying, capturing, managing and disseminating intellectual assets that are very important for the long-term performance of the organization [28]. From these various opinions, it can be argued that KM is a system to create, document, classify and disseminate knowledge in organizations. Thus, this knowledge can be easily used whenever needed, by anyone according to the level of authority and competence. Processes related to KM on knowledge include acquisition, creation, refinement, storage, transfer, sharing, and utilization [21].

In the knowledge creation process, refer to the Knowledge Spiral or SECI (Socialization, Externalization, Combination and Internalization) model [24]. SECI model is a framework that describes the knowledge creation process through dynamic interactions among tacit knowledge and explicit knowledge. Knowledge acquisition process describes several processes for gaining knowledge from external sources, such as searching the web, selecting sources to use and adding to the organization individuals with the desired knowledge. The knowledge refinement process relates to the processes and mechanisms used in selecting, filtering, purifying, and optimizing knowledge to be included in various storage media. The knowledge storage process includes knowledge contained in organizational participants ' heads, stored in electronic databases, obtained and stored by groups or teams and embedded in business processes, products and services as well as their relationships with customers, partners and suppliers. The knowledge process transfer and sharing are defined as two continuous processes. The knowledge transfer process involves from focused communication and directed knowledge from the known sender to the recipient. The knowledge sharing process is the dissemination of the less focused knowledge, for example through repositories, to individuals who were often undetermined to contributors [29]. The knowledge utilization process is the use of knowledge by developing different interpretations that have been identified with fundamental problems and are examined on the basis of the development of different understandings by different people or groups in order to assist in the provision of innovation, collective learning, learning individuals, or collaborative major issue addressing [30].

Social software

Social Software is a software that promotes human interaction and produces artefacts by merging input from independent participants without a predetermined mechanism [12]. If more users use it, social software can be defined as a software that gets better. From a technical point of view, social software is a class of web-based applications that support the management and exchange of information, identity and network management, interaction and communication [14].

Several types of social software combine information that is contributed in such a way as to create a new artefact and put together the contribution. An instance is the fusion information in such a wiki. Another type of social software also combines contributions, e.g. a blog only juxtaposes and connects information. Table 2 summarizes the types of social software classifications.

Table 2. Classification Type of Social Software [12].

Type	Definition
Wiki	Wiki produce content where the author makes text and multimedia then connects it to become a context. Wiki also has a collaborative editing mechanism mixed with optimistic mechanisms for access or locking as the core essence.
Blog	Blog does not have content integration; user contributions are provided separately but can still be used to annotate other content. Blog is used as an interaction mechanism that documents the communication sequence.
Tagging and Social Bookmarking	The association object information context of the tags is freely selected and not part of the structure. Creating an unregulated vocabulary flat world. Objects are not classified from a controlled vocabulary according to terminology but from a set of tags, namely cloud tags. Due to lack of controlled vocabulary and hierarchical terminology, synonyms and antonyms are not found on tags.
	A collection of collaborative bookmarks which often overlap with tagging as a set of bookmarks are organized using a tagging mechanism commonly known as social bookmarking.
Recommender and Reputation Systems	Recommender systems, applying social software principles including aggregation and consolidation (merging). Those are used in books, hotels etc. to aggregate reviews individually. And also have an evaluation of various user contributions which is an explicit statement from the user or from his behavior observation
	Recommendation systems are generally combined with a reputation system to enable weighting of user contributions with a reputation to avoid camouflage.
Social Links	Social links can only be defined by one person where users themselves can submit friendships with other users that aim to generate contact between other participants.

Social BPM

Social BPM has become a practice that actively involves all relevant stakeholders in the efforts of BPM by using social software and its fundamental principles [14]. Social BPM could be comprehended as a collaborative platform for BPM, an effort to solve problems that arise when BPM is implemented and adopted [31]. Social BPM is empowering between skilled business users through a platform to collaborate, identify and connect with each other which is not only dedicated to trusted colleagues, but also to individuals who may not have been connected before [32].

From some of the above opinions, it can be concluded that Social BPM is a method that allows user participation and collaboration through social software to improve business processes and BPM's life cycle. Schmidt and Nurcan [12], propose two possibilities of using social software in improving business processes including:

- **Increase knowledge and information exchange, accelerate decisions, etc**. This option arises because social software facilitates new patterns of communication between customers as well as companies. Corporate communication to customers and among customers, for instance, becomes two-way. By using blogs to capture thoughts on new product development and features, the company integrates customers into product development. As a result, more and more companies see social software and social production as a way to improve business processes and business models.
- **By using social software, business processes can also be managed by themselves, i.e. the process of designing, operating, improving, etc**. In this case, social software not only supports certain business process activities but also creates, operates and adapts abstract business processes. Using social software, substance that is changed is a business process model and relevant information.

3. Research methodology

A theoretical approach method is used for designing the conceptual model based on the currently available literature. This conceptual model is expected to be used as a reference and benchmark that can help companies improve the performance of business processes through the use of social software in organizations to implement BPM and KM.

The first stage of the research methodology is formulating the problem statement of the research. The main research question driving this study is the relationship between social software use in BPM and KM that affect the performance of the organization's business process. Literature studies are conducted to answer the research question. First, the literature is searched using keywords such as (Business Process Management) OR (BPM) AND (Knowledge Management) OR (KM) AND (Social Software). However, the search using all three keywords did not find a good match. This suggest that there has not been any research that focus on the three areas simultaneously. Therefore, different combinations of search terms are used. The result obtained journal papers that discuss the application of BPM and KM in organizations or papers that discuss the use of social software in organizations to implement BPM and KM. The search obtained 51 relevant papers for further analysis. There are several papers that become the main reference to form the conceptual model, that include the relationship between BPM and KM [16], use of social software on BPM implementation [12], and also the use of social software on KM [33].

The results of the literature study are then integrated and analyzed to develop the conceptual model of the application of BPM, KM and social software usage. The conceptual model emphasized three main constructs i.e. process identification in business process management, knowledge management processes and classification of social software usage that are appropriate for the organization. BPM and KM are interconnected to improve business process performance in the organization.

4. Findings and results

A study of BPM-related research shows that more research focuses on the application of BPM and the relationship of KM to BPM. A study by [16] placed KM above BPM because KM as a process that encourages business process improvement and accelerates value creation can improve the performance of BPM. In this case knowledge becomes a critical component of business processes because the process is knowledge itself. KM is placed after BPM, so KM supports other basic processes such as research and development (R&D), customer relationship management (CRM),

and others. In this case BPM builds a framework for KM and determines how and when KM content is used in the process. BPM acts as a kind of structure for KM. KM and BPM are interdependent and integrated because knowledge must be taken in organizations through business operations.

On the other side, studies on the use of social software in the application of BPM are also available. Study by [14] examines the challenges of using social software on the implementation of BPM, where social software can also be used to resolve the deficiencies of the traditional BPM approach and as a new instrument supporting BPM activities. The use of social software in the BPM approach is commonly termed Social BPM. The first thing to do is to understand the scope of BPM, its main components and how they are based on social approaches. The research focuses on six core elements responsible for BPM's success, including: strategic alignment, governance, methods, IT, people, and culture. Study by [12] explains that using social software improves business processes by enhancing knowledge and information transfer, speeding up decision-making processes and others. In the evaluation and improvement stages, social software can facilitate collection and integration of knowledge and advice by all stakeholders.

The results of the literature review on each of the research domains are then analyzed and linked to produce a conceptual model. The main theory that links the domain of BPM and KM is by [16] theory, where BPM and KM need to go hand in hand to increase organization's competitiveness in facing fast changing global competition. Research by [12] relate the use of social software on the application of BPM in organizations where social software can support the process of BPM including the process of design, operation, improvement, etc. Business Process management constructs refer to [20] strategic processes including design, modeling, execution, monitoring and optimization. The knowledge management variable refers to [21] related to knowledge process including acquisition, creation, refinement, storage, transfer, sharing, and utilization. Social software variables refer to [12] which include a classification of social software types including Wiki, Blogs, Tagging and Social Bookmarking, Recommenders and Reputation Systems, Social Links. Fig. 1 is the result of a conceptual model built by researcher. Based on the conceptual model three propositions can be obtained that provide direction for future research. These propositions will be discussed further in this section.

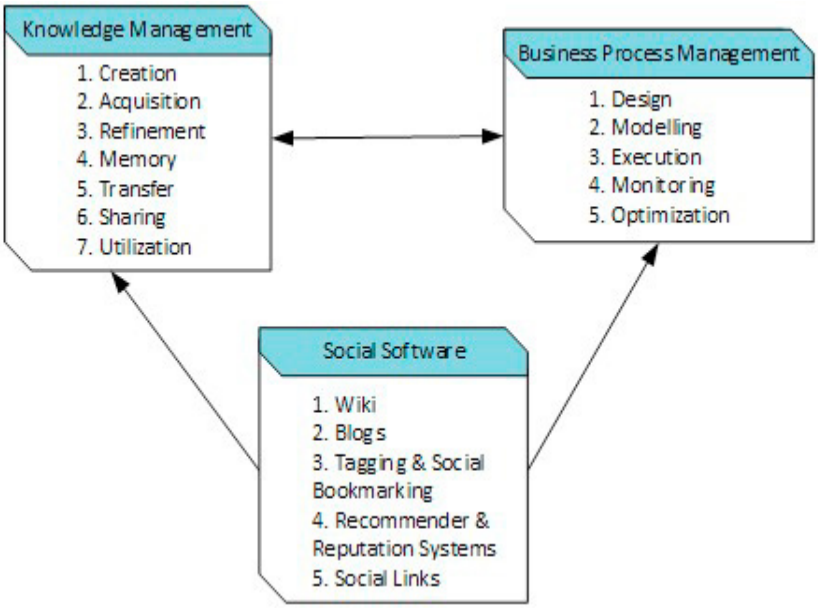

Fig. 1. Conceptual model relating to the use of Social Software on the BPM-KM practice.

- *Proposition 1: The Knowledge Management process is related to Business Process Management.*

The relationship among KM and BPM is explained by [16]. This relationship explains KM when placed above or after the processes in the company. The relationships are improving business processes, accelerating values, research,

customer relationship management (CRM), etc. This offers an opportunity to further explore the impact of knowledge management on business process management. Which part of processes where knowledge management and business process management are interconnected?

- *Proposition 2: Social Software supports the Knowledge Management process*

Social Software supports the process of KM, as researched by [33]. Social software acts as a Knowledge Management System (KMS) in the knowledge management process. The function of social software is as a tool for managing knowledge needed in the success of conducting business activities. This opens up an opportunity to explore what type of social software commonly used to support KM in different organization. What part of KM is supported by the social software?

- *Proposition 3: Social Software supports Business Process Management*

Research conducted by [12] explained that social software supports Business Process Management. Social software supports BPM to increase the exchange of knowledge and information. Social software facilitates new patterns of communication among businesses and clients. The use of social software can also support BPM in the process of design, operation, improvement in business processess. The question is: How social software work to support different stages in business process management lifecycle?

5. Conclusion

Based on the findings in the conceptual model and previous research it can be concluded that the use of social software will be able to help the process of business process management and knowledge management. As explained by previous studies social software helps the process of storing information related to consumers, colleagues and suppliers to the company and helps the company's operations related to improving business process performance. Social software also acts as a KM tool for maintaining and sharing knowledge to organization participants. The use of knowledge management could also affect the implementation of business process management because knowledge is the most important resource in optimizing and creating new business processes for the company. The propositions described are expected to be a reference in future research. Where the focus for this research is on the use of social software that helps improve the performance of the company's BPM and KM application.

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