Social Business Process Management Approaches
A Comparative Study

Hadjer Khider[1] and Amel Benna[1,2]

[1]*Department of Information Systems and Multimedia Systems,CERIST, Algiers, Algeria*
[2]*Computer Science Department, USTHB University, Algiers, Algeria*

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Abstract: The rapid development of web 2.0 has led fundamental changes and has offered huge opportunities in the way the business process models are made available to individuals and organizations. Indeed, in order to enhance their traditional Business Process Management (BPM), organizations are looking increasingly to use these web 2.0 technologies. The social software easiness of use and their distinct features (weak ties, implicit knowledge, knowledge sharing, etc.) has recently led the emergence of the social BPM approaches. In this paper, we discuss the interaction of social software with BPM and provide a comparative study between social business process approaches for each business process life cycle phase; we then propose how, in each phase of a business process life cycle, a BPM can capitalize on social software.

1 INTRODUCTION

The rapid development of web 2.0 has led fundamental changes and has offered huge opportunities in the way the business process models are made available to individuals and organizations. Indeed, Web 2.0 platforms have favored the development of the social software, this social software supports various actors in the production of content generated by the user developing and maintaining social relationships, promotes interaction and collaboration, supports the communication and the collaboration between users and increases the scope of interactions (Graupner et al., 2012).

At the same time, the business is in fast evolution; some companies and organizations need to communicate directly with their partners and customers and to quickly adapt the results to the daily activities. In response to these challenges of performance, of competition and volatility of the market, it is widely recommended that the business processes of these companies integrate social web (Brambilla et al., 2012).

Indeed, the business Process Management (BPM) is designed to support the management of business processes in organizations. Its objective is to make efficient, flexible and competitive business while producing goods and the quality services at a lower cost to users (Weske, 2007). Asocial software can enhance business processes by improving the exchange of knowledge and information, and by speeding up the decision making process. It can also be used to overcome the shortcomings of traditional approaches of BPM (Schmidt and Nurcan, 2008). Social BPM combines social software with BPM in order to optimize and improve the efficiency of traditional BPM. It aims to make interactions and participation, on internal and external plan to the enterprise level, loosened in order to maximize collaboration in a larger community.

The contribution of this paper is to present a comparative study between the most referenced social BPM approaches and to propose how in each phase of a business process lifecycle, a BPM can capitalize on social softwares. The rest of the paper is organized as follow: Section 2 provides an overall understanding of the concepts related to the business process lifecycle. Section 3 evaluates social BPM approaches in the different BPM lifecycle phases and proposes our position statement. Section 4 is conclusion.

2 BUSINESS PROCESS MANAGEMENT LIFECYCLE

The business processes lifecycle describes the sequence of activities leading to the implementation of a process management approach in an organization.

As described in Figure 1, four phases characterize the lifecycle of a business process (Weske, 2007):

- Design and Analysis phase: in this phase, the business processes are identified, validated and modeled;

- Configuration phase: in this phase, the business process is detailed by combining the roles to specific players in the business and involving a machine or a program activity;

- Enactment phase: in this phase, the activities are linked one after the other by following the process definition. In this case, the process and its activities are instantiated. These are performed by professional actors according to their role in the process;

- Evaluation phase: This phase, allows to analyze the process qualitatively and quantitatively in order to propose possible improvements of the process.
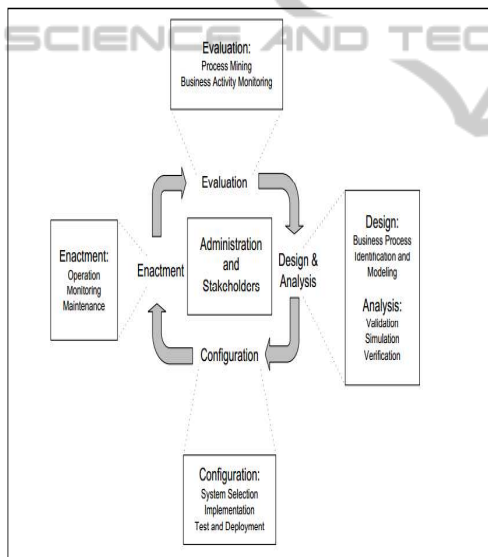

Figure 1: Business Process Management lifecycle.

3 EVALUATION OF SOCIAL BPM APPROACHES

To evaluate social BPM approaches, we organize this section as follows: We first define evaluation criteria (Section 3.1), followed by the description of the social BPM approaches (section 3.2). Then, we evaluate these approaches (Section 3.3) and present our position statement and we propose how BPM can capitalize from social software in each phase of its life cycle in the (Section 3.4).

3.1 The Evaluation Criteria

In this section, we present the social criteria, defined by Brambilla (Brambilla et al., 2012), and that form the foundation of our comparative study:

- Exploitation of weak ties and implicit knowledge: the aim is to discover and to use the knowledge and the informal relationships in order to improve the execution of the activity.

- Transparency: the goal is to make the decision procedures of the process more visible to stakeholders.

- Participation: the goal is to involve a wider community in order to sensitize users in contributing to the activity they want in process design and execution.

- Activity distribution: the objective is to assign an activity to a wider set of actors or to find required contributors for its execution.

- Decision distribution: the goal is to generate opinions that help to making a decision .The users will not only participate by giving their input and be involved in the process design, but they would also all play a major role in decision making.

- Social feedback: Having a social feedback is to acquire information from a wider set of stakeholders for process improvement.

- Sharing knowledge: the aim is to disseminate knowledge to improve the execution of tasks, and at the extreme, it could be to promote mutual assistance between users in order to avoid making costly activities.

3.2 Social BPM Approaches

Recent research on BPM (Qu et al., 2008), (Schmidt and Nurcan, 2008), (Brambilla et al., 2012), (Rangiha and Karakostas, 2013), have been proposed to integrate elements of social software in the BPM life cycle. In this section, the most referenced approaches combining social software with BPM are presented based on the business process life cycle and the evaluation criteria described in section 3.1.

The approach proposed in (Brambilla et al., 2012) called BPM4PEOPLE, is based on the integration of social software to the BPM in order to improve organizational effectiveness by using the potential of social software. This approach is based on model driven architecture or MDA. A specific notation is defined by Brambilla et al in (Brambilla et al., 2011) to describe the social behavior of BPM (defined as extension of BPMN 2.0). This notation allows the annotation of

Table 1: Evaluation of Brambillaś approach.

BPM life cycle	Exploitation of weak ties	Decision distribution	Sharing knowledge Transparency	Transparency	Participation	Activity distribution	Social feedback
Design and Analysis phase		poll results		sharing social content, social network notifications			poll results, votes and comments
Enactment Phase		poll results, votes and comments		Publication of social content, social network notifications		Find skills for activity, assign an activity to social actors	
Evaluation Phase	Comments				through a vote on social networks		poll results, votes and comments

Table 2: Evaluation of Rangihaś approach.

BPM life cycle	Exploitation of weak ties	Decision distribution	Sharing knowledge Transparency	Transparency	Participation	Activity distribution	Social feedback
Design and Analysis phase	solicitation of users networks	Manager returns the final decision		through notifications	public contribution in design phase		poll results
Enactment Phase	solicitation of users networks			through notifications	public participation		poll results
Evaluation Phase	solicitation of users networks	poll results			through notifications	public participation	poll results

specific tasks such as collaboration and their potential implementation in a social network environment and provides four main extension points:

- Social monitoring: the ability to capture social activities and events of a social network;
- Adoption of social behavior: the ability to perform social activities;
- Description of social content: the ability to model social data and content;
- Social access: the ability to use user profiles and social credentials to access the BPM platform.

We summarize the social criteria for each business process life cycle of Brambilla et al. approach (Brambilla et al., 2012) in table 1.

In the Goal-based modeling approach proposed in (Rangiha and Karakostas, 2013) the user groups can be involved in collaboration in both the business process execution phase, in order to achieve fixed goals, and in the design process. Thus, instead of developing the processes and send them to the end users, the idea is that end users are also involved in the design process. The model proposed by Rangiha (Rangiha and Karakostas, 2013)comprises the following elements:

- User-System Interaction through recommendation: To achieve a specific goal, the user is flexible to choose its action. The system assists users to ensure firstly, that the actions taken lead the expected goal, and secondly that the actions can be captured and reused in future by the social BPM.

- Business rules: Constraints and dependencies are the essential elements of recommendation mechanism. Indeed, before to recommend or to suggest a task, this mechanism is assisted by some business rules.

- Social goals: As the proposed model is based on an approach based on a goal, it is important to specify what type of goal is referred to in the context of social BPM.

We summarize the social criteria for each business process life cycle of Rangiha et al. (Rangiha and Karakostas, 2013) approach in table 2.

The business process models is shared and exchanged in Koschmider et al. approach (Koschmider et al., 2009). Users are assisted by an existing recommendation system. In this approach the use of social networks can help users behave as expert modelers. Two kinds of social networks are used to this end:

- A social network from a process model repository: the social network provides an organizational view of business processes.

- A social network from a recommendation history: it shows the relationship among modelers who use the recommendation system. The social network is generated from its usage history.

We summarize the social criteria for each business process life cycle phase of Koschmider et al. approach (Koschmider et al., 2009) in table 3.

An alternative solution for BPM is presented in (Qu et al., 2008) approach. Indeed, instead of having some experts as process creators, a Web-based application is provided to all experts to collaborate on the standardization and the optimization of processes. In particular, a process of collaborative wiki, called Cyano, is developed. It is used to publish hundreds of processes and it is used by thousands of experts. Beside to be content consumers, this wiki allows users to become content creators. The main contributions of Qu et al. in (Qu et al., 2008) are as follows:

- Introduction of a BPM system based on social networks.

- The proposal of a novel social recommendation system, SCOOP, to customize the neighbors of user in collaboration.

- Deploy SCOOP to a production environment and confirm its success on a real data and usages

We summarize the social criteria for each business process life cycle phase of Qu et al. approach (Qu et al., 2008) in table 4.

3.3 The Evaluation: A Comparative Study

This evaluation aims to answer to research question in which phases of BPM lifecycle social BPM approaches could meet criteria presented in Section3.1. For this comparative study we take into account the social features for BP in the following phases of BPM life cycle: Design, Enactment, and Evaluation. Across the table 5, it was concluded that social BPM approaches presented do not meet all the social criteria.

Indeed, Brambilla et al. approach in (Brambilla et al., 2012); doesnt include some social criteria such as exploitation of weak ties, sharing knowledge and activity distribution in design and analysis phase. Rangiha et al. approach in (Rangiha and Karakostas, 2013) does not include sharing knowledge and activity distribution in the following phases: design and analysis phase, enactment phase and the evaluation phase. Also, Qu et al. approach in (Qu et al., 2008) includes the social aspects only in the design phase. Koschmider et al approach in (Koschmider et al., 2009) includes the social criteria only in the design phase and the decision distribution and participation are not taken into account in this phase.

3.4 Our Position Statement

Following the comparative study, we concluded that social BPM approaches presented at the top take into account only some social criteria and only in some phases of the business process life cycle. This section aims to describe how BPM can capitalize from social software in each phase of life cycle.

3.4.1 Design and Analysis Phase

As in Qu et al. approach in (Qu et al., 2008) that meets all the social criteria in design phase, our approach will be based, in the design and analysis phase, on weak ties, sharing knowledge and activity distribution social criteria. Indeed, in this phase, the business processes are validated and modeled. The social software provides new opportunities for more efficient and flexible design of business processes. It can integrate stakeholders needs in a more comprehensive way by enabling better integration of all stakeholders in the validation and modeling. During this phase, the social software can also help to more easily create reference models.

Table 3: Evaluation of Koschmiders approach.

BPM life cycle	Exploitation of weak ties	Decision distribution	Sharing knowledge Transparency	Transparency	Participation	Activity distribution	Social feedback
Design and Analysis phase	based on users with same recommendations		Possibility of spreading new models in the model repository	Modelers access to the repository models		assign the new process models definition to a set of modelers	new business processes models generated
Enactment Phase							
Evaluation Phase							

Table 4: Evaluation of Quś approach.

BPM life cycle	Exploitation of weak ties	Decision distribution	Sharing knowledge Transparency	Transparency	Participation	Activity distribution	Social feedback
Design and Analysis phase	All the experts participate to define new models	taken into account	taken into account	expert input is visible	all experts can participate	between experts	collaborative wiki
Enactment Phase							
Evaluation Phase							

3.4.2 Enactment Phase

In this phase linking activities are performed by professional actors according to their role in the process. We propose to use social software to provide support for BPM workflows. Indeed, in both approaches of Qu et al in (Qu et al., 2008) and Koschmider et al in (Koschmider et al., 2009) social criteria is neglected in this phase. The exploitation of weak ties and social feedback are included only in Rangiha et al. approach in (Rangiha and Karakostas, 2013) and the sharing knowledge and activity distribution are not taking into account in both Brambilla et al in (Brambilla et al., 2012) and Rangiha et al. in (Rangiha and Karakostas, 2013)approaches.

3.4.3 Evaluation Phase

To analyze the process and propose its improvements, we propose to use social software in this phase. Indeed, the social software can enhance the exchange of knowledge and predicts decisions.

Few works include the social aspect in this phase.

Social criteria such as decision distribution, sharing knowledge are neglected in both Brambilla et al in (Brambilla et al., 2012) and Rangiha et al. in (Rangiha and Karakostas, 2013) approaches. What have been proposed are just minor contributions. There is also much speculation that social BPM has the greatest impact when running processes, it is important to establish a clear understanding of how the elements of social software will be used during execution processes

4 CONCLUSIONS

The traditional BPM approaches have evolved and ideas of integrating social software elements in the BPM life cycle have been proposed. However, these ideas are still in their infancy.

In this position paper we tried to identify and study how social software and BPM can be used in complementary ways to support collaborative work in organizations, and then present the most referenced

Table 5: Comparative study between Social BPM approaches.

BPM life cycle	Social BPM approach	Exploitation of weak ties	Decision distribution	Sharing knowledge Transparency	Transparency	Participation	Activity distribution	Social feedback
Design and Analysis phase	Brambilla et al, 2012		✓		✓			✓
	Koschmider et al, 2009	✓		✓	✓		✓	✓
	Rangiha et al, 2013	✓			✓	✓		✓
	Qu et al, 2008	✓	✓	✓	✓	✓	✓	✓
Enactment Phase	Brambilla et al, 2012		✓		✓		✓	
	Koschmider et al, 2009							
	Rangiha et al, 2013	✓			✓	✓		✓
	Qu et al, 2008							
Evaluation Phase	Brambilla et al, 2012	✓				✓		✓
	Koschmider et al, 2009							
	Rangiha et al, 2013	✓			✓	✓		✓
	Qu et al, 2008							

approaches in BPM that try to integrate social software in the different BPM lifecycle phases. An evaluation of the use of social criteria in the BPM life cycle for each approach is achieved. We find that, social criteria are not included in all BP life cycle phases and then propose an approach that includes these social criteria in the different BPM life cycle. As a future work, we propose an approach which inherits the approach of (Brambilla et al., 2012) and includes the social criteria such as weak ties, sharing knowledge and activity distribution in both design and enactment phases.

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