

# Combining Social Web and BPM for Improving Enterprise Performances: the BPM4People Approach to Social BPM

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## ABSTRACT

Social BPM fuses business process management practices with social networking applications, with the aim of enhancing the enterprise performance by means of a controlled participation of external stakeholders to process design and enactment. This project-centered demonstration paper proposes a model-driven approach to participatory and social enactment of business processes. The approach consists of defining a specific notation for describing Social BPM behaviors (defined as a BPMN 2.0 extension), a methodology, and a technical framework that allows enterprises to implement social processes as Web applications integrated with public or private Web social networks. The presented work is performed within the BPM4People SME Capacities project.

## Categories and Subject Descriptors

H.3.5 [Information Systems]: Information Storage and Retrieval — On-line Information Services – *Web-based services*; J.0 [Computer Applications]: General

## Keywords

Business process, BPM, social network, enterprise 2.0, web 2.0, MDD, Web engineering, conceptual modeling.

## 1. INTRODUCTION

With the advent of the Web, citizens and business users perform an ever-increasing fraction of their everyday activities online and consequently, organizations from all sectors (commercial enterprises, public administration bodies, health and education institutions, etc.) are more and more deploying their business processes on the Web, with the aim of better reaching their customers, employees and stakeholders and of reducing their total costs.

However, online availability is no longer sufficient for an optimal fruition of services and applications: the success of Social Networks has demonstrated the centrality of communities of practice, whereby users can interact with the service providers and among themselves, to be informed, share experience, and express their opinion on the quality of a service. This “socialization” of the users’ online experience, for customers, citizens, or employees, will carry over to the business processes of organizations, changing the paradigm of Business Process Management, from “closed” to “open and social”. No one size fits all organizations: flexibility has to reflect business requirements and the degree of openness to social and informal

interactions must be coherent with the organization of the enterprise.

Social BPM fuses business process management practices with social networking applications, with the aim of enhancing the enterprise performance by means of a controlled participation of external stakeholders to process design and enactment [5, 6, 7, 8, 9]. In classical BPM, processes are defined centrally by the organization and deployed for execution by internal performers, i.e., actors formally entitled to execute the activities and directly produce the advancement of a process case. This closed-world approach can be opened with social features at different levels of control [2].

This project-centered demonstration paper focuses on demonstrating a model-driven approach to participatory and social enactment of business processes, based on the implementation of such processes within Web applications and on their integration with public or private Web social networks.

We will present the ongoing work and the results achieved so far within the BPM4People project<sup>1</sup>, a 7<sup>th</sup> FP project funded under the SME Capacities program. The project is now only at month 5, but it has already delivered valuable results both at the conceptual and implementation level.

## 2. SOCIAL BPM

The social extension of a business process can be regarded as a process optimization phase, where the organization seeks efficiency by extending the reach of a business process to a broader class of stakeholders. This general objective articulates into different optimization goals, which constitute the motivation of the process socialization effort:

- Exploitation of weak ties and implicit knowledge: the goal is discovering and exploiting informal knowledge and relationships to improve activity execution.
- Transparency: the goal is making the decision procedures internal to the process more visible to the affected stakeholders.
- Participation: the goal is engaging a broader community to raise the awareness about, or the acceptance of, the process outcome.
- Activity distribution: the goal is assigning an activity to a broader set of performers or to find appropriate contributors for its execution.
- Decision distribution: the goal is eliciting opinions that contribute to taking a decision.

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<sup>1</sup> <http://www.bpm4people.org/>

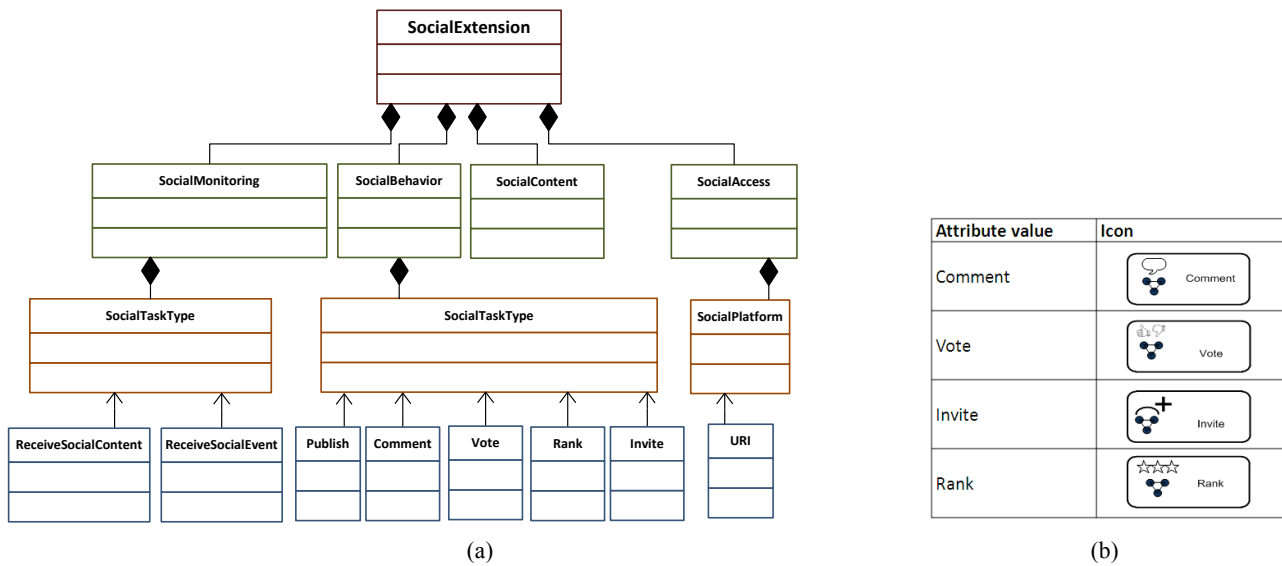


Fig. 1. (a) fragment of the metamodel of the proposed extension of BPMN for addressing Social BPM requirements; (b) example of domain-specific notation for some of the social task types.

- Social feedback: the goal is acquiring feedback from a broader set of stakeholders, for process improvement.
- Knowledge sharing: the goal is disseminating knowledge in order to improve task execution; at an extreme, this could entail fostering mutual support among users to avoid performing costly activities (e.g., technical support).

To implement these requirements, several tools are needed, both at conceptual and technical level: a notation for specifying social BPM aspects, a solid methodology associated to it, and toolsuite support at design and runtime for enabling social BPM modeling and execution. The current status of the Social BPM research and of the industry is still in its infancy: even the biggest BPM players only provide minor, loosely coupled social features within their BPMS offers. This status is far from enabling full exploitation of the social BPM benefits.

### 3. THE BPM4PEOPLE APPROACH

The BPM4People proposal aims at applying Web engineering and model-driven development techniques to Social BPM. The contributions of the project comprise:

- A summarization of the main factors that drive the socialization of a business process (socialization goals).
- An extension of BPMN 2.0 enabling the specification of social roles, activities, events, and process flows (Social BPMN).
- A gallery of design patterns, expressed in Social BPMN, that represent archetypal solutions to recurrent process socialization problems (social process patterns). Social patterns are referred to the goals they contribute to solve, to support the construction of process models from requirements.
- A technical framework for generating Social BPM applications from specifications encoded in Social BPMN, based on model transformations and on a runtime architecture integrating business process execution and social task enactment, implemented in a commercial tool suite called WebRatio [1].

The proposed technical framework will provide the unique capability of one-click social process prototyping. Thanks to the model-driven approach and default code generation rules, the business analyst will be able to immediately create a running Java Enterprise Edition (JEE) prototype of the business process designed in Social BPMN, with all the social interaction functions fully implemented. This will enable rapid evaluation cycles with the stakeholders, a key capability for reaching the Project’s objective or reducing the re-design of already deployed processes.

Another innovative aspect of our project will be the provisioning of a complete methodology for social BPM development, going from business requirements analysis to evaluation and maintenance. No such methodology exists today and we believe that such a contribution will be fundamental to the adoption of agile and social-based BPMN solutions in the future.

#### 3.1 Notation

Process design benefits from visual languages that convey the process structure and constraints in a clear way, immediately communicable also to non-technical stakeholders. Social process design should preserve the intuitiveness and expressivity of state-of-the-practice visual languages and possibly be based on standard notations.

To this end, social extensions of business processes can be conveyed using the BPMN standard<sup>2</sup> as a linguistic base. BPMN 2.0 incorporates a native extension mechanism that makes the language well suited for the adaptation to special process requirements, like those arising in Social BPM. By enriching the existing BPMN concepts with a social meaning, it is possible to achieve a visual language that is both familiar to BPMN practitioners and possess enough expressive power to convey social behaviors. At the current stage of the project, we have already proposed a first draft of this extension, as reported in [3].

<sup>2</sup> <http://www.bpmn.org/>

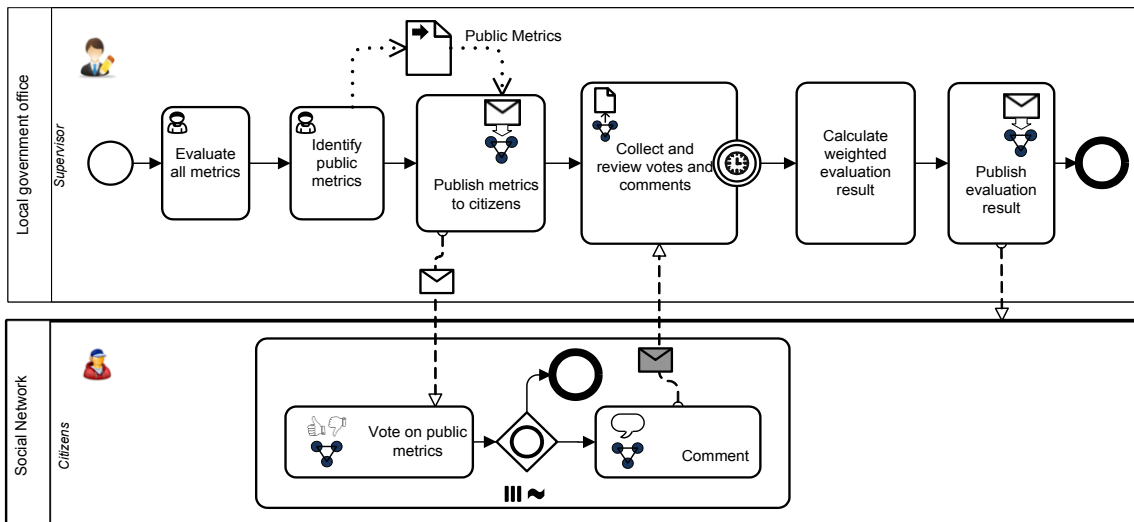


Fig. 2. Example of extended BPMN model for addressing Social BPM requirements of a participatory public administration process where citizens are involved in the evaluation of the government performance. The example features social behaviour tasks (e.g., *Publish metrics to citizens*), a social pool, and social monitoring tasks (e.g., *Collect and review votes and comments*).

The extension exploits the extensibility mechanism of BPMN 2.0 and provides four main extension points, as shown also in Figure 1(a):

- Social monitoring: the possibility of capturing social activities and events from a social network;
- Social behavior enactment: the possibility of performing social activities;
- Social content description: the possibility of explicitly modeling social data and contents;
- Social access: the possibility of using social user profiles and credentials for accessing the BPM platform.

This concretely consists in defining new types of BPMN tasks, events, and containers (pools and lanes) for describing the social interactions. Figure 1(b) shows some examples of notation for some social behavior tasks.

An example of resulting Social BPM model is shown in Fig. 2, describing a social process where a local government office publishes on the public social network of the citizens a set of quality metrics on which people are asked to evaluate the office. The social voting happens on the social platform, and then the offices collect and analyzes the data, which is finally broadcasted to the network.

### 3.2 Methodology

In line with the software engineering and the business process modeling practices, we will propose a rapid prototyping approach to Social BPM, combined with a pattern based design approach. At this purpose, we identify the most common social scenarios in BPM and we define the corresponding design patterns, i.e., archetypal or best practice solutions to recurrent problems where cooperative tasks are executed using social software.

A first set of social interaction patterns have been identified so far, including: Dynamic enrollment, poll, people/skill search, social publication, social sourcing, case advancement notification, and social feedback. Further details are available in [2].

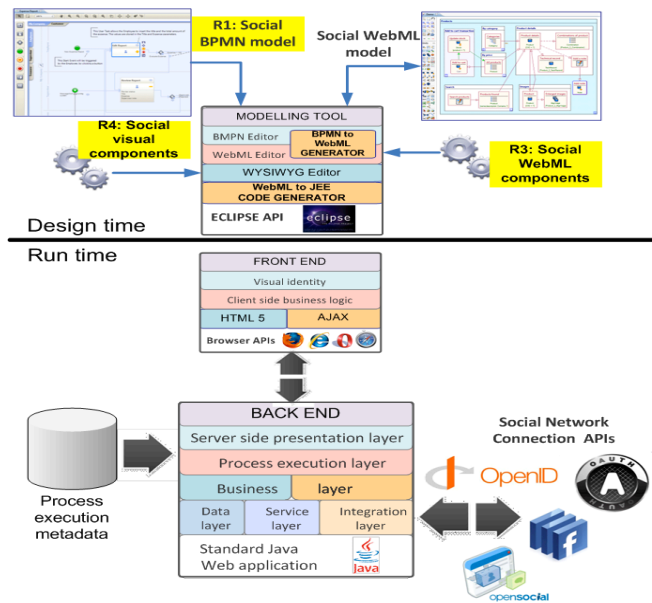


Fig. 3. Architecture of the BPM4People Social BPM system.

### 3.3 Technical Architecture

On the technical side, the BPM4People vision requires the construction of an innovative architecture and of tools for the design, implementation, deployment, and monitoring of Social BPM solutions, illustrated in Fig. 3.

The architecture has a **design time** part, comprising a Model-Driven Integrated Development environment, and a **run time** part, where automatically generated applications are run on a standard JEE platforms connected via Web Service APIs to one or more Social Networking Platforms.

The distinguishing feature of the BPM4People approach is the greater flexibility granted by a **two-level Model Driven Development approach applied to Social BPM**, which exploits two modelling levels and two transformations (model-to-model and

model-to-code), in the spirit of the Model Driven Architecture (MDA) of OMG: the two modelling levels are represented by the **extended BPMN models (R1)** at the PIM level and by the WebML model [4], extended with new **social components (R3)** and visual widget (R4), at the PSM level.

Two main model transformations enable the quick prototyping approach:

- The model-to-model transformation BPMN to WebML, automatically maps BPMN specifications into WebML, including the social extension (Social BPMN to Social WebML).
- A model-to-code transformation (WebML to JEE Generator), automatically produces standard JEE code from WebML

This transformation will use the **social WebML conceptual components and visual interaction widgets** to produce code that implements social interaction functions and the connection to Social Networking Platforms via API invocations.

## 4. IMPLEMENTATION AND DEMO

New social components that describe at the conceptual level the basic social features (e.g., *social login* and *social contact search*) have been implemented and included in the modeling and code generation framework of WebRatio.<sup>3</sup>

Furthermore, some demonstration applications have been implemented following the BPM4People approach. A simple demonstration scenario, similar to the one described in this paper, is proposed on the BPM4People site at:

<http://www.bpm4people.org/cms/content/en/demos>.

A demonstration video shows the approach at work and describes the generated application, which is actually generated automatically and is integrated with LinkedIn (for retrieving the user's contacts) and with Doodle (for performing a poll).<sup>4</sup> Figure 4 shows a screenshot of the generated application, which shows the list of retrieved LinkedIn contacts.

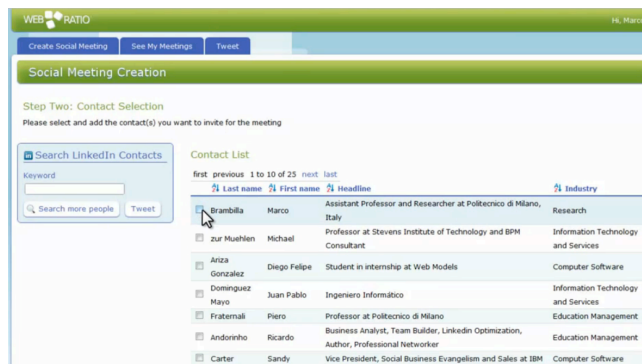


Fig. 4. Screenshot of the generated Social BPM application.

## 5. CONCLUSIONS

In this short paper we have presented the BPM4People approach to social BPM. The approach consists of defining a notation for Social

BPM defined as a BPMN 2.0 extension, a methodology, and a technical framework that allows enterprises to implement social processes. While the project is still in the early phases, we think we have already paved the way to concrete adoption of the approach. Future and ongoing activities are focused on applying it to real scenarios both within enterprises and public administrations.

## 6. ACKNOWLEDGMENTS

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For more information about the project please visit: <http://www.bpm4people.org>.

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<sup>3</sup> These components are available online on the WebRatio store. They can be downloaded for free and integrated in any WebRatio installation (<http://www.webratio.com/store>).

<sup>4</sup> The video is also available on YouTube at the following URL: <http://www.youtube.com/watch?v=7qNV11w1oiA>