Enhancing Enterprise Performance
with Social BPM and TOGAF Framework

Jyhjong Lin
Department of Information Management
Ming Chuan University, Taoyuan City, Taiwan
E-mail: jlin@mail.mcu.edu.tw, Fax: 886-3-3593875

Abstract—For the rapid advances of Internet technologies in recent years, EB (Electronic Business) has gained many attentions as a major theme for enterprises to keep their competitiveness. Amongst all possible endeavors, research has shown that an effective management of business processes is a critical source for enterprises to achieve their EB goals. In this paper, we present a layered architecture that employs such well-known constructs as the social BPM (Business Process Management) lifecycle and the TOGAF (The Open Group Architecture Framework) framework to support an effective management of business processes where the use of social tools in the BPM lifecycle under the TOGAF framework is particularly emphasized. To illustrate, the architecture is applied to the social BPM of an enterprise for book publishing.

Keywords—business process management; social tool; enterprise architecture; TOGAF

I. INTRODUCTION

For the rapid advances of Internet technologies, EB (Electronic Business) has been commonly recognized as a major theme for enterprises to keep their competitiveness. Research has shown that an effective management of business processes is a critical source for enterprises to achieve their EB goals. Therefore, it has usually been given as an important objective for an enterprise to promote its business processes through effective management mechanisms among which the BPM (Business Process Management) is mostly employed. In the literature, many discussions related to the BPM have already been presented [1-3]. More recently, some ideas about imposing social features on the BPM to enhance further business processes are proposed [4-6]. Extended from these ideas, we present in this paper a layered architecture that employs a lifecycle-based social BPM to support an effective management of business processes by emphasizing on the use of social tools within the BPM lifecycle.

In terms of the realization architecture for enterprise operations and governance (or the so-called Enterprise Architecture, EA), many EA frameworks have been proposed in the literature [7-9]. However, among these frameworks, in our view, the TOGAF (The Open Group Architecture Framework) framework [8] is most popular for improving the enterprise performance. In addition, due to its well-defined ADM (Architecture Development Method) cycle, its association with the above mentioned lifecycle-based social BPM for the realization of the social BPM is considerable where distinct architectural features can be connected with specific social BPM constructs. As such, our layered architecture would employ TOGAF as the realization basis for the above mentioned social BPM.

In general, the architecture starts from the characteristic identification of social business processes, via the recognition of architectural components to support the realization of these characteristics by the TOGAF-based social BPM lifecycle, and ends with the collaboration specification among architectural components to realize these characteristics. Particularly, UML (Unified Modeling Language) [10] and Petri-net [11] are used as its modeling tool. To illustrate, the architecture is applied to the social BPM of an enterprise for book publishing.

This paper is organized as follows. Section 2 presents the architecture that is modeled with four UML diagrams: use case, package, component, and sequence ones. The architecture is then illustrated in Section 3 by applying it to an enterprise with the social BPM for book publishing. Finally, Section 4 has the conclusions and future works.

II. THE ARCHITECTURE

The architecture is developed with the following four steps:

2.1 The requirement identification of the social BPM

The first step is to identify, described in an UML use case diagram, the characteristics of the social BPM. Initially, consider the situations of the phases in the social BPM lifecycle [6] as below.

1. Participatory Strategy opens the discussions about adapting the strategy for business processes for satisfying the enterprise strategy. Internal actors (i.e., project members or relevant employees) or external ones (prospective customers) can participate in the discussions via social communication tools.
2. Participatory Design opens the design of business processes based on the above process strategy. Internal or external actors can also participate in the design via social tools.

3. Participatory Execution opens the execution of business processes. Internal or external actors can participate in the execution (also via social tools) with such activities as sharing information, conversation among each other, and commenting on a subject.

4. Participatory Control opens the control of business processes. The focus is on the analysis about the executions based on some measures. The analysis results (e.g., the desired/undesired features of these processes) can then be used in the next-cycle phase of ‘Participatory Strategy’ for adapting the process strategy. Internal or external actors also participate in the control and analysis via social tools.

To address these situations, the desired requirements for the social BPM can be identified as in Figure 1 where


2. Social Tools – help actors complete their tasks around the social BPM lifecycle with various communication activities.

3. Social Business Processes – help enterprises to achieve their EB goals by the suitable processes of business and social tasks under well-defined adaption, design, execution, and control works.

2.2 The architectural identification of the TOGAF-based social BPM

With the above requirements, the next step is to determine the architectural components in the social BPM model that collaboratively support the realization of these requirements. Figure 2 illustratively shows in an UML package diagram the considerable components around the four phases of the social BPM lifecycle where TOGAF is employed as the realization basis for these components:

1. The four phases are opened for various actors to communicate with each other through social tools; for their realization, the underlying TOGAF application architecture is imposed to derive application components that provide services for the completion of the tasks around these four phases and also for the communications through these social tools.

2. Artifacts accessed in these four phases are also identified where (1) the ‘Business Process Strategy’ produced by the ‘Participatory Strategy’ phase is used in the ‘Participatory Design’ phase for producing the ‘Social Business Processes’; (2) the ‘Social Business Processes’ are executed in the ‘Participatory Execution’ phase that produces the ‘Process Measures’ to address the execution status; and (3) the ‘Process Measures’ are used in the ‘Participatory Control’ phase for analyzing these measures (to produce the ‘Process Analysis’) to determine the possible adaption of the current business processes for the next cycle of the social BPM life.

3. For these artifacts, (1) ‘Business Process Strategy’ is realized by the TOGAF business vision that derives application components for adapting the business process strategy; (2) ‘Social Business Processes’ are realized by the TOGAF business architecture that derives application components for specifying these business processes; and (3) ‘Process Measures’ and ‘Process Analysis’ are realized by the TOGAF data architecture to derives application components for storing/retrieving these process measures and analysis.
2.3 The structural specification of the TOGAF-based social BPM

With the above architectural components, the next step is to determine the structural constituents in these components that behave as a whole to realize the above identified requirements.

2.3.1 The structural specification for the four phases of the social BPM lifecycle

Figure 3 illustratively shows in a UML component diagram the considerable constituents (realized by the TOGAF ABBs) of the architectural component for the ‘Participatory Strategy’ phase where

(1) Two constituents are imposed to complete the required tasks in this phase and the TOGAF Architecture Building Blocks (ABBs) are imposed for their realization.

(2) Internal/external actors may discuss about the process strategy through ‘Social Tools’ via the ‘Social Communication’ constituent.

(3) The discussions may consider an analysis about the executions of current processes from the ‘Process Analysis’ constituent.

(4) With the discussions, some actors may make decisions about the adaption of the current process strategy such that a new strategy is produced via the ‘Strategy Decision’ constituent.

Similarly, Figures 4 – 6 respectively show the considerable constituents (also, realized by the TOGAF ABBs) of the architectural components for the remaining ‘Participatory Design’, ‘Participatory Execution’, and ‘Participatory Control’ phases of the social BPM lifecycle.
2.3.2 The structural specification for the artifacts accessed in the social BPM lifecycle

With the architectural constituents, the next is to specify the details about the relevant artifacts accessed in these constituents. As in above, these artifacts are also realized by the TOGAF ABBs. For example, Figure 7 illustrates a Petri-net based specification for the ‘Social Business Processes’ artifact accessed in the social BPM lifecycle where (1) the Petri-net based model supports a sufficient formality and hence the behaviors of these processes can be analyzed for verifying specific properties; (2) in a social business process, there may have tasks that contain multiple instant activities; such a task is performed by internal/external actors that results in the executions of its inside activities; (3) with the executions of these tasks/activities, relevant objects may be associated with specific actors for their possible actions on these objects (e.g., commenting on a subject); and (4) external actors can only participate in the executions over ‘Social Tools’ where the execution effects are communicated with the internal actors through suitable channels in these ‘Social Tools’ such as e-mails, group sites, and collaborative docs.
2.4 The behavioral specification of the TOGAF-based social BPM

With the above constituents/artifacts, the next step is to specify the collaborations among them that behave as a whole to realize the identified requirements. For illustration, Figure 8 shows the behavior (by its reachability graph diagram) of the ‘Social Business Processes’ artifact specified in Figure 7 where the analysis for verifying such properties as deadlock, fairness, and sequence/parallelism can be proceeded [13]. For instances, some undesirable properties can be found in the specification: (1) a deadlock happens between nodes n5 and n6; this is because the executions of ActivityA3 and ActivityU2 need the presence of input objects which are produced by each other; and (2) an endless loop may happen between nodes n5 and n6 because the executions of ActivityA3 and ActivityU2 result in the presence of input objects which make each other executable. In general, such a specification can be used in the ‘Participatory Execution’ phase for executing the tasks and activities in the specified processes where the concerned measures about these executions (e.g., desired or undesired business effects) can be collected.

III. APPLYING TO THE SOCIAL BPM FOR BOOK PUBLISHING

For illustration, we present in this section how a service for authors to collaborate with the book publishers via social tools to publish new books is realized by the proposed architecture.

3.1 The requirement identification of the social BPM for book publishing

The first step is to identify the requirements for the social BPM for publishing new books. As discussed in Section 2.1, the desired requirements for the social BPM for publishing new books can be identified as follows: (1) Participatory Strategy/Design/Execution/Control – help book publishers and authors to adapt, design, execute, and control a process for publishing new books; (2) Social Tools – help book publishers and authors to complete such social activities as sharing ideas about the book contents; and (3) Social Business Process – help book publishers to complete the book publishing under the four phases of the social BPM lifecycle.
3.2 The architectural identification of the TOGAF-based social BPM for book publishing

With the above requirements, the next step is to determine the architectural components in the social BPM model for the realization of these requirements. As one may conceive, since these requirements are strictly the same as those in Figure 1, the social BPM model for book publishing hence has the same components as those in Figure 2 to collaboratively support the realization of this model.

3.3 The structural specification of the TOGAF-based social BPM for book publishing

With the above architectural components, the next step is to determine the structural constituents in these components. As in above, since the requirements for the social BPM for book publishing are strictly the same as those in Figures 1 & 2, these components hence have the same constituents as those in Figures 3 – 6. Additionally, with these constituents, the next is to specify the relevant artifacts accessed in these phases. For illustration, Figure 9 shows an example specification of the ‘Social Business Processes’ artifact accessed in the social BPM lifecycle for book publishing where (1) in this process, a task that contains multiple activities for sharing ideas about the book contents is specified; the task is performed by the publishers and, once started, its activities are executed due to the presence of input objects or the interacting of publishers/authors; (2) with the executions of these tasks/activities, relevant objects may be associated with the publishers/authors for their possible actions on these objects (e.g., read/revise the ideas); (3) the authors can only participate in the executions over the ‘wikis’ tool; and (4) the process specification is Petri-net based such that the analysis about its properties can be proceeded.

3.4 The behavioral specification of the TOGAF-based social BPM for book publishing

With the above constituents/artifacts, the next step is to specify the collaborations among these constituents/ artifacts. For illustration, Figure 10 shows the behavior of the ‘Social Business Processes’ artifact specified in Figure 9 where there are two undesirable properties in the specification: (1) a deadlock happens between nodes n5 and n6 because the executions of ‘Organize Ideas’ and ‘Revise Ideas’ need the presence of input objects which are produced by each other; and (2) an endless loop happens between nodes n5 and n6 because the executions of ‘Organize Ideas’ and ‘Revise Ideas’ result in the presence of input objects which make each other executable.
IV. CONCLUSIONS AND FUTURE WORKS

In this paper, we present a layered architecture that addresses a lifecycle-based social BPM to support an effective management of business processes by emphasizing on the use of social tools in the BPM lifecycle under the TOGAF framework. For illustration, the architecture is applied to a social BPM for book publishing. The desired requirements for the social BPM for publishing new books are identified, realized, and achieved for more satisfying the prospective participants (i.e., the book publishers and relevant book authors).

As our future work, we will continue to explore the real implementation of the architecture on such a social BPM for book publishing. In addition, we will also study its application and implementation on other kinds of social BPM including for instance bookretails and exchanges. Thereafter, we will also look forward to the practical use of the architecture in other application domains like Collaborative Commerce and Supply Chain Management; the usability of applying such features as the TOGAF framework and social entities on the four phases and relevant accessed artifacts of the social BPM lifecycle will be carefully experienced.

ACKNOWLEDGMENT

The material presented is based on the work supported by the Ministry of Science and Technology in Taiwan under Grant MOST 104-2410-H-130-025.

REFERENCES


BIOGRAPHY

Jyhjong Lin is a full professor and the chair of the Department of Information Management at the Ming Chuan University in Taiwan. His research interests include Software Engineering, System/Business Architecture and Management, and Web/Cloud Applications. Prof. Lin received his Ph.D. degree in 1995 from the Computer Science Engineering Department at the University of Texas at Arlington in USA.