Guidelines for Business Process Modeling and Its Application to Training Process

Vijay V. Gandhewar and Aatul P. Wadegaonkar

***Abstract*—A process model provides a comprehensive understanding of a process. An enterprise can be analyzed and integrated through its business processes. Different process models have been developed by academia and industry to enhance the effectiveness and efficiency. This paper gives general guidelines for process model implementation which helps modeler to ensure features like readability and understandability; most process representations in their modeling approach. The case study of training process in thermal power plant in India is discussed.**

***Index Terms*—BPM, modeling, training process.**

I. Introduction

Highlight Modeling of BPR is intended to represent the information and the information flows in an organization through the use of tools such as conceptual framework, mathematical models and simulation. The process modeling method has two phases: an informal fact gathering phase and a formal descriptive phase. Business process modeling enables a common understanding and analysis of a business process. A process model can provide a comprehensive understanding of a process. An enterprise can be analysed and integrated through its business processes. Hence the importance of correctly modeling its business processes [1]. The modeling of business processes is becoming increasingly popular. Both experts in the field of Information Technology and business Engineering have concluded that successful systems start with an understanding of the business processes of an organisation [2]. The techniques for characterizing and analyzing business processes are referred to as business process modeling (BPM). Models are useful because they can be used to simplify complex systems. Models highlights or emphasize certain critical features of a system, while simultaneously de-emphasizing other less important aspects of the system [3]. Furthermore, business processes are a key factor when integrating an enterprise. For agile business operation, modern corporations are making frequent business process changes as well as organizational changes through Desirable Features / Characteristics of Modeling & Guidelines For Business Model.

Ron Anjard (1998) has given characteristics of modeling methods including the following four:

1) Formality: How formal or precise are the languages and notations of the modeling method? Some methods have a set of well defined notations and require formal semantics to be strictly followed. Other methods may only have a set of guidelines. While formal methods may be well positioned to provide a more precise representation of a process and have the benefits of well-developed properties for advanced analysis, they may also be less flexible in terms of modeling ambiguous processes and human involvement.

2) Scalability: How large and complex a business process can the modeling method represent? Many methods can handle large processes and offer mergers and acquisitions. In 2001, Hewlett-Packard Company and Compaq Computer Corporation announced a merger agreement to create an 87 billion dollar global technology leader. The merged company offers the most complete set of products and services in the IT industry with expected cost savings of approximately 2.5 billion dollar a year. Many important issues arise in integrating the two giant organizations, one of them being how to integrate their business processes. Since frequent changes in business processes and operations are becoming increasingly common, both through internal reorganizations and through mergers and acquisitions, the integration of business processes become important [4]. In the Following section literature related to various aspects of BPM is classified and discussed to understand the importance and role of BPM in successful implementation of BPR. Business process modeling is essential within a BPR life cycle. The BPM plays two important roles:

1) To capture existing processes by structurally representing their activities and related elements, and
2) To represent new processes in order to evaluate their performance.

Besides above two functions, a BPM method can posses the capability in facilitating process evaluation and alternative selection. This can be further effectively implemented through computer simulation [5].

II. Desirable Features / Characteristics of Modeling & Guidelines for Business Model

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2) Scalability: How large and complex a business process can the modeling method represent? Many methods can handle large processes and offer mechanisms that support multi-level representations. Other methods may be best suited for modeling processes that are relatively small in size.

3) Enactability: Does a modeling method support automated enaction and process manipulation? Some modeling methods only allow process designers to depict a process in a static state, whereas other methods, such as Role Interaction Net, also provide automated tools for process simulation and analysis.

4) Ease of use: How difficult is the modeling method for process designers and other non-technical employees to understand and use? Many existing methods use simple and easy-to-understand notations such as arrows and boxes. Other methods may utilize more complicated mathematical symbols and formulae [6]. According to Harrington (1991) the following characteristics can be assigned to each process.

1) Flow-The methods for transforming input into output.
2) Effectiveness-How well customer expectations are met.
3) Efficiency-How well resources are used to produce an output.
4) Cycle time-The time taken for the transformation from input to final output.
5) Economy-The expense of the entire process.

Understanding these process characteristics is essential for three reasons. First, it helps identify the problem areas within the process. This information will provide the basis for redesigning the process. Second, it provides the database needed to make informed decisions about incremental or radical changes. We need to see the impact of changes not only on individual activities but also on the process as a whole and on the departments involved. And third, it is the basis for setting improvement targets for evaluating results [7].

When analyzing the business process it is necessary to have more sophisticated mechanisms than qualitative analysis of static diagrammatic models, models that present both dynamic and functional aspects of the process. In these cases users might want a model, which permits him/her more interaction (e.g. it might be simulation) to analyse the question 'what if'. Finally, in presenting the business process, approaches easy to understand are chosen, again a readily understandable, typically diagrammatic notation is suitable [8]. Falkernberg (1996) has given three quality properties of the modeling: expressiveness, arbitrariness and suitability [9]. Harmsen (1997) proposes other desirable features of modeling such as comprehensibility, coherence, completeness, efficiency and effectiveness [10].

III Guiding Principles for Practical Modeling

In creating the construct for a practical modeling environment that can be very quickly understood by any business executive, the following principles are key:

1) All relevant objects need to be classified in no more than a handful of groups, thus enabling the comprehension of the model.
2) Hierarchical decomposition enables drilling down to expanded level of details, while maintaining the simplicity of information structure.

Modelling the corporate processes and functions has been the subject of numerous methods and techniques in the information systems analysis.

Mentzas (1997) has given guidelines for business model which cover the following requirements:

1) Description of the process steps and their results (i.e. functions/activities that need to be performed, conditions necessary, sequencing of activities, rules for feedback or iteration, constraints on the process, etc.)
2) Description of the state of objects produced by or used in performing the process;
3) Description of organizational roles (i.e. who implements which activities, mapping of individual process steps to tools or humans, decision-making roles, etc.);
4) Possibility of identifying bottlenecks, inconsistencies or anomalies in the process;
5) Analysis of process management issues, e.g. process scheduling, concurrent/sequential implementation of activities, idle times, resource conflicts, etc [11].

Process maturity: Macintosh (1993) defines five levels of process maturity:

1) Initial—setting up of processes,
2) Repeatable—repeatable processes,
3) Defined—documented processes standardized throughout an organisation,
4) Managed—measured and controlled processes, and
5) Optimizing—continuous process improvement.

It is easy to imagine that for each level different models are needed. Levels 1–3 require models whose purposes are to describe the process and thus knowledge of the processes to be captured and analysed. Levels 4 and 5 require models whose purposes are decision support in order to monitor and control processes [12].

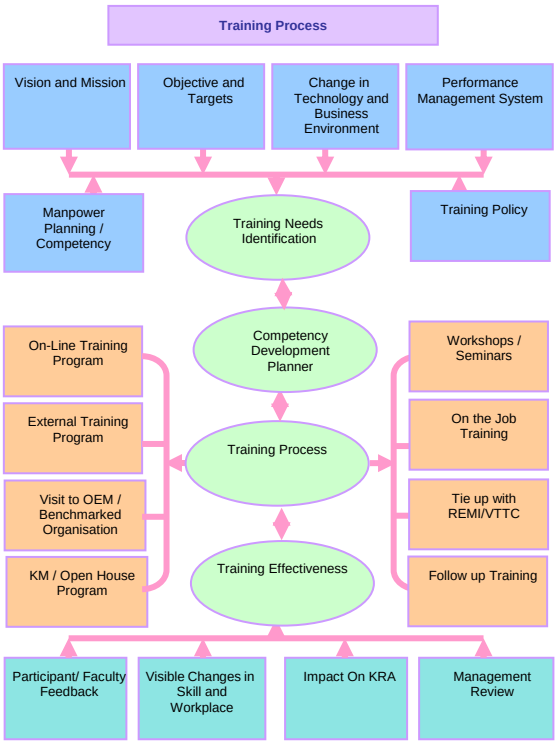

Fig. 1. Business process modeling example

IV. Case Study of Training Process

If In order to explain a business process modeling in a simple manner, let us assume an activity of training in the professional organisation. In business process modeling, these are represented as inputs with arrows pointing inwards. All employees are required to identify minimum two training programs from behavioral, work related etc. for to identify training needs at the time of PMS Process, which are reviewed by their superiors. The Superiors are also identifying the organizational training needs as per the change in technology, new regulatory requirement etc. The stake holders in a process can analyse parts of the process by looking at the model, for example, the training manager may decide to increase communication with the departments to get more nominations, top management see that change in technology reflect in the training etc [13].

V. Conclusion

A process model provides a comprehensive understanding of a process. An enterprise can be analysed and integrated through its business processes.

Business Process Modeling (BPM) methods have a direct impact on the result of process improvement initiatives, it facilitates the understanding of business processes, help in analyzing and improving existing processes it also assist in managing and monitoring business processes. The modelling method should be formal for simple processes which will benefit advanced analysis, for modeling ambiguous processes informal method is better suited. It should support automated inactions and process manipulation. Modeling should posses features such as comprehensibility, coherence, completeness, efficiency and effectiveness Users want a model, which permits him/her more interaction (e.g. it might be simulation) to analyse the question 'what if', in presenting the business process, approaches easy to understand, accurate communication and analysis.

BPM method can posses the capability in facilitating process evaluation and alternative selection. To serve these purposes, computer simulation is applicable due to the progress of information technology. Simulation is an invaluable tool for Business Process Modelling (BPM) especially when modelling inter-organisational business processes. BPM gives guidelines for prospective users or developers of business process simulation models. Different BPM methods not only have different features and capabilities but also view business processes from different perspectives. Modeller chooses the correct methodology for the type of system i.e. human activity system or mechanical orientated system and, the desired usage of the model i.e. strategic process envisioning or software.

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