

# BUSINESS PROCESSES MODELLING IN KNOWLEDGE MANAGEMENT PERSPECTIVE

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## **Abstract**

Process management is considered to be an up-to-date approach to an organization's operation, while process structures offer a sense of order. The main objective of this article is to identify the business process modelling in knowledge management perspective in contemporary organizations.

**Key words:** business process, business process modelling, knowledge management.

## **1. Introduction**

Business process modelling – an approach to depict the way organizations conduct current or future business processes. It is a fundamental pre-requisite for organizations wishing to engage in business process improvement or Business Process Management (BPM) initiatives (Indulska et al., 2009a, Sharp & McDermott 2009; Madison, 2005). In their most basic form, process models describe, typically in a graphical way, the activities, events and control flow logic that constitutes a business process (Recker et al., 2009, Bosilj-Vukšić, 2006).

## **2. Idea of Business Process Modelling**

Process modelling is concerned with transformation of knowledge about the functioning of a selected (business) area in an organization and the processes that take place within it into the corresponding models. A process model is a formalized representation of an actual process (recorded with a specific notation system), which allows to demonstrate its structure and the interrelations between its elements (i.e. the tasks, data, resources, and other). A process model is a graphic illustration of the links and mutual interactions within the process. Process modelling usually takes

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place based on two approaches: the top down approach and bottom up (Indulska et al., 2009a, Keyte & Locher 2004).

Process modelling is used within organizations as a method to increase awareness and knowledge of processes, and to deconstruct organizational complexity (Bandara et al., 2005, Indulska et al., 2009). It is an approach for describing how businesses conduct their operations and typically includes graphical depictions of at least the activities, events/states, and control flow logic that constitute a business process (Davenport, 1992, Indulska et al., 2009). Additionally, process models may also include information regarding the involved data, organizational/IT resources, and potentially other artefacts such as external stakeholders and performance metrics, to name just a few (Scheer, 1998). In this context of business process management modelling usually is defined as a process for mapping the “real world” (models as-is, modelling diagnostic) and at the same time as an active creative activity reflects possible future states of the organization or processes and suggesting potential directions of change (models to-be, predictive modelling) (Krcmar and Schwarzer, 1994). Process models help define the processes and connections between them, allow the presentation of logical and temporal relations activities in the process, which allows for making analyses, efficiency measurement, assignment operators, to determine the flow of information, decisions, documents (Becker et al., 2005; Scheer et al., 2005; Loos and Krcmar, 2007).

Modelling processes using graphical notation and understanding of the processes thus determines the development of the maturity process and improving organizational effectiveness through the implementation of management by processes (Gabryelczak, Jurczuk, 2015, p. 83).

Modelling and analysis of selected processes are of key importance for the organization, and may be the main processes, auxiliary processes, management processes. It is extremely important to determine the relationship between the individual processes in the enterprise to ensure their integration and mutual adjustment in order to achieve maximum added value and customer satisfaction, both external and internal.

You can use the database as a resource models, organizational knowledge of the institutions and their use in analysis and computer simulations. Modelling can be performed for diagnostic purposes. In order to find the causes of the error, or to adapt them to the changed organizational requirements. You can also use it in the design of new, previously undescribed processes.

In practice, process modelling depending on the scope and subject of work can be addressed in a diagnostic or prognostic, or both together (by limiting the use of the approach forecasting only to the design stage processes. With respect to the modelling of processes depending on the degree of formalization adopted where solutions can be They are divided into three groups: formal methods, semiformal and informal. The formal methods used mathematical language to describe the economic

processes. In the informal methods – forms of linguistic-verbal and methods, semi-formal – language and graphic form of the description (Nowosielski, 2009).

In practice, business process modelling faces many obstacles and difficulties. Followed by sporadic and fragmentary process modelling, often without setting targets and is not sufficiently appreciated the need for modelling complex and multi-level structure of the process (Becker, Kugeler, 2001, p. 490). Therefore, at the beginning you must define what strategic objectives of the company wants to achieve by means the power of modelling business processes. S. Nowosielski stresses that dominate the static procedures, based on the approach phase, unidirectional, without feedback. Less use of a predictive approach (reference models), and abusing the diagnostic approach (Nowosielski, 2009, p. 194). Modelling business processes increases the transparency of the organization, it allows us to understand the essence of its functioning through the prism of processes and simplifies and accelerates the introduction of the process approach to the organization (Nowosielski, 2009, p. 60).

### **3. IT systems as the tools for supporting business process modelling**

The development of process management occurs both on the level of creation of models as well as the supporting tools and methodologies adopted in practice. implementation of the model of the knowledge management process influences generation of innovation, stimulates creativity of staff members, and supports internal communication. This is related to the comprehensive approach connected with other management concepts and methods applied, which takes into account many dimensions: e.g., the social or IT one. This poses an array of new challenges for the management staff dealing with analysis and assessment of this issue as well as business practitioners, managers, and the managerial staff. Adoption of this concept allows to improve competitiveness of enterprises and ensure continual advancement and development. Modelling of the process of knowledge management aids companies in determining and deciding on priorities as well as the objectives of remedial projects, and offers incentives to identify the necessary actions that need to be taken in order to develop innovativeness. If a process-based organization is built on the best practices and guidelines, the risk of failure of projects intended to improve the organization and implement the model of knowledge management is minimized. The social factor needs to be taken into consideration as well as the technological one by way of using IT tools from the perspective of the strategy that is being followed. The analysis that has been performed and the resultant conclusions may be applicable in other European countries or other organizations which intend to implement the process of knowledge management. The findings also indicate that ICT practices improve financial performance only when they are coupled with HRM practices.

Modelling of processes in organizations requires the support of tools specifically dedicated to this important role at this stage, plays a standardization of organ-

izational processes. It means the way unification of certain types of behaviour and actions in the organization according to the same formula applicable all its members. Standardization is one of the fundamental dimensions of the organization because it allows managers to determining ways to implement tasks by individual contractors.

Interest in modelling of economic processes is related to the development and application of new IT solutions. Process modelling is currently supported by the use of computers and specialized software allowing to create graphic representations of models. Lately, the market has been flooded with numerous IT solutions supporting the designing and monitoring of business processes from such providers as: ADONIS, ARIS, Axway, BizAgi, Holocentric Modeler, iGraphix. Such software aids the process of identification of tasks undertaken by individual organizational units, allows to create a graphic representation of a business process and simulate the course of a business process. Usually such software ensures the possibility to prepare user interfaces in the client-server architecture, which enables control of the work of individual participants in the process. As far as definition of a graphic representation of a business process is concerned, many various notations that support business process modelling may be used, e.g., BPMN (Business Process Modelling Notation) and BPEL (Business Process Execution Language) (Ko et al., 2009; Keyte, 2004; Harmon, 2003; Smith & Fingar 2003, Gabryelczyk, Jurczuk 2015). One of the most popular standards of process modelling is the Business Process Modelling Notation (BPMN) (Silver, 2011, Spanyol, 2005). The currently applicable standard BPMN 2.0 was published by the Process Management Initiative (BPMI) in 2011. The main objective of creation of the BPMN was preparation of notation to describe processes, which would be easy to understand by all parties taking part in modelling, especially business analysts and software developers responsible for the implementation of solutions supporting processes, or people who possess content-related knowledge but no broad understanding of modelling.

#### **4. Source of knowledge in business process modelling**

Knowledge is present in ideas, judgements, talents, root causes, relationships, perspectives and concepts. Knowledge can be related to customers, products, processes, culture, skills, experiences and know-how (Baker et al., 1997). Knowledge originates in the head of an individual (the mental state of having ideas, facts, concepts, data and techniques, as recorded in an individual's memory) and builds on information that is transformed and enriched by personal experience, beliefs and values with decision (Bender, Fish 2000). Knowledge management is part of organizational management and encompasses all the processes related to localization, acquisition, creation, transferring, application, and retention of knowledge, which serve the purposes of an organization, including analyses, planning, operational activity, and control (Tiago, 2008, Wen, 2009). The idea of knowledge management has created considerable interest because it gives a deeper explanation to managers'

interest in core competencies and develop internal communication, It also creates awareness of knowledge as an important economic asset, and of the special problems of managing such assets (Spender, 2002). A business process model is based on practical experiences and solutions that large consulting firms make use of. Large contribution to the development of the process model has been provided by T. Davenport and L. Prusak from IBM Consulting Group, G. Probst, K. Romhardt and S. Raub (Davenport & Prusak, 1997; Probst, G. et al. 2000). They have made a synthesis of the existing practical experiences. In line with the process model, knowledge management is all the processes allowing to create, disseminate, and use knowledge in order to fulfil the purposes of an organization. There are three main phases of knowledge management:

- acquisition (creation) of knowledge;
- sharing knowledge;
- transforming knowledge into decisions.

Process model used mainly by large organizations is based on methods proven in practice. There is also the so-called Japanese model (Nonaka & Takeuchi 1995). Knowledge management based on the principle of a spiral is a repeating cycle of four processes of knowledge conversion: internalization, socialization, externalization, combination.

The improvement in clients' satisfaction and the effectiveness of services and decision making must also be highlighted. Knowledge is the inseparable resource processed as part of processes. Knowledge is generated when organizational processes take place, such as: distribution, marketing, designing, and preparation of production. As far as knowledge created in the course of the processes of designing and preparation of production is concerned, it is technical in character. Knowledge is put to use by both the performers of processes – process team members – as well as the owners of processes. Any information related to processes, such as: process model, indicators, measures, and aims, should be collected and formalized in order to contribute to the improvement and consequently the development of the whole organization (Bitkowska, 2010).

Additional information, such as goals, risks and performance metrics for example, can also be included. Accordingly, process models are considered a key instrument for the analysis and design of process-aware Information Systems (Dumas et al., 2005), organizational documentation and re-engineering (Davenport & Short 1990; Davenport 1992), and the design of service oriented architectures (Rabhi et al., 2007). Therefore, the processes occurring in an organization should be increasingly based on individual, team, and organizational knowledge and, consequently, become more and more flexible as well as adjusted to the changing environmental conditions (Richter-von Hagen et al., 2005). Business process modelling in an organization should take into account the knowledge resources that the organization possesses in order to ensure that employees have access to knowledge regarding

specific tasks which are part of particular business processes (Maier & Remus, 2002; Bitkowska 2015).

A major role is played by information technologies, management systems, attitude of the staff, and organisational culture that arouses enthusiasm and eagerness of staff members, which contributes to knowledge sharing and creation of the so called 'project teams' (Alavi & Leidner, 2001; Andreeva & Kianto 2012; Barnes & Milton 2014; Bartol & Srivastava, 2002). The strategy pursued by an organization, its employees, technology, and organizational culture underlie the processes in particular: creation, codification, and transfer of knowledge. Knowledge management should be based on three fundamental pillars: people, technology, and processes.

It should take into consideration the knowledge resources that it possess in order to ensure that employees have access to knowledge about specific tasks performed as part of a particular business process (Maier & Remus 2002, Bitkowska 2015). The key factors causing all business processes modelling in an organization to run smoothly are learning and cooperation. Therefore, the processes occurring in an organization should be increasingly based on individual, team, and organizational knowledge and, consequently, become more and more flexible as well as adjusted to the changing environmental conditions. Each organization should collect knowledge on the processes that take place within it.

Moreover, employees should play an active role in shaping of the course of processes and implementation of changes in an enterprise. A new motivation system which is designed for team work should be developed, which would stimulate the striving for increased efficiency as well as transfer of knowledge among team members (Donate & Sanchez de Pablo, 2015; Choi et al., 2008). Knowledge as the main resource of an organization may not be put to good use, if employees compete with one another while hiding information and not sharing their skills. Teamwork helps to improve qualifications (Spanyi, 2003; Liao, 2010). The main advantage arising from the adoption of the model of knowledge management is that it allows users to avoid an excess of information, increase the usefulness of knowledge, and concentrate on the information that is of key importance for the chain value (J. Jung et al., 2007). Due to the information-related significance of process models, advanced supporting tools should also have the feature of publishing the contents for the purposes of an organization. This may take the form of a simple export of the graphic representations of process diagrams into files, however, it is often possible to present the whole models as process portals. They are kept in intranet networks and allow the authorized members of an organization to look through the selected images of the process map and access their attributes.

## 5. Conclusions

Process management is considered to be an up-to-date approach to an organization's operation, while process structures offer a sense of order. It is easier for or-



ganizations using business process modelling knowledge is collected in databases of processes in repositories. There are knowledge resources and they are used, modified, shaped, and perpetuated. There are also relations based on knowledge sharing, which are part of the informal organizational culture. The business process modelling is intended to systematize these informal rules and relations existing in process-based organizations and make them objective. The aim is to acquire, store, and distribute knowledge. The most significant actions in this contexts should be oriented at adoption of IT systems supporting the modelling of the processes. IT tools are supposed to ensure that the knowledge management process is run effectively, the IT tools are introduced into the knowledge process management (i.e., planning, coordinating, monitoring, and accounting for), and organizational culture fostering trainings and cooperation among the staff members is being built. Coping with this sphere and its operationalization by means of specific strategic, structural, technological, and personal solutions constitute a challenge for each and every process-based organization.

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## **MODELOWANIE PROCESÓW BIZNESOWYCH Z PERSPEKTYWY ZARZĄDZANIA WIEDZĄ**

### **Streszczenie**

Zarządzanie procesowe stanowi fundament wielu inicjatyw zarówno teoretycznych, jak i badawczych. Głównym celem artykułu jest identyfikacja modelowania procesów biznesowych we współczesnych organizacjach z uwzględnieniem perspektywy gromadzenia i wykorzystywania wiedzy.

**Słowa kluczowe:** procesy biznesowe, modelowanie procesów biznesowych, perspektywa wiedzy.