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The Ruse Branch of the Union of Scientists in Bulgaria was founded in 1956. Its first Chairman was Prof. Stoyan Petrov. He was followed by Prof. Trifon Georgiev, Prof. Kolyo Vasilev, Prof. Georgi Popov, Prof. Mityo Kanev, Assoc. Prof. Boris Borisov, Prof. Emil Marinov, Prof. Hristo Beloev. The individual members number nearly 300 recognized scientists from Ruse, organized in 13 scientific sections. There are several collective members too – organizations and companies from Ruse, known for their success in the field of science and higher education, or their applied research activities. The activities of the Union of Scientists – Ruse are numerous: scientific, educational and other humanitarian events directly related to hot issues in the development of Ruse region, including its infrastructure, environment, history and future development; commitment to the development of the scientific organizations in Ruse, the professional development and growth of the scientists and the protection of their individual rights.

The Union of Scientists – Ruse (US – Ruse) organizes publishing of scientific and popular informative literature, and since 1998 – the "Proceedings of the Union of Scientists- Ruse".

BOOK 5

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THE PLACE AND THE ROLE OF BUSINESS PROCESSES GENERATION IN THEIR LIFE CYCLE

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Abstract*:The article discusses the place and the role of business process generation and its linkages with the opportunities to improve the quality of enterprise reality. Emphasis is placed on the importance of the correct and consistent business process planning. Successful enterprise involves business process generation. The most important objective in business process generation is the proper execution of the activities in a business organization and studying the links between them.It is impossible to be able to change a component without interfering the operation with the others. The business process generation offers quick and various views.*

Keywords: *Business Process, Business Process Modeling, Business Process Generation, Business Process Life Cycle.*

INTRODUCTION

Modeling, generation and overall the management of business processes is a topic of research, both in the economy and in the field of computer science. The experts from these two professional fields show different interest in business processes. Economists are working to improve the operations in the companies, increasing customer's satisfaction, reducing costs and developing new products and services at competitive prices. The interest of researchers in the field of computer science is aimed at seeking better methods to describe processes by different notations in order to create models that can be retrieved, analyzed and optimized.

There are different definitions for the business process concept. Some authors define it as a set of actions which receive one or more input objects and create an output object that is beneficial to the company or the client. This definition emphasizes the input/output behavior of a business process, as showing the preconditions (the input objects) and post conditions (the output objects). The process is described in an abstract way as a multitude sub-processes. The term "multitude" involves neither mistake, nor any other restrictions, so this definition is quite liberal with regard to the processes. There are identified limitations in the activities during the execution of business processes, and therefore appears a new definition that defines a business process as "a set of logically related tasks to achieve a defined business result for a particular client or market" [1]. The term "logical connected" emphasizes the sub-activities, while recognizing the links between the individual sub-processes and their order of execution. The definition for business process evaluated to the wording: "a specific arrangement of activities at time and space with a beginning and end, and clearly defined input and output objects" - "business processes have users internal or external, and they can extend beyond domestic borders of the organization, i.e. they include various departments in one organization". Based on the described characteristics of business processes, it can be assumed that a business process consists of a number of activities that are implemented in a coordinated organizational and technical environment. These activities accomplished together reach a business goal. Each business process is done by one organization, but it is possible to interact with business processes performed by other organizations.

Section 2 of the paper discusses the place of a generation in business process life cycle.Some ways and standards for business process graphical representation are discussed in section 3.How the generation of business processes impacts on enterprises' planning phaseis described in section 4. Conclusions are summarized in section 5.

THE PLACE OF A BUSINESS PROCESS GENERATION IN ITS LIFE CYCLE

By professionals in the field of computer science, the business processes are an integral part from the systems for managing business processes. Viewed in this way the life cycle of a business process consists of the following phases: planning, implementation, monitoring, improving [4]. The planning phase can be divided into three stages: modeling, generation and analysis, implementation and documentation (figure 1). It will be discussed in more details during the planning phase, which is part of the object of study - the stage of generating a business process.

Fig. 1. Life cycle of a business process

THE MODELING STAGE

The process modeling is a stage on which it is creating a conceptual model involving the processes, which compose the business.Composing graphical representations of business processes,that are focus on the process structure and the interaction of the participating sides and do not affect the technical aspects of the production and the marketing. This is an important feature of the business processes modeling as their definitions and their behavior does not prescribe specific implementation strategies or platforms. The technique of business processes modeling, along with the techniques of validation, verification and simulation are used during the planning phase of the life cycle of the business process. Modeling of business processes is the main technical sub-stage during the design process. Based on the studies'results activities for improvement the business processes from an economic point of view, their informal description is formalized by using a specific notation.

For business processes modeling some widely spread standards are used– EPC (Event-driven Process Chain), some kinds of UML diagrams (Unified Modeling Language), Petri Nets, Workflow Patterns, BPMN (Business Process Model and Notation). A number of research teams [2], [7], [8], [9], [10] dedicated their activities to the business processes management. They use some of the following for business processes modeling in the copyrights environment. These standards provide resources through which it is possible to

be modeled almost every business process. In order mostly by subjective reasons, each notation for business processes has its supporters. It is possible to define a group of rules through which model of business process, described through one standard, can be transformed into a model of the same process, described with another standard. For two of the standards – EPC and BPMN these rules are described in [10]. An example for their application might be indicated by one simple business process. The process starts when an application is applied for registration of a document. The document is written as a draft and is carried out verification for correctness. Depending on the outcome action it is taken one of the two functions (actions): delete the document or publication of the document. When you delete a document the process ends. After the publication of the document there are performed two parallel functions for registering the document and sending a notification. When the two functions end, the business process ends too. Figure 2 presents clearly the arrangement, according to which the actions of the business process will be followed respectively by EPCand BPMN. It may be noticed that these graphical notations for modeling business processes are fundamentally quite similar.

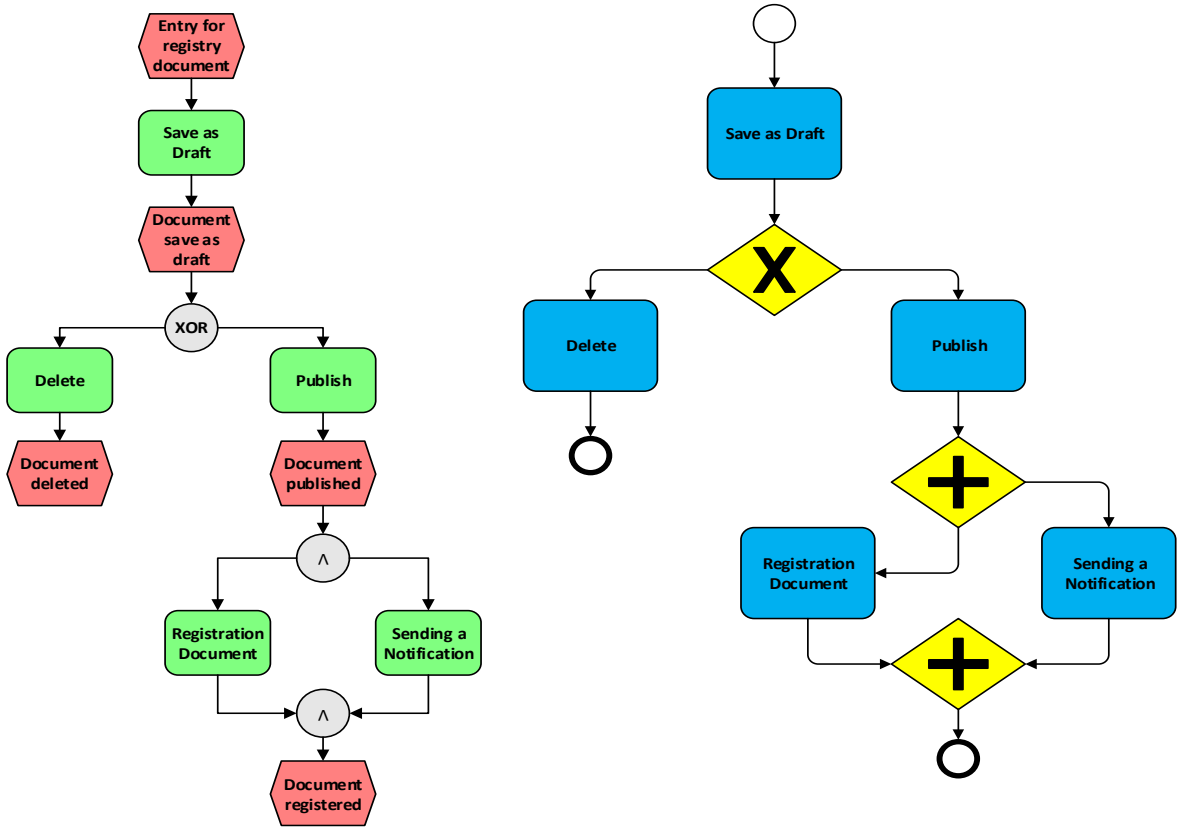

Fig. 2. Example for business process, modeled through EPC (in the left) and BPMN (in the right)

THE GENERATION AND ANALYSIS STAGE

The basis of the idea for business processes generation is presentation with the constituent's sub-processes and the limits during the execution together [1]. Once after a current business process is defined and modeled, it can be an object of generation, use and improvements. The generation of business processes is found by monitoring that every activity which the business performs is a result of multitude constituent activities. These activities are logically connected and usually dependent. The generation of

business processes is with a purpose to organize in an optimal way for implementation of the activities so that to become more effective for the business.

The description of the activity of a current business process is consisted of multitude descriptions to the consisting activities and their limits during the implementation. The generation of business process represents a concrete case of implementation of the activities. Also it represents the process in a real situation but with defined conditions.

The interactions of a multitude form business sub-processes can be described by a process composition. The word composition reveals the lack of a central agent who has to control the activities of the participating sub-processes. Interaction between them can be achieved only with events which play the role of input and output points of the sub-processes [5]. To be correct and targeted the interaction of the processes involved in it, have to have a general logical commitment before starting the implementation. Graphical presentations of the business processes as one of these examples are focused to the sub-process' structure and the implementations of the participating sides more than the technical aspects of the realization. This is an important situation of the business processes so that their definition and description of their behavior doesn't suggest the use of a concrete technology or strategy for inculcating. Every user can change a current business sub-process, if he doesn't break the part of the process which is visible for the other users. With other words every user can change some of the sub-processes, if only he doesn't change the implementation between the main business processes.

After the generation of the business processes is done, many copyright collectives develop methods and techniques for their verification [9], [10]. They accomplish tests of the processes for conformity with the technical specifications, for correctness, for conformity with the business logic, for a change in the version of the process. There are different ways, realized as a part of the community for business process management through which the verification is accomplishing. They support different specifications of the processes: imperative, declarative, event-driven and artifact-oriented.

In the imperative specifications the processes are modeled as a set of activities, branches and events, connected by transitions. In the declarative specifications the models of the processes are defined as a multitude of activities and a multitude of restrictions between them without specifying the sequence of implementation of the activities. Event-driven is another way for verification of business processes, defined in EPC, consisted essentially of events, functions and connectors. The use of this opportunity of EPC gives a chance in the generation business processes to be verified and safe the demand and the applying of additional procedures for the purpose [6]. Artifact-oriented specifications are focused over involving of business objects and information.

The analysis uses the available information to assess and improve the models of business processes and their general versions. There are used techniques which have the purpose to classify the quality of the models and the business logic's adequacy. For example the tracking of the working activity can show that one of the activities is performing for a very long period of time because of the lack of resources for its performance. This information is very helpful also for the generation of the business processes which makes these two sub-stages of the phase of planning interrelated.

THE IMPLEMENTATION AND DOCUMENTATION STAGE

This is the stage in which the conception's model coverts into a model of the executable process. After the model of business processes is ready with the design and it is verified, it can be implemented. There are different ways to do this. It can be implemented by a set of politics and procedures which the personal have to follow. In this case the business process is realized without maintenance of specialized system for control of business processes. In case that it is used a specified software system, during

the configuration phase is selected a platform on which to be carried out the execution of the business processes. The model of the business processes is enriched with technical information which coordinates the execution of the process from the software system. The system has to be configured according to the organizational environment in the business organization and according to the working processes which performance the system will control. These configurations involve the implementation of the personal with the system and also the integration of the existing software systems with the system for business processes management. The last one is very important because in nowadays business organizations most processes are supported by the existing software systems. The process is documented with a purpose to be used for studying and management in the future.

CONCLUSIONS

Business process modeling and generation abilities are key points of many scientific workers. By the professionals in the field of computer science, a business processes consists of the planning, implementation, monitoring, improving phases.

Business process generation requires to reflect properly business logic and given expectations according to the specification model. The business process management systems support different tools that ensure proper generation processes. These tools vary according to several factors: formal description, modeling language and implementation.

The most important objective in business process generation is the proper execution of the activities in a business organization and studying the links between them. The detailed description of business processes is key for achieving this performance. Identifying activities, links between them and their representationas model of business processes allow stakeholders to communicate about these processes in a more efficient manner. Flexibility is key operational objective in the maintaining of the set of business processes. The circumstances that can be changed are varied, both in organization and in technological implementation. It is possible to be able to change a component without interfere the operation with the others.

REFERENCES

[1] Davenport Th., Process Innovation, Harvard Business Review Press, 1992.

[2] Fisteus J., Fernandez, L., and Kloos, C., “Applying model checking to bpel4ws business collaborations.”, in Proc, ACM Symposium on Applied Computing (SAC), pages 826–830, ACM, 2005.

[3] Grigorova K., I. Kamenarov. “Object oriented business process repository.”, in ComSysTech'12, Ruse, pp. 72-78, 2012.

[4] Jeston J., Nelis J. Business Process Management Practical Guidelines to Successful Implementations. Elsevier Ltd. Oxford. USA, 2008.

[5] Kamenarov I., “Classification of events in the EPC standard.”, in Information Systems & Grid Technologies, Sofia, Bulgaria, pp. 320-327, 2013.

[6] Kamenarov, I., K. Grigorova. “EPC – better option for business process generating.”, in Information Systems & Grid Technologies, Sofia, Bulgaria, pp. 25-31, 2014.

[7] Koehler, J., Tirenni, G., and Kumaran, S., “From business process model to consistent implementation: a case for formal verification methods.”, in Proc. 6th Int. Conf. on Enterprise Distributed Object Computing (EDOC), pp. 96–106, 2002.

[8] Masalagiu, C., Chin, W.-N., Andrei, S., and Alaiba, V., “A rigorous methodology for specification and verification of business processes.”, in Formal Aspects of Computing, 2009.

[9] Weber, I., Governatori, G., and Hoffmann, J., "Approximate compliance checking for annotated process models.", in Advances in Enterprise Engineering Proceedings of the GRCIS workshop at CAiSE, 2008.

[10] Willi Tscheschner, "Transformation from EPC to BPMN", Hasso-Plattner-Institute, Potsdam, Germany, 2010.

[11] Wynn, M. T., Verbeek, H., van der Aalst, W., Hofstede, A., and Edmond, D., "Business process verification - finally a reality!", in Business Process Management Journal, 2009.

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МЯСТОТО И РОЛЯТА НА ГЕНЕРИРАНЕТО НА БИЗНЕС ПРОЦЕСИ В ТЕХНИЯ ЖИЗНЕН ЦИКЪЛ

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Резюме: *В статията се разглежда мястото и ролята на генерирането на бизнес процеси и неговата връзка с възможностите за подобряване на качеството на бизнес реалността. Акцентът е поставен върху значението на правилното и последователно планиране на бизнес процесите. Успешният бизнес зависи от коректното моделиране на бизнес процесите, които го съставят. Най-важната цел при композирането на тези бизнес процеси е правилното отражение на дейностите в бизнес организацията и изучаване на връзките между тях. Важно е да се осигури възможност промените в един компонент да не пречат на работата на останалите. Генерирането на бизнес процеси предлага бързи и различни гледни точки.*

Ключови думи: *Бизнес процес, Моделиране на бизнес процес, Генериране на бизнес процес, Жизнен цикъл на бизнес процес.*

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