

# PROCEEDINGS

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of the Union of Scientists - Ruse

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Book 5  
**Mathematics, Informatics and  
Physics**

Volume 13, 2016



RUSE

# **PROCEEDINGS**

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# **PROCEEDINGS**

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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".

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**"MATHEMATICS, INFORMATICS AND PHYSICS"**

**VOLUME 13**

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## BUSINESS PROCESS GENERATION OPPORTUNITIES

Galina Atanasova, Ivaylo Kamenarov

*Angel Kanchev University of Ruse*

**Abstract:** *The article discusses priority that should be given to business process generation in business enterprises in way to deal with all challenges of the day. Emphasis is placed on the developed approach and an example of a given business process generation. The business processes generation in the environment that allows flexibility about manipulations with them can help significantly to reduce the loss of business resources at a later stage in the lifecycle of the business process. The usage of such environment provides an opportunity for experimentation, optimization and decision-making in emergency situations, particularly in business processes from the enterprise area.*

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

### INTRODUCTION

Business enterprises must deal with large number of tasks as reducing the cost of outcome, and rapidly developing new services and products. Businesses can achieve their goals in an optimal way only if people and other resources of the enterprise, such as information systems, are integrated effectively. Business processes have an important role in this concept by supporting the cooperation. The generation of business processes is affected by concepts and technologies from different fields of the economic community and the computer science. Some authors define business processes 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 [7].

A business process life cycle comprises the following phases: planning, implementation, monitoring, improving. The planning phase can be divided into three stages: modeling, generation and analysis, implementation and documentation. The stage of generating a business process is an important mechanism for providing accurate information about the status of the implementation of business processes. This information

is valuable, for example, when you have to answer a question about its current status in case of a problem [5].

Section 2 of the paper discusses different level of automation of business processes and generation opportunities. An approach and an example of a given business process generation are presented in Section 3. There are showed various opportunities supports with appropriate comments. Conclusions and overall benefits of the business process generation are summarized in Section 4.

### **LEVEL OF AUTOMATION OF BUSINESS PROCESSES AND GENERATION OPPORTUNITIES**

The business processes can be distinguished by the level of automation which they allow. There are business processes which completely are a subject to automation meaning that any of these activities from the process doesn't involve a human intervention. Example for this is ordering an airplane ticket online. Automation in the example however is only the airline's side, while the client has to make manual activities.

In case the process model describes the implementations and their restrictions completely, it is called that the process is structured. The various opportunities for different choices are cleared during the stage of modeling.

The most important aim in business processes generation is proper execution of activities in business organization and right following the links between them [3]. The key for achieving this performance is the detailed description of business processes. Identifying the activities, the connections between them and their performance in a model of the business processes allows stakeholders to communicate about these processes in a more efficient manner. The flexibility is a key operational objective maintenance of a business process set. Things that can be changed are diverse, both in organizations and in technology. There is a high level of dynamics and changing any component has to be done without interfering others [6].

It is essential a business process generation to reflect properly the business logic and to give the result that is expected according to the specification. The systems for business process management support different tools that ensure the correct processes' generation. These tools vary according to several factors: used formal description, language that is used for modeling, language that is used for implementation [4]. The usage of appropriate processes' modeling and generation makes such type of implementation needless. For the logical integrity and consistency of a business process it is responsible the algorithm of generation in which sub-processes are connected via input and output events.

### **AN APPROACH AND AN EXAMPLE OF A GIVEN BUSINESS PROCESS GENERATION**

Generally for the correct generation of a business process it is important the proper functionally decomposition of the activities in business organization. In order to provide a more detailed view on these activities, they are broken into functions with a smaller range. The end aim is to get to the separated operational activities of a business process. This may be achieved by a technique, called functional decomposition. In functionally decomposition business a function of higher level is broken into simpler implementation tasks. This continues until the tasks reach a level of complexity that would allow uniquely generating business process in conformity with the logic of the business model. The final states have to be conditions sufficiently clear so that there are excluded misinterpretations. Let consider an example of a business process that monitors the correctness of activities for making a test. The business process starts when the event "Start Test" occurs. Then it is chosen which test to be completed. It follows setting the questions' answers. After user signal for a completed response there is validated whether the response is set. In case the

validation failed follows returning to the filling of a response again by the event "Not validation Answer". In case the validation is successful, depending on whether the test has more questions, proceed to one of two possible events: "No more Questions" or "Have more Questions". If there are more questions, the business process goes on with the next question and gets the opportunity for its answer filling. If there are no more questions available, the process passes to result displaying and completing by the event "Finished Test".

The developed Object Oriented Business Process Repository [2] allows for sub-processes selection, which to be included in the main process. According to the described above example the complete generated sequence is obtained by all five functions (sub-processes) (Fig. 1).

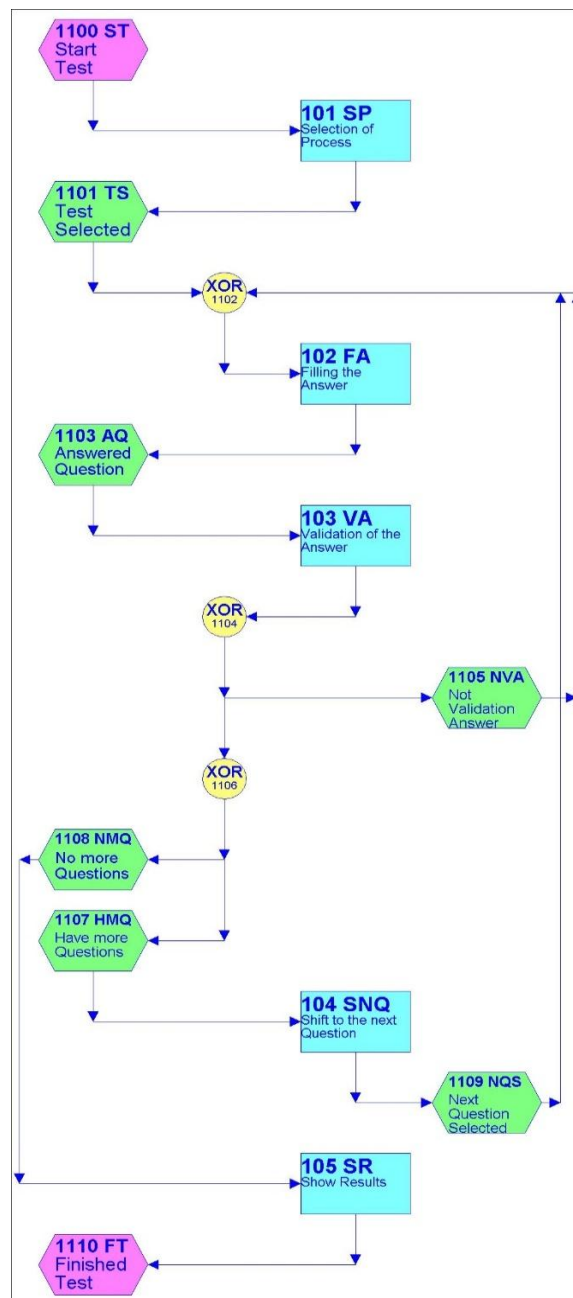


Fig. 1. Generated business process with all sub-processes

On Figures 2 and 3 there are missing some sub-processes. On Figure 2 there is missing function for the results visualization. In this case the process ends with the event "No more Questions". In the main process, that is shown on Figure 3, there is not included the passing to the next question. So the generated sequence contains two input events ("Start Test" and "Next Question Selected") and two output events ("Have more Questions" and "Finished Test").

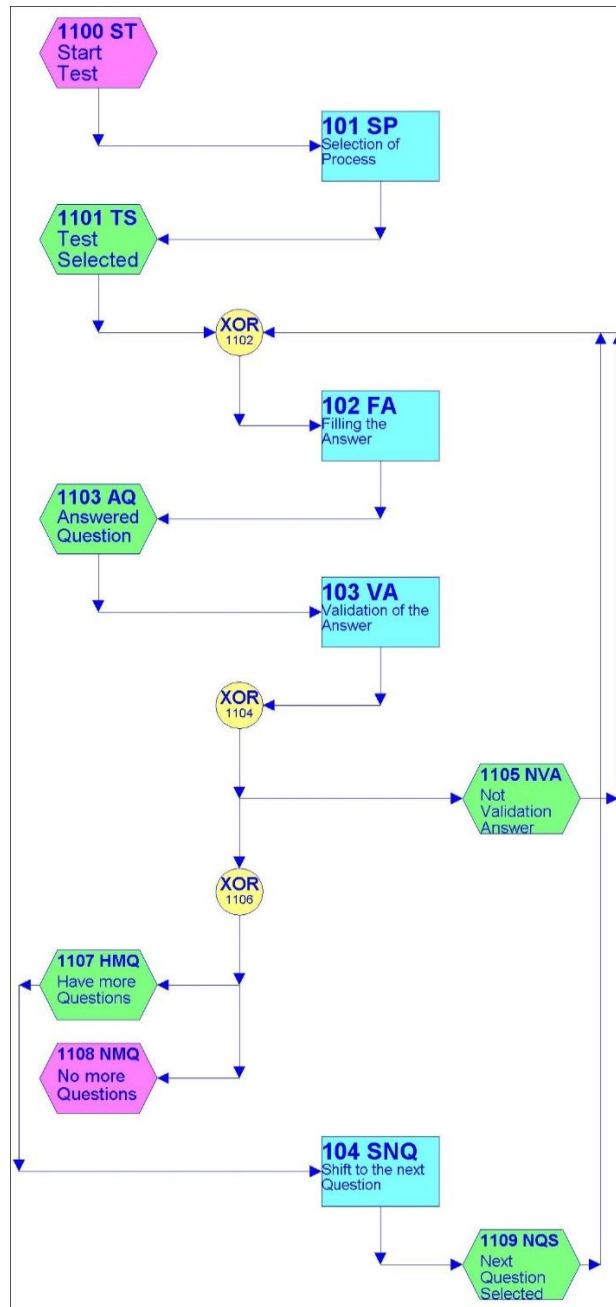
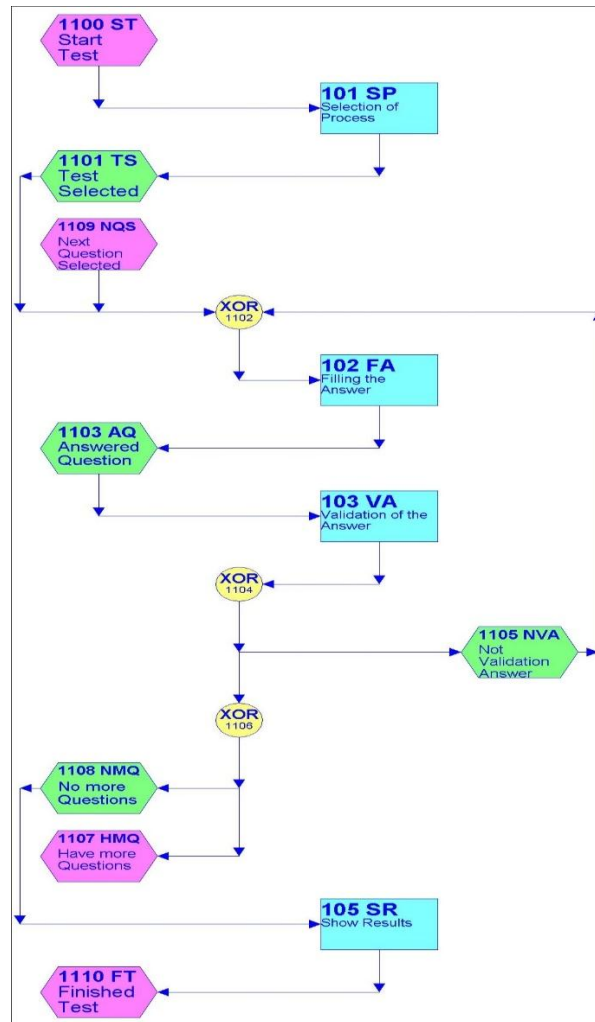


Fig. 2. Missing function for the results visualization





**Fig. 3. Passing to the next question is not included**

**CONCLUSIONS**

The business processes generation in the environment that allows flexibility about manipulations with them, such as Object Oriented Business Process Repository, can help significantly to reduce the loss of business resources at a later stage in the lifecycle of the business process. The usage of such environment provides an opportunity for experimentation, optimization and decision-making in emergency situations, particularly in business processes from the enterprise area. Generating different models of a given business process should provide the following benefits:

1. The quality of the business processes' design evaluation - if the description of the model or its internal representation contains logical or procedural misunderstandings it would not be possible the generation and just in time there would be a need for the formal description revision.
2. Different compositions review - it is possible the different compositions of a business process generation. This provides various options for decision-making and supports the managers' activities without real cost or resources.
3. Sub-processes interchangeability - it is shown the possibility for sub-processes interchangeability that allows the evaluation of the effectiveness of different generated processes.
4. The sub-processes functionality dependencies - it is possible to indicate the degree of relevance for each sub-process from other sub-processes' functionality.

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**ВЪЗМОЖНОСТИ ЗА ГЕНЕРИРАНЕ НА БИЗНЕС ПРОЦЕСИ**

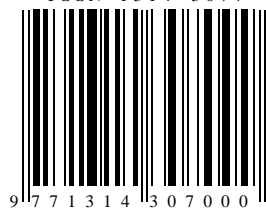
**Галина Атанасова, Ивайло Каменаров**

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**Резюме:** Статията разглежда приоритета, който трябва да имат предприятията и бизнеса да дадат на изследването на възможностите за генериране на бизнес процеси като начин да се справят с предизвикателствата на деня. Акцентът е поставен върху разработен подход и пример за генериране на даден бизнес процес. Предоставяне то на среда с възможности за генериране на бизнес процеси, която позволява гъвкавост и манипулации с тях, може да помогне значително да се намали загубата на бизнес ресурси на по-късен етап от жизнения цикъл на бизнес процеса. Използването на такава среда дава възможност за експериментиране, оптимизация и вземане на решения в извънредни ситуации.

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

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