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# Basis of the Language for the Business Processes Description in Information Systems

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**Abstract.** *The automation of business processes performance provides the computerization of management processes in information systems. It is possible to achieve this aim using the strict formal description of the automation object. The main idea of the proposed approach consists in the basic description of business processes on the basis of the formal language that allows to model, to design and to verify the program implementation of the management system and the business process model. The language for the description of the business processes performance is developed for the implementation of the main ideas of the management theory as an option of the logical-mathematical language.*

**Keywords.** *Business Process, Business Process Model, Language for Description of Business Process Performance, Business Process Management.*

## INTRODUCTION

Progress in all branches of manufacturing consists in the gradual transition from manual work through mechanized work to automated one. The labor productivity during the design works performance always lags behind the productivity of the main industrial manufacturing. It was supposed to solve this problem with the creation of the systems for the design works automation (CAD systems) [1,2]. The management theory development of that time hasn't allowed to implement the proposed ideas, and the abbreviation "CAD systems" has become a brand.

### THE CONCEPTUAL BASIS FOR THE FUNCTIONING OF SYSTEMS OF THE DESIGN WORKS AUTOMATION

The system for the design works automation is rather resource-intensive, thus it has to carry out the maximum amount of functions. For example, the function for the management of the performance of the contracts set, for the management of the performance of each contract,

for the management of the performance of each design operation. Different tasks are carried out and different methodologies are used on each of these three levels. Each manager wants to find the contract and the financing and to organize the implementation of the order. The supervisor of the system for the design works automation has to track the limit, after which the system won't be able to perform all contracts. According to each contract, from the point of view of the development of projects of designed objects, the situation mostly coincides with the principles of the project management in sense of the performance of project phases and its stages, but as for the performance of separate design procedures, the situation is fundamentally different. The essence is that the course of the design procedure performance is defined not so much by requirements of the external management, according to design procedure, but by the substance of subject area, a set of data, relations and patterns of the change of working and geometrical parameters, in general, by the "knowledge" of subject area.

The last aspect will not be investigated, but the first ones fall under typical strategies of management. The theory of processes is presented in work [3]. Miller's approach about the business processes description on the basis of messages has found further development in it. However it doesn't allow to plan business processes on the basis of their time of performance. Therefore we develop separate own version of the business processes theory, using requirements to formal theories from work [4], based on results of work [5].

## THE DATA STRUCTURE OF SIMPLE BUSINESS PROCESSES

For the analysis of the simple business process it is necessary to identify it, to present its original name, to establish the position of this business process in the hierarchies of more general business process and the status of the business process performance, to know the planned and actual values of timepoints of the beginning and end of its performance, the executive person of the business process, which implements the planned purpose.

The specified parameters (or indicators) form the main table in the database of business processes. According to specifics of subject area, the additional table with the relation 1:1 can be attached to the main one, containing the specific information, for example, the information about financial, human and other resources and other types of supports.

Each business process for the management system has to form information, which provides “economic” functioning of the system for business processes management. Such requirement can be provided by the function, which returns a value of the Boolean type.

If function returns a value with the satisfactory state, thus, according to it, the load to the management system will be minimum. The performance of two identical business processes doesn't happen during the design, except specific cases. Therefore the function, which describes the separate business process, is designated as  $P_i$ .

## THE DESCRIPTION OF COMPLEX BUSINESS PROCESSES

Even for the simplest business process, consisting of one stage, it is possible, and sometimes, is expediently, to carry out the decomposition on simpler business processes. For example, the business process of the analysis of Terms of Reference, its performance, control and results approving. It is complex and has to decompose for simpler business processes to perform them separately by different executors. The main order of business processes performance can be both sequential (1) and

parallel (2), depending on the nature of performed works.

$$P_1 + P_2 \quad (1)$$

where  $P_1$  – business process, which is performed the first;

$P_2$  – business process, which starts to perform after the completion of  $P_1$ ;

+ – sign of business processes performance sequentially.

$$P_1 * P_2 \quad (2)$$

where  $P_1$  – business process, which is performed the first;

$P_2$  – business process, which starts to perform along with  $P_1$  at the same time;

\* – sign of business processes performance in parallel.

## CONCLUSIONS

The formalized description of business processes for their modeling and maintenance in information systems is offered. The chosen form of the description allows to carry out an inspection of a correctness of the project description by lexical and syntactic analysis. The strict and unambiguous formal description of business processes allows to create on its basis other forms of descriptions, which are more adapted for different participants of design, for performance and management of business processes, for example, a text form – for conceptual design by supervisors, a graphic form – for detailed development by analysts, a tabular form – for program maintenance of business processes performance.

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