



System of Digital Models – New Technology for Data Balance

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Abstract. Use of the digital technologies is new and very productive approach for balance of supply and demand. It is very important and significant for increase of competitiveness of products. Various types of digital models were developed as a result of scientific research, they found reflection in article. Digital models for the description of the list of the sequences of steps and operations of various stages and process in general allow installing system of interrelations between operations and steps and reaching necessary logic, increasing of effectiveness of any process. Object-relational models for establishment of communications between data of various blocks of databases and functional models of the choice of strategy of data balance form analytical base for justification of the choice of the direction of transformation of data. Models of a combination of a plurality of various data of the offer of products in the form of matrixes of multi-purpose optimization have double effect, because they allow not only developing various options of data combination, taking into account opportunities of change of location of products over the markets and temporary phases, but also estimating aggregate useful effect from products. These models together with models of comparison of various options and the choice of optimal solutions allow generating compatible strategic and current programs of the offer of products as a plurality of the output data balanced with each other and with data of demand. It is providing the best synergetic result. The developed methodology of creation of system of the interconnected digital models for transformation of data and generation of the output data of the situational-strategic program of the offer of products is a cornerstone of formation of new digital economy – of data economy.

Keywords: digital model, system, demand, offer, product, balance, process.

Processes of modeling of data in economy are of special importance and prospects for creation of digital economy. Therefore, relevance of the conducted research for use of digital models for balance of supply and demand is obvious. The description of economic processes by means of digital models is the original scientific development having scientific novelty. These my researches were recognized as the new scientific direction.

Economic processes can be classified into groups over target appointment. Among them there are processes of effective ensuring of production by resources and their rational use, processes of creation of development programs of competitive products, processes of management by technological projects, scientific organization of labor, employment and stimulation of workers, also processes of financial control and the account, processes of management by activity of firm and other processes. Each of these economic processes has special purpose, tasks, the implementation mechanism and sequence of stages, steps, operations, and it can be described by digital model.

The methodology of creation of different types of digital models for realization of various purposes connected with formation of economy of data was recommended, as a result of a research [1–3], and it was illustrated on the example of generating of strategic and current programs of creation of competitive products. The first type of models – descriptive digital models, they in the

description of the sequence of stages, steps and operations of economic process. Process of creation situational-strategic program of the offer of products includes processes of collecting and data storage, the analysis of data, forecasting of data of demand, planning of data of the offer and consists from six stages. The first stage – process of creation of the interconnected blocks of databases; the second stage – process of formation of object-relational models; the third stage – process of the analysis and forecast of dynamic key data of demand; the fourth stage – process of definition of strategy of transformation of data; the fifth stage – process of data planning on long-term outlook according the predicted data of demand for generating of the output data of strategic programs of the offer of products; the sixth stage – process of transformation of data, assessment of variants of the decision and the choice of an optimal a data plurality of current program of the offer of products. Each of these stages includes special steps and operations. The digital code was defined not only for each stage, but also for steps and operations entering it. This approach allows creating the special list of the sequences of digital codes of each stage, as a result, it can be described by digital model. Digital models of each stage are components of the general digital model of uniform process of creation of the situational-strategic program of the offer of products in interrelation with temporary and spatial parameters. However, each stage except the certain list of the sequences integrated into the general digital system has to solve a specific task, namely carry out target appointment. Each stage has different functional purpose, but anyway connected with transformation of data. Therefore, special models are recommended for effective realization of the functional target appointment of each separate stage too.

Thus, the second type of models, which can be defined as functional digital models, is developed [3]. The object-relational models, which are formed at the second stage, can belong to them. They establish interrelations both between data inside of database, and between data of different databases. The digital code was defined for every line and each column in the database. It allows passing from analog-digital object-relational models to digital object-relational models, in which interrelations between data will be reflected as interrelations between digital codes. It will open boundless opportunities for unification, standardization, classification of data and processing of any volume of information in a compact form, and also for establishment in a compact form of interrelations between data of any type, what considerably will accelerate processing of information.

Models of elaboration of strategies of transformation of data can be other example of functional models. All possible conditions and situations on the markets are classified over groups, and the digital code is defined for each of possible situations. Possible restrictions over resources and internal reserves are subdivided into options, which are designated by digital codes too. Individual digital codes are defined for possible strategies. As a result, various most probable combinations of digital codes of strategies, conditions and restrictions have to be made for definition of the direction of transformation of data under various conditions

and the market restrictions. The choice of strategy over means of digital model will allow standardizing and accelerating this process, making it available to machine processing of information. These types of functional models belong to a class of analytical models. However, models, which promote generating of versions of the decision, are necessary too.

Matrixes of multi-purpose optimization are offered for these goals. These matrixes belong to types of models for planning and development of options of transformation of data. Embodying the mechanism of multi-purpose optimization, matrixes allow achievement of higher technical result over comparison with all known analogs. Output data of the offer of each product are optimized comprehensively, to provide the best compatibility of volume, price, and qualitative parameters of offering product as between themselves, so and with the corresponding parameters of demand, when determining the best option of spatial positioning of products over markets into different temporary phases during both the long-term period and current period. Matrixes of long-term planning of data have a priority, as they determine the strategic range of data of the offer of products on the basis of expected data of demand and are base for the subsequent transformation of data of current program, considering change of the current demand. Matrixes possess the mechanism of double action, because allow not only generating various combinations of data of the program of the offer of a product, but also estimating aggregate useful effect from a product at various options of its offer. The aggregate useful effect is defined as sum of useful effect of the producer and consumer. Modeling of data in a matrix allows embodying technologies of synchronization and balancing of data in all cages of a matrix among themselves. It increases the accuracy, reliability, effectiveness of output data of situationally-strategic program.

Matrix models are inseparably linked with models of comparison of options and final choice of the optimal solution. It is recommendatory type of models, which are a basis for forming up algorithms and the computer programs. Digital character of these models allows generating in a compact form a plurality of variants of decisions over data transformation and comparing them for choice of the optimal solution. The constructed recommendatory models allow comparing various options of a configuration of a matrix among themselves and choose the best variants, which can provide the synergetic result, balance between data of the strategic and current program, as well as will allow counterbalancing a plurality of data of the offer of products among themselves and with data of demand of various markets during the current period.

Thus, the article is devoted to new technologies of transformation of data and lights the mechanism of functioning of various types of the digital models interconnected with each other in united system. All described digital models are reflected in the application for the invention considered by the European patent organization. The new technology of data balancing is set of various digital models in unity with digital databases and other digital elements and tools of system. Thus, economy of data is application not of separate elements of digital technologies, but in essence it is system of interconnected digital models and tools used for the description of the most different economic processes, their steps and operations and also for development of combinations of decisions, their comparison and the choice of an optimal variant. The conducted scientific research opens big prospects for creation of new perspective economy of the future on the basis of digital technologies.

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