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Scientific Aspects of Productivity Management in the Investment and Construction Sector

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Abstract: In the conditions of threats and challenges of the economy in crisis, when the functioning of social and economical system is accompanied by the constant risk of achieving crucial level of crisis developments' influence on the efficiency of its functioning, one of the most important requirements to the managing system is crisis-free functioning. So, the managing system must not only provide the principal possibility of solving tasks, set at the stage of goal-setting but also provide a certain level of stability, corresponding to a safe level of stable existence of the economic system and its development. To satisfy this the system of productivity management of investment and construction sector's enterprises must ensure reducing the level of uncertainty at the stage of forecasting and planning, having enough information channels for carrying-out feedback between the results of forecasting in conditions of uncertainty at the stage of planning, being flexible and structured enough to be able to react with the necessary promptness to the identified deviations of companies' functioning from the planned parameters of investment and construction product realization.

Key words: Productivity management, organizational and economic system, profit increment rates, innovations, taxonomy, functional and statistical modelling

INTRODUCTION

Productivity in the general case means the volume of product, manufactured of a unit volume of resources in a unit of time and concerning building the aggregate potential (aggregate resources) and time, necessary for completing the whole complex of works of organizing and managing a real estate construction project (Fig. 1).

The modern stage of the development of building and construction industry management systems is characterized by two peculiarities. The first one consists in the attempt to approach the problem of improving management on the basis of system conception, i.e. by simultaneous considering all basic elements of management system including organizational forms and management structures, management functions and decision-making techniques, control facilities (communication and data processing tools).

Another peculiarity consists in the structural and organizational insulation of the questions of management improvement which are acquiring the more and more specialized character and becoming an independent administrative function, named the function of "organizational management" or organizational development".

The key factor which influences the reduction of construction periods is the factor of "continuity of command" which consists in the necessity of managing the execution of investing and building project, beginning from the earliest stages of investment process, i.e. from taking a decision about the object's construction till its putting into service. A number of research works, similar in methodology, carried out in other spheres of national economy have shown that the management factor is considered by the great majority of specialists as the most important in the view of influencing the increase in labour productivity, building efficiency, profitability, i.e., influencing the productivity of building industry (Kovalsky, 1994). Rating of the factors, influencing the productivity of building industry is carried out by the scale (Table 1).

The carried-out enquiry among building, engineering, realtor and other companies has singled out three most important factors, influencing the productivity, business

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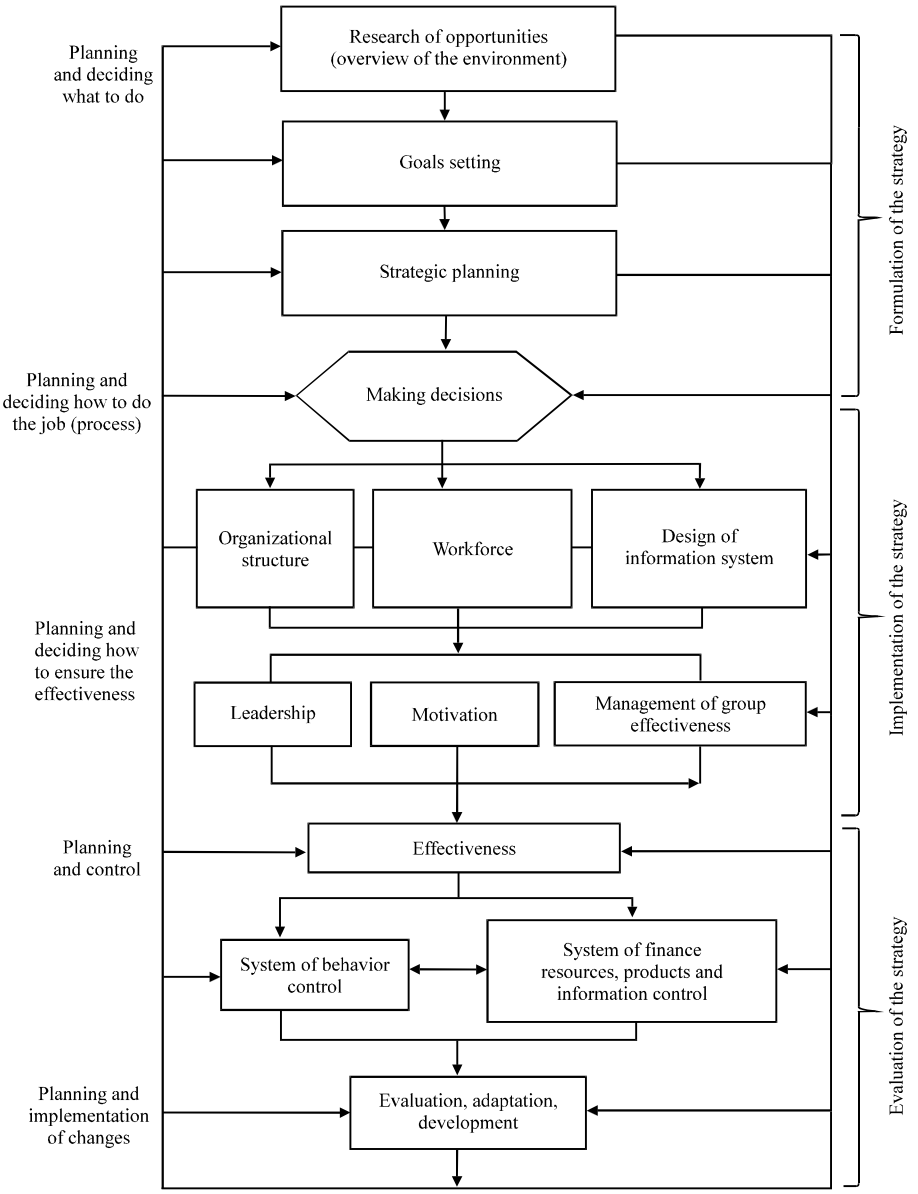

Fig. 1: General process of management

Table 1: Rating of characteristic groupsamong construction and investment companies in Moscow mega-region

Characteristic groups	Small (population to 150)	Middle (population to 150÷1000)	Large (population over 1000)	All companies	Percentage
Development efficiency	15	7	9	31	23
Productiveness	13	7	16	51	26
Business activity	15	17	19	36	37
Others	5	11	4	20	14
Total					100

activity, productiveness and potential capacity. Regardless of the size of the companies, all have noted the managing characteristics as the most important.

So, management factor, according to the opinions of all the companies, taking part in the enquiry, independently of their size and specialization is the most important from the point of view of influence on the productivity of building industry.

Productivity Management (PM) in Investment and Construction Sector (ICS) is the management of

implementing the company's strategy into reality, turning the business plans into specific results. Large building enterprises have monitoring and building quality management systems, systems of managing expenses, information, decisions, financial results, production, stocks, risks, etc.

PM unites indices, processes, systems of information support, planning and control of construction company activity. PM can be presented as a concept, uniting the known methods of improving construction business and technologies of construction operations and innovations.

This concept embraces all levels from heads of the companies and includes the construction activity processes. Summing up the advantages of the concept, we can say that it allows taking decisions and calculating productivity taking into account a large range of functions, providing the implementation of controlling systems, making all the reliability elements work for implementing the strategy of the building enterprise.

In the modern conditions, the stagnation (slack period ordrop in production) has affected all the countries of Europe including Russia. Stagnation in Russia is initiated, in the first place, by a complex of reasons, the most important of which is theadverse effect of external factors, namely the foreign economic sanctions, unbalanced federal budget and the high level of non-manufacturing overheads of the state, disengagement of wage advance from the increase of labour efficiency and a number of other reasons (Baronin, 2012).

The long phase of stagnation stimulates the search for the cost-saving of building industry by introducing technical innovations.

In the beginning of the 20th century N.D. Kondratyev (Russia, 1892-1938), inventor of do called Kondratyev life cycle was answering to his critics which were saying that the technical progress comes from outside and is exogenous to the manufacturing process that the changes in technologies is not a random or external phenomenon, they are arisen by economical necessity and interlaced with the rhythm of the large cycle of a long wave. The simplified version of long waves model can be presented as follows:

$$\frac{dy}{dt} = -\alpha(y-bk); \frac{dk}{dt} = -\beta(k-gp); p = y-k \quad (1)$$

Where:

y = Labor productivity increment rate
k = Capital endowment (innovation) increment rate
p = Profit increment rate
α, β, b, g = Composition indices

But N.D. Kondratyev restricted himself with this. He didn't try to explain the real mechanism of interrelation of the technical progress and long wave. They are connected with mid-length cycle and the structural changes of reproduction in the national economy, including Investment and Construction Sector (ICS). Work equipment and labour force, forming an aggregate potential are always changing in time. So, they are usually recharged not in their initial but in the modified form. Indemnity of fixed assets almost in all cases is connected with innovations to one extent or another. The only question is to which extent.

Innovations move from one sectors of economy to others, eventually embracing all the sphere of social reproduction and transforming the basics of the technical methods of building industry. The deep changes embrace also the labor resources (labor-power), its qualification, professional skills, methods of work and production organization. N.D. Kondratyev was writing just about such complex of shifts, pointing out the material basis of technical and structural alterations.

So, the inhibition of technical progress arouses contradictions which can't be solved without its acceleration, i.e., the new "technical revolution". Technological revolutions give life to new sectors of production and increase the rate of accumulation and sub-sequently the production increment.

The Kondratyev life cycleis connected with certain periodicity of "main capital goods" and technical trends renovation. Such renovations compose the material basis of long waves. It was also pointed out on the important role of the inertia of capital, invested into this economical structure, on its payback logic. Meanwhile, the flow of capital, invested into economical structure as well as of any accumulative capital has its own economic merits, without understanding of which we can't have an idea of the long wave mechanism, nor the mechanism of oscillations in economy in general.

The modern stage of world construction system development is characterized with the increase of competitive struggle for new building markets, the result of which in conditions of scientific and technological advance depends to a great extent on the all-round improvement of production and its management. Competitive struggle, commercial purposes and interests are the determining impulse for searching new decisions in managing the construction industry organization and prompt implementation of science achievements into practice (Poston and Stewart, 2014).

The movement from quantitative changes to qualitative ones can be taking place within one life cycle of real property item and is subject to certain

periodicity. The foreign construction companies pay a great, sometimes even extreme, attention to the questions of management improvement, seeing in the management the main reasons for success and failures and explaining with miscounts in management the objective disadvantages and drawbacks of the external environment. It's appropriate to point out that the under estimation of the importance of the management factor which is typical, particularly, for Russian capital construction is connected with large material losses, inaccessibility of powerful resources for improving the efficiency of building industry (Zukerman and Blevince, 2003).

Improving of the process of real estate reproduction is acquiring great relevance in Russia in the present crisis conditions. It must be mentioned that the adopted methodological approach reflects the problems of the global world economic trend of value-based management at all stages of real estate item's life cycle. The basis of such economical transformations is formed by the perception of category of real estate item' cost not only as local price of a purchased product but as an equivalent of integrated expenses of real estate along the whole life cycle of its reproduction from pre-investment sub-stantiations, construction (purchase) to maintenance (capital repairs) and its liquidation (Gore, 1980).

The world experience indicates that the cost of life cycle is determined by the purchase cost only by 20% and preemptive expenses of the owner are formed by 80% with the total expenses of the operating phase. Such concept of value creation mindset in investment and construction sphere through the point of evaluation and management of cost of the real estate life cycle requires the active application through the energy-efficient and productivity management.

Some ICS companies believe that it's enough to use a balanced system of indicesas uniting the financial and non-financial measures for more balanced management. But as practice shows a balanced indices system is not efficient if there is no contact with other management processes (Bolotin *et al*., 2012).

METHODOLOGY

Productivity management allows numerically evaluating the results of planning expenses with the help of key indices included in the controlling of cost at all phases of life cycle, based on the analytic hierarchy process standards (Saati and Vargas, 2001).

The controlling systems are classified in the basis of the resource and the process of management of goals, for which the system is aimed (Fig. 2). Productivity measuring is in fact, a kind of managerial control.

There are five different but not necessarily mutually exclusive criteria of productivity of ICS building enterprises as an "organizational-economical system":

- Business activity (operability)
- Efficiency of using the building industry enterprises' and specialized contracting companies' production capacities
- Productivity
- Profitability
- Implementation of innovations

Five criteria of productivity are characterized further.

Business activity (operability): It implies achieving the goal due to opportunities of accelerating the intensity of

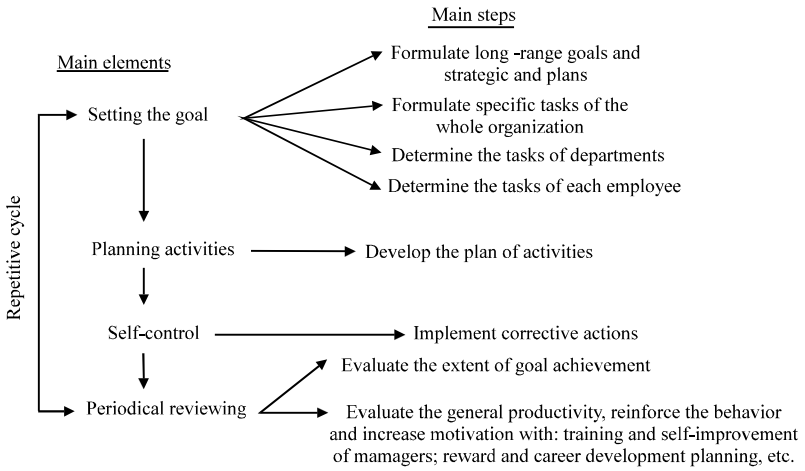

Fig. 2: Process of goal management

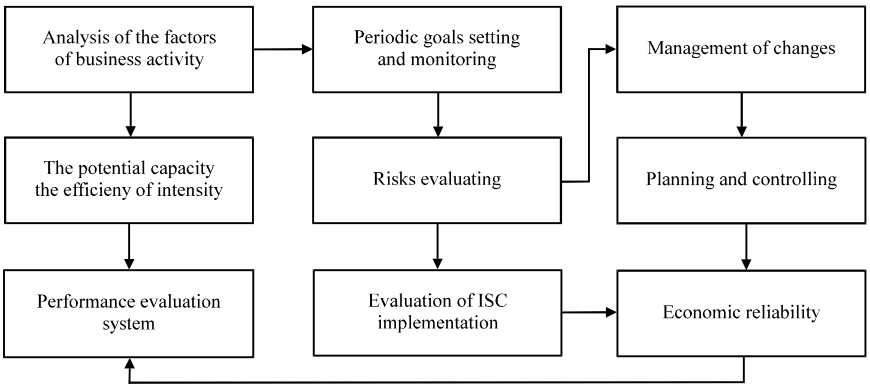

Fig. 3: Management process by goals and managing the "business activity" factor

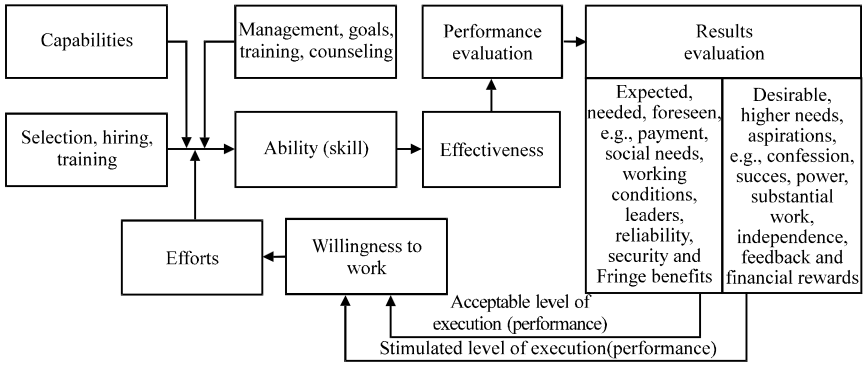

Fig. 4: Basic model of productivity by the factor of "performance"

investment processes development, using in time with the demanded quality of the necessary resources for obtaining the building products (Fig. 3).

Business activity (BA) can be characterized as the share of market which theoretically can embrace building products at any stage of life cycle:

$$BA = \frac{1}{\left(1+\frac{\sum_{i=1}^{n} B_i}{B_a}\right)} \times \frac{m}{K_a} \quad (2)$$

Where:

K_a = Competitive ability of product a
n = Number of products-rivals of product a
m = "Supply-demand" ratio
B_a = Good will index of the construction company-Seller of the product
B_i = Goodwill index of the rivaling construction company

Efficiency of development intensity by the rational use of production capacities of a construction and investment company (EDI): It is achieving the subjective goals, the successful and necessary for use aggregate potential, i.e. in general terms:

$$EDI = \frac{\text{Resources which should be consumed}}{\text{Resources, actually consumed}} \quad (3)$$

The development intensity indices are the qualitative indices of using resources, i.e., workforce productivity (or labour intensity), returns on materials (or materials consumption), returns on assets (or capitalization ratio), amount of circulating assets (or fixity coefficient of circulating assets). It should be pointed out that returns on assets N/F (capitalization ratio F/N) summarizes such intensity indices as amortization return N/A (amortization capacity A/N) and turn-round of basic production assets in years F/A (adverse turn-over ratio A/F). Let's show this interrelations at an example of capitalization ratio modelling (Fig. 4):

$$\frac{F}{N} = \frac{A}{N} \times \frac{F}{A} \quad (4)$$

Where:

F = Annual average basic production assets
N = Ommodity output
A = Mortization, aimed for the totalrestoration of basic production assets

Table 2: Threshold (minimal) rate of return of profit for ICS enterprises

Type of capital investments	Cases of use	Threshold (minimal) rate of return of profit (%)
Enforced capital investments carried out to improve the reliability and safety of production in order to fulfill the requirements of the environment in accordance with the new legislation in this area and taking into account the other elements of the state regulation	In all cases	No requirements to the profit rate
Investments for the retention of positions at the market	Maintaining the stable production level	6
Investments for renewing production capital funds	Maintaining the continuous activity	12
Investments for saving current expenditures	Costsaving	15
Investmentsforincreasing income	Business expansion: increasing the production capacities, reconstruction	20
Riskcapitalinvestments	New construction, implementing new technologies	25

Productivity (P): The amount of building products of organizational-economical system of ICS companies for the certain period of time, referring to the amount of resources, consumed by this organizational-economical system for the same period in general terms:

$$P = \frac{\text{Quantity meeting the quality requirement}}{\text{Actually consumed resources}} \quad (5)$$

So, productivity, according to the definition is a ratio of execution indicator to economy one. Let's note that productivity for a country is often expressed in the form of rate of change. In fact, these are productivity indices, obtained by means of dividing productivity coefficient for one period by the similar productivity coefficient for the earlier period.

To develop a certain structure and logical basis of implementing ICS at the territory of priority development the researchers suggest determining Aggregate Productivity (AP) of an ICS building enterprisein the following way:

$$AP = \frac{AB}{AE} = \frac{\sum_i P_i}{\sum_i E_i} \quad (6)$$

Where:

AB = Aggregate appraisable building product of an enterprise
AE = Total appraisable expenses of an enterprise
P_i = Ready appraisable building product, corresponding to product i
E_i = Appraisable expenses, corresponding to building products

Profitability: A measure or a complex of measures, characterizing the interrelation between financial resources and the character of their use. The threshold rate of return of profit for ICS enterprises is shown in Table 2.

Innovations: Demand for building production, its services at the market and its adaptation to internal and external requirements, requests, changes, etc. and the process of maintaining the acceptance ofbuilding products by a consumer. It is measured by profit growth rate index.

To evaluate the innovation activity of an ICS company and its innovational competitive ability four groups of indices are used (Goncharenko and Arutyunov, 2009):

- Cost indices
- Indices, characterizing the dynamics of the innovation process
- Renovation indices
- Structural indices

To determine innovational potential capacity in comparison with the last year the following indices are used:

- Breakeven
- Percentage of new technologies implementation
- Wear coefficient of the active part of production capital funds
- Returns on assets, etc.

Potential capacity: Real or probable ability of an ICS enterprise, having an aggregate potential to perform purposeful work of implementing a stock of orders. In the general case the potential of an enterprise is a direct analogy of energy in physics. All management entities at any time have a finite capacity of performing work. The ICS companiesare also able to increase the efficiency of their work. The enterprise with "high potential" can be defined as an organization, managing its opportunities in the most feasible way. It's evident, though that the concept of high or low potential is the result of enterprise's goals as the enterprise can choose various ways of performing it.

Potential capacity includes the aggregate ability of production facilities and labour resources to achieve the strategic aims of ICS companies. As the potential capacity measurement (R) the researchers suggest the aggregate risk which includes all stages of ICS enterprise functioning (Prykina, 2014).

The innovation Potential Indices (IP) for specialized companies and enterprises ofbuilding industry which characterize therenewal process are:

- Equipment disposal coefficient
- Coefficient of renewal of active part of production capital funds
- Level of new technologies implementation
- Capital repairs expenditure level
- Reducing of manual labour level

Potential capacity includes the aggregate ability of production facilities and labour resources to achieve the strategic aims of an ICS company. As a measurement for potential capacity (R) the researchers suggest the integrated index of innovational potential of a building enterprise which can be calculated by the following equation:

$$R = \sum_{i=1}^{n} k_i \sum_{j=1}^{m} \frac{k_{ij} + g_{ij}}{2} f_{ij} \quad (7)$$

Where:

k = Coefficient which determines the factor's influence on the innovational potential of a building enterprise, obtained in the enquiry
g = Coefficient of the subjective evaluation of the factor's influence on the innovational potential of the given enterprise
f = The value of factor, influencing the innovational potential of a building enterprise
n = Number of factor groups
m = Number of factors in a group

From the point of view of strategic management of individual building enterprises it can be divided into three groups: technological, technical and organizational-managerial. Technological and technical innovations influence on implementing new technologies, machines and equipment, technical facilities, up-to-date goods and services. The organizational-managerial innovations must have the social orientation.

MAIN PART

The given indices of the system's productivity can be considered as a multi-purpose or multi-criteria measuring system. To measure productivity the method of functional-statistical modelling or grapho-analytical method with taxonomy is used.

The formation of ICS enterprises development strategy is an iterative process so the strategy of economic status management can be considered as a result of continuous process of evaluation and analysis of various dependences of its financial and economical results on the productivity. As ultimate variant of choosing strategies usually the strategies of high and low risk are used. The high risk strategy (large investments and too many imponderables) can be chosen, first of all by a large-scale enterprise, having, firstly, enough resources and secondly, the opportunity to risk with large capital investments.

If a large-scale building enterprise sometimes has no other option, than to choose the high-risk strategy, taking into account the high level of competition, the small contracting companies on the contrary have no other option than to choose a low-risk strategy. But between the large-scale and small enterprisesthere are a lot of middle-sized companies which always have a task of choosing a strategyin a form of some combination of high and low risk strategies.

It's impossible to finish the previous and to run the new life cycle without serious losses which creates additional pressure or alterations in the construction sphere. It's especially justified for cases when there are considered the categories of the aggre gate organizational and economical stability of ICS enterprises, economic reliability of an investment and construction project which are one of evaluation criteria of productivity at using the functional-statistical modeling method.

The algorithm of managing an investment and construction project's productivity in the structure of non-diversified real estate includes five hierarchy management layers, within which the productivity of the project is assessed (Fig. 5).

As the system reliability we will consider, on one hand, the system's ability to function at certain conditions of interrelation with the outer environment and on the other hand, quantitative parametersat the given conditions of functioning. One can talk about the reliable functioning of an investment and construction enterprise only in case if a profit is made by producing and selling a certain product which is provided at many various combinations of two parameters-profit per unit and volume of sales. The choice of optimal economic reliability indices depends on the purposes of functioning. It's evident that any processes, each of which has an influence on the productivity of an ICS building enterprise functioning can take place with a probability from 0 (absolutely improbable event) to 1 (event on the implementation of which nothing can influence).

So, the economic reliability is of probabilistic nature. At this, nomenclature of reliability parameters of a Building Manufacturing Company (BMC) can be rather wide:

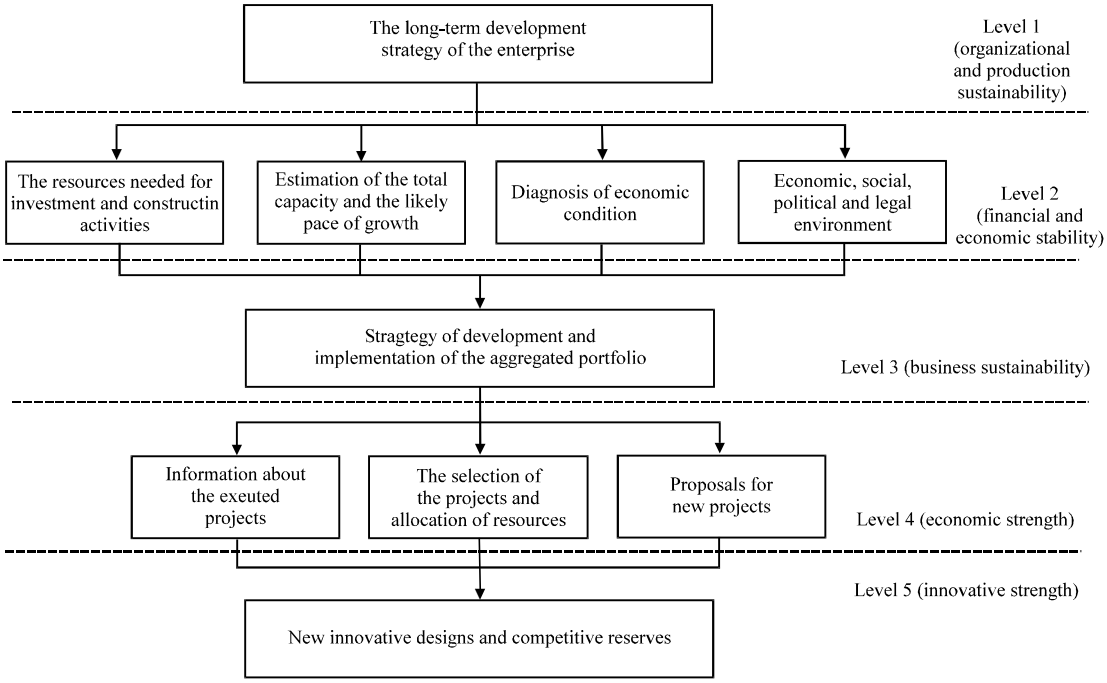

Fig. 5: Algorithm of choosing an orders' portfolio according to along-term development strategy of an ICS building enterprise

- Probability that in the ith period of time the BMC will be functioning normally (e.g., make profit from the stock market trading of 20% per annum)
- Period of time t, within which the probability of the normal functioning of the BMC will be no lower than a certain value

For example, at the stage of manufacturing the first samples of goods on the base of a newest but rather expensive technology, a manufacturing company can be pursuing a goal of image-making of a company, able to develop and implement new technologies. The reliability at this stage is assessed as probability of achieving this goal. At this it's evident that firstly, the probability of the company's contributing to the innovational activity by a new kind of building product will be reducing with the technology's ageing or with the appearance of competitive goods, at the production of which the similar or even more up-to-date technologies were used and secondly that the other goals that can be set for this company, for example, making fixed profit, may be unapproachable at the first stage.

At the next stage of the product life cycle, the stage of serial production and bulk selling, on the contrary, the company's functioning can pursue the goal of making certain profit. The reliability of BMC at this stage is measured by the probability of making fixed profit at each time interval within a certain period. The durability of a real estate item's life cycle is determined by the time which is necessary not only for the full cost replacement of the given reserve but also for its increment with the prescribed pace. The maximum durability is of course, limited with the physical existence of the resources. But from the point of view of economic feasibility resources usually get out of date long before they physically deteriorate.

Return on technology or the capital invested to it goes irregularly. The general rule consists in the fact that the return grows gradually, achieving maximum about the middle of life cycle, after which it reduces, so its dynamics resembles the normal probability plot. The lower return in the beginning of the period is due to natural constraints which are contained in any new resource and its initial exploitation and in the end it's due to physical ageing and competition from the side of new products and technologies.

The durability of life cycle is directly proportional to the amount of aggregate need of the society of the given resource (aggregate potential) and inversely proportional to the rate of its satisfying. The existence of life cycle implies simultaneously the presence of gradual, continuous process of using capital resources (which corresponds to the positive correlation) and the discrete, irregular process of creating capital resources (which

corresponds to the negative correlation). The combination of these two properties is a necessary condition of periodic oscillations in the model.

It must be pointed out that the process of management, considered in the generic form, refers both to the managing director of the company and to aforeman at the construction operations. Of course, the operational content of managing process changes from level to level and depending on the department. The main difference is connected with the distribution of time between certain managing functions. The time, assigned to the planning or operative manage ment, must differ substantially. The other differences in the character of managerial process are also evident. Nevertheless, it must be mentioned that the main managing functions-planning, organization, management, controland regulation are present at all managerial levels. More specifically, any manager orperson in charge must control the productivity of system for which he is responsible. Further, they are responsible that the management function were carried outprofessionally, efficiently and economically feasibly. The control system which they design, develop, implement and use should not only supervise the productivity of an organizational system but signalize when where and probably why the productivity can fail.

As an attempt to build the conceptional logical structure for methods, presented in this study and to help managers more systematically approaching the search and selection of improving productivity methods, according to their requirements, the following taxonomy is suggested. Taxonomy is a science about classification.

It identifies and uses the laws and principles, determining the classification of real estate items. In this case, the taxonomy of methods and approaches to improving productivity is developed to make it easier to understand the process which the management should use when going from measurement and evaluation to assessment, control and improvement (Sink, 1985).

At Fig. 6, the general taxonomy is presented. There are many factors which can be used as bases (axes) for this taxonomy. Of course, the taxonomy can have more than three dimensions but in this case we wouldn't be able to display it graphically. The three dimensions for this classification are:

Unit of analysis and the size or scale: Unit of analysis and the size or scale of the considered organizational system or in this taxonomy, focus of efforts to improve. We should point out that the size of units of analysis varies from the group level to the company level.

Type of influence: The used categories reflect very wide, general types of approaches to influence. For example, a lot of more particular approaches such as developing methods, regulating manufacturing and management procedures can be included into the category "process". It becomes evident that these categories are not mutually exclusive. Such approach asmanu facturing regulation can

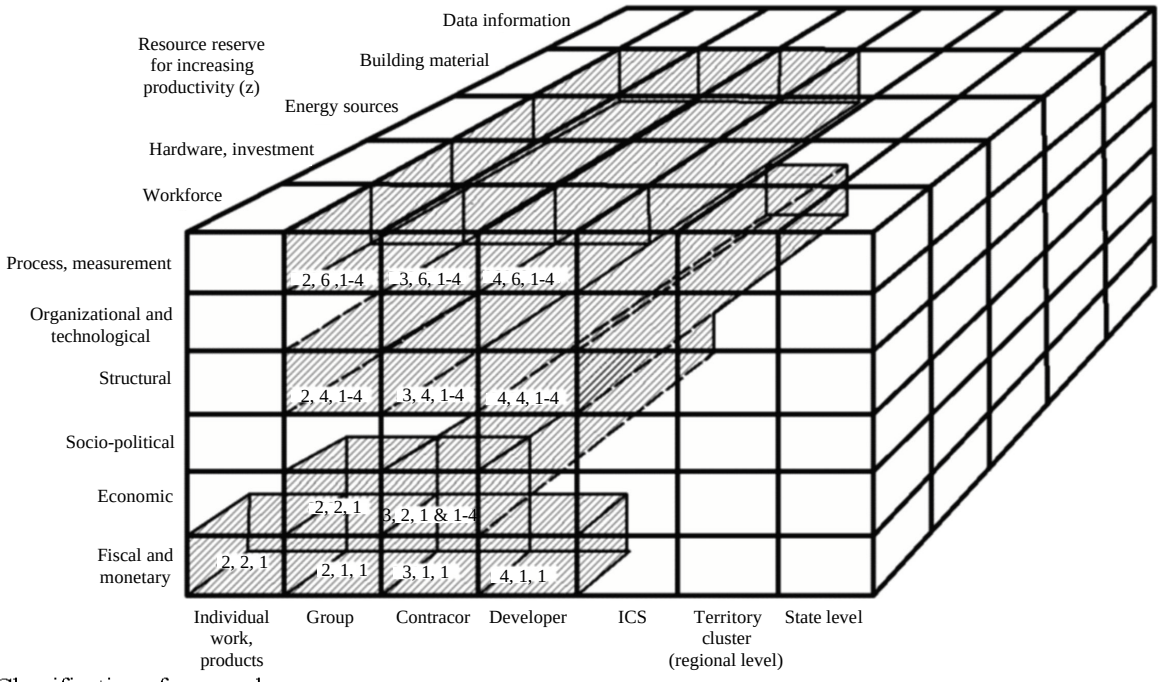

Fig. 6: Classification of approaches

be easily included to the category "process" as well as to the category "technology". At the same time, the list of categoriesis of rather representative nature.

Manageable resources or resources provision of efforts to improve: We should point out that on this axis there are four categories of resources, singled out in the multifactor model of productivity measurement, additionally to the category of data or information.

This triaxial taxonomy provides the conceptional structure which can be used for arranging specific means and approaches to improving the performance. It may be argued that such taxonomy is not too valuable for practitioners. But this taxonomy is important for carrying out systematic research and development, both theoretical and applicable.

So as we can say that the work of managers is permanent applied researches and developments, the arguments about low practical utility becomes less significant than one may suppose at first.

The triaxial taxonomy includes 210 cells, each of which contains many approaches and methods of improving productivity. To consider all cells, the scale of the taxonomy of this part should be limited substantially. Figure 6 reflects this with high lighted cells in the taxonomical triaxial matrix. Let's point outthat each cell isnumbered on each axis. So, each of 210 cells can be determined with three coordinates, reflecting its exact location in the matrix.

The purpose of this taxonomy is to structure the promising approaches to productivity improvement. It can help the researchers to determine certain cells which are not paid enough attention or for which the means of achieving efficiency and economic feasibility are not as they should be. For managers, the taxonomy can be used as a controlling unit for the measures of improving productivity, taken in the certain organizational system. For specific organizational systems, the different cells can play a crucial role at this in course of time the other cells may become crucial. Probably, the most important advantage of the taxonomy is its ability to determine and structurally describe the prospects in such complicated and multifactorial sphere as productivity improvement.

SUMMARY

The state of long waves in the national economy, consisting of main branches of industry, in fluences the life cycle of building industry. Only by rational planning of the accumulated potential one can efficiently manage and equally distribute the capital reserves in time which allows reducing the negative influence of the so-called "echo effect" in macro-economics. The application of the long wave's simulation model, in which the main components are the gross national income increment rate due to the growth of economic activity, production, innovations and other indices of productivity and marketability, allows making the following conclusions:

- Though the life cycles of economic state of ICS enterprises are the material basis for the appearance of the range of periodic oscillations, the length of such oscillations is not the direct reflection of life cycle of this or that type of capital as it is transformed with the whole system of economic links at micro, meso and macro levels
- The important role in managing economic stability in the activity of ICS enterprises is possessed by the innovational policy and investing financial resources to innovations, diversification of industry production and selecting the rational combination of subject and technological specialization.

CONCLUSION

It's evident that in the continuing crisis conditions when the functioning of social and economical system is accompanied by the constant risk of achieving crucial level of crisis developments' influence on the efficiency of its functioning one of the most important requirements to the managing systemis the requirement to provide the opportunity of crisis-free functioning, aimed at achieving the goals of social and economical development. So, the managing system must not only provide the principal possibility of solving tasks, set at the stage of goal setting but also provide a certain level of stability.

In our case to satisfy this the system of productivity management must ensure, firstly, reducing the level of uncertainty level or level of consequences of the uncertainty at the stage of forecasting and planning; secondly, having enough in formation channels for carrying-out feed back between the parameters of actual functioning of ICS enterprises and parameters which are results of forecasting in conditions of uncertainty at the stage of planning and thirdly, being flexible and structured enough to be able to react with the necessary promptness to the identified deviations of companies' functioning from the planned parameters of investment and construction product realization.

Organizational-managerial and economic mechanisms of managing productivity at the territorial level are:

- Development of nation-wide infrastructure including roads, modernization of heat engineering facilities, utility networks, communal in frastructure
- Development of rental housing market with the help of local and municipal budgets and developing the mechanism of this activity's productivity
- Creating the system of professional retraining of managing and engineering personnel at all levels of business activities-from holding companies and housing and utility sector organizations to building companies of small and medium business, etc.
- Creating the system of small business enterprises' and municipal authorities' interest in their productivity by implementing innovations and tax concessions as a reward scheme
- Creating a specialagency at the Ministry of Housing and Building to supervise the observance of standards in construction costs and instandards of utilization of building materials and constructions

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