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PROJECT MANAGEMENT AS A REFORM TOOL

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INTRODUCTION

The debates on what is Project Management (PM) and what is the difference between Project Management and "all other managements" extended over thirty years of PM development. These long-standing discussions gave birth to the very simple and very general definition (See [1]):

"Project Management is management of change".

So one can see, how ambitious the PM professionals are when the expansion of the field of applications of PM concepts, methods, and tools is concerned. This definition is given by PM professionals, but far from all of actual and potential PM users (i.e. managers, businessmen, engineers, economists, and the like) would agree with it.

However these ambitions are rather justified. It is well known that it was a lot of changes in the economy of Western countries in eighties, that primeraly initiated the considerable promotion of PM.

The world changed a lot during eighties; the beginning of nineties demonstrated that the period of even grater changes had started. We can assert (safely from being immodest) that Russia is the very center of these changes. In previous years that was the political sphere that modified mostly; now the changes are more and more related to economy.

The economic reforms, those actually started in Russia last year, are the center around which changes in this country are concentrated. These days all fundamental events and processes in political and economic spheres are coursed by the reform progress, by their successes and failures.

In its turn, the success of reforms evidently depends on the level of management of programs and projects that are just the essence of the reforms.

How to manage reforms? Is there any regular approach to reform management? Could PM be a tool of management of such large-scale changes as reforms? On which level and how should PM methods and tools be applied? Which new requirements to PM approaches and methods are brought by these challenges? Those are the questions we are going to discuss in this article, having no ambitions to give the final answers.

Both in Russia and in the whole other world PM professionals are inclined to overestimate the possibilities of PM (PM Without Boundaries - that is the motto of the last world congress of INTERNET in Florence), whereas decision making persons are inclined to underestimate these possibilities. A search for "the happy medium", the elucidation of the real role of PM is probably the major target of any professional project management association. We would like this article to be a step in approaching this target.

CHANGES WITHIN REFORMS IN RUSSIA

The rapid going from a stable system that rejected any changes (by the way, the system rejected PM as a tool of management of changes too, [3]) to the violent changes, to almost "chaos" is the distinguish feature of Russian reforms. First of all, we will try to make sense of this chaos, to analyze the structure of the changes going within economic reforms in Russia. Naturally, we will consider the issues related to the possible areas of PM applications.

Levels of changes.

The changes in Russia may be classified according to three main levels:

- the state or region (mega-project) level
- the company (multi-project) level
- the project (or mono-project) level

These levels will be the basis for our discussions (see fig.1).

The state and region level

The economic reforms of this level are embodied in programs (mega-projects) of the development of regions or brunches of industry. The programs include the variety of projects combined by common goals, resources, and interrelated dates of implementation. They touch not only considerable material values but also the interests of large groups of population. Naturally, the mega-projects are compiled, coordinated, and controlled by the federal or regional governments.

The company level

Economic reforms initiate deep changes in companies and enterprises including transformation of the state property to the private one. But privatization is not the final goal of those changes. Quite the opposite: it is only a start of the way of companies to become effective. Orientation on new products, technology innovations, reorganizations has to follow. This is why transformations of a company should be considered as an integrated multi-project, related to technical, structural, and social changes. Such multi-project is managed by company authorities.

The project level

In the long run certain improvements of economy, social infrastructure, ecology are the results of certain investment, innovation, organization, and the like projects, those with particular goals, strict financial, resource, time, quality, and the like limitations. Such project requires the unified project team.

The content of the changes

What is changing within today reforms in Russia? The main "spheres of changes" on the all above levels are illustrated by fig. 2 and discussed below.

Property relationships

That is the main change which determines all the others. The most of small, medium, and now large enterprises (with the exception of those in certain brunches of industry) are transferring from state to private owners, those personal or collective.

Organization forms

The changes of the relationships of property require the new forms of organization. There exists a number of options: public or private companies, controlling stock holding by personnel, a group of high managers, or outside private investors; with or

without foreign investments. The State may participate and/or control variously: it can hold controlling stock or, say, 30% of stocks, it can create different associations, consortiums, concerns (founded on the basis of former Ministries) in order to affect strategies, technical politics, prises, and the like.

Market changes

The market changed dramatically since the reforms started. The liberalization of prices was followed by the transition from chronic deficit, from ever-lasting exceeding of demand over supply to a dynamic equilibrium between supply and solvent demand. Wide possibilities to choose goods and limited possibilities to spend money changed essentially the structure of demand. The destruction of the USSR, on the one hand, and the integration of Russia into the world economy, on the other hand, affected the internal Russian market considerably. These processes defined the particular role of the market analysis and prognosis.

Transformation of company concept

The above mentioned changes force enterprises to define new goals, economic policy and strategy of development, to select hopeful products and services.

Transformation of manufacture

Then production processes should be transformed, which means reconstruction, renewal of technologies, retraining of personnel, etc.

Transformation of organization structures

All above requires new organization structures appropriate for new goals, purposes, and environment.

Transformation of management

And the last but not the least. The style and methods of management should be modified as well as management tools including communications, information aid, and all the like sevices that provide progress of projects and programs.

PM AS A TOOL FOR MANAGEMENT OF LARGE-SCALE CHANGES

Management of Changes: two approaches

There exist two opposite concepts of management. They could be named as follows:

- systematical (methodical) management
- empirical (spontaneous) management

The first approach assumes the methodical application of purposely developed sophisticated methods of management. In this case the necessity of careful planning, well organized control, thought-out coordination are taken as granted.

The second approach assumes nothing but the existence of global goals ("democratization", "transfer to the market economy", and the like). In this case the management is performed by intuitive, empirical decisions, decisions "in accordance to the situation", by the trial-and-error method, by hit and miss.

Of corse, these two approaches almost never appear in the pure state. In real life one can meet their various combinations. When it comes to comparatively simple

systems (single projects) the first approach has proved to be effective. The situation is different with such complicated systems as large enterprise, brunch of industry, economy of region or of the whole country. The example of Russia could show how non-effective the extreme approaches are.

Before "Perestroyka" started the concept of centralized management had ruled. That was the period when the economy of the country was planned and controlled as the activity of one huge enterprise. Apparently the extreme embodiment of this concept was the Kruschev's "Program of the Construction of Communism ", where the process of Communism Construction in the USSR was designed almost in the same way as usual construction project.

The failure was so evident that the opposite extreme - the concept "hit and miss" became triumphant. This concept is well expressed in numerous Gorbachev's appeals, those of the sort: "Let us do, and then we shall see and correct". Unfortunately far from everything could be corrected. The price for many errors turned out to be too high. However even today the hopes are pinning mostly on the self-regulation of market economy, on the idea that "the life itself will arrange everything". The today inflation in Russia follows in a sense from this second approach. (The authors emphasize that they are firm supporters of the reforms. The case in point here is the approaches to the management).

The key to the happy medium between these two approaches lies with the "Necessary Variety Law" stated by Eshbey in 1956 [4].

The essence of this law is that the complexity of the control system has to be in correspondence with the complexity of the controled subject. In other words, for given regulator there exists the limit of the complexity of the system under control.

Thus, the question arises: Could PM improve the regulator? To put it differently: Could PM be a tool for management of rather complicated systems? In which directions PM should be developed in order to put it in correspondence with the motto "PM without boundaries"? We shall consider this questions in the context of above mentioned levels of changes.

The (mono-) project level

This level is investigated rather well. Here we are dealing mostly with traditional PM methods as well as traditional fields of applications. The brief review of the state-of-the-art and some notions about development could be found in [5].

The Company level (Multi-projects)

PM of this level is actively developing now. However, multi-project management is still an open area. Besides, the area of applications we are dealing with - the transformation of companies in the reform environment - has some peculiarities and deserves a separate review.

The story of the "20-th Trust"

Let us start with the history of the transformation of the sertain company: "20-th Trust corporation". Prior to 1989 it was an ordinary, though comparatively good, state construction organization: "Trust N20" in Leningrad (St. Petersburg now). As all similar "trusts" in Leningrad (and through over Russia), "Trust N20" with about 2000 employees performed construction works by orders of the city authorities and enterprises of the city. Due to the chronic shortage of construction capacities in Leningrad (as well as in the whole USSR) "Trust N20" was provided with orders for many years ahead and could sustain a comparatively successful existence.

However, with the beginning of real economic reforms in Russia the situation changes essentially. The solvent demand on construction works decreases sharply. The capacities becomes redundant, the hard competition appears. A lot of companies came to the verge of bankruptcy at that moment. They had to ask the State for credits and subsidies, lost their best workers due to impossibility to pay them even average salaries.

That, however, did not occurred to the "Trust N20". Quite the opposite, this company increased considerably (it became 4 times lager), became highly profitable, and could provide its employees with high salaries and social benefits. The point is that back in 1989 young leaders of the company along with the group of PM experts were thinking about the future. They developed a long term (multi-) project of transformation of the "Trust N20" into a modern, powerful, flourishing company. And, what is most amazing, they managed to do what they planned, although the changes of environment were fast and hard to foresee.

The following are the fundamental points of this multi- project.

1. Escape from total State control, privatization
2. Step-by-step transformation of organization forms: taking the enterprise on lease, establishing the stock society owned by the personnel, transformation the company into the public one by issue and sale of stocks.
3. Permanent analysis and forecast of the market.
4. Step-by-step change of the enterprise concept and activity:

- shift from being a pure contractor (which in Russia executes nothing but construction works) to being a project holder (which implements the whole project).
- investment of its own money in its construction projects
- short-term, profitable investments in financial, trade, and real estate business

5. Transformation of manufacture, equipment renewal, involving new technologies
6. Organization changes: transformation of the divisions of the company into the daughter companies.
7. Shift to the Western style of management, creating necessary infrastructure (communications, own publishing capacities, powerful computer networks, modern software including PM software)
8. Series of key construction projects as well as a number of projects related to the improvement of social benefits of the employees.

<u>The peculiarities of multi-projects related to company transformation</u>

This story is the rare in modern Russia example of both successful application of PM and systematic approach to the management. However, the situation itself is quite common: thousands of Russian enterprises face the same problems.

But what is the peculiarity of the multi project of the kind we just described? What is its dissimilarity from the traditional project? In our opinion, its main peculiarities are the following:

A. The transformed company is establishing on the base of existed enterprise with building, equipment, experience, personnel, suppliers, customers, and the like. Sharp changes would cost a lot and could lead to such undesirable effects as mass dismissal. Thus, the initial state should be taken into account with special care. It will influence considerably during all project stages.

B. The aim of transformation usually can be described only in general words ("the maintenance of competitiveness", "reaching balanced financial state", "prosperity"). In today situation one can hardly determine some desirable quantitative indices that should be reached.

C. The process of organization transformation is cyclic. The continuous monitoring of enterprise work, making decisions on further changes are vitally important. That, combined with the above points, brings us to the idea that such a project has a start but does not have any finish.

D. One multy-project combines a number of interrelated projects of different kinds:

- technical, organization, economic, and social
- internal, carried out in order to develop the company itself, and external executed for outside customer

E. It is necessary to take into account the features of project environment, such as:

- lack of society stability
- market transformations
- inflation and lack of stable taxes and financial-credit systems
- violation of traditional company contacts Of course, all these peculiarities make the problem more complicated. On the other hand, we believe that just these peculiarities force one to use such a tool as PM.

The State and Regional level

As far as we know the PM methods for this level are underdeveloped and rarely used in practice. The management is usually reduced to the distribution of funds among program elements and to the general control of their spending. Is it possible to adopt the experiences accumulated in the management of large-scale projects? Which peculiarities must be taken into account?

The Yakutia Story

We are beginning with an example again.

Yakutia is one of the Republics of Russia (Sacha Republic). It is situated in the North-East part of Siberia. The total area is 3103 thousand square kilometers (1/3 of USA area). The population - 1092 thousand. The density of population is near 0.3 persons per sq.km. Yakutia is the most cold country in the Northern hemisphere. The average temperature in January varies from -50oC to -34oC.

On the one hand Yakutia is one of the richest region of the World. All Russian diamonds and about 50% of Russian gold are from Yakutia. There are reach oil fields, coal mines, and huge storages of natural gas, non-ferrous metals, and many other minerals, not mentioning the wood.

On the other hand, Yacutia is one of the unfavorable regions of Russia when a good housing, social infrastructure, transport, communications, and the like are concerned. The processing brunches of industry are weak, so is the agriculture. All these points, (not the hard climate), make the life in Yakutia rather tough and force many citizens to leave.

The republic needs a development program. The means for its implementation are appearing of late. By the new agreement between the federal government and the Republic the latter possesses all its natural resources (with the exception of diamonds and gold, of those only a part stays in possession of Yakutia).

However for 2 years there was nothing but talks around this program. The help was offered by SOVNET professionals and experts from the USA (Victor Arnold, University of Texas, Austin, Texas and David Pells, Strategic Project Management, Dallas, Texas). They proposed the approach to the Republic development planning. Their approach included the following basic processes:

- analysis of trends of development
- identification of needs
- definition of main goals and objectives
- definition of priority system
- determining of requirements and limitations
- analysis of alternatives
- selection of recommended alternatives
- definition of program outputs
- scope statement
- determining of milestones and master schedule
- cost estimating
- requirements to modification of local laws and regulations - program management and organization

Those processes are obveously similar to those in preparation of usual project. We have no doubght that PM approahes would be useful both in the stage of detailed program elaboration and its implementation .

Peculiarities of mega-projects, related to development programs

Yakutia, being so gifted by natural resources, is unique in Russia. However the situation there is rather typical: most of Russia regions confront the similar problems. In the long run the amount of allotted funds is not that important. What is really important, is how effectively these funds will be used.

So which are the peculiarities of such mega-projects? What differentiates mega-project of that kind from traditional project? We believe that all peculiarities presented in the paragraph dedicated to multi-projects (points A-E) take place here as well. But there are some others.

G. First, administration is substituted by regulation on the mega-project level. Such regulation tools are well known: taxes policy, credits, stimulation by giving privileges, and, of course, direct investments sometimes.

H. The center of gravity should be (is) shifted from an operative, detailed control to strategic planning and the control of key economic and social outputs.

I. The coordination of different projects and programs involved is taking new content. The lack of traditional (Mega-)Project Manager and (Mega-)Project Team, the multiplicity of participants and the impossibility to control them from the one center - those are the problems that arise here.

In our opinion, these peculiarities could as well be taken into account in the framework of PM methodology, and the appearance of the new field of PM applications just stimulates the development of PM as a tool of change management.

Prime directions of development

The expert estimates of the importance of PM functions presented in the PMI's Project Management Body of Knowledge (PMBOK) from the point of view of the above fields of applications are shown in diagrams in fig. 3. These diagrams also

illustrate the "quantaty" of necessary modifications which should be made in traditional methods and tools to adapt them for management of large-scale changes.

As is evident from the above examples and from the analysis of the peculiarities of all "levels of changes", the transformation of PM into an effective tool for management of large-scale changes is connected with the development of PM itself in the following major directions.

FROM	TOWARDS
projects related to changes in technical systems	projects related to changes in economy and social sphere
(mono-)project	multi- and mega-projects
implementation phase	concept and development phases
operative control	strategic management
"pure" scheduling and resource allocation	economic evaluation control of key outputs
management in stabile environment	management in crisis environment

It is significant that similar tendencies can be observed in the Western literature.

WHICH METHODS AND TOOLS COULD BE APPLIED?

Thus, the new challenges, new applications require new methods and tools. What could be used for their development? We have no ambitions to make a comprehensive review, we are going to review some promising pieces of research only. In doing so, we will enlarge mostly on the works of Russian authors. Not that those works are more advanced than the Western ones. The reason is that on the one hand, we are more familiar with Russian works, on the other hand they are unknown in the West.

Transfer of traditional methods into nontraditional spheres

However, we should primarily mention the methods that become traditional and widespread today. Being transferred into new spheres of PM applications mentioned above they must be adopted and developed relatively.

Conceptual-design method

Methods and tools for the concept phase of projects are developed less than for other project phases although the concept phase is of most importance to the project success. This phase is even more important for multi- and mega projects. However, perhaps, completely new techniques are required for conceptual development, particularly for programs related to changes in organization, economy and social sphere.

So-called "Conceptual-design method" was developed in the USSR [5]. The essence of this method reduced to the special logic technique using which one can describe formally any complex subject areas. Tools produced within the method allows one to

analyze a permissible ways of reaching of project goals and to choose the concept of project or program implementation among alternatives.

The method is of most benefit because today the concept of project implementation is formed empirically by comparing a few alternatives and many better variants are left unexamined.

Project-modelling methods

Probably project-modelling techniques are most developed among other PM methods. However, its improvement is still up-to- date, because the level of correlation of the models with the real processes defines the effectiveness of PM as a whole. The following original pieces of research are devoted to the improvement of project modeling methods.

Generalized network models (GNM) are more general and powerful than model of the CPM-type or of the MPM-type. Using these models by means of simple network technique one can reflect for example the variable durations of project activities, the coincidence of activities, the links between activities not only of "Not Earlier" type but also of "Not Later" type [6].

These models provide easily enough more realistic description of projects than the traditional networks. The GNM have a chance of being preferred model for complex projects and programs.

Hierarchical models are a system of projects models of various levels of detail determined by various break-down structures and intended for various project/program participants and levels of management. The approach proposed in [7] differs from the similar approach known in the West by the lack of necessity to calculate permanently the parameters of detailed model of the "lowest level". Thanks to GNM technique each user has an opportunity to work with his/her own compact model.

The hierarchical models could be useful when applied to national and regional programs in which it is impossible to observe the whole detailed network and when the number of participants and variety in management levels are large enough.

Simulation models for PM [8] combine the advantages of the euristic methods of decision making and of the method of stochastic modeling. It is remarkable that in these models the new simulated factors (such as economic consequences or the procedures of management and control), can be added to traditional factors (time, resources, risk).

Simulation models allow one to work with those project aspects were traditional models fail. It is possible to apply them for risk analysis as well as for simulating of decision making process and for selection of reasonable organization structures and procedures.

Multi-project management. The balancing method

In recent years the need for new methodology of what is commonly called multi-project, portfolio, or program management is becoming more and more clear. Conventional techniques that treat a portfolio of projects as one "large-project" or "big- network" are not effective enough when large portfolios are handled and processed.

In [9] a new approach to multi- project planning was presented (see, also [13]). It is based on evaluating and balancing of user-defined key portfolio parameters

("indices") which are most relevant to the portfolio of projects at any particular stage.

The key parameters or indices are typically determined by external conditions such as limitations imposed by authorities, contractual agreements between parties, etc. These could be overall financial or cash flow limitations, similar limitation by client organizations, limited delivery capacities by some contractors/suppliers, limited availability of other resources, and the like. However, a wider class of relevant portfolio indices can be also accommodated, such as those which reflect goals of the company or the program, for example, revenue and profit contribution, or new production capacities and expected number of new job positions.

The balancing process starts with user identifying the most relevant key indices (the "balancing indices"), and specifying the values of these indices which it is desired to reach (the "desirable values"). The original balancing algorithm (the heart of the method) then reschedule all the projects of the portfolio to give the least differences between derived ("balanced") values of the key indices, and their desirable values.

In essence this method can enable a program directors to rapidly simulate and model the optimal mix of projects upon various business scenarios, to "play tunes" with the indices investigating a wide range of possible strategic opportunities and particular problems.

The balancing method offers the workable multi project management methodology which is applicable for programs of enterprise organizations and programs of region or industry branch development.

The very interesting and partly similar approach was suggested in [10].

Theory of active systems

Within the theory of active system [11], PM mechanisms that take into account interests of executors in task fulfillment and the reliability of the information provided by them were proposed and researched. The theory of Active Systems produces tools that formally consider a human factor which strongly influences the process of project implementation.

Expert systems and knowledge bases

Expert system and knowledge bases are playing an increasingly significant role in new information technologies. Their active development in the West shows that they are of great importance for all PM applications. From our point of view using expert systems and knowledge bases in conceptual development and in scope management is the promising application.

CONCLUSION

Taking the economic reforms in Russia as a model, we tried to analyze which were the new possibilities for PM application, as well as how much such a tool as PM responded the new challenges.

The considerable changes that going on in the world in the end of this century offer new perspectives for the expansion of the fields of PM applications, and extension of the circle of PM users, as well as for development and promotion of Project Management concepts, methods and tools all over the world including developed and developing countries.

Of course, transformations go differently in different countries. However, for all of them there is one important factor in common: the success of transformation depends on the level of management of programs and projects that are just the essence of these changes.

So we hope that our above considerations could be applicable not only in Russia but could also be interesting for PM professionals in other countries

But there is one more point. Usually wide practice application follows the research work after a long-year period. So, if we want the new approaches and methods to become next decade standards (just as the Networks Methods become standard these days), we should develop them now (fig. 4). That is hardly possible by efforts of the specialists of one, separate country. In our Florence Congress report we offered the international R&D project "PM methods and Tools for 21-th century". We believe that such a program could be the basis for cooperation of all national PM associations and institutions.

REFERENCES

(1) Barnes, M. "Summary of the Day and Some New Thoughts", Proceeding of INTERNET'91 Symposium in Zurich, Zurich, April, 1991.

(2) Voropajev, V., Scheinberg, M. "Project Management in the USSR: Yesterday, Today, Tomorrow", Proceeding of INTERNET'91 Symposium in Zurich, Zurich, April, 1991.

(3) Ashby, R., "An Introduction to Cybernetics", Chapman and Hall Ltd., London, 1956

(4) Voropajev, V., Scheinberg, M., "Project Management Methods and Tools for 21st century", International Journal of Project Management, Vol.10, N4, 1992.

(5) Nikanorov, S. et al, "Mastering and Conceptual Designing of Intellectual Systems", Proceeding Moscow Symposium. Central Inst.on Economics and Management of Construction, April,1990.

(6) Voropajev, V., Scheinberg, M. et al, "Generalized network models", CNIIPIAS, Moscow, 1974.

(7) Voropajev, V., Lebed, B., Orel, T., "Decomposition methods of data presentation in construction management", CNIIEUS, Moscow.

(8) Kulikov, Y., "Simulation Models and their Application on Construction Management", Stroyizdat, Moscow, 1983.

(9) Scheinberg M. "Planning of Portfolio of Projects", Project Management Journal, Vol. XXIII, N2, 1992.

(10) Turner, J.R., Speiser, A., "Programme Management and Its Information System Requirements", International Journal of Project Management, Vol.10, N4, 1992.

(11) Burkov, V., Theory of Active Systems, Nauka, Moscow, 1990.

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Mr Wally Merrin
Technical Program Chair
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C/O Mr. David Pells

REF: Control Number 93058

Dear Mr. Merrin:

Here is the final paper "Project Management as a reform tool" presented by Vladimir Voropajev and myself for PMI'93 (International Track).

While preparing the manuscript we tried to meet your requirements. However, we agree in advance with any changes and abridgements you would like to make.

A diskette with the WordPerfect 5.1 file is enclosed. This file includes all figures. Just on case I send also files with the text in ASCII format and PCX files for graphs.

Sincerely

Mark Scheinberg