PROJECT MANAGEMENT MATHEMATICAL MODELS FOR SALES DEPARTMENT OF THE ORGANISATION

(ON THE EXAMPLE FROM CONSTRUCTION INDUSTRY)

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SUMMARY

The article considers the mathematical models intended for managing a project's activity at all stages having one interested party, sales department involved. The problem of managing projects from the position of the sales department is explicitly formulated and stated. Use of the mathematical models is aimed at increasing the efficiency of sales department's activity as well as the increasing the success in construction projects execution. The development of mathematical models for project management from position of sales department is a basis for a new set of competences for this stakeholder.

KEY WORDS: Interested parties, stakeholders, project management mathematical models, sales and marketing department in construction, project management competences.

INTRODUCTION

Most of the projects are aimed to get the financial result and meet the financial and economic criteria as the success criteria. The investor decides to join the project, based on a business plan and aims to gain profit. The customer defines the product requirements, the project management team, together with the general contractor and suppliers performs the project and creates a product in accordance with the declaration of the customer's requirements and objectives of the investor to make profit. In modern project management methodologies, the roles of investor, customer, project management team, suppliers have been well studied and described. However, to make the project profitable it is necessary to ensure the cash flow to come to the organization. This is done by sales department of the organization which is responsible to find the clients (end users of the future product) and sell the product to them. Despite the fact that sales are directly linked to ensuring the profitability of the project and is one of the important criteria for success, in the existing project management methodology little attention is paid to the competencies, methods and tools, necessary for the effective execution of the sales department's functions.

Sales department – part of the organization or organization itself responsible for the implementation of the project product (deliverables) to the clients (end users) and providing cash flow from the clients (end users) to the project budget.

It is necessary to distinguish commercial, industrial, residential real estate and land. Figure 1 represents the possible classification of real estate depending on purpose.

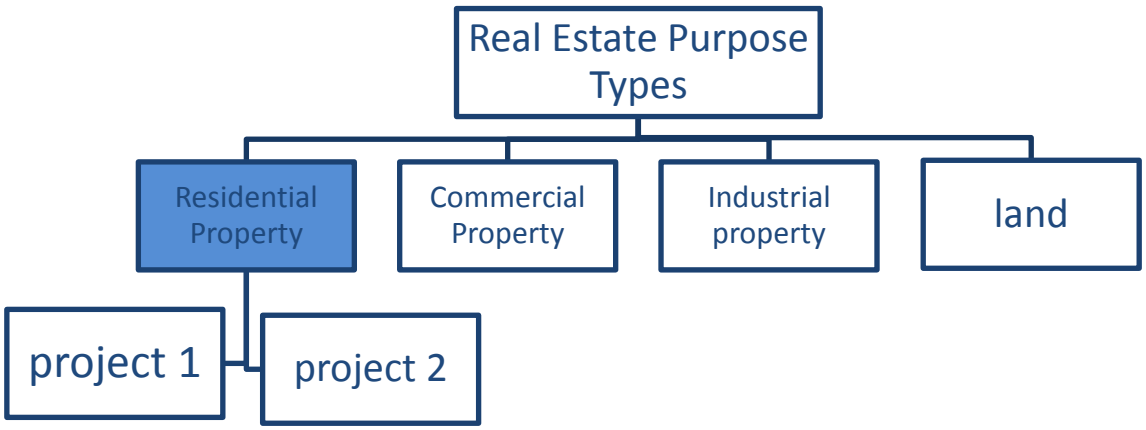

Fig. 1. Classification of real estate on purpose principle

Depending on the type of object being created there could be distinguished several main types of projects:

- land management projects (formation of new land plots, reorganization, changing the status and purpose of the land plot, realization/selling/acquisition with capitalization etc.);
- new construction (capital construction) and modifying existing objects (extension, re-modeling, reconstruction, re-concept etc.);
- single-stage projects (design, evaluation) and multistage (construction and development).

Most of the projects in the real estate field, aim to make a profit, which leads to the choice of the industry as an example in this chapter.

In this paper, we consider the construction industry as an example for developing the mathematical models and have chosen the real estate that creates new residential property as a result of the project execution.

PURPOSE AND ROLE OF SALES DEPARTMENT IN PROJECTS

The role of the professional sales department today is difficult to overestimate. The vast majority of companies that are successfully working in the Russian market have been operating for over 10 years. Experience accumulated during this time allows companies to use the

corporate project management system to achieve the competitive advantage. Experts in this area notice that the main purpose of sales department is generating cash flow along the whole project life cycle by starting to sell the flats/apartments under construction. The sooner sales specialists start selling the square meters of the property the better and more stable the income is generating. Thus, the role of the sales department is difficult to overestimate. The income has its influence on the financial and economic indicators of the project and consequently on the project success criteria.

Depending on their goals there could be mentioned several types of sales departments, for example, companies - brokers, specialized real estate agencies, real estate brokers, real estate companies division and units. They carry out their main function selling the product of the project by parts and providing organization with money coming from the end users.

Case study. We consider the activities of the special department on the example of the organization that deals with construction of residential property, namely, two complexes of buildings on the two plots of land. The organization is a full-cycle construction and development company, executing two projects at this time. The business unit, responsible for the cash flow from the end users of the future apartments, comprises two functions in one division - marketing and sales. The purpose of marketing and sales department is to provide cash flow through the sale of apartments in two buildings under construction.

Based on the objectives of the company the functions are clearly defined:

- development and implementation of marketing activities aimed at finding and attracting clients;
- contracting with clients;
- tracking of cash flows under the contracts;
- problem solving with clients and work with the complaints.

The information, tools and methods used:

- sales plan per month, including the number of units of a certain type (1-bedroom, 2-bedroom, etc.);
- project budget;
- business plan;
- legal support in the form of contracts and other documents;
- consolidation of network project schedule;
- milestone schedule.

KEY CHALLENGES

In this section the main limitations and constrains connected with the project execution are described as well as the key issues and challenges to be solved. Among the main limitations and constrains are the following:

- timing of the apartments to be sold;
- deadlines of constructed object to be finished and handed over;
- availability of certain type of apartments at different stages of the project;
- insolvency of the clients;
- sensitivity of the real estate market to macroeconomic factors (politics, economy, exchange rates, etc.);
- volatility of the prices on the real estate market;
- budget allocated to market research, advertising.

The methodology used on this case study is based on two methods that fit for purpose of the descriptive analysis, i.e. observation and interview with the marketing and sales department employers, functional manager of the department and top – manager of the company. After the interview accomplished and observation data gathered, the analysis of the key issues has been completed. The eight key issues have been discovered.

1. M&S department is not involved in the project

Representatives of marketing and sales department are not engaged into the project team. They do not have detailed information about the project, do not have the ability to track changes in the schedule and the reasons for these changes. Due to the low level of awareness they feel "detached" from the realities of the project, which complicates communication between the M&S department and project team members. Lack of understanding of common goals, problems, tasks, events and milestones in the project has been identified.

2. Sales plan as the main tool used is not effective

Sales plan is developed based on the project business plan basis. The plan shall be approved and reviewed monthly. It is known (from the network diagram) at what times and how much money should be received from the clients. However, in the network diagram there is no time scheduled for the marketing and sales activities which leads to incorrect sales planning. Inadequate planning, not taking the work for marketing and sales into account, leads to serious cash gaps in the execution phase of the project.

3. Gap between the sales plan and the actual revenue in a given time frame

Due to various reasons, commercial service does not fulfill the plan sales. Revenue from the sale of an object or part of the property is not coming regularly.

4. Irregularity and unpredictability of revenue from clients

It is difficult to predict the behavior of the client. It is necessary to monitor macro factors and assess risks connected with their activity, determine their impact on the project and its performance.

5. Seasonality of sales

Sales are subjected to the seasonality factor. During the Christmas holidays, first quarter of the year, summer months is the time when potential buyers are on holidays and do not make purchases. This factor is not taken into account in the planning and construction of the project schedule. As a result, the sales plan is formed inaccurate initially, based on their average monthly needs. For example, as some of the experts mention in their interviews, the plan could be to sell 30 apartments per month. The seasonal factor must be considered when planning the project.

6. Risks connected with marketing and sales are not enough taken into account

M&S department does not have a tool to assess the macroeconomic and other risks in order to predict whether they will impact the sales plan or not. It is necessary to develop and implement such a tool into the whole risk management system.

7. Sales forecast: revenue and profit of project

The most difficult task is possible to forecast sales more accurately, expressed both in real terms (e.g., square meters) and in terms of money. It is necessary to be able not only analyze plan and actual sales but also evaluate the impact of the "shortage" of money on the entire project indicators.

8. Impact of the schedule variance

Another issue is that in the project schedule slippage occur. At some stage, the situation may occur when violation of terms of delivery of the object causes clients sue in court. In this case, according to the contracts, with clients there can arise proceedings which entail fines and court costs. There should be a mechanism developed to prevent this scenario, or at least minimize its negative impact and consequences.

Thus, for marketing and sales department to function more effectively the special tools and methods should be developed for operational management and medium-term activities and tasks. For this purpose it would be good to have a model based on the operational schedules, events, risks events and other activities that includes also operational accounting, reporting, control, monitoring, analysis, management, forecasting and feedback. Applying a convenient model the M&S department staff will be able to provide certain sales necessary to certain events of accomplishment of required milestones, realization of the product at various stages

of the project, the needs of end-users of the product of the project, the implementation of marketing activities.

Possible elements of the functional model for M&S department could be milestones, works and activities on marketing and sales, according to the schedule planning based on the end of the project, contracts, financial parameters, activity on processing the complaints.

Among the M&S department there are functions closely related to the COST and FINANCE of the project and could include:

- market research and estimate (solvency of the population, sufficient number of potential buyers for the certain property type, needs of consumers and their expectations of a specific level of quality of the object);

- preliminary assessment of the amount of cash that may be gained from the sale of the property, the required monthly payment receipts, calculation of the number of volumes sold (square meters of apartments);

- developing estimates of operating costs required for the operation of M&S department (employees' wage and motivation system, marketing activities costs);

- cash flow planning (timing and amount);

- execution and control of sales plan, analysis of deviations and their causes;

- evaluation of the effectiveness of marketing activities to attract clients (potential buyers);

- revenue and profit forecast.

The main objective is to comply with the pace of construction in accordance with the original plan, the planned acquisition of revenue in relation to the pace, and as a consequence, for an appropriate profitable project. In the section below the possible mathematical models in project management for the M&S department are represented. These models are just the examples and the attempt of the authors to develop tools and methods for application by M&S department in construction organizations. The author will be grateful to receive any feedback and are open to further work d development of the model as well as testing them on real projects in organizations.

Mathematical model describing the nature of the influence of the characteristics of the project and the progress of its implementation on the performance of the sales plan

As analyzed and predicted quality Y^k take a percentage of the plan sales for k months after the official deadline for submission of the project. This model is designed to identify the nature of the selected parameter depending on the characteristics of the quality of the project and the progress of its implementation.

The initial information is statistical data about the fulfilled N projects x_{pi} values of quality Y_p^k (k=0,…,K; p=1,…,N). i (i =1,…,n) is number of project characteristics (factors), group the projects by type, for each type may have its own set of factors.

For example, for housing projects set the following factors:

- The number of one-bedroom apartments;

- The number of two-bedroom apartments;

- The number of three-bedroom apartments;

- The number of four-room apartments;

- Number of floors;

- The cost of 1m^2;

- Infrastructure and landscaping of the adjacent territory on a 5-point scale (1-very bad, 5 very good);

- Distance to the subway;

- Distance to public transport;

- Money spent on advertising this project (the advertising of housing complex - the share of assets associated with the object in the complex);

- Deviation of the actual period of completion of the plan (in% of the planned duration).

Construction of the linear regression (additive) model the impact of the characteristics of the project and the progress of its implementation on the performance of the sales plan. We seek a relationship of the form:

$$Y^k = a_0+a_1*X_1+\ldots +a_n*X_n, \qquad (1)$$

where a_i - regression coefficients indicating the degree of influence of each factor on the quality parameter i. When you change the value of the factor per unit (unit of measurement data submitted) value of the quality change by the amount of the corresponding regression coefficient.

In the process of constructing a model defined set of project characteristics (factors), has a marked effect on the simulated quality index, and for each k, there may be a different set of factors and regression coefficients. The selection is carried out by calculating the factors of correlation coefficients r_{ij} for each pair of variables X_i, X_j in equation (1). Correlation of variables shows how great their relationship to each other. If the connection is sufficiently large ($|r_{ij}|\geq 0.8$), then the use of one of the variables is inappropriate and excessive. Furthermore, it should exclude factors that are weak degree of influence on the quality index Y. This decision is made by the responsible person for each factor individually, through the analysis of the regression coefficients and t-statistics. As a result, we get a lot of factors which influence on the investigated parameters Y^k is most significant, and will eliminate redundant variables.

Using the resulting model is possible in two ways:

1) improving the quality of the plan of sales due to the change (if possible) the values of the characteristics of the project (increasing the i-th factor, if $a_i > 0$, and, consequently, decreases if $a_i < 0$);

2) prediction of the implementation of the sales plan for k months after the official deadline for submission of the project.

Construction of nonlinear (multiplicative) model the impact of the project on the characteristics of the execution of the sales plan, ie depending on the type

$$Y^k = a_0 X_1^{a_1} X_2^{a_2} * \ldots * X_n^{a_n} \quad (2)$$

In this case, it is impractical since here exponents a_i - elasticities are constants. They show the percentage changes analyzed indicator Y^k when changing factor i by one percent. However, the analysis of statistical data on the characteristics of housing projects and the implementation of the sales plan shows a substantial dependence of the coefficients of elasticity of the analyzed indicators Y^k on the values of factors. Therefore, for this type of projects is recommended to build a regression model (1). In the presence of statistical information about the characteristics of other types of projects, permanent elasticity coefficients should build a regression formula (2).

A mathematical model for estimating housing market

To estimate the market also applies regression model of the form (1) or (2). Here we use the statistical information describing the market of housing under construction in Chelyabinsk and Chelyabinsk region. Thus obtained is a methodology for constructing the model can be used in all other regions of Russia, except for Moscow and the Moscow region, where the market is determined by the characteristics of not only the region but the country as a whole (in Moscow, to Moscow ... - Anton Chekhov, Three Sisters) .

Making its assessment of the housing market in a particular area, the company is guided by a number of indicators:

- geographical location;
- the number of potential customers;
- the expected profit;
- infrastructure;
- presence of competitors in the selected region, and so on.

Our goal is to create a methodology that would operate indicators, measurable and comparison reflecting the main socio-economic characteristics of the region. In addition, the data source must be valid and available for use, the organization does not need to conduct additional research to get the information. This simplifies the work with the model and the company saves money.

The basis for creating a model the statistical compilation "Cities of the Chelyabinsk region" and "Russian statistical compilation" has been taken.

The first collection includes the following socio-economic indicators: actual population, the average number of employees, the number of unemployed people, the average nominal wage workers organizations, the number of pensioners, the average monthly pensions, industrial production volume index of industrial production, agricultural production, the volume index of agriculture, dwelling houses, retail trade, the volume of paid services to the population, the volume index of paid services to the population, the net financial results of the organization, investment in fixed assets.

The second collection is a more detailed statistical information, such as:

Population: permanent population, population density, the number of births, number of deaths, natural increase, decrease, the number of registered marriages, the number of registered divorces.

Labor: Average number of employees in organizations of unemployed citizens are recognized as unemployed.

Living standards and social welfare: the average nominal monthly wage, the number of pensioners, the average monthly pensions, the number of preschool, children in them, the number of children per 100 places in day care, the number of general education institutions, students in them, the number of state secondary specialized schools, students in them, the number of public institutions of higher education students in them, the number of physicians of all specialties, the number of nurses, the number of hospitals, number of beds, number of outpatient clinics, the number of public libraries, library Fund, the number of institutions of cultural and leisure-type, the number of museums.

Protection of the environment: the amount of pollutants emitted from stationary sources, the volume of wastewater discharge.

Offense: the number of registered crimes identified the perpetrators of the crime.

Housing stock: housing, on average per inhabitant.

Industry: industrial output of large and medium-sized organizations, the industrial production index, the number of industrial personnel.

Production of selected industrial products: iron, steel, cement, whole milk products.

Building: Dwelling houses Dwelling houses individual developers, the amount of work performed on construction contracts for large and medium sized organizations.

Trade and services to the public: the turnover of retail trade turnover of catering, retail trade turnover per capita volume of paid services to the population, the volume of paid services per capita.

Transport and communication: Shipping large and medium sized organizations in motor, the carriage of passengers by large and average organizations of transport, the number of handsets (no pay phones), including residential.

Finances: net financial results of the organization, the share of unprofitable enterprises, the amount of loss.

Investments: Investments in fixed capital investment in housing.
From all this diversity indices were selected key independent (correlation coefficient <0.85), which give a comprehensive description of the region:

- Year;
- Population - reflects the potential number of clients;
- Wages - reflects the potential value of payments;
- The volume of the private sector (the number of homes m^2 / pers.);
- The housing in apartment buildings, m^2 / pers .;
- Number of cars.

As analyzed and predicted take "Dwelling houses", which allows the construction company to assess the prospects for its development in the region.

Building a model to hold information database 6 cities Yuzhnouralsk (№1), Troitsk(№2), Zlatoust(№3), Miass(№4), Kata-Ivanovsky (№5), Ust-Kata (№6), where the construction company was housing construction in 2011, 2012 and 2013. Uniting the selected indicators for selected objects we study data in table 1.

Table 1. Socio-economic indicators for the analyzed areas.

Region	Year (x_1)	Population, thous.people. (x_2)	Wage, rubles. (x_3)	Private owned property, number. (x_4)	Rate of provision with property, $м^2$/head. (x_5)	Automobiles, pices. (x_6)	Number of the houses put into operation, $м^2$ (Y)
№1	2011	39,400	4063	2098	10,25	13200	6345
	2012	39,600	4854	2106	11,13	14546	2086
	2013	39,500	6106	2217	12,57	15034	7241
№2	2011	83,900	4459	2957	10,23	29062	12286
	2012	83,500	5589	2861	11,11	28178	11861
	2013	83,000	7155	2862	12,33	29119	21420
№3	2011	196,600	4114	3823	11,5	29230	17917
	2012	195,200	4854	3722	12,98	30185	21072
	2013	193,900	6079	3651	12,56	31746	36609
№4	2011	171,700	4206	2521	11,79	53382	17010
	2012	170,400	5164	2449	13,14	53586	20078
	2013	169,000	6420	2776	12,54	52497	33303
№5	2011	20,300	2883	1135	10,68	13483	2346
	2012	20,000	3922	1336	12,2	13161	1936
	2013	19,800	4812	1374	12,41	13226	4252
№6	2011	30,100	2966	797	11,74	12500	1406
	2012	29,800	4039	1192	12,5	12531	1992
	2013	29,400	4813	1227	12,81	12849	2643

It would be necessary to explain why we are limited to only six indicators, although the statistical diversity allows the use of much more factors for analysis. Case, firstly, the fact that much of the data is interdependent, that showed correlation analysis. Secondly, the less data is used to build the model, the more accurate the model is. With a large number of initial parameters and the proportion of errors increased, and hence decreases the accuracy of the model. In addition, it is necessary, in principle, to make sure that the chosen method can be used to assess and predict the market of housing under construction. With further use of the model in other regions of Russia, it will be possible to improve, adapt, adding additional factors.

Building a model of the dependence of the Y - «Dwelling houses" in the variables x_1, ..., x_6 using the package MS Excel, a function of "regression".

$$Y= -6628926,17+3324,46x_1+266,64x_2+5,78x_3 - 9,085x_4 - 6117,41x_5 - 0,22x_6. \quad (3)$$

As can be seen from the resulting equation, positive impact on the result of having a year, the number of population and wages, which is quite logical.

Negative coefficients for the volume of the private sector and the availability of housing in multifamily housing is also quite logical - are content with what they have. A negative effect of the number of vehicles is explained as follows: at low income people choose between the car and the improvement of living conditions - all the money is not enough.

The coefficient of determination is very close to unity (0.97), therefore, we obtained the model adequately reflects the real state of things. The resulting regression (3) can now be used to predict the market of housing under construction in already developed areas, as well as for the analysis of prospects for the market in new regions.

Analysis of potential areas for the beginning of Housing

For analysis 3 relatively large cities of Chelyabinsk region have been taken, where work is underway until construction company. These cities are Kyshtym, Tchebarkul and Satka.

For each of the selected cities on the basis of statistical data for 2001-2013 were constructed according to equation (trends) values of each socio-economic indicators (factors) against time (t = 1, ..., 13) using linear regression.

We obtain:

Table 2. Trends in socio-economic indicators (factors) for the analyzed areas

Factor	For Kyshtym		For Tchebarkul		For Satka	
	trend	R^2	trend	R^2	trend	R^2
x_2	$-2,11t_i + 67.6$	0.88	$-1,16t_i + 59,2$	0.95	$-0.18t_i + 51.22$	0.86
x_3	$721.5t_i - 3104.2$	0.93	$877.1t_i - 4675.4$	0.92	$772.1t_i - 3137.2$	0.93
x_4	$295.7t_i - 2104.7$	0.91	$291.1t_i - 1292.4$	0.94	$319.3t_i - 1514.2$	0.85
x_5	$1.1t_i - 2,38$	0.89	$0.5t_i + 7.47$	0.89	$0,34t_i + 7.56$	0.86
x_6	$787.4t_i + 3059.4$	0.85	$682.6t_i + 4546.2$	0.87	$-61t_i + 15728.1$	0.84

Based on these trends forecast values necessary for the analysis of socio-economic indicators for the next 5 years, we obtain:

Table 3. Predicted values of socio-economic indicators – Kyshtym

Year	Population, x_2, thous.people	Wage, x_3, rubles.	Private owned, number. (x_4)	Rate of provision with property, м^2/head.(x_5)	Automobile, x_6, pieces.
2014	38,020	6997	2035	13,02	14083
2015	35,900	7668	2357	14,13	14870
2016	33,780	8339	2678	15,22	15658
2017	31,660	9010	3030	16,34	16435
2018	29,540	9681	3321	17,44	17217

Table 4. Predicted values of socio-economic indicators – Tchebarkul

Year	Population, x_2, thous.people	Wage, x_3, rubles.	Private owned, number. (x_4)	Rate of provision with property, м^2/head.(x_5)	Automobile, x_6, pieces.
2014	42,960	7604	2783	14,47	14103
2015	41,800	8481	3074	14,97	14786
2016	40,640	9358	3365	15,47	15468
2017	39,480	10236	3656	15,97	16150
2018	38,320	11113	3947	16,47	16833

Table 5. Predicted values of socio-economic indicators – Satka

Year	Population, x_2, thous.people	Wage, x_3, rubles.	Private owned, number. (x_4)	Rate of provision with property м^2/head.(x_5)	Automobile, x_6, pieces.
2014	48,700	7671	2956	12,32	14874
2015	48,520	8443	3275	12,66	14813
2016	48,340	9215	3594	13,00	14752
2017	48,160	9988	3912	13,34	13691
2018	47,980	10760	4231	13,68	13620

By (3) based on the obtained forecasts of socio-economic indicators calculate predicted values of the resulting index (Y) for selected cities.

Table 6. The predictive values of the resulting index (Y) for selected cities (data), m^2.

Year	Kyshtym	Tchebarkul	Satka
2014	6,573.17	2,371.09	11,851.21
2015	6,490.58	2,076.85	11,695.98
2016	6,407.98	1,782.62	11,540.74
2017	6,325.39	1,488.38	11,385.51
2018	6,242.79	1,194.15	11,230.27

The resulting projections show an absolute promise of Satka deployment there of housing, in the second place Kyshtym, Tchebarkul with modest results analyzed list closes.

A mathematical model for determining the optimal characteristics of the project

The input to the model taken as the restrictions on the allowable values of the characteristics of the project (x_i) and built in 4 multifactor regression (1). Restrictions may be technical, technological, social, economic and other character. For example, a range of apartments in the building, floors are dictated by technical, social and economic reasons; cost m^2 - social and economic reasons, etc. We have:

$$a_i \le x_i \le b_i \ (i=1,\ldots,n). \qquad (4)$$

Problem Statement:

Find the characteristics of the project {xi}, satisfying the constraints (4), which maximizes the reduced flow of payments from the sale of apartments.

Because built in 4 multifactor regression (1) allows Y^k -% of sales of apartments in the k-th month after delivery, then a member of the stream of payments related to the k-th month, will be equal$(Y^k - Y^{k-1})V$, where V - the value of all the apartments of the object. Thus, the objective function

$$F = Y^0 + \sum_{k=1}^{n} (Y^k - Y^{k-1})(1+i)^{-k} \to max.$$

Here i - rate reduction (discount), which characterizes the desired level of efficiency of investment in housing. Constant V taken out of the brackets and removed from the objective function does not affect the result.

Found in this way the characteristics of the project $\{x_i\}$ can serve as a guide for developing a set of measures to increase its economic efficiency. Proposals to change the technical, technological characteristics are part of commercial advisory services, and changes in the characteristics that can be implemented most commercial service (e.g., by type of marketing works), are, just, its plan of action.

CONCLUSION

At the moment there exists a wide range of methods and tools intended to be used by project manager and the team while the sales department has no specific methods and tools to fulfill its important function in the project efficiently. At the same time the purpose and the role of the sales department is crucial as the main objective is to provide the organization with the income by selling the product of the project to the end users.

The suggested mathematical models implemented for project management from position of one of the stakeholders – marketing and sales department are considered in this article. Mathematical models for marketing and sales department could be further used in creating special IT means and software.

Within the article we have reviewed new scientific and practical directions in improving the project management methodology from position of different interested parties. Based on the case studies of the projects in real estate sector of economy and the certain departments of the organisations the new mathematical models have been developed and suggested. At the same time, the mathematical models shown above may become part of the complex multi dimensional model of project management on the whole that will consider all interested parties requirements, functions, goals and objectives, interests and expectations as well as limitations and constrains.

Further development and improvement of the tools and methods for sales department could lead to the development a specific range of competences for this stakeholder during the implementation of the project. These models may already serve as a methodological basis for the development of the applied software suites (automated systems) to accomplish the project management tasks described above by the marketing and sales department during all project stages.

Further development and improvement in this area could lead to the creating the specific models foe certain industries and sectors of economy and consequently increase of effectiveness of project management on the whole and all interested parties involved.

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Professor Vladimir I. Voropajev, PhD. is Founder and former President and Chairman of the Board of the Russian Association of Project Management, SOVNET. Dr. Voropajev is professor of Project Management at the State University of Management, Moscow, Russia. He is also Head of the Program and Project Management Faculty for the Russian State Academy's Program for Professional Retraining and Professional Skill Development for Executives and Specialists in Investment Fields. He is a full member of the Russian Academy of Natural Sciences on Information Science and Cybernetics, and of the International Academy of Investments and Economy in Construction.

From 1991 to 2001, he was Vice-president and a member of the Executive Board of the International Project Management Association (IPMA), the global federation of national PM associations based in Zurich, Switzerland. He is the First Assessor for several IPMA certification bodies. In 2005 he was awarded IPMA Honorary Fellowship Award. He is also an honorary Fellow of the Indian Project Management Association and a past member of the Global Project Management Forum Steering Committee. During his 40 years of engineering, scientific, teaching and consulting activities, he has published over 250 scientific research works including 7 monographs and 5 textbooks about the organization and planning of construction, information systems, and project management.

Vladimir serves on the editorial boards of several international project management journals, is a frequent participant in PM conferences worldwide, and provides ongoing counsel and support to PM professional leaders in Azerbaijan, Kazakhstan, Ukraine, Yugoslavia and several other countries. Professor Voropajev can be reached at voropaev@sovnet.ru

Yan D. Gelrud

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Mr. Yan Gelrud was born in 1947 in Birobidjan (Khabarovsk Territory). In 1965 he finished a school of mathematics and physics at Novosibirsk. In 1970 he graduated from the mathematical faculty of university at Novosibirsk on "Mathematics" speciality. From 1970 to 1991 Yakov was working in the Research Institute of automated control systems as a head of mathematical division. He took part in creation and adoption of more than 100 automated control systems in different branches of industry.

From 1991 to 1997 Mr. Gelrud was doing business, being director general of "URAL-ASCO-SERVICE". Since the 1st of September 1997 till now he works as a professor of the "Enterprise and management" department in South Ural State University. He teaches a multitude of disciplines, such as "Mathematics", "Theory of probability and mathematical statistics", "Econometrics", "Economic and mathematical methods", "Mathematical methods of decision-making", "Bases of decision-making methodology", "Economical evaluation of investments", "Mathematical methods and models of project management", "Studies of managerial systems."

Yan Gelrud has more than 100 publications and speeches on seminars and conferences of different level. His monograph "*Project management in conditions of risk and uncertainty*" was published recently. He can be contacted at gelrud@mail.ru

OXANA KLIMENKO

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Business – consultant on project management, certified project management professional, level C - IPMA, certified program and portfolio management consultant, level PPMC - IPMA level, Regional director of the International Center for Complex Project Management - ICCPM in Russia and CIS countries (2011 – 2013). She worked as a Director of certification body of Russian project management association SOVNET (2011 - 2013). At present she is a senior lecturer on project management at the PM chair at National Research University "Higher School of Economics" in Moscow. Oxana is delivering MBA programs at Real estate Institute of National Research University "Higher School of Economics".

Provides trainings, consulting sessions, moderations, lectures and seminars in English. Organizer and Director of the yearly International Youth Scientific and Practical Project Management Conferences "Youth and Management of Projects in Russia", Moscow (2011- till present).

The project management team member, developing the international standard on management of projects of the International Association of Management of the IPMA projects (2010 – till present). As a team member she took part in developing IPMA Delta organizational – technological competence model in IPMA. As IPMA Delta manager in Russia she led the assessments for four organizations: Sberbank of Russia (2010), class 2; Ekaterinburg electric grid company (2012), class 2; Nizhny Tagil Plant of metal Designs (2012), class 2; TNK-BP (2012), class 1

Trainer's and consulting experience: Development and delivering of trainings, seminars, training programs more than 18 years. In consulting - more than 8 years. More than 25 consulting projects in the companies (from small enterprises to large corporations) as the leading consultant/consultant of projects are realized. More than 500 trainings and seminars in Moscow and other cities of Russia held.

Among clients: BRITISH AMERICAN TOBACCO, EFES, COWI CONSULT, KNIGHT FRANK, KUEHNE+NAGEL, OZON, SHL, SG Group, AZIYa, Garant, Dominanta Energy, INKOM-Nedvizhimost, Inteco, Intrek, Komstrin region, Megafon, Miel, bank "Otkritie", Peresvet Group, Portal, ROSNO, Rosneft, Rusfinance Bank (Société Générale group), Rusagro, Rufil, Settelekom, bank Sberbank, Grazhdanstroyproyekt, Stroygalerey, TVEL Stroy, Transmashholding, Esset Management, Triumph, Finam, Central Telegraph, Elara, Elkod, others.

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