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Modern Management of Urban Projects Using Information Systems

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ABSTRACT

Due to complexity of the activities, distribution of projects, large amounts of information and cross sectional workforce, a modern management model is required in the field of urban constructional management. Because of the nature and distribution of these projects, the project-based organizational structure is suitable for managing the organization. Management of project portfolio is an approach derived from the project management knowledge with this content that in this system, managing a combination of the project is concerned. On the other hand, the role of information technology's powerful tools in changing the nature of the management way from the traditional way to the virtual way and how to measure the possibilities of implementation of the predesigned algorithms, are examined in managing the urban projects. Continually, some discussions will be introduced to indicate the possibility of web-based managing of the projects. Getting help from the information systems along with the management knowledge of the portfolio project can be a strong support for managing project-based mega organizations. Many researches have been accomplished in the field of managing the portfolio project and information systems, but combining these two knowledge and modern tools is the discussion subject of this research.

KEY WORDS: Portfolio, Information systems, Management of urban projects

1- INTRODUCTION

Through the examinations done, management of constructional projects, planning for finishing the project and project control are the main reasons of delay and problems in constructional projects [1]. An island look at the success of the projects along with the intensified of inter-organizational competitions for achieving interests and conflict of work plans and lack of cohesion in strategies can be threatening the project-based companies' fate [2]. Management of the projects portfolio deals with the idea that the companies not only must focus on the independent management of projects and their special aims, but also they must manage the projects as a united organization with common purposes. Management of projects portfolio will have countless advantages in the commercial affairs compared to separate management of each project, because it creates a relation bridge between the strategies and the projects of the organization, also presents a tool to dedicate resources. For instance, dedication of dearth resources of the organization to the projects is from the most important issues which any organization face and this problem is simply solvable by the tools presented by the project portfolio management [3].

On the other hand, nowadays, access to the information is the base of the organizations' ability to develop. Volume and accuracy of the information, speed and simplicity of accessing the data are the key and determining factors. In order to access to the great volume of data in the project-based companies, there is significant need for secondary systems. To organize the information and help managers to make decisions, the information systems are utilized to make the management intelligent. For this mean, kinds of the information systems that can help the organization in collecting, keeping and distributing data are introduced and discussed. For designing the algorithms and how the information systems are used along with the management of project portfolio, the interview with the masters of the industry, statistical and field studies and collecting and analyzing the study references have been used.

2- Management of project portfolios

The researches indicate that more than half of mega organizations of the world utilize the portfolio project management in order to manage the projects which they examine; and also it has been determined that most of these organizations are in the growth levels of this management system and they have not deservingly been able to be success in establishing the system of management of project portfolio yet. Also, the obtained results from this study confirms that in the organizations which have been unsuccessful in establishing the management system of project portfolio, the main reason has been mentioned the lack of necessary support from the chief

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manager of the organization and also the fact that no official trustee and responsible have been introduced and determined for this issue in the organizational structure. Consequently, in order to create an organization that benefits from this method, the first step is to rationalize the chief manager in order for him to support the formation and maturity of this system, ant the next step is to introduce a responsible and trustee for developing this system [3].

2-1- The Stages of Excellency of the Project Portfolio Management

As mentioned in the introduction, organizations are still weak in growing the level of management of project portfolio. This weakness has been determined in a field study that most of the chief managers of the organizations needed more than one week to response the posed questions by the researcher that this indicated the lack of maturity of this system in their organization. Mark Jeffry describes the model of ascendancy of the project management system in four stages as follows (figure 1). In the second level it has referred to the office of project manager that will be discussed continually [3].

2-2- Project Management Office

Through these offices most of the related affairs to the guidance of organization's projects are determined and leaded. The project management office is a supportive organization for guaranteeing, adjusting and utilizing the best action in project management and presenting support services to the trustees and experts of the project management in order to access to the optimized levels of function in the projects, that is to say that improving of interactions, preaching and encouraging the ascendancy in project management in all of the projects of the organization, creating project-based intellectual pattern which tries to create commitment and make the projects powerful and ultimately increase the success and improvement of adoptions of the projects through introducing and utilizing different tools and technologies [3].

2-3 Strategic Project Office

Formation of the Strategic project office is from the necessities of project portfolio management. Supporting projects, selecting and supporting software of project management, implementation and keeping the current processes of the project management, designing and adjustment of the standards and methodology of doing the work, project management trainings, presentation of consulting services of the project management, managing and developing the project managers are the main purposes of strategic project office [5].

3- Information Systems:

Information systems includes a perfect system designed for producing, collecting, organizing, storing, retrieving and publishing the information in an institute, organization or any other defined field of the society [4].
The most general information systems that are usable in the project-based urban organizations are: MIS (Management Information System), EIS (Executive Information System), DSS (Decision Support System), TPS (Transaction Processing System), KMS (Knowledge Management System).

3-1- Management Information Systems

This system is used for the daily decisions and it does not have the ability to analyze but tries to process the data. So, it cannot be used for making decisions in difficult and complex issues. This system produces four types of reports as following:
Detailed reports: Presenting all of the details with the least eliminations and restrictions.
Historical reports: They are similar to the detailed reports but about the interactions and transactions.
Summary reports: the classified information for the managers that can be in the form of graph or table.
Exceptional reports: reports are filtered before transmit and then only the non-standard cases and the determiner situations will be reported.

3-2- Decision Support Systems:

Information system of management does not express special information or each of the managers separately, so, this impediment has been caused the creation of other information systems. The decision support system is a set of related programs and data, which help the manager in analyzing and making decisions. In fact, these systems support the organizational decisions through utilizing analytical models, specialized databases, judgment and insight of the decision makers and the adjusted process based on computer.

3-3- Executive Information Systems:

Executive information systems are called to the set of topics and tools, which provide the required information of the organization's managers in their professional fields of responsibilities exactly and desirably in the appropriate time. In fact, the system elevates the quality of decision making with its information. The information of the various parts is prepared in the management information system part by the personnel and manager. After that, the actions of formulization, accounting and comparing are accomplished in the section of decision support systems in order to provide the ability of required analyzing and decision making for the manager through predication and preparation of the possible scenarios. Regarded to the matter that the main purpose is

to support the management levels of the organization through presenting the information in the appropriate forms with the kind of exploitation of the managers, therefore, the manager is responsible for supplying the informational needs of the high-level managers and they are prepared from the other information systems [6].

3-4- Transactions Processing System

A multi-task information system has been designed for processing the data created by the operations of the organization. This system collects and keeps the data related to the organizations' operations in details and then it will be used for decisions of the operational levels. Especially about the urban projects, this system has the duty of registration of buying and selling, orders and statement of the contractors, inventory changes and employee's payments.

3-5- Knowledge Management System

It includes using the information technology in order to help creating, collecting, sorting, storing and sharing the knowledge and information within the organization. In fact, this system tries to identify and record the existing knowledge with people and groups or the hidden knowledge in the organization [2]. The important trainings which the managers must be aware of them include: theory of architectural design, cost estimation, how to analyze price for tenders, project planning and controlling, processes of doing activities and relationships between the activities, communication management, modern tools used in the company's structure and administrative procedures of doing the work. As a result, the major part in the organization is the way of managing the above knowledge, which an appropriate structure must be designed for it.

4- The Implementation Process of intelligent Management of the Urban Project Portfolios

The followings are practical steps in order to implement the desired management model:

- Determination of responsibilities and roles, selection and utilization of the portfolio manager and managers of every urban project
- Creation of work break down structure for portfolio manager, creation of plans for project managers and defining the position, duties and responsibilities
- Analyzing and identifying all of the beneficiaries, creating communication management plan and distributing portfolio management plan, holding regular weekly meetings for coordination of project managers with the portfolio manager
- Establishment of project management office and strategic project office and explaining their duties
- Designing the organization's information system algorithms by the help of the introduced systems, these algorithms must be designed for the different parts of the organization in order to keep management and integration of the projects and the moving path be clear for the people, continually some samples of the algorithms will be given.
- Examination and Optimization of System after the Reports [7]

The aim of this study is to smartly and efficiently manage the civil projects portfolios. Therefore, in the first step the project portfolios management, the Excellency stages of this technique was identified and discussed and the general identification of the necessary management activities to manage the project portfolios was formed. Continually, it was referred to the project management office as the main base in the management and the relationship of this office with the management of project portfolio was investigated. After that, in the next part, it was referred to the kinds of information systems that help manager or the project in the different levels. This smart system can separate the received information from each project depending on the management level of the data and distribute it in the company's structure. So, this technique is used for regular and purposive transfer of the information in each of the project [8]. Here the workflow algorithm and information cycle are required which form the information system and give managers the way of integrated performance as a powerful tool [9]. In the following, the general desired process is referred in order to manage the project portfolio smartly (Figure 1 & Figure 2).

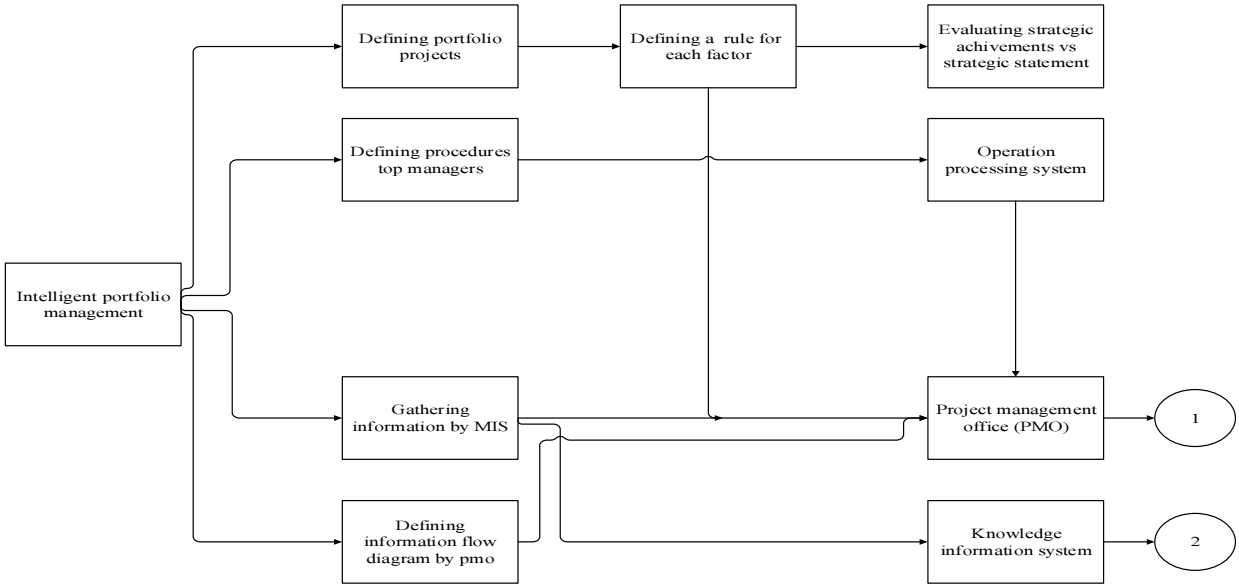

Figure 1: General desired process to intelligent management of project portfolio (part1)

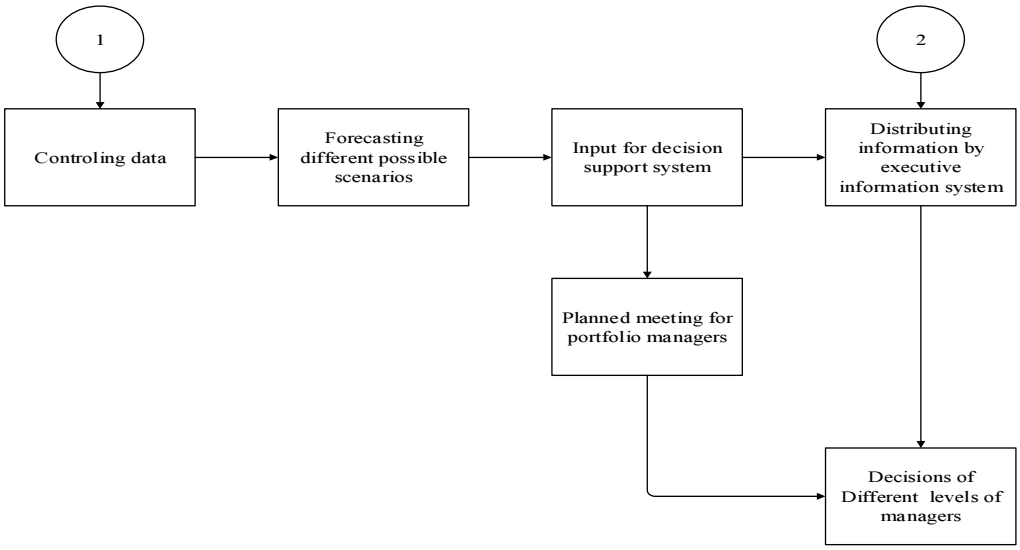

Figure 2: General desired process to intelligent management of project portfolio (part2)

5- RESULTS AND DISCUSSION

First, the project portfolios are formed and then with the help of the strategic project office, the standard indicators of successfulness or unsuccessfulness in the different sections are defined and this process is continuously controlled in order to be compatible with the strategies of the organization. These standard indicators can be obtained from the mean of the project portfolio or can be defined according to the idea of the managers. In the next level the manages and management office of the project define the workflow algorithm and the progress of doing the activities in the organization, the project managers are given these definitions in the form of algorithms and their software infrastructure must be created by the organization for web-based management. So far three groups of the information have been transmitted to the management office of the project which the organization's projects must move based on them [10]. After that, the project data is collected through management information system, and in order to compare this information with the previous designed basics the decision support system is used in the project management office. For example, the defined standard indicators are compared with the calculated indicators of each month and their output enters the next stage of the above algorithm. In this stage, the support system of the operation is responsible for controlling the progress of doing the activities and the knowledge management system collects the data in the organization and makes it easy to access to that through keeping this knowledge. After presentation of the various alternatives by the decision support system, the data separated by the executive management system is transmitted to the different

levels of managers in order to make easy the decision-making. On the other hand, this system has sent a management report for the meetings of managers of the project portfolio that in these meetings, they investigate on the coordination of the projects with strategic path of the organization and the necessary management orders are sent for the managers of different levels.

Here is a general sample of the management plan for the organization has. Due to the restrictions in studying types of projects and special conditions of each organization, the above pattern can be used for implementations of this plan and one can design appropriate patterns for each organization. For example, here we only referred to the information system management to present a report to the management office of the project and knowledge management system, while each of the four kinds of the report, which are produced by this system, can be considered separately and their output can be benefited.

7- Summary and Conclusion:

The information systems have the duty of transferring, keeping and analyzing the data in the organization. In management of projects portfolio, due to the large volume of flowing information it is very important to utilize the appropriate information system. In this paper, in course of brief introduction of management of projects portfolio and information systems, we have tried to simplify management of the complex urban projects through presentation of the management model obtained from the combination of both of knowledge. In this regard, first the necessary roles for management of projects portfolio must be defined and dedicated. Then, the number of using information systems is determined due to the multitude of the existing information systems and depending on the size of the organization.

By taking the advantage of the suggested model, the following benefits will be obtained:

1- Facilitating in decision making in different levels due to the creation of automation in transferring and analyzing the data and accessing more information that is comprehensive.

2- Increasing the management power of the organization in different levels due to comprehensive accessing to the information of the projects and organizing the data.

3- More opportunities for fixing the weaknesses of projects by the portfolio manager due to increase of transfer rate and refining the mass volume of information.

REFERENCES

1) Akhavan Kazemi, K. 2009. Study of the Problems of Contractors and Increase of Project Implementation Time, the fifth international conference of project management, Tehran.
2) Ravanshad Nia, M. Abbasian, H.R. From Project Management to Project Portfolio Management, first edition, Tehran, Fadak Isatis, pp. 38-67.
3) Zare' Ashkzari, J. 2010. Project Portfolio Management System, Concepts and Basics of the Approach, the second international conference of project management.
4) Niaei, M., Tayebat, M., Abu Taleb, G., Rezaei, K. 2007. Presenting the Integrated Model for Management of Project Portfolio of the Project-Based Organizations, the fifth international conference of project management.
5) Jahan Bin, N., Tabatabaei, R., Mir Hosseini, N.S. 2013. Evaluation of the Success Factors of Project Management Office Based on the viewpoint of Project Portfolio management, The sixth ultra-regional seminar of modern advances in engineering science.
6) Lotf Allahi, Y., Nikou Far, M.A., Nikou Far, I. 2009. Establishment of the Information Management System Using (EIS, DSS, MIS) Information Systems in the Reservoir Dams, the first national conference of engineering and management of the infrastructures.
7) Shao, Y.P., Liao, S. 1996. A New Organizational Model: Implication on Virtual Organizations, Journal of information science
8) Shakeri, I., Sedaqat Kish, O. 2007. The Comparative Study of Information System Management in Great Companies with the Approach of Implementing An Integrated Model Among the Project Executive Factors, the third national congress of Civil Engineering.
9) Khazanchi, D., Zigurs, I. 2005. Patterns of Effective Management of Virtual Projects: An Exploratory Study.
10) Baxendale, A.T. (1990) Construction management information System for production control, building economics and Construction management, in: CIB W-55/W-65 Joint, Symposium Papers, and Vol. 4, Sydney 80-91standard