

TIES 2020**International conference «Trends and innovations in economic studies»****SPECIAL ASPECTS OF INNOVATIVE PROJECT LIFE CYCLE
MANAGEMENT**

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Abstract

The article covers special aspects of innovative project life cycle management when using project management IT systems from the viewpoint of a Project Manager. Therefore, the purpose of this article is a research of IT application features in innovative project portfolio life cycle management for a large-scale production. The subjects of this research are IT systems for innovative project life cycle management. Weaknesses of conventional project management technique and main advantages and disadvantages of the most commonly used IT systems are specified in this article. The following research methods were used: analysis, comparison, generalization and information systematization, apperception and descriptive method. 5-stage management technique is recommended for enterprises dealing with multiproject planning and innovative project implementation on different life cycle stages: “Initiation processes” stage with the most convenient workbenches such as Marketing Expert, Project Expert (Microsoft Project 2000); “Planning processes” stage with the most convenient workbenches: MS Project, Project Expert, BPWin, MS Excel, Matcad, Matlab, TimeLine 6.5, Spider Project, WST Corporation; “Implementation processes” stage with workbenches like Matcad, Matlab, MS Project, WST Corporation; “Monitoring and management processes” stage with workbenches like Matcad, Matlab, MS Project, WST Corporation; workbenches for “Completion processes” stage are targeted packages for statistical analysis of results. It is recommended to improve innovative project life cycle management by means of selecting software products which are optimal for removal of disadvantages: non-compliance with project deadlines, miscalculation of innovative project cost estimate, errors in project planning, forecasting and results, misdistribution of duties during project implementation.

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1. Introduction

Innovative activity efficiency is directly connected with innovative project life cycle implemented at enterprises as well as with the use of innovative process control mechanisms. Overview of literature sources makes it possible to conclude that activation of innovative activities of an enterprise depends on market competition and competitive performance of enterprises, fluctuating demand from customers, development and diversification of new technologies (Andreeva & Nechaev, 2014; Bezrukova, Borisov, & Shanin, 2013; Bunkovskiy & Veretnova, 2019; Golovina, Dykusova, & Zhizhelev, 2018; Konyukhov & Frolova, 2018; Konyukhov & Stefanovskaya, 2019; Li, Bovkun, Beregova, & Shaukalova, 2019; Parahina, Boris, Bezrukova, & Shanin, 2018; Starkov, Sapozhnikov, & Lontsikh, 2015). Moreover, one should be mindful of the fact that some factors limit innovative activities during implementation of innovative projects: lack or absence of financial resources, high risk levels, long pay back periods, level of manufacturing process management and business administration, lack of information on new technologies and target markets and other factors (Arkhipkin, Lapshin, & Golik, 2019; Nechaev & Terenteva, 2018; Nechaev, Antipina, Matveeva, & Prokopeva, 2015; Salivon & Konyukhov, 2018).

Introduction of information technologies may reduce many of the mentioned barriers as they play an important part in improvement of innovative process efficiency at an enterprise. Utilization of information technologies is required for systematization and generalization of information on current and strategic situation at the enterprise. Implementation of information technologies helps management to increase efficiency, rate, completeness and reliability of information flows at every stage of innovative project life cycle under development at the enterprise.

The article addresses special aspects of innovative project life cycle management when using project management IT systems from the viewpoint of a Project Manager.

2. Problem Statement

Innovative project management consists of several stages:

- 1) Initiation processes;
- 2) Planning processes;
- 3) Implementation processes;
- 4) Monitoring and management processes;
- 5) Completion processes.

In reliance on the analysis of literature sources and results of enterprise practices, one can tell that issues related to a variety of disadvantages during implementation appear on the stages of: planning processes, implementation processes and monitoring and management processes (Bezrukova, Borisov, & Shanin, 2013). The following disadvantages of conventional project management technique were noted:

- timing errors;
- miscalculation of innovative project cost estimate;
- errors in project planning, forecasting and results;
- irrational task sharing during project implementation.

For the most part, all indicated disadvantages were associated with implementation of conventional project management approach, as well as absence of project management software products. Therefore, core issues of innovative project management appear as a result of application of a technique applied without automation of all processes.

Information technologies are widely used in modern innovative project management systems. Development of innovative project management system is performed by means of project management information system implementation. As a result of such management, enterprises score significant competitive advantages. Project management information systems offer the possibility to timely acquire reliable and up-to-date information on every project throughout its life cycle, to use the acquired information for change and risk management, to enable coordination between all project participants, to monitor and control work progress.

3. Research Questions

Innovative project life cycle management includes many aspects which may be divided into groups of technical and technological, social and cultural directions. Specifics of each innovative project life cycle management stage are described in Project Management Body Of Knowledge (PMBOK). There is a dedicated technique for every group of project management processes and respective software products for it.

There is a wide variety of modern project management systems designed to increase efficiency of innovative activity management. But general requirements should be taken into account by project managers. First of all, they include requirements to complexity and scope of project activity: management of an individual project, innovative program or innovative project portfolio of a company.

The subjects of the research are IT systems for innovative project life cycle management.

Let us consider the main advantages and disadvantages of the most commonly used IT systems allowing for management of large-scale projects, innovative project portfolio or innovative programs:

1) Microsoft Project 2000 by Microsoft Corporation. The advantage of this software is that Microsoft Project is the most popular project planning system to date. This program is notable for its simplicity and interface taken from Microsoft Office 2000 range of products. Microsoft Project offers the possibility to make a completion schedule, track progress and analyze all acquired project data. The disadvantage of this project management system is that it can be used only for small-scale projects. This system is unsuitable for the goals of a large-scale enterprise.

2) TimeLine 6.5 by TimeLine Solutions Corporation. TimeLine 6.5 software product implements the following areas: multiproject planning concept and storage of all information on the project under development in a common database. Major disadvantages of this software product weren't found.

3) Spider Project by Spider Technologies Group. Application of high efficiency planning algorithms when using the resources is one of the advantages of this software. Features of work scheduling when using interchangeable resources are implemented in Spider Project. It helps the manager to designate performers for all types of project activities. Predominating over many software packages with its capacity and flexibility of functions performed, eventually, Spider Project loses in software implementation, which includes, for example, user interface etc.

4) WST Corporation's software products. These software products are professional tools for multiproject planning and control. They cover the entire variable collection when defining various project activity parameters (Ivasenko, Gridasov, & Pavlenko, 2017). The main disadvantage of this software product is its high cost.

There are other IT systems for innovative project management, but this article is confined only to the above listed software products.

4. Purpose of the Study

The purpose of this article is a research of IT application features in innovative project portfolio life cycle management for a large-scale production.

In the furtherance of this purpose, the following objectives were set and solved in this article:

- description of relevance of information technology utilization for innovative project life cycle management;
- articulation of an issue associated with removal of disadvantages during innovative project life cycle management with the help of software products;
- description of innovative project life cycle management systems;
- setting a purpose of research and statement of problems;
- description of methods used in the research of special aspects of innovative project life cycle management;
- description of obtained research results;
- conclusions on the application of innovative project life cycle management systems.

5. Research Methods

The following research methods were used: analysis, comparison, generalization and information systematization, apperception and descriptive method.

Analysis method consists in dividing capabilities of innovative project life cycle management systems, highlighting their advantages and disadvantages. Software product descriptions and practical skills were used for the study of each capability group.

Comparison method is based on intercomparison of project management systems in order to find similarities and differences between them.

Generalization method is based on selection and registration of invariable project management system features. As a result of generalization, the most important features of project management IT systems, contained in many of them, from the viewpoint of the authors, were selected. This selection was performed on the basis of the needs of a large-scale production for innovative project portfolio management.

Systematization method is based on development of a unified feature system of project management IT systems. Project management IT system features required for pursuing goals set by a large-scale enterprise are identified using this method.

Apperception method includes supplementing the research process with new information from various sources consistent with the direction of the research in the field of information technology application in innovative project life cycle management.

Descriptive method allows for concretizing the train of thoughts, finding keywords, prioritizing the most important research results.

6. Findings

One may improve innovative project life cycle management by means of selecting software products and systems which are optimal for removal of the following disadvantages: non-compliance with project deadlines, miscalculation of innovative project cost estimate, errors in project planning, forecasting and results, misdistribution of duties during project implementation.

For enterprises dealing with multiproject planning and innovative project implementation on different life cycle stages, the following management technique may be recommended.

At the first stage – “Initiation processes” – the results of implementation are business ideas and in order to find these ideas one has to: analyze and estimate alternatives, estimate efficiency of ideas, conduct an evaluation and approve concept, appoint project supervisor and team. At this stage it is reasonable to use brainstorming technique and expert methods. Instruments of method implementation are brainstorming, forecasting theory and practice, morphological analysis. The most convenient workbenches are Marketing Expert, Project Expert (Microsoft Project 2000) (Gritskevich, 2019).

At the second stage – “Planning processes” – business plan is developed, which includes formulation of the main scope of the project, determination of economic indicators, goals, results, actions and resources, performance schedule and allocation of resources. In this case, analytical (expert) methods are the best. Instrument of method implementation is project evaluation and review technique. Moreover, planning processes may be executed using alternative plan evaluation methods (quantitative methods). Instruments of method implementation are economic analysis, structure and simulation modeling and others. Workbenches at this stage are: MS Project, Project Expert, BPWin, MS Excel, Matcad, Matlab, TimeLine 6.5, Spider Project, WST Corporation.

Third stage – “Implementation processes” – includes implementation of idea or execution of innovation itself, management of the project. Economic methods (quantitative) are applied for this purpose. Implemented during execution of corporate functions. Workbenches are Matcad, Matlab, MS Project, WST Corporation.

At the fourth stage – “Monitoring and management processes”. This stage consists of coordination, in-process monitoring and adjustment of the key project indicators, economic methods (quantitative) are applied. Workbenches are Matcad, Matlab, MS Project, WST Corporation.

The fifth stage – “Completion processes” – includes test and introduction of the project results, statistical analysis methods are applied. At this stage, workbenches are targeted packages for statistical analysis of results.

In reliance upon analysis of results, works in progress, applied methods and workbenches, one can choose an innovative process management system which will be optimal for most of the innovative

project life cycle stages. In order to improve efficiency of the innovative process management system, it is recommended to introduce WST Corporation software package, which includes Open Plan program.

Open Plan is a project management system for enterprises and a professional tool for multiproject planning and control. This system provides the entire parameter pack required for definition of various characteristics of innovative project activities. Project data are structured by means of:

- work breakdown structure (WBS);
- work coding structure;
- resource breakdown structure (RBS);
- organization breakdown structure (OBS).

Open Plan system includes three main software products: Open Plan Professional, Open Plan Desktop and Open Plan Enterprise, which help project participants – project managers, project team, persons in charge of work performance, subcontractors etc. – to resolve the issues.

Open Plan Professional is used by managers running the large-scale projects. This IT system has powerful features for planning of resource using multiproject mode and it is a flexible column and schematic reporting tool.

Open Plan Desktop is a simplified version of Open Plan Professional and it is used when working with a part of a large-scale project or with small-scale projects. Open Plan Desktop is compatible with Open Plan Professional making it possible to use project templates and split project activities.

Open Plan Desktop and Open Plan Professional software products have considerably high functionality: for identification of risks, restriction of access to project information, data storage in various formats and others.

Open Plan Enterprise has the main Open Plan Professional features and it is ERP-integrated, which is an enterprise resource management system. This enables access to project information for other information systems used at the enterprise.

7. Conclusion

In conclusion, there are some concluding observations.

In order to improve efficiency, information richness and lower the expenditure of time at every innovative project life cycle stage, it is necessary to use project management IT systems.

Conventional project management approach has a number of disadvantages that can be compensated by application of project management software products.

The research of IT application features in innovative project portfolio life cycle management for a large-scale production affords an opportunity to select an IT system for efficient use in project management.

The following range of research methods was used in this research: analysis, comparison, generalization and information systematization, apperception and descriptive method.

One may improve innovative project life cycle management by means of selecting software products which are optimal for removal of disadvantages: non-compliance with project deadlines, miscalculation of innovative project cost estimate, errors in project planning, forecasting and results, misdistribution of duties during project implementation.

Enterprises dealing with multiproject planning and innovative project implementation on different life cycle stages have to select project management technique according to life cycle stage. In reliance upon analysis of results, works in progress, applied methods and workbenches, one can choose an innovative project management system complying with the most life cycle stages. It is recommended to introduce WST Corporation software package as this type of system, which includes Open Plan program.

Labor productivity (which makes 10 % of work time and salary with a relative error) increases at the enterprises applying project management IT systems. Using this approach, it is possible to significantly increase efficiency of the enterprise innovative activities and competitive advantage of new types of products.

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