

PROJECT-BASES RISK MANAGEMENT

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Abstract

The project-bases concept is presented. There are defined operations on project-bases. The software developed for project-bases management is analyzed based in its structure and functionality. A series of criteria of structuring risks is listed are tailored for project-bases management. Next there are suggested solutions of mitigating risks by maintaining efficiency within acceptable thresholds.

Key words: risk, project-base, software, management.

1. Project-bases

For being financed, projects must be evaluated quickly, correctly, holistic and must be categorized. Evaluation operations require the creation of projects-bases, in order to be treated unitary. There must be defined operations that lead to results for the evaluation process. For this endeavour there have been used the results of large projects, which could be found in the papers mentioned in the bibliography [1]-[3].

In a competition for being financed there are enrolled the project proposals $P_1, P_2, \dots P_n$, where n is the total number of participating projects. Projects are built upon rules enforced by the management team of the financing program.

A project must include:

- a description of the domain to be financed – research, construction, investment, in order to prove that the team which created the proposal has sufficient expertise in that domain;
- a presentation of the proposed solution, by in-detail describing activities, resources, risks, milestones and effects;
- details from the financial point of view of the effects that derive from material procurement, wages payroll, overflow of time & material boundaries;
- the economical and social effects generated by the implementation of the proposed solution.

The projects collection $\{P_1, P_2, \dots P_n\}$ must be evaluated in a unitary manner and the projects accepted to be financed must be tracked throughout their lifecycle. This is why a projects-base and a software package to maintain are needed to be created.

Fig. 1 presents the way the text of a project P_i is structured, where $i=1..n$.

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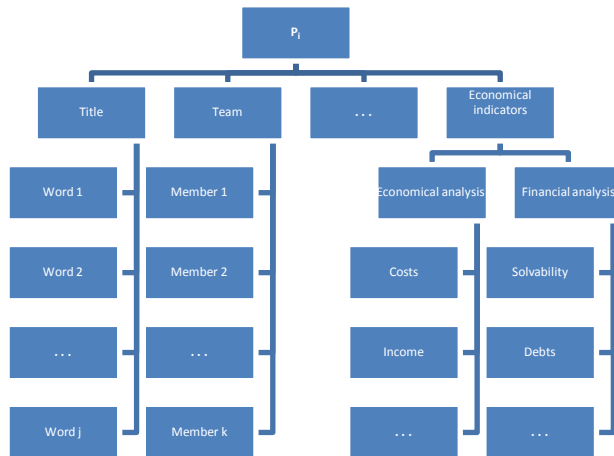


Fig. 1 – Structure of the text of a project

The complexity of projects imposes large variations in structure from one project to another [6]. Projects have in common a set of elements, which will be called project description pattern:

- title;
- abstract;
- project objective;
- team;
- co-financing;
- economical indicators.

At this point there comes the idea of building up a projects-base. The projects-base contains the project proposals which will be submitted to the evaluation process.

2. Operations on project-bases

Once the project-base is in place there must be defined a set of operations which will lead to obtaining results for the evaluation process. Those operations are summarized as follows:

- *insertion*, which means the process of populating the projects-base with a new member;
- *modification / replacement*, which can occur in the following situations:
 - the existence of errors as a result of the insertion operation;
 - some additions/modifications are required for the text of the project;
 - when a project needs to be replaced by another one;
- *projects listing*, which means printing the complete list of projects from the projects-base;
- *retrieving projects based on criteria*, which means listing only the projects that contain the words from a certain search vocabulary;
- *retrieving the complete list of people assigned to the projects*, which means the output is a matrix which contains for each person the number of projects on which he/she is

assigned, that person's professional specialization and the degree of compliance with his/hers professional specialization, based on the real roles assigned within the projects;

- *establishing if projects are orthogonally*, which means that an upper triangular matrix is created, which contains the orthogonality coefficients – they measure the degree of resemblance – between any two titles from the projects-base;
- *evaluation and projects selection for being financed*, which means that a predefined list of evaluation criteria is applied – the title has to include a predefined set of key words, the value of the project team cohesion coefficient must be greater or equal to a minimum imposed value, the sum requested has to be within the allocated financing budget; evaluation is further extended by including methods for complexity calculation as well as methods that take into account the factors that influence an ongoing project;
- *checking projects for imposed limits and structure integrity*, which means controlling the adherence to an imposed structure for each project, by measuring each qualitative or quantitative property, considered to be useful for projects evaluation; the value resulted from measurement is put against a specific evaluation grid, in order to see if the minimum acceptability level is met.

3. Software for project-bases management

A software application that implements the operations and orthogonality measurement is presented. The application is Web-based and is called PBOS – „Projects-Bases Operations Software”. PBOS is open, flexible software and it implements new functionalities for good reporting of the evaluated projects flow, before the kick-off, during the project life and at their end-point.

PBOS has the following main advantages:

- it was designed to operate on a server and to display the results of the treatments / requests within a web browser client;
- information is presented in an interactive manner, by using both HTML and Java Script;
- it is accessible from any computer connected to the Internet;
- it is secure – log in procedure is based on user & password;
- being built upon the Java language, the application is portable on servers running different operating systems.

The software application was build using WSAD, which uses Java programming language. WSAD, also know as WebSphere, is an IDE -integrated development editor, created by IBM, which has as main IDE competitors JBoss, JBuilder and JDeveloper.

The core of WebSphere is built upon the Eclipse server – which is distributed under GNU General Public License, which IBM customized in order to increase software development process productivity.

Technologies used within PBOS are:

- *JDK 1.4* – the kit containing the core classes of Java;

- *J2EE 1.2* - Java 2 Enterprise Edition, for building large applications for the business environment;
- *JSP* - Java Server Pages, for dynamic Web content;
- *Servlets*, Java classes that have the task to control the workflow of requests/replies within a system based on the J2EE architecture;
- *EJB* - Enterprise Java Beans, Java classes that incorporate the business logic needed within the application;
- *Java Beans*, Java classes used for simple treatments and for saving data;
- *Java Script*, scripting language, used for easy client interaction;
- *HTML, CSS* – Cascading Style Sheets, used for displaying information in common language known to all Internet browsers.

Main functionalities cover project data manipulation, allocation of resources per project, evaluation of projects and final selection of projects.

The menu is accessible from any screen, because the application is thought as a frameset, having one invariable frame containing the menu and another frame, which presents the requested information.

4. Risks in creating and using project-bases

The generally spread understanding of risk is that of a future positive or negative impact of an action or series of actions that results from a deviation from the most common expected outcome.

In [4] risk management is translated to risk-handling activities can be planned and invoked as needed across the life of the product or project in order to mitigate adverse impacts on achieving objectives.

Therefore the action items on risk management are as follows:

- identify risks, by noting down all identifiable influencers with a positive or negative, no matter their importance or likelihood;
- evaluate and prioritize risks, by stating the impact and the likelihood of each risk;
- develop mitigation plans, in the sense of creating response plans for each risk that deemed to be important;
- implement mitigation plans, in case risks do occur.

For projects-bases there have been identified the following risks as related to the creation and usage of projects-bases :

- inconsistency of projects within the projects-base, in the sense that the projects do not really apply for the financing criteria or have been placed in the wrong projects-base;
- copycat of other projects, meaning that besides some reformatting and changed in figures, the base framework and ideas of one successful project has been replicated many times;
- user erroneous usage of the projects-base tool, so that the projects are not fully documented or files are mistakenly deleted during some updates;

- usage of a project team inconsistent in skills with the project requirements, meaning that the proposal refers to people who are not up to the job of actually delivering the project;
- projects selected for financing do not address a real world need, which can easily happen in case the project is not properly evaluated by experienced personnel;
- the users of the application forget their credentials, therefore they can no longer access the projects-base application;
- temporary unavailability of technical platform, as a result of an application defect or hardware or network failure.

Using high, medium and low as qualifiers the risks have been assessed as depicted in table 1. Final rating is average of the impact and likelihood. The rounding is performed downwards, having in mind the convention that 1 = Low, 2 = Medium and 3 = High.

Table 1 – Evaluation of risks when creating and using a projects-base

No.	Risk	Impact	Likelihood	Final Rating
1	Inconsistency of projects within the projects-base	High	High	High
2	Copycat of other projects	High	Medium	Medium
3	User erroneous usage of the projects-base tool	High	Low	Medium
4	Usage of a project team inconsistent in skills with the project requirements	High	Medium	Medium
5	Projects selected for financing do not address a real world need	Medium	Medium	Medium
6	The users of the application forget their credentials	Low	Medium	Low
7	Temporary unavailability of technical platform, as a result of an application defect or hardware or network failure	Medium	Low	Low

After having listed and ranked all risks that seem relevant, those risks then planned for mitigation in the following step of the risk management process.

5. Risk mitigation approaches

In order to properly plan an implementation of a projects-base all risks underlined in table 1 have to be evaluated and one of the following decisions has to be taken:

- accept the risk, by assuming the effects of the risk turning into an issue do not significantly affect the planned actions;

- avoid the risk, by seeking to eliminate the uncertainty, either by not pursuing the action at all or by considering alternatives that no longer fall under that risk;
- transfer the risk, by acknowledging the risk is significant and therefore transferring the ownership and liability to a third party;
- mitigate the risk, by seeking to reduce both the impact and the likelihood of that risk.

For the risks identified as applicable to the creation and usage of projects-bases the response selected is that of mitigation. Therefore table 2 below summarizes the mitigation actions to be planned.

Table 2 – Mitigation plan for identified risks

No.	Risk	Mitigation	Owner
1	Inconsistency of projects within the projects-base	Validate with projects-base evaluation commission the firm criteria to be used to differentiate categories of projects falling in different projects-bases	Application Business Analyst
2	Copycat of other projects	Establish quality indicators such as orthogonality in order to test for duplicates	Project Manager
3	User erroneous usage of the projects-base tool	Create and deploy a user manual	Software Technical Team Leader
4	Usage of a project team inconsistent in skills with the project requirements	Implementation of an indicator that tests the compatibility of project team experience and expertise with project requirements	Specialist Assessor
5	Projects selected for financing do not address a real world need	Understand the market need for the project and validate the feasibility of the project	Specialist Assessor
6	The users of the application forget their credentials	Create a password recovery process that reset the password in maximum 30 minutes	Technical Support Engineer
7	Temporary unavailability of technical platform, as a result of an application defect or hardware or network failure	Put in place a budget for a alternative power supply and for hardware backup. For the technical platform a 24 max. resolution timeframe has to be envisaged	Technical Support Engineer

Conclusions

Risk management is a mandatory process to be followed whenever project management practice is properly implemented. Therefore this is fully applicable as well when it comes to setting up, populating and managing projects-bases. The whole process has to be perceived as a project that comes accompanied with certain risks. It's up to the project management and financiers of the overall program which risks will be fully financed for mitigation, which will be transferred, accepted or avoided. In this paper there has been performed an overall analysis of major risks that can occur during the creation and usage of projects-bases.

Risks taken into account varied from technical related, to project content related and furthermore to evaluation process related. The identification, evaluation and final rating of each risk are important in deciding which risks worth acting upon.

Project-bases should pursue a tough process of risks identification and risks follow-up in order to ensure a smooth implementation of the concept.

Bibliography

- [1] Ion IVAN, Andrei SANDRU, "Projects-bases management software", 20th IPMA World Congress on Project Management, Shanghai, China, 15 - 17 October, 2006;
- [2] Li-Ren YANG, James T. O'CONNOR and Chu-Ching WANG, "Technology utilization on different sizes of projects and associated impacts on composite project success", International Journal of Project Management, volume 24, issue 2, February 2006, pg. 93-184;
- [3] www.projectstoday.com; India's largest database on new projects;
- [4] Software Engineering Institute, "CMMI for Development, Version 1.2", Pittsburg, Carnegie Mellon, 2006;
- [5] Constanta-Nicoleta BODEA, "Handbook of Project-Based Management", Economical Publishing House, Bucharest, 2002;
- [5] Robert ECKSTEIN, "Java SE Application Design With MVC" , java.sun.com, 2007;
- [7] Andrei SANDU, "Indicators for Measuring the Quality of Projects-base Components", 4th International Conference for Applied Statistics, 20-22 November 2008, Bucharest, NIS printing House, ISBN 1018-046X;
- [8] Ion IVAN, Andrei SANDU, Daniel MILODIN, Cosmin LUGOJI, "Orthogonally Based Digital Content Management Applicable to Projects-bases", Informatica Economică Journal, INFOREC Publishing House, vol. 13, nr. 3, 30 September 2009, ISSN 1453-1305, pg. 140-152.