Project Management Metrics

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Abstract: Metrics and indicators used for the evaluation of the IT projects management have the advantage of providing rigorous details about the required effort and the boundaries of the IT deliverables. There are some disadvantages, as well, due to the fact the input data contains errors and the value of metrics depends on the quality of data used in models.

Keywords: Project Management, Information Technology, Metrics

1. Introduction

In the IT field, projects include the development or the implementation of software and hardware systems, data communication, video, voice or integrated systems.

Project management is a new way to manage in order to complete the goals having the cost minimized in different domains like industry, constructions, medicine, education, research.

The entire project management process has to be evaluated continuously for quality. This can be done using specific metrics related...
to the project management in the projects' field.

2. Project Management Metrics

IT project failure, especially on software projects, occurs frequently. In order to reduce the degree of failure for new projects, data have to be collected and metrics to be computed.

Poor management is a very important factor in the failure of IT projects. The completion of a project can take place through the achievements of all objectives, but unprofitable financially. Instead, other advantages can be obtained, like the increase team or organization prestige or the experience gained. Some projects, even they fail in the objectives achievement, can return through gained experience, new team members, some positive results etc.

The quality of the project deliverables cannot be obtained without a high quality process, but a quality process does not guarantee quality products. The quality of the process is certified through quality standards.

Also good trained personnel do not guarantee the quality of deliverables. In order to obtain quality results, the organization has to have trained and educated personnel, and standardized project management and technological processes.

The indicators and metrics used in IT projects evaluation creates a general view over a diversity of IT projects aspects, like resources consumption, costs, performance, and risks.

Starting from the system of indicators based on historical data regarding projects that have been run in the past there can be easily created a system that allows releasing information related to the chances that a running project can be successfully completed. There also can be
determined the stage of the subject in relation to the projects that have been undertaken in similar conditions and thus action can be taken based on the records of these projects using the lessons learned from those projects.

The management of the IT projects evaluation from the perspective of the user is aiming to ensure the client's satisfaction through the maximization of the coverage of its needs.

The indicators allow for fundment the decisions and the marking of the structural elements. They should stand for a system which allows an overall appreciation of all the aspects concerning IT projects. This system should render an image of all the resources used and of all of them that will benefit from in the future.

The extension of the system of indicators and the use of very large data series converge to a reference system used to make decisions with effect on the further social and economical development from the point of view of the very important sector of information technologies and communication.

The system of indicators is developed in steps and it is further to be improved with specific data from other projects in other fields, thus being consequent to the methodological rules required for a comprehensive knowledge of the elements related to the characteristics of the modern society.

3. Classification of Project Management Metrics

As defined in a metric represents a mathematical model developed around an equation having the following form: \( y = f(x) \).

A mathematical model consists of one or more equations, inequations, and objective functions and it has the role to describe the
associated system state. The metrics measure the project or product characteristics based on the characteristic’s influencing factors. Using project metrics is created a basis for projects hierarchies and classification.

The metrics have the following functions:

- Measurement;
- Comparison;
- Analysis;
- Synthesis;
- Estimation;
- Verification.

Defining the metrics for IT projects consists of building models and indicators that start from values measured with objectivity, such as the number of objectives, number of milestones, budget, number of modules, number of phases, number of activities etc.

Projects metrics and historical data are very important for project oriented organizations. Often happens these records are missing, incomplete, incorrect, or are not centralized and metrics are not computed.

The factors that can be measured and used in IT project management metrics are classified in: personnel, process and project/project indicators.

The personnel evaluation could take into account:

- education level;
- certification level;
social abilities;
experience;
project team homogeneity degree;
personnel productivity.

The evaluation of the process is focused on the maturity of the IT project management. The quality of the project deliverables cannot be obtained without a high quality process, but a quality process does not guarantee quality products. The quality of the process is certified through quality standards. Regarding the evaluation of the process, the following factors can be used:

- development techniques and methodologies used;
- company certification level;
- the degree of novelty for software and hardware;
- programming language used;
- degree of reuse.

Some factors derive from the product/project characteristics and its related environment. There are several factors related to the project/product evaluation, like:

- project complexity;
- number of users/stakeholders;
- the existence of similar product on the market;
- software application specific.
These metrics have to be classified and grouped in systems of metrics and they have to be tested and validated after they will be used in practice.

Conclusions

The metrics used for projects evaluation create a general view over a diversity of project management aspects, like resources consumption, costs, performance, and risks. Based on historical data regarding projects that have been run in the past, there can be easily created a system that allows releasing information related to the chances that a running project can be successfully completed. There also can be determined the stage of the subject in relation to the projects that have been undertaken in similar conditions and thus action can be taken based on the records of these projects using the lessons learned from those projects.

References


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