THE INFORMATION QUALITY IN PROJECT MANAGEMENT

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INTRODUCTION

The competitive pressure on organizations is still increased. This fact has led them to engage in projects that are critical to their performance. If organizations want to be successful they have to realize projects on time, within budget and project must meet the requirements for the management of project risks. Much time and many resources are dedicated to the selection and development of projects, but most important is that projects are properly implemented in organizations to achieve their objectives. For effective projects management organizations are using project management information systems, which are viewed as support for project management. Within project management is necessary to emphasize on quality of input information as well as their ongoing monitoring, coordination, editing throughout the project life cycle. Quality management is performed through the project life cycle with particular reference to quality planning, quality assurance, quality control and independent verification of quality. The basis of the project’s success is of course the project team and the selection of competent project team members.[5]

Effects of the improper election of the Quality of information (IQ) can lead to the termination of a business. Moreover, the lack of the quality of information has a significant impact on customer satisfaction, as well as the operational costs and financial indicators. Thus, there is a growing need for the use of methods to assess the quality of information.[3]

Quality was defined as “fitness for use”. This means that the quality is defined customers such as customer satisfaction which is considered analogous. It can be defined as meeting and exceeding customer expectations, as well as a perfectly produced product which has little value unless it is what the customer wants. [9] Moreover, Juran (1974) introduced the term "cost of quality". [1] [9] Crosby (1979) however, argued that "quality is free", because all the money spent on quality control is ultimately saved, due to less quality problems. [4] Although this doctrine recommendation was originally developed for the manufacturing industry, the same principles were applied to the field of information quality.

1 ASSESSING THE QUALITY OF PROJECTS

Project Quality Management processes include all activities of the organization that determine quality policy objectives and responsibilities so that after the implementation of the project all customer needs are satisfied and guaranteed. The Quality Management System is implemented through policies, procedures and processes of quality planning, quality control and continuous process improvement activities as needed[12].

The role of the quality management project is to ensure that the project will satisfy the needs for which it was created and to start addressing them. The role of project management processes is to meet or exceed the needs and expectations of participants. The project team must therefore build good relationships with key stakeholders, particularly with major customers of the project where it is necessary to clarify what they regard as quality. Many projects end in failure, mainly because the project team concentrated their attention only to the written specification of the major products in development, and forget about other needs and expectations that participants attach to the project. [16] It follows that it is equally important to put emphasis on the quality just as much as the scope of the project together with the time and costs required for its implementation. [15] [8]

The quality management projects have three major processes:

a) The planning process of quality is in setting quality standards which are applicable to the project and identify how they reach their fulfillment. A key part of quality planning is the integration of quality standards in the project proposal. In technical projects, it is also possible to determine the time duration for a maximum response from technical support (Help Desk), or as long as is necessary to deliver a replacement of a hardware component. [12] [15]

b) Process assurance quality - describes how to use the planned and systematic activities concerned with quality, so as to ensure the utilization of all processes needed to meet its requirements. This is a periodic assessment of the overall effectiveness of the project and to check whether the project meets the quality standards.
c) The process of carrying out quality control – the monitoring of specific project results and seeing whether they comply with relevant quality standards and to determine how to eliminate the causes of unsatisfactory results and to identify opportunities to improve the overall quality. [16]

2 TOTAL DATA QUALITY MANAGEMENT

Looking at the quality of information recorded the significant progress in a relatively short time period. Researchers and practitioners are constantly engaged in solving problems of quality of information, quality of information definitions, the measurement, analysis, improvement tools, methods and practices. [1] However, in the theoretically based methods for Total Data Quality Management (TDQM) - a comprehensive quality control of the data is still lacking. This issue deals with Prof. Richard. Y. Wang, who is a pioneer and an internationally known leader in the investigation of data quality, edited by Deming's method of definition, measurement, analysis and improvement, information on production and suggested TDQM that emphasizes continuous improvement and the provision of quality information products. [7]

The purpose of the methodology of TDQM is to deliver and inform consumers about high quality information products. Its objective is to implement the organization's top management and to express a policy of comprehensive data quality management. In order to obtain high quality information, the organization should implement TDQM. A determining factor of the TDQM cycle is to identify the important dimensions of IQ and the IQ requirements. Measuring the individual components create IQ metrics. The analysis identifies the basic components of IQ problems and IQ calculates identify the consequences of information of poor quality. Finally, the improvement of individual components provides techniques for improving IQ. Maintaining data quality is often problematic. There are many factors that can hinder IQ; these include inadequate provision of timely, complete and accurate reporting of data, undefined rules for the management of information, lack of processes for data collection and fragmentation, new methods for their management and dynamic management of the information lifecycle.

According to research by Professor Hakim (2007), the factors that affect IQ can be divided into three areas:

a) technology (IQ control and improvement approaches and techniques of data collection architecture, tools and techniques, creation of internal standards for IQ, application and process integration, IQ technology for data integration, data storage architecture, techniques for data cleaning),

b) organization (leadership, commitment of senior management to IQ, development of appropriate policies and standards for IQ and their implementation, organizational structure, organizational culture, supplying information about quality management, customer focus, audits and assessments, evaluating the cost/benefit trade-offs, and teamwork communication, change of management, internal (internal) control system, access control, feedback to IQ),

c) people (staff competence, performance evaluation and remuneration, relations between employees, management responsibilities, training), in each area, it is necessary to address the factors that may significantly or less significant have an impact on the quality of information in the organization. [7]

A quality framework data model for a data environment must be based on a strategy that has a wide scope. This strategy sets out a business plan and relationship between data. Its aim is to create a framework of data quality tools that can be used for everyday work activities. The main components of data quality are in determining quality that will create a framework for quality assessment and the implementation of strategies. [7]

3 DATA QUALITY EVALUATION FRAMEWORK

Data Quality Evaluation Framework (DQEF) establishes the processes and metrics (criteria) to assess whether the level of data dimensions (e.g., accuracy) is acceptable or not. In order to measure and define the concept of IQ, it is not enough to identify the common elements of IQ frameworks as individual entities themselves. In fact, the IQ must be considered in the context of its generation and subsequent use. And because the quality attributes of the data may vary depending on the context in which they are to be used. The definition of IQ in terms of the World Wide Web and its search engines largely depends on whether the information will be surveyed for creation, storage and maintenance, or to find information about its users. [7]
A framework for data quality assessment should not only evaluate, but also plan, analyze and solve problems related to the quality of data for a proactive management. There are four objectives regarding IQ:

- framework for assessing the quality of data should provide a systematic and concise set of criteria by which to evaluate,
- framework should provide a system to analyze and solve problems IQ,
- also should be the basis for measuring IQ and proactive management,
- and finally it should provide a community (the scientific community) with the concept maps that can be used for different design approaches, theories and phenomena on IQ. [6] [7]

3.1 MATURITY MODELS AND TDQM

Maturity models are designed for process control in organizations. Based on the idea of the CMMI model, which consists of five levels:

- **Initial** (teams at this level defined non-implemented or only partially implemented processes),
- **Managed** (is designed and project management activities are planned),
- **Defined** (procedures are defined, documented and controlled),
- **Quantitatively Managed** (products and processes are managed quantitatively),
- **Optimizing** (the team continuously optimize its activities).

Each level represents an evolutionary stage of quality information management capabilities. It is assumed that the distribution of the quality of information on several levels can easily achieve sub-goals in an incremental way. Scholars from Australian universities Andy Koronios, Jing Gao and Saša Baškarada adapted TDQM methodology for improving the quality of information by aligning a phase TDQM cycle model at different levels of maturity.

In addition, this provides additional guidance and identifies specific process areas that affect the quality of the information. Each level, except the first, sets out a number of information management processes regarding the quality and management of information. They compiled a process of information management and quality control of information to the different levels of the maturity evaluation model; this was in order to provide more specific guidance.

3.2 DIMENSIONS AND BASIC CRITERIA FOR ASSESSING THE QUALITY OF INFORMATION

Meade and Sarkis point out that the real environment no longer provides sufficient experience, skills, knowledge and information to achieve and increase competitiveness. It is essential to be able to transform knowledge, skills and information into products. [2] The ability to adapt is based on the results of two assumptions, information technology and process experience. The ability to “adapt/convert” should be maintained through continuous process improvement and learning. [10]

Prof. Wang made a step forward beyond the work of professors Meade and Sarkis and found an analogy between the issues of the quality of industrial products and quality issues of information processing and further stated that information processing can be working on sensitive data to produce information products. Prof. Wang points out the organization to handle information such as managing one’s products, if one want to increase productivity. [18]

Turban defined information as "data, which are managed in a way that gives meaning to the recipient". [18] A definition by Copeland and Simpson extended this to include “all communication or representation of knowledge such as facts or data in any environment and form”. [17]

<table>
<thead>
<tr>
<th>Information quality category</th>
<th>Dimension of information quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic</td>
<td>accuracy, objectivity, believability, reputation</td>
</tr>
<tr>
<td>Representational</td>
<td>interpretability, ease of understanding, representation, consistent representation</td>
</tr>
<tr>
<td>Contextual</td>
<td>relevancy, value-added, timeliness, completeness, amount of information</td>
</tr>
<tr>
<td>Accessibility</td>
<td>accessibility, security access</td>
</tr>
</tbody>
</table>

Source: created by [19]
The result, the problem of the quality of information defined as a difference of one or more dimensions of quality, which is inappropriate data or a large part of suitable data for use. [14]

Verification of the quality of information is a complex process. Five basic criteria that are needed to be addressed in order to present information that can be identified as reliable include: a) authority, b) accuracy, c) currency, d) coverage, e) objectivity.

These criteria have their origin in the world of printed media and are considered to be universal criteria that need to be addressed regardless of the media evaluated; each criterion must be addressed individually. Often, however, there is overlap between the various criteria, leading to discussions, such as “authorship” and “accuracy” – thus, for a more complete picture, these should be taken into consideration together. The mentioned five key evaluation criteria for assessing the quality of information will provide a starting point for assessment of the problems related to these features that are characteristic of all information [17]

4 THE MAIN CAUSES OF POOR INFORMATION QUALITY IN ORGANIZATIONS

The journey to reach the quality of information is tortuous. Poor quality information leads to chaos in the organization. It is necessary to identify the root cause of this situation. Professors Strong, Lee and Wang described 10 leading causes of IQ:

- More resources of the same information produce different values.
- The information generated by the subjective judgment may be biased.
- Making mistakes can lead to loss of information. The database must be protected in order to prevent overwriting by unauthorized persons, as well as other adjustments that can be performed only by those users who have administrator-defined access. The recommended solution to this problem is: to introduce a statistical-process control, improved process control, process control and improvement of appropriate incentives.
- Too much information is not necessarily better.
- Distribution systems - for the organization, it is important to have well-designed distribution channels. This means that the information must have a well-defined format where all the systems in the organization, where the information is intended to be processed further - read, analyzed and further use, are known.
- Information in the form of non-numerical characters is difficult to index.
- Advanced requirements analysis.
- Change Task needs - customer needs influence the change of information. Information systems should be designed for flexible reporting.
- Requirements for security and privacy. The organization must be prepared by the security policy, which is to say, what kind of information is relevant to whom. [14]

Until recently, there was a very low awareness of the pervasive problems of IQ and the related severity of financial and the operational costs of organizations. With the increasing dependence of organizations on the quality of management, information and operational decisions “patches” IQ are no longer an equivalent way. Organizations must learn to recognize potential signs of the possible development of “patches” in order to devise solutions before problems arise. This, however, requires knowledge of information processing and the understanding of why these processes were carried out as they should be, or why they were unfulfilled. Organizations that deal with warning signs of IQ problems provide a smooth path for their customers a higher quality of information. [14]

5 MATERIALS AND METHODS

The main objective of our research is to elaborate the methodology for the application of quality information assessment in project management in the Slovak Republic. Based on the theoretical knowledge of the literature from the area of project management as well as the information management and monitoring costs of poor quality information, we have prepared the analysis of the current status of the issue in Slovakia.

Three hypotheses are proposed that will verify research and then evaluate it in order to design and build a methodology.

Working hypothesis 1: There is a relationship between the degree of IS used in project management and information quality.
**Working hypothesis 2**: Information Quality control is not incorporated in project management methodologies applied in the Slovak industrial enterprises.

**Working hypothesis 3**: There is a relationship between the quality of information within project management and the projects quality (scope, budget, time etc.).

The research we have divided into two parts: a structured interview in 15 selected companies in Slovakia and a questionnaire survey. These were the 137 companies with foreign capital participation, as well as purely Slovak enterprises (micro enterprises 26%, small enterprises 23%, medium-sized enterprises 25%, and large companies 26%). 44 percent of respondents implemented medium-sized projects in time which does not exceed 12 months and 35 percent of respondents realized customer focused projects.

### 6 THE RESULTS OF RESEARCH

We conclude that companies manage their projects using different methodologies of standards which help them in their implementation (Fig.1). However deficiency occurs, often fails to meet all the criteria of Triple Constraint established at the beginning which are quality, time and cost. Businesses in the implementation of their projects do not make databases for recording the process of the project, the shortcomings of project team members - to what area they were specialized, the costs and results.

**Fig.1 Question 5: What guidelines for quality management in projects do you use?**

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>We do not use any methodology</td>
<td>31%</td>
</tr>
<tr>
<td>Internal corporate methodology</td>
<td>6%</td>
</tr>
<tr>
<td>STN ISO 10006 Quality management systems</td>
<td>14%</td>
</tr>
<tr>
<td>Guidelines for quality management in projects</td>
<td>2%</td>
</tr>
<tr>
<td>Prince 2®</td>
<td>6%</td>
</tr>
<tr>
<td>PMBoK ®</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>42%</td>
</tr>
</tbody>
</table>

*Source: own research*

48 percent of respondents answered that they have common database without access restrictions, 32 percent of respondents replied, that in their company information is controlled, and access rights are assigned to them, 28 percent of respondents reported, that every department is controlling their own information. 39 percent of respondents replied, that the project manager is responsible for quality of information. Only 38 percent of respondents update their database. The database would provide information that could help solve the following projects; it could prevent some situations, or they would be solved quicker. There are also missing databases of occurred errors. Enterprises pursuing during the implementation of the project cost, what was the cost of the project and alike. 56 percent of respondents replied, that they recorded relationship between rising costs of project and quality of information. But many companies do not pursue the costs of incurred errors, and even if some of them do, they do not split them into individual types of direct and indirect costs of poor quality.

**Working hypothesis 1**: There is not a relationship between the degree of IS used in project management and information quality. (Hypothesis 1 is not confirmed)

**Working hypothesis 2**: Information Quality control is not incorporated in project management methodologies applied in the Slovak industrial enterprises. (Hypothesis 2 is confirmed)

**Working hypothesis 3**: There is a relationship between the quality of information within project management and the projects quality (scope, budget, time etc.). (Hypothesis 3 is confirmed)

### CONCLUSION

In the literature, there are methods to help users manage their projects. Also, the literature is concerned with the quality, the quality of data and quality information. Each of the experts in the field prefers certain types of features to obtain quality information. However, the literature is not a comprehensive look at the quality of information in project management. The research is aimed at
industrial enterprises within Slovakia. It is important that companies evaluate the quality of information in the field of project management, to create a tool that will not only help organizations to find their way in their projects, to build the database of projects which may be helpful in solving other projects, but also the effective use of information which the organization disposes of. For an organization, it is important to think about how to capture, share, do not lose and apply the right information at the right time and on the right place.

REFERENCES


THE INFORMATION QUALITY IN PROJECT MANAGEMENT

Abstract

Poor quality of information in modern organizations may be caused by the quality of the inputted data. Applying a methodology of quality control helps organizations create effective management of their information. The method of quality information control depends on all those aspects. The importance of the organization should be given to dispose of an optimum amount of information in the required level of quality and especially to share this information. The quality of information is the key to the success of the project’s management; this also applies in many other areas. Understanding the mechanics of the control of information management and its class is essential; this is an experience that distinguishes successful information managers. The role of the quality management project is to ensure that the project will satisfy the needs for which it was created and to start addressing them. Many projects end in failure, mainly because the project team concentrated their attention only to the written specification of the major products in development, and forget about other needs and expectations that participants attach to the project. It follows that it is equally important to put emphasis on the quality just as much as the scope of the project together with the time and costs required for its implementation.

Key words:

Project, project management, information quality, dimensions of information quality, criteria for assessing information quality.

JEL Classification

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