

Barriers and Facilitators in the I.T. Project Management: A Multicases Exploratory Study

Fagno Alves Fonseca¹, Selma Regina Martins Oliveira², Patrick Letouze Moreira²

Associate Professor, Department of Computer, Federal Institute of Education, Science and Technology of Tocantins,
Palmas, Brazil¹

Associate Professor, Department of CMaster in Modelling of Computer Systems, Federal University of Tocantins,
Palmas, Brazil²

ABSTRACT: Facing the high rate of failures in projects, organizations are fighting for efficiency and competitive advantage, developing strategies and adopting the best practices possible in order to achieve the desired goals. Based on the reflection caused to the company's business, the difficulties faced during management is an evident reality in the context of several organizations. Thus, this study had as its initial objective, identify the main facilitator¹ and barriers² found during the Information Technology (IT) Project Management supported by the literature. Subsequently, we tried to highlight, through the experience of experts in the field, considerations of which facilitator or barrier is the successor to benefit or affect the success of management. The results obtained of a quantitative nature, through a questionnaire, an instrument used for data collection, showed that the facilitators and barriers identified in literature indeed show the reality of companies.

KEYWORDS: Barriers and Facilitators in IT Project Management, Project Management, Critical Success Factors in IT Project Management.

I. INTRODUCTION

The Information Technology (IT) Project Management has been subject for constant discussion in the companies' daily lives, because of a large part of IT projects result in failure. Several projects are not having the expected results, due to several critical factors. In present scenario of business environments, changes occur very quickly, making organizations develop projects of diverse purposes. Due to this highly competitive environment, companies seek to apply the best possible practices to innovate the projects management for competitive advantage. It is important that managers know the main factors that determine the success of a project, and the benefits that are acquired with the proper management of the same in the organizations. According to Ding and Wang [1] if we do not know which factors are affecting the success of projects, we cannot choose the most appropriate tool. Success in project management ensures several benefits to the business of the organization. Sauser et al. [2], explain that the projects have become a core activity for most organizations due to the increasing need to develop new products and services. In this context, the following question for the research arises: According to the literature, what are the main facilitators and barriers encountered during the Information Technology project management?

Seeking to evidence the main reasons why a significant number of IT projects fail, this work identifies through current literature the main facilitators and barriers encountered during the IT project management, and subsequently evaluate their importance in companies' everyday life through expert's experience and judgment.

Such evidences will be important to complement the knowledge of common critical issues during the management, which may affect, or even lead a project to failure. Achieving the best results is the goal of all projects, due to this,

¹ FACILITATORS - critical factors intended to contribute to the progress or success of project management.

² BARRIERS - critical factors that tend to impair the progress or success of the project management.

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having the resources or tools to ensure good results, are measures that improve the actions during its planning and management. Following, the article is structured in sections: 2) State of the art; 3) Conceptual model; 4) Scope of the research; 5) Collecting and sample; 6) Verification of the conceptual model; 7) Results; 8) Analysis of the results; 9) Implications for the practice of management; 10) Conclusions and limitations.

II. STATE OF THE ART

According to the PMBOK [3], a project is a temporary endeavor undertaken to create a product, service or result. Its temporary nature indicates a beginning and an end defined. The end is achieved when the goals have been achieved or when concluding that these objectives will not or cannot be achieved and the project is terminated, or when it is no longer needed. According to Little [4] successful projects do not just happen. They need careful planning, skillful management and some degree of luck. To Liu et al. [5], recent findings highlight the management control influences the competence to carry out tasks and thus the performance of project management. According to Duarte [6], the need for discovery of new techniques of project management in IT stems from the fact that the better a project is managed and in this particular, an IT project, the better the benefit associated with the cost of the project, when this cost is target object of "productivity paradox" associated to the area of IT companies. The results published by CHAOS manifesto 2012³ Conducted by the Standish Group⁴ [7], shows that the sector of information technology has a relatively low success rate in projects, as shown in Figure 1.

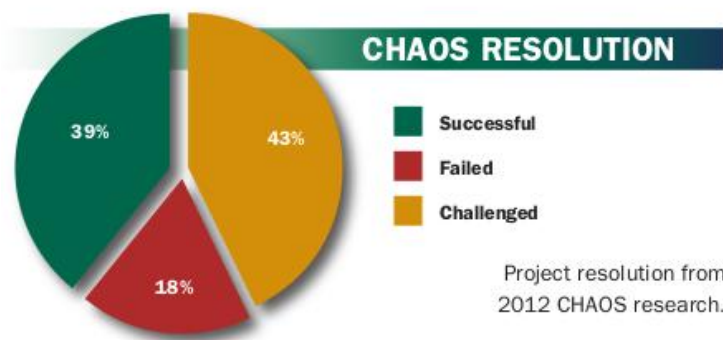


Figure 1: Successes and failures of IT projects (CHAOS Manifesto 2012)

With 39%, were considered to have successfully delivered all projects on time, within budget, with the features and functions required. The projects that have had losses, with 43%, was due to problems with delays, budget and fewer resources. Finally, with 18%, projects that had failed were those canceled prior to the conclusion or delivery and never used. Despite a minimal increase in success rates on the results of 2012 report compared to previous years [8], we observed through Figure 2 that was not such a relevant increase. However, it is also perceived that despite the alternated results over the years in general, there is an increasing success. A study conducted by Junior and Plonski [9] in six companies that act in Brazil, concludes that companies are concerned with defining the success of their projects more broadly, beyond the traditional iron triangle: time, cost and quality. Another practice observed is the use of different strategies for management requirements and product construction in strategic projects. It shows that companies, in some way, consider the uncertainties in the definition requirements for projects with greater load of innovation.

³ CHAOS MANIFESTO 2012 - Report by Standish Group about success and failure in the management of IT project.

⁴ STANDISH GROUP - Company market research and consulting firm specializing in e-commerce and software for basic tasks.

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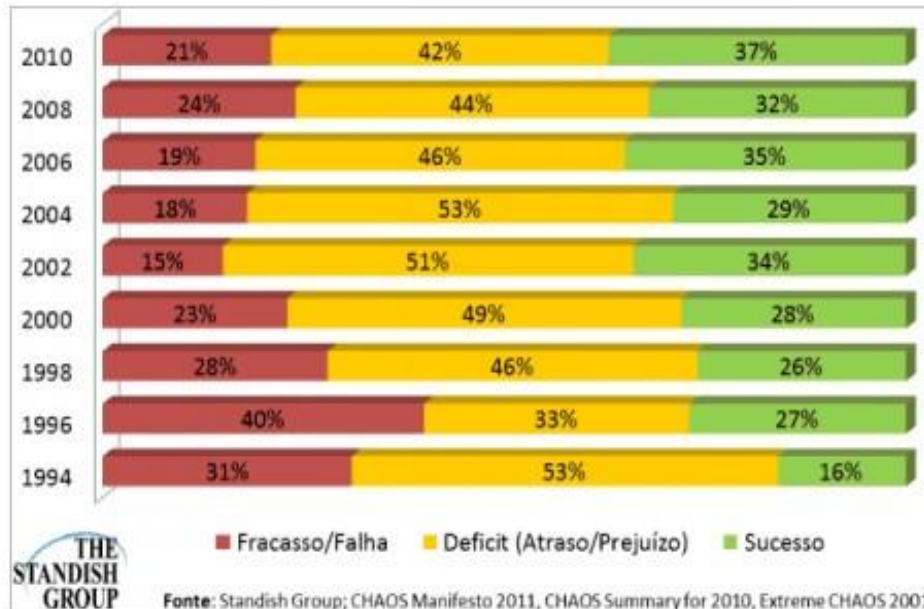


Figure 2: Successes and failures of IT projects (CHAOS Manifesto 2011)

According to Duarte [6], IT projects, when analyzed under the light of the theory related to project management, has, on average, a great grip on theoretical terms of applicability, which strongly suggests that models specific to the management of IT projects, when elaborated, must possess the essence anchored in established models in classical literature of project management. To Berssanetia et al. [10], a project that is not very far from the initially planned budget, meets the schedule and does its deliveries meeting the requirements set by the project stakeholders and is considered a successful project.

III. SCOPE OF THE RESEARCH

In this research it is intended to obtain results that aim to contribute to improving the management of IT projects. Given this, we seek to identify the main barriers and facilitators that may come to affect or contribute to the management process. The construction of this research aims to help managers achieving better results, while avoiding potential problems resulting from activities during the project. To best structure and steer the methodology guidelines of this research, one starts from the following hypotheses: - Identify the main facilitators and barriers during IT project management which will contribute to the decision-making process of the leaders during the project management. - To highlight the results obtained from the literature from experts in the field, strengthens the results regarding the main critical factors in the management of IT projects. This research introduces the idea that most studies discuss certain factors in particular, studies that address some critical factor of success on project management. Proceeding from this standpoint, it was thought to identify generally all critical factors relevant to project management.

IV. COLLECTING AND SAMPLE

For the present study, we adopted an empirical study of exploratory character and quantitative nature. According Serapioni [11], quantitative research works in levels of reality and aims bring to light data, indicators and observable trends. The interview was conducted with experts who had experience in the field, a total of 19 professionals, seeking to collect data to solve the research's problem. The research utilized a questionnaire as a tool for collecting data, applied online, sent via e-mail containing guidance regarding the purpose of the research and the interview. The script of the questions asked was prepared containing questions related to the research theme, as well as questions about the profile and information of the interviewees. For the array of judgment created from these factors, the measurement

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scale Likert⁵, set on five ordinal categories was used to indicate: In which level facilitators and barriers indicated, affect the IT Project Management? As set out, the following are the cited scales describing the levels: 1-very low, 2-low 3-average, 4-high and 5-very high. According to Batista [12], a major concern in empirical research, in especially organizational quantitative, is the definition of the measurement scale appropriate for the collection of information. A scale extensively used in this type of research is the ordinal scale and, in particular, the Likert scale. To consolidate the data obtained from the research, charts and graphs to show such results have been prepared. The same will be presented in a section later, measuring the results obtained from the research.

V. RESULTS

For a better understanding of the collected data a summary of the profile of the interviewees is shown below. Figure 3 below shows what of part of the country are the interviewees.

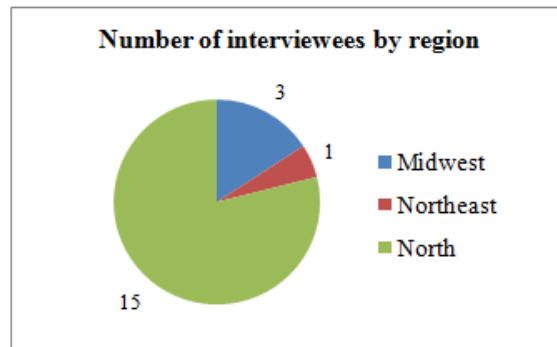


Figure 3: Number of interviewees by region of the country

In Figure 4 is shown the years of experience of the interviewees. In this research we tried to interview experts who have any possible experience in the area. The data from interviewees, who had no experience, were not included in the analysis.

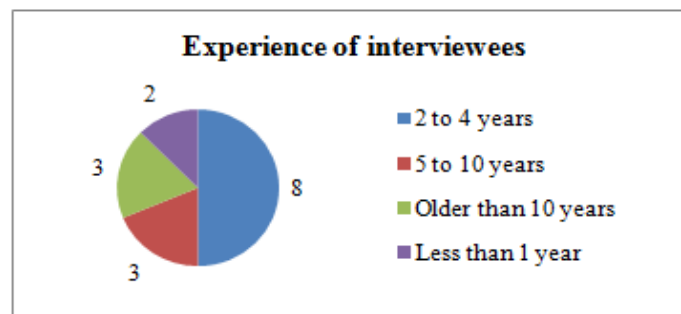


Figure 4: Experience of interviewees in the area in years

Also below is presented in Table 1, more detailed data of the years of experience of the interviewees, and also the acting position of the same.

⁵ LIKERT SCALE - is a type of psychometric response scale commonly used in questionnaires, and is the most widely used scale in opinion polls.

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Table 1: Role and experience of respondents in years

Acting position	2 to 4 years	5 to 10 years	Older than 10 years	Less than 1 year	Total
IT Analyst	6			2	8
IT Coordinator	2		1		3
Executive director		1			1
Software Engineer				1	1
Administrative Manager			1		1
IT Manager				1	1
Teacher		2	1	1	4
Grand total	8	3	3	5	19

In figure 5, the level of education of the interviewees is presented.

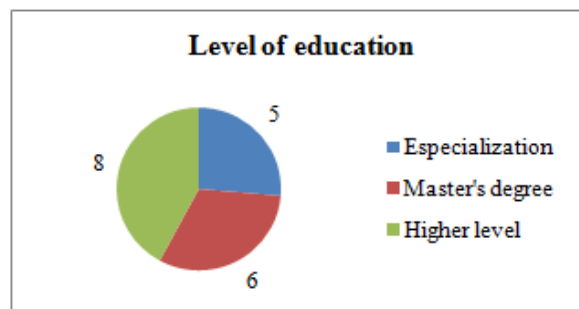


Figure 5: Level of education of the interviewees

Table 2: Segment and classification of companies

Classification	Education	Energy	Financial	Government	Computer	Justice	Search	Health	Total
mixed			1						1
private	2	1			2			1	6
public	4			5	1	1	1		12
Grand total	6	1	1	5	3	1	1	1	19

In Table 2, is shown the segment and classification of companies where the interviewees worked as the property of their capital.

All these data were important to select the data in a better way, in order to be included in the analysis. The literature presents a number of factors that lead IT projects the positive and negative implications. In this work, the implications were defined as facilitators and barriers. In Table 3 below, along with the facilitators identified through literature survey, the result is shown in a percentage of indications mentioned by interviewees as the question: At what level facilitators pointed contribute to the successful management of IT projects?

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Table 3: Facilitators and percentage indicated by interviewees

Facilitators	1	2	3	4	5
	Percentage of interviewees				
Clear objectives.	0%	0%	5%	37%	58%
Focus.	0%	11%	11%	26%	53%
Team training.	0%	5%	11%	37%	47%
Financial support.	0%	11%	32%	16%	42%
Fully meet customer demand.	0%	5%	21%	37%	37%
User involvement.	5%	0%	21%	37%	37%
Define governance.	0%	5%	32%	26%	37%
Establish a communication plan.	0%	16%	16%	32%	37%
Correct demand of participants in project teams.	0%	11%	21%	37%	32%
Properly scale the timeline.	0%	16%	11%	42%	32%
Constant feedback.	5%	0%	21%	47%	26%
Properly gauge the costs.	5%	0%	21%	47%	26%
Stakeholder involvement.	0%	21%	11%	42%	26%
Manage risks.	0%	5%	26%	42%	26%
Formalization process.	0%	11%	37%	26%	26%
Satisfaction of those involved in the project.	0%	5%	32%	42%	21%
Behold the visible expectations met and exceeded all project stakeholders.	0%	11%	32%	37%	21%
Correctly identify stakeholders.	5%	0%	37%	37%	21%
Eliminate risks posed by participants.	0%	16%	42%	21%	21%
Cooperation between sectors.	5%	0%	21%	58%	16%
TOTAL	1%	7%	23%	36%	32%

It is observed generally that only 1% of the interviewees consider these facilitators with importance 1-very low to benefit the management of projects, and 7% as being 2-low. And 23% with 3-average level, 36% at high level and 32% with a very high level. Given these results, we can imagine that the results obtained from the literature correspond to situations of day to day operations of companies during the project management. It is observed that the smaller the indications at low levels, one imagines, that these factors are very important, and if properly managed contribute to a project be successful as well as good results during the administration. Table 2 presents results as described above, but with barriers, in other words, the percentage of indications mentioned by interviewees as the question: At what level the barriers identified, affect the management of IT Projects? The data are sorted by levels indicated by the interviewees.

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Table 4: Barriers and percentage indicated by interviewees

Barriers	1	2	3	4	5
	Percentage of interviewees				
Lack of leadership from the manager.	5%	16%	16%	21%	42%
Lack of involvement and commitment of the organization.	11%	0%	21%	42%	26%
Lack of communication during the project.	5%	5%	37%	26%	26%
Define the necessary competencies of staff.	11%	16%	37%	16%	21%
Lack of experience and competence of staff.	11%	21%	21%	32%	16%
Changing demands of the project.	0%	16%	42%	26%	16%
Does not have required number of participants on the team.	0%	16%	37%	32%	16%
Frequent movement of people.	5%	21%	21%	37%	16%
Lack of adequate infrastructure.	11%	21%	21%	32%	16%
Do not invest time in requirements engineering.	11%	5%	21%	53%	11%
Lack of cooperation during the project.	5%	5%	53%	26%	11%
Lack of customer involvement.	5%	11%	32%	42%	11%
Conflicts.	16%	26%	26%	21%	11%
Rapid change in the environment.	5%	26%	42%	21%	5%
Rapid technological update.	11%	26%	42%	16%	5%
TOTAL	7%	15%	31%	29%	16%

It is also observed that despite the level 1-low have a higher percentage in relation to the facilitators, in general, it is thought that the barriers identified can affect the management of IT projects, as described in the literature. Only 7% of interviewees indicated that barriers have a very low level to affect the management of IT projects. However, most point to the following results, 15% with level 2- low, 31% with medium level, 29% high level and 32% with a very high level. Results obtained through the sample in question, report according to expert opinion, and the order of the critical factors to be treated on the various situations during project execution. The ranking of projects by higher level in the opinion of the interviewees indicate they are the most important. Each project has its value before the organization during its planning, which makes indispensable its strategic value to conquer successful results. According to Almeida et al. [13], the lack of differentiation between the projects and the use of suitable practices for each type, are usually adopted the so-called "best practices" of management, which were gathered from the analysis of a large number of projects in different areas. The problem is not in practice itself, but in its general use, particularly in developing innovative products. These factors, if well managed and organized, can generate positive impacts at the project level and achieve success in a planned way. According to Santos et al. [14], the evolution that companies have had since the late nineteenth century, with the appearance of new organizational models, are going to encounter a more collaborative form of working within the organization (between sectors and departments) and interaction with other companies (concept of network organizations). The priority is to focus on the quality of delivery of products and / or services to a customer by using approaches like vision of business processes.

VI. ANALYSIS OF RESULTS

The results describe the levels indicated by the specialists, which were table 3 and 4, an assumption that the order of the factors by levels and indication of respondents, are considered to be the most important for the management of IT projects. Characterized as those factors that are more important and significant to affect or contribute to the success of projects. The values have minimum possible differences among the various factors described, being equivalent information to the ones contained in the literature researched. Hence, the study is valid for interpreting the application of the factors in project management with a view to valuing those considered being more impactful. Making an approach with the first three factors identified as most impactful, both for barriers and facilitators, we associate the connection between areas of human resources and communications. This analysis shows the grouping existing among the factors, and describes the importance of the said areas concerned. Clearly these assumptions can identify possible

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problems during the project management on several areas by identifying which may negatively or positively contribute to the due date of the project.

VII. IMPLICATIONS FOR PRACTICE MANAGEMENT

It is evident that the results obtained from the literature are equivalent and comprise the same factors commonly existing in the management of projects on a day to day of the business according to experts in the area. The validation of these happenings, permitted to verify the factors which actually happen in practice. The reflection resulting from this work made it possible to identify and visualize relevant and important information for the management of managerial point of view. The execution of a group of processes during a project reinforces the importance in knowing the main critical factors impacting involving different areas and which are successors of success and failure during management.

VIII. CONCLUSIONS AND LIMITATIONS

From this research it was possible to add knowledge to the literature with evidence on which the main barriers and facilitators in managing IT projects, and also, what are the most impacting ones. Thus, the inherent prioritization of these factors are significant both for success as failure in the results. It is understood that companies should look a clear definition of their management planning and business strategy. To establish an importance among the main factors of IT projects, which makes possible to conclude the adhesion between the contributions and critical success variables during managing, adjusting thus possible aspects to increase the chances of success of their projects. It is expected that the results obtained may contribute to a better management during the project favoring the leaders, a better understanding and possible improvements in results. Finally, for further studies it is indicated to apply a questionnaire with a greater amount of specialists, complementing the research on possible observations of real cases that adopt practices on such factors classified.

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