

Project Management: Evaluation of the Problems in the Portuguese Construction Industry

Leonel Rocha¹, Anabela Tereso¹, and João Pedro Couto²

¹ Department of Production and Systems Engineering
Algoritmi Centre

² Department of Civil Engineering
Centre for Territory, Environment and Construction
University of Minho, 4800-058 Guimarães, Portugal
leonelfrocha@gmail.com, anabelat@dps.uminho.pt,
jpc@civil.uminho.pt

Abstract. During recent decades it has been possible to identify several problems in construction industry project management, related with to systematic failures in terms of fulfilling its schedule, cost and quality targets, which highlight a need for an evaluation of the factors that may cause these failures. Therefore, it is important to understand how project managers plan the projects, so that the performance and the results can be improved. However, it is important to understand if other areas beyond cost and time management that are mentioned on several studies as the most critical areas, receive the necessary attention from construction project managers. Despite the cost and time are the most sensitive areas/fields, there are several other factors that may lead to project failure. This study aims at understand the reasons that may cause the deviation in terms of cost, time and quality, from the project management point of view, looking at the knowledge areas mentioned by PMI (Project Management Institute).

Keywords: Project management, knowledge areas, tools and techniques, construction.

1 Introduction

Nowadays, construction companies have been struggling to improve their practices in order to keep in activity on the market. However, it is still possible to see projects that miss the planed targets, making the total cost of the project to increase or not being able to reach their targets in terms of schedule and quality of the final service or product, which along with the financial crises the country is facing, may lead business failure.

On a study conducted by The Standish Group International [1] in 2012, it was possible to see that the quantity of projects that missed their targets still represents a considerable percentage. From the total of the projects studied, only 39% were finished with success, while the remaining 61% faced problems related to costs, for example, or were canceled.

This research arose from this perception of the problems faced by construction industry, especially in Portugal, where there is an excess of supply in construction, besides the crises affecting the country, so the goal of the research was to understand the difficulties faced by the companies and warn to the necessity of using the best project management practices. Project management may be defined as a science of management that has been considered more and more relevant, according to the studies in the area, as Pellegrinelli [2] mentioned. Besides that and according to Hamilton and Rybkowski [3], it is not possible to manage complex projects, using just the intuition.

In this study, the main problems faced by Portuguese construction industry in terms of project management were analyzed, the causes of project management failure were studied, with the goal to show the added value that project management can represent for the companies and understand the existing barriers to the adoption of project management tools. An important result revealed by this study is that the construction companies continue to manage empirically their projects without considering adequately the best management practices and standards of project management. Another new relevant aspect found through the questionnaires used in this study was the possibility to realize that, according to respondents, some important knowledge areas such as risk management are not considered. This is a particularly pertinent aspect given the unpredictability and risks affecting the majority of the sector's activities.

After this introduction, a brief literature review is presented in section 2. Section 3 describes the research methodology used, with details about the research strategy and the design of the questionnaire. Section 4 presents the results and its analysis and finally section 5 the conclusions are drawn and further studies recommended.

2 Literature Review

At a time when companies struggle in order to survive in the market, all the factors are important. The search for efficiency and lower costs makes the companies develop and improve. The year of 2012 was the year in which the consumption of cement was the lower in the last three decades [4]. Studies indicate a decrease of competitiveness of Portuguese construction industry has been happening, with projects missing the targets in terms of time, cost and quality of the final product [5; 6]. Several studies analyzed these failures, for example, according to a study done by Menesi [7] it is possible to observe several reasons which lead to the project failures, being those reasons related to human resources, delays on the decision making, bad planning, changes requested by the client, just to mention the most important ones.

Being project management a complex and diversified area and a project a starting point to the "change" [8], project management cannot be done only by intuition and needs to be a conscientious task, following the best practices available, that can help in the necessary decisions making process to conduct projects and companies to success [3]. On a study by Zwikael [10] it was possible to see that the most problematic areas are cost, time, human resources and risk management. PMI [9]

refers to 10 knowledge areas which aggregate the ones referred by Zwikael, being those areas divided in measurable and support areas. Cost, time, scope and quality are the measurable ones, and normally considered the most important ones. Risk, procurement, integration, stakeholders, human resources and communications are the support areas. Despite the measurable areas are normally consider the most important ones, communication of risk management from the support areas, may have an important role for the project success and make the difference between success and failure.

However, the existence of barriers to project management tools adoption such as the unfamiliarity with the available tools or culture can still be an obstacle that may lead to project failure. With this study, it will be possible know the existent barriers to the adoption of project management tools.

3 Research Methodology

3.1 Research Strategy

For this study a questionnaire was used, distributed through an online platform: Qualtrics Survey Software and disseminated by email to several Portuguese construction companies. The contact list used was built by combining contacts from various university researchers. The target were project managers or persons involved in projects of the selected companies. According to Malhotra [11], a questionnaire is made of a set of questions that aims to collect information from people that can answer in a structured manner, consisting of verbal or written questions. This approach was selected because it allows collecting information quickly and simultaneously from different respondents, while facilitating the analysis of the information obtained.

Disclosure began on August 8, 2014, and 121 answers were obtained, from which only 51 were considered valid for analysis. The remaining answers were considered invalid and excluded because they were not complete.

3.2 Design of the Questionnaire

The questionnaire is divided into two parts, the first part of the questionnaire aims to gather information from the companies, and the second part focuses on the issue of project management and problems faced by project managers. The questionnaire was based on similar studies carried out by several researchers as Assaf and Al-Hejji [12], Faridi and El-Sayegh [13], Arditi and Pattanakitchamroon [14], Winters [15] and Bredillet et al. [16].

As already mentioned, 51 answers were received. In table 1 it is possible to see the respondents' role in the organization.

Table 1. Respondent's distribution according to his/her function in the company

	NR (N. of Responses)	%NR
Construction Manager	14	28%
Production Manager	3	4%
Department Manager	10	20%
Budget and Proposals Manager	7	14%
General Manager	10	20%
Other:	7	14%
Other:		
Purchasing technician		
Develop manager		
Buyer		
Engineering responsible		
Provision technician		
Health and safety		
Sub-contracts specialties manager		

It was also observed that the sample contains small (22) and large companies (21) corresponding to 84% of the total sample. The average years of experience in project management is 11, and the range of answers stood in the range 0-35 years. It was also requested to the respondents to indicate the number of years of duties performed in construction, and it was found that 76% of surveyed companies has been operating for over 15 years in the area, 16% between 5-15 years and only 8 from 0 to 5 years.

It was asked to respondents to insert the period, in years, that they would report when replying to the questionnaire, regarding the results of the company's projects in consideration. Through the answers we found that the period was between 1 and 35 years, and the average was approximately 10 years, as well as the mode.

In addition, the questionnaire allowed concluding that 90% of the companies execute several projects simultaneously, while only 10% conducts only one project at a time; and that 55% of the companies are project oriented and the rest (45%) are not project oriented.

4 Results and Analysis

In the questionnaire, it was asked the companies if they used project management tools. Of the 51 responses, 28 said they were using project management tools, while 23 said they were not using them. Since this question was directly linked to another question of the questionnaire ("Do you consider that the use of them was important to the success of the company projects?"), it is noteworthy that of the 28 companies that answered that they used the project management tools, 23 said that the use of these tools contributed to the success of the projects. This result allows perceive the value that project management represents for the participant companies. Besides being referred by the respondents that project management contributed to the success, was also identified by the respondents that the experience of the project team, the properly executed prior planning and understanding of customer requirements were considered as key factors to projects' success as documented in Fig. 1.

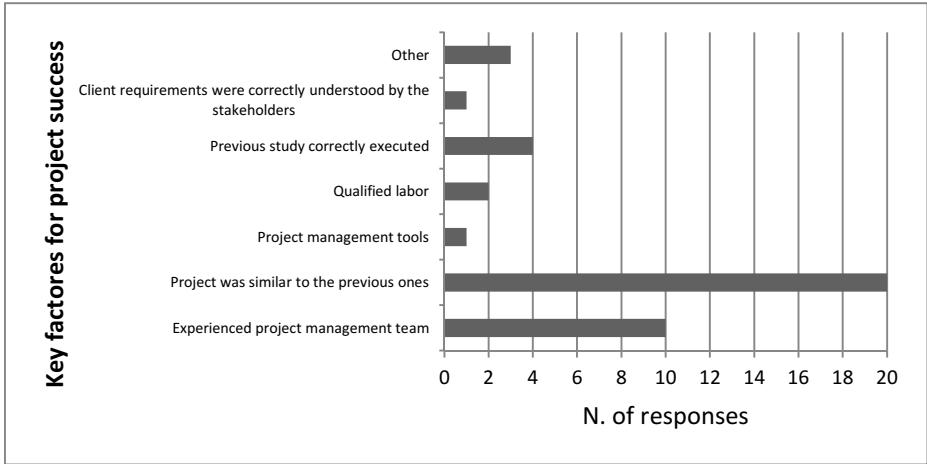


Fig. 1. Distribution of the answers according to key factors for project success

On the other hand, an analysis to the respondents that replied that their company did not use the project management tools, factors such as the lack of knowledge of existing tools and the company choices (Fig. 2), are quoted as the main barriers to tools adoption.

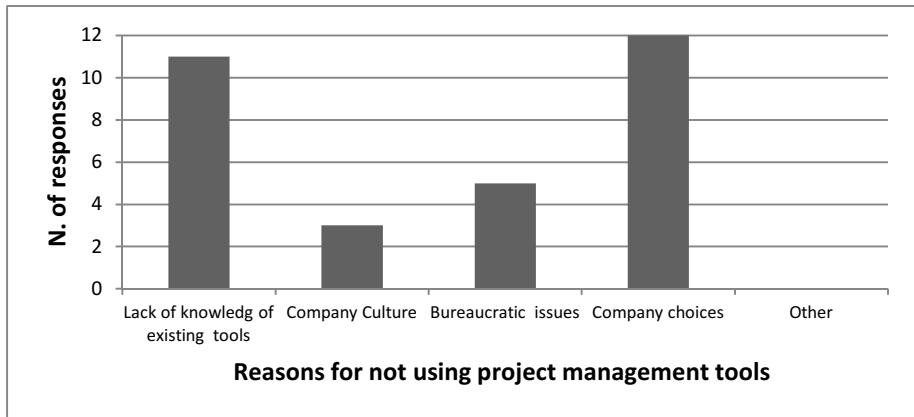


Fig. 2. Answer distribution according to the reason for not using project management tools

It was also asked to the participants to mention which tools for project management were used by the company, with the distribution of their answers shown on table 2. Project management software like MS Project and Primavera, as well as Gantt charts are the most used tools.

Table 2. Answers distribution, according to the project management tools used

	NR	%NR
Project management software (e.g. MS Project, Primavera, ...)	22	79%
Gantt charts	19	8%
PERT (Program Evaluation and Review Technique) and CPM (Critical Path Method)	9	32%
WBS (Work Breakdown Structure)	8	29%
EVM (Earned Value Management)	9	32%
Project resource tools	2	7%
Other(s):	1	4%

Answers to the question about the project failure causes can be seen on table 3, with the top 5 of the most mentioned ones shown.

Table 3. Top 5 of project failure causes

	NR	%NR
Changes requested by the client	34	67%
Bad planning	27	53%
Bad communication	22	43%
Delay in decision making	20	39%
Misunderstood of what client wishes	14	27%

An analysis to allows concluding that of the five causes mentioned, one is related with the knowledge area of communication management, and two directly related to the area of scope management.

The changes requested by the costumer, the miscommunication, bad project planning, amongst others, are factors already mentioned by several authors, regarding the problems faced by the Portuguese construction industry and the principal causes to the flaws on projects. They are, therefore, areas that should have more attention from project managers.

However, when questioned about the knowledge areas with more relevance for the success of the projects, it is possible to verify that none of the above was considered as one of the three key areas, as shown on Fig. 3.

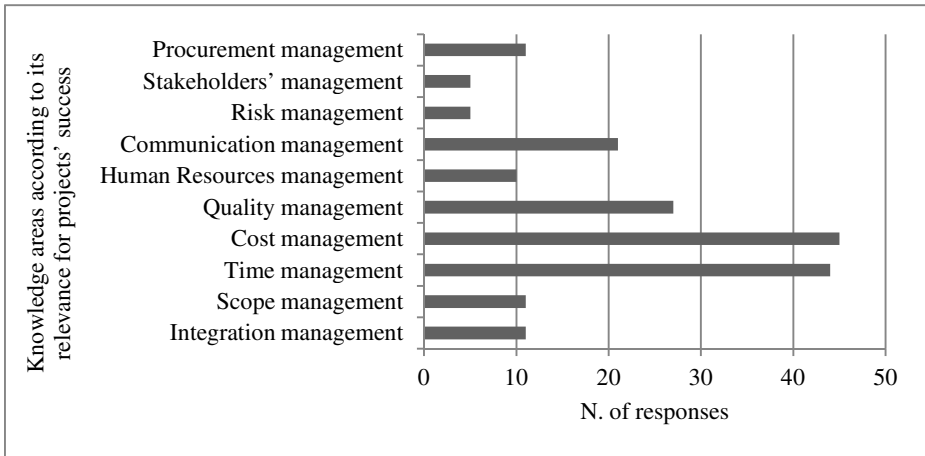


Fig. 3. Knowledge areas according to their relevance for projects' success

It was also possible to see, that the flaws start to appear on the project execution phase, being important to mention that the phase of monitoring and control did not get any answer.

Furthermore, it was also possible to observe through the questionnaire that, for each company, the higher percentage of projects that failed in terms of deadline, cost and quality was between the 0% and 30%.

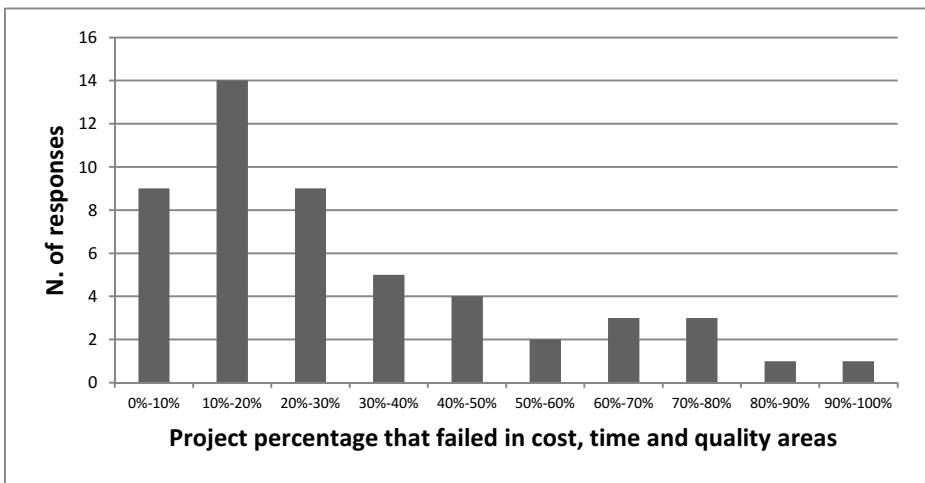


Fig. 4. Distribution of project percentage that failed in cost, time and quality areas

It is noteworthy that the flaws registered had an impact on the final cost of the project between 0% and 50%, with 25 of the 51 inquired mentioning that because of those flaws, the customer decided to abandon the project referred.

Table 4. Distribution of the answers according to the percentage of the projects that the client decided to abandon, after failures happened

	NR	%NR
0%	26	51%
1% to 25%	21	41%
25% to 50%	1	2%
50% to 75%	3	6%
75% to 100%	0	0%

After the answers obtained related to the flaws encountered, it was questioned if the company created meetings to communicate to the team the conclusions obtained, demonstrating the flaws, critic points, key factors, amongst others. In the answers to this question, it was possible to see that 26 of the companies inquired did not take any action to have meetings/communications, whereas 25 companies did.

After this question, it was asked to the respondents if they consider that a data base creation with the problems faced by the companies nationally and internationally, as well as its results and lessons learned, would be a good action in order to prevent similar problems in the future and was possible to observe that 92% of the respondents referred that it would be a positive action and that the best method to share this information would be recurring to publications and conferences.

It was also questioned if the respondents considered that the construction knowledge areas as security management, environmental management, financial management and claims management could relegate to a second place the most specific project management knowledge areas. Analyzing the answers to that question, it was possible to see that 57% of the respondents considered that the last ones are not relegated to a second place.

5 Conclusions and Further Studies

Due to the problems that Portuguese construction industry has been facing, it was necessary to study the sector from the management point of view. So, this study appeared with to goal to identify the management problems faced by the Portuguese construction industry, the causes that originated the project failures, show the add value that project management can represent to the companies and understand the barriers to the adoptions of project management tools.

From the questionnaire used in this study [18], it was possible to observe the several causes that lead to project failures in Portuguese construction industry, where it was identified as the main reason the changes requested by the client, bad project planning, bad communication, delays in decisions making and incorrect perception of client requests, which is in agreement with studies done by Couto [19]. Some of the failures that were identified by the respondents are related to project management scope and communication knowledge areas. However, when analyzing the knowledge areas identified by the respondents, the most important areas to achieve project success, were considered to be time, cost and quality, relegating the knowledge areas of scope and communication to a second place, as well as some other ones such as

risk management, that in our opinion may have an important role in achieving the project success.

Risk is an area that is always present and which requires a lot of attention by the project manager. An attempt to anticipate or reduce the duration of an activity, for example, may bring some additional risk to the project success. That way, there is the necessity of manage the risk that is related to that change and this area allows the project manager to have a perception of the activities that may cause difficulties to achieve the defined goal for that project [20]. Besides that, it allows doing a qualitative and quantitative analysis of the impact of those activities and its changes, and after identifying the risks associated, the project manager will be aware of the activities that require more attention and control from and the probability and impact of the occurrence of those risks [21]. Besides, it can help on controlling the changes required by the clients, showing them the risks associated to their changes requests.

It was also possible to observe that project management tools, when used, can bring some important inputs to the projects final result, as mentioned by the respondents, meeting the study done by Dai and Wells [22], which has shown that there is a strong relationship between project performance and the use of the best management practices and standards of project management.

Besides that, was also identified by the respondents that the creation of a data base with the main problems faced by the companies, at national and international level, as well as the final results and lessons learned, would be a good step in order to prevent similar problems in the future. However, the factors mentioned by the respondents as the unfamiliarity with the available tools, culture or even the company choices still continue to work as barriers to the adoption of those tools and, therefore, a barrier to the evolution and improvement of the companies' performance, allowing, this way to confirm the existence of barriers to the adoption of project management tools.

In the future, understand the types of construction projects that have the more failures, can be an important study in order to understand if there is a relationship among specific types of construction projects and the main reasons for the projects failures. The reasons for not using project management tools and for lack of consideration of the risk management on construction projects should be also studied.

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