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# **The Evaluation of the Delays in the Portuguese Construction**

João Pedro Couto, José Cardoso Teixeira

## **ABSTRACT**

The lack of competitiveness of the Portuguese construction industry has been recurrently mentioned in the press and in technical literature. Some symptoms of this have been stressed by several parties and their causes often related to the lack of accomplishment of essential management functions in construction projects. In view of this, a research project has been launched to help clarify causes and find possible solutions for the problem. Parallel to the project development, a PhD thesis on construction delays has been undertaken by the first author. In the scope of the latter, a large survey to Portuguese construction stakeholders has been conducted. This paper briefly reports the results of this, providing some information on the survey and commenting results in the shape of preventive measures highlighted by respondents.

Understanding the causes of project delays may help in curbing the problem and contribute to an improvement in management and productivity, inevitably making the sector a more productive one contributing to country economic development.

## **Keywords**

**Portuguese Construction Competitiveness, Construction Delays, Cost Overruns, National Survey.**

## **1. INTRODUCTION**

Over the past few years, the lack of competitiveness of the Portuguese construction industry has been insistently mentioned in the press and in technical literature.

The symptoms have long been known: time and budget overruns lack of safety and insufficient quality. The main reasons often adduced are the

recurring ambiguity of preliminary programmes, the poor quality of projects and the inefficiency of project management.

The above symptoms however, have been systematically downplayed by using several justifications: the perceived characteristics of construction, the entrepreneurial structures, the phased scheduling of projects, the unskilled workers, the climate, and so on. However, these do not explain why Portuguese construction industry evidences the above symptoms, while it appears to be more efficient in other European countries and therefore more competitive in the international market.

In view of the above, research is needed on the reasons for the lack of competitiveness of the Portuguese construction industry. Research was focused on the four areas mentioned above and gained in utility while it helped find paths for overcoming those reasons (Couto *et al.*, 2005).

Accordingly, this paper reports the work done in the scope of a research project on the reasons for construction delays and possible remedies for the problems detected. The project is deemed as a contribution for improving the Portuguese construction competitiveness.

### **1.1. The Consequences of Construction Delays**

The consequences of time overruns are almost always serious and hard to resolve. Failure to meet deadlines represents financial losses to users and, more often than not, has a negative impact on the project profitability for promoters. However, understanding the causes may help curb the problem and contribute for improving productivity.

Relevant studies on the causes for time overruns of the Portuguese construction could not be found in the literature, although the impact of project delays is often discussed. Nevertheless, there are some studies on the lack of quality, poor management and construction deficiencies as a whole. But the importance of the delay problem by itself constitutes enough grounds for the development of specific research on this topic.

The project aims at making information available and at helping to deploy strategies and specific measures for predicting and controlling delay causes in construction (see figure 1.1). This may positively influence project design and construction stages to achieve better compliance with scheduling therefore assuring project success (Couto and Teixeira, 2006a).

Succinctly, once the construction is one of driving forces of the national economy, with a clarifying reasons for lack of competitiveness of national construction industry namely in concerning construction delays, it will be easier to develop and to implement adequate management strategies for improving efficiency, in order to substantially increase the competitiveness of Portuguese construction industry and then to contribute for the country economic development.

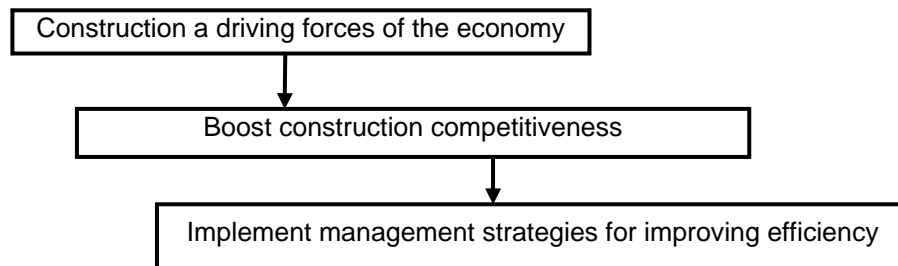


Figure 1.1 The importance of deploying adequate management strategies

## 2. RESEARCH DONE

Lack of accomplishment of the above four management functions (cost, time, safety and quality) in the Portuguese environment has been concerning the authors over the last few years. The problem has been compared to a chronic disease (we hope it will be eradicated one day!) with well known symptoms, as stated above. Understanding the reasons for this encompasses answering the following questions:

- 1- Why construction projects are systematically delayed?
- 2- Why there are budget overruns in almost all single projects?
- 3- Why is safety still badly overlooked?
- 4- Why is quality still not satisfactory, even in recent projects?
- 5- How do promoters and contractors deal with growing environmental demands?

In order to evaluate the present situation, clarify the reasons for the problem and find possible solutions for it, the authors<sup>1</sup> recently participated in a research project on the "Reasons for the Lack of Accomplishment of Time, Costs and Safety Objectives in Construction". The project is financed by the Portuguese Science and Technology Foundation (Fundação para a Ciência e Tecnologia, FCT, Projecto SAPIENS N° 47625) (Couto *et al.*, 2005).

The project encompasses the following work packages:

- To inquire the Portuguese construction stakeholders on the causes and background reasons for project delays, cost overruns, deficient safety and lack of quality from their experience in recent projects;
- To collect information from former studies on the subject;
- To compare previous results with international information available from other similar projects;

<sup>1</sup> In the scope o the Construction Management and Technology Group of the Department of Civil Engineering – University of Minho

- To establish a common set of causes and background reasons for the problem;
- To establish possible paths to solve the problem.

Parallel to the project development, a PhD thesis on construction delays has been undertaken by the first author. In the scope of the latter, a large survey to Portuguese construction stakeholders has been conducted (Couto and Teixeira 2005b). The results of this are briefly reported in the following sections of this paper.

### 3. SURVEY

#### 3.1 Background

The study of delay causes and their impact in project success is widely recognised in the literature as a key factor for project success and for construction company performance (Baldwin *et al.*, 1971) (Assaf *et al.*, 1995) (Arditi *et al.*, 1985). Accordingly, abundant international research has been undertaken, typically based on the survey to the industry, addressing the following objectives:

- To analyze the reasons and factors for project delays;
- To classify and evaluate delays, claims and related issues;
- To understand, compare and specify their causes.

The survey to the Portuguese construction stakeholders was first set up by using information collected from international sources complemented with the results of an unstructured inquiry to a number of relevant professionals from the industry. The inquiry to professionals essentially aimed at validating a preliminary set of construction delay causes but it was also used to confirm the relevance of the research being conducted. Additionally, the inquiry enabled to set links with the industry form which the research benefited. Finally a set of twelve causes for construction delays was established as depicted in table 1.1.

**Table 1.1** Cause classification for construction delays.

Cause Classification for Delays			
MT	Material-related	DT	Design Team-related
EQ	Equipment-related	PM&I	Project Management and Inspection-related
LB	Labour-related	CCR	Contract and Contractual Relationships-related
CM	Contractor Management-related	IR	Institutional Relationships-related
FMP	Financial Management of Project-related	PS	Project Specificity-related
OW	Owner-related	OF	Outside Factors-related

### 3.2 Survey

The survey was conducted by a questionnaire based on the delay causes classification described in table 1.1. The questionnaire was organized in five sections:

- The goal of section A is to obtain general information on the institution or company being enquired.
- Section B presents a list of 118 possible delay causes, organized into the 12 cause classification. To each cause, respondents were asked to attribute degrees of frequency, impact on workflow and the types of construction project where they are most likely to occur.

Causes were ranked according to their average relevance by combining their frequency and impact (see table 1.3) (Couto and Teixeira, 2005) (Couto and Teixeira 2006b).

### 3.3 Respondent selection

For the selection procedure, two essential aspects were considered: firstly, to represent a significant cross-section of all country (mainland and islands included), and secondly, to include a comprehensive variety of experience and turnover of respondents.

Construction companies were selected according to their ranking as established by the Institute for the Market of Public and Private Construction and Real Estate (*Instituto do Mercado de Obras Públicas Particulares e do Imobiliário*, IMOPPI.), which is responsible for preparing and issuing building permits.

Designers were selected from the member list of the Portuguese Association of Designers and Consultants (*Associação Portuguesa dos Projectistas e Consultores*, APPC), their geographical location (for covering as much territory as possible) and their specialties.

Private clients were selected from the member list of the Real Estate Promoter Association (*Associação do Promotores Imobiliários*). Public clients include the main local authorities, public institutes and central government organizations.

### 3.4 Conducting the Survey

Initially, a hundred questionnaires were sent out to contractors, 85 to consultants and project designers and 100 to construction clients. A response time was set out for responses. On stage two, direct contacts were made to missing respondents suggesting an interview instead. This alternative was gladly accepted by most of them. As a result, 39 interviews took place during which the questionnaire was filled up.

Answers to the questionnaire were provided by management staff personnel or technical staff in management positions of the organisations inquired (line managers, project managers, site managers and senior engineers).

Finally, 59 answers by contractors, 26 by designers/consultants and 79 by owners were collected. These answers include 8 interviews to contractors, 8 to designers, 18 to public clients and 5 to private clients, for the above reasons.

Table 1.2 presents a summary of requests and responses obtained, distributed across the four groups of stakeholders surveyed.

**Table 1.2** Summary of survey results.

Group	Questionnaires sent	Answers to questionnaire	Interviews	Total number of answers	Percentage of answers
Contractors	100	59	8	51	59%
Public clients	75	62	18	44	83%
Private clients	25	17	5	12	68%
Designers/Consultants	85	26	8	18	30.5%
Total	285	164	39	125	57.5%

It is noteworthy that the percentage of answers from contractors and owners is about 70% and the percentage of interviews reached 24%, which in practice comes to  $\frac{1}{4}$  of the answer total. Comparing these figures to those obtained in similar studies, and weighing the typical difficulties in persuading sector participants to respond to this kind of study/survey, it could be argued that the percentage of answers is quite significant.

### 3.5 Inquiry to Portuguese Relevant Institutions

In order to bring the cycle of the survey to a close, it was deemed important to hear from several institutions connected to the construction sector. A total of 16 institutions were surveyed, including professional associations, governmental departments, private and public institutes and so on.

This round of interviews was quite fruitful, allowing for a presentation of the preliminary results of the survey to these bodies and thus obtain their opinion on the matter.

#### 4. SURVEY RESULTS

Results revealed that responsibility for delays can be ascribed to all parties involved. Moreover, results were treated statistically and allowed for some important conclusions that were fully published in the thesis and will be further disseminated elsewhere. Some of those conclusions are summarised in table 1.3 below.

From the 118 causes analysed in the survey, the following set of 15 were most highly ranked by the four groups of construction stakeholders inquired (public clients, private clients, contractors, designers /consultants) (Couto and Teixeira 2006a) (Couto and Teixeira 2006b).

**Table 1.3** Ranking of 15 most relevant causes.

No.	CAT	CAUSES FOR DELAYS	Average Relevance Ranking
77	DT	Incomplete designs, ambiguities, errors, omissions, inadequate or inconsistent detailing, etc.	1
10	IR	Excessive dependency on authorizations from several institutions and ruling bodies	2
2	IR	Difficulties in obtaining licenses and permits from authorities	3
10	IR	Difficulties in obtaining licenses and permits from authorities	3
0	IR	Difficulties in obtaining licenses and permits from authorities	3
97	CC	Tendency to use procurement systems with a bias toward the cheapest solution	4
	R		
28	CM	Deficient, activity/material/labour and equipment planning, management and control	5
18	OW	Shortage of skilled labourers	6
76	DT	Errors in design due to the lack of knowledge of local conditions and environment	7
75	DT	Delays while preparing technical documents by designers while construction is in progress	8
49	CM	Neglect critical activities	9
51	CM	Overly optimistic planning	10
62	OW	Frequent change orders during construction	11
44	CM	Deficient coordination among participants	12
26	OW	Low productivity	13
98	CC	Lack of financial incentives for meeting	14
	R	anticipating deadlines.	
10	IR	Difficulty and delay in drafting and submitting requests for institutional authorization	15
3	IR	Difficulty and delay in drafting and submitting requests for institutional authorization	15

Furthermore, survey results show that the design team (DT), institutional relationships (IR) and construction management (CM) are the most mentioned delay cause categories. Table 1.3 includes three causes of each of these categories ranked in the first 15 places.

## 5. PREVENTIVE MEASURES

The results of the survey undertaken blended with the outcomes prior studies conducted elsewhere, allowed for setting up a number of preventative measures that may help lessen the problems under scrutiny. Among those measures, the following set is highlighted:

- To implement a unified national database for construction works that can be used for different construction projects - this project is now under way;
- To implement appropriate and efficient organizational systems within design teams;
- Clients to prepare appropriate schedules and preliminary programmes;
- Greater precision for viability studies;
- To raise awareness on risks inherent to construction;
- To optimize management with a basis on qualification and the use of more adequate techniques;
- To update some inadequate regulations, to clearly define and segregate responsibility and liability;
- Greater demands to be placed on the professional qualifications of technical personnel in charged of designing, licensing, managing, supervising and inspecting construction works;
- To define the professional qualifications required to public administration officers responsible dealing with construction projects ( setting project preliminary programmes, issuing technical elements to be included in bids, verifying and approving designs, inspecting and managing construction works, etc.) (Santo, 2002);
- To refine the definition of the components pertaining to each design phase and the procedures for approval;
- To increase technical staff requirements for issuing construction permits;
- To implement mandatory reviews to the design of public projects (Meneses, 1995);
- To adequate contract clauses to project specifics. However, the insertion of clauses must undergo a fair and equitable cost-benefit analysis that does not lose sight of the project specificity. This recommendation was deemed *very important* by most respondents (92%) and *important* by the remainder (8%), although most of them (82%) have considered that this is often underestimated by clients;
- To implement measures to prevent delay claims. The main areas where precautions may be taken to avoid disputes and/or minimize related costs are: (1) reducing uncertainty; (2) reducing contract-related problems; (3) increasing problem-solving capacities and (4) putting in place alternative mechanisms to solve disputes. Although this is a general recommendation, 74% of respondents deemed it *important* and 26% *very important* for the mitigation of time overruns;



- To review the role of the State both as contracting and policy-making entity. Some specific measures deemed *very important* by all respondents should be highlighted;
- To reinforce the rules of transparency in public awarding of contracts and its inspection by the Fiscal Court;
- To fight the practice of the lowest bid award because it contributes for price slumping and subsequent delays;
- To implement measures to avoid delay causes of contractor responsibility. Some of these causes may be confirmed in the literature, for example, inexperienced labour, late supply of material and plant, use of unreliable suppliers or subcontractors, weak planning, inadequate practices and procedures, excess responsibilities, inefficient communication, interference among skilled workers and so on.

## 6. CONCLUSIONS

Each preventive measure mentioned in the previous section must not be looked at by itself or having one single aim but rather as part of an integrated approach.

In fact, it is the authors' belief that only an integrated approach may possibly have effect and consequently avoid or mitigate delay causes in construction.

Another noteworthy aspect of those measures is that they can help solve other problems beyond delays because they have not actually been geared exclusively towards delays by many respondents to the inquiry. This was quite evident to the authors during the interviews conducted to some participants.

However, the utilization of such measures for controlling delays has been validated through respondents' opinions and specialized literature.

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