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Time-to-market vs. time-to-delivery Managing speed in Engineering, Procurement and Construction projects

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Abstract

The time-to-market in NPD projects is a key factor in the competition between innovative firms. Research on concurrent engineering has shown that time can be managed as well as a delay and as a speed. Our concern in this paper is to study the time factor in the case of Engineering, Procurement and Construction (EPC) projects, where a customer initially contracts for a project from a contractor on the basis of specifications, budget and delay. Is time-to-delivery a key factor? Does its reduction represent a competitive advantage for the client and/or for the contractor in EPC projects? Is project speed a key variable to be managed, or does it result from other project parameters? We first define an analytical model to characterize a speed profile in EPC projects. We implement this model for six major construction projects developed by a large, international firm. A variety of speed profiles result. We conclude by showing the relevance of NPD project speed management in EPC projects.

Keywords: Project management; Time-to-market; Time-to-delivery; Speed; Engineering, Procurement and Construction; Speed profile; Construction; Concurrent engineering

1. Introduction

Since the end of the 1980s, the time-to-market of new products has become a competitive advantage, particularly in markets where the first mover has a strong advantage such as in the computer industry [1,6,13]. Speeding up NPD projects in these markets reduce costs and create value.

Our concern in this paper is to study the time factor in the case of Engineering, Procurement and Construction (EPC) projects where a customer contracts for a project from a contractor.

Time management in EPC projects has principally been studied from two different perspectives:

- an instrumental approach based on tools for optimizing and identifying critical pathways, achieving the project planned delay [2,3,5] and explaining the project duration [8,10].
- an organisational approach that explores the limits of these tools or the difficulty of integrating them into the project structure.

Our aim is to study time management in EPC projects from a strategic perspective. Is time-to-delivery, which is the delay between the beginning of the project and the handing-over of the product by the contractor to the client, a key factor for EPC projects as the time-to-market is for NPD projects in innovative competition? Does reduction in time-to-delivery represent a competitive advantage in EPC projects? What does speed represent for these projects? Is it a dependent variable resulting from other parameters of the project? Can it be managed and driven?

In order to study speed in EPC projects, we propose the concept of project speed profile. We implement this

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Table 1
Main characteristics of the studied projects

Project type	Duration	Place	Object of the contract – type of contract	Amount of contract
Construction of a railroad tunnel and bridge	26 months 22 months	England	Construction work Cost + fee contract	£100 million
Construction of two office buildings	16 months	France	Construction work Fixed price	30 million
Construction of civil engineering work on a highway	24 months	France	Construction work Unit price contract	10 million
Construction of four tunnels for extending a subway line	46 months	Hong Kong	Design and build Fixed price	87 million
Construction of a suspension bridge	24 months design 60 months work	Greece	Fixed price Build operate and transfer	585 million
Construction of an underwater tunnel	60 months	Northern Europe	Construction work	2 billion

concept for six major construction projects developed by a large, international contractor. [1] The criteria for choosing these projects were that they had to cover a variety of situations based on the following variables: type of work (building, road construction, etc.), type of contract (fixed price, unit price, incentive clauses, etc.), composition of the group in charge of the project (foreign partners, joint venture, etc.) and location of the project (domestic or international). In each case, a case study was drawn up and approved by the project participants. These case studies were based on an analysis of existing documentation, visits and interviews with a wide variety of those involved in the project at different hierarchical levels (project chief, design engineer, works clerk, general foreman, etc.) and in different organizations (customers, project manager, construction firm, etc.) (see Table 1).

The projects analysis shows that a firm can manage project speed by choosing a planned speed profile at the preparation stage of the project, and by driving an effective profile speed, which may differ from the planned one. The planned speed profile is chosen according to the strategy of the firm concerning the speed management. The effective profile is driven according to the terms of the contract, to the relationship between the customer and to the contractor and/or the importance of the time-to-delivery factor for them. We conclude by discussing the relevance of the NPD speeding up model in the case of EPC projects.

2. Time-to-market reduction in NPD projects

Time-to-market reduction is a competitive advantage for NPD projects Speeding up NPD projects can increase profit margins by reducing the cost and/or increasing the earnings. Time plays a role in these two ways of generating profit : reducing delay can reduce the cost by the reduction of the financial immobilisation [12], and can also, based on an economic analysis of *first mover advantage* [9], create value in markets where obsolescence is central.

Thus, concurrent engineering [4] is a project management method that reduces project delay particularly by using cross-functional teams early in the NPD process and by planning parallel activities on the same project (for example, marketing and engineering work). Midler [11] showed that more than overlapping the project phases, delay reduction lies in the management of the relation between them. He represents a project by two curves: a learning one representing increase in knowledge about the project and a decision-making one representing a reduction in the possibilities of action on the project. The first is a process (shown as a dashed line), where uncertainty about the project characteristics and its feasibility are gradually reduced; the second is a process of action (solid line), where the degree of freedom is steadily reduced as the irreversibility of decisions rises. Managing a project involves trying to resolve this dilemma : at the beginning of the project almost everything can be done but almost nothing is known; at the end, everything is known but almost no possible choices remain (see Fig. 1).

One might think that in order to reduce the delay of the project decisions must be made as quickly as possible. But at the beginning of the project, understanding is at too low a level and it serves no purpose to make hasty decisions. There is a risk of getting off on the wrong track, possibly resulting in costly and time-consuming modifications. Accelerating a project thus requires taking time at the beginning to explore and prepare project

[1] This research won the company's annual Innovation Award in the *Sharing Knowledge* category.