



Product development cycle time for business-to-business products

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Abstract

For a number of years, firms have been implementing changes in the way they develop new products, changes that are targeted at reducing overall product development cycle times. And over the years, a number of academics have conducted research trying to understand the factors that are related to *reducing* new product development (NPD) times. But the question remains — just how long does product development generally take in absolute numbers? Information on how long product development takes is helpful to firms for planning and controlling the flow of products into the marketplace and in determining resource needs for NPD. Other than anecdotal data pertaining to particular projects that have been commercialized by particular firms, very little hard data have been reported on this topic. This article analyzes data to quantify average cycle times for physical goods commercialized by business-to-business (B2B) firms. The data are a subset of a much larger data set from the Product Development & Management Association's (PDMA) Best Practices research. The analysis presents average product development cycle times for four different types of projects (new-to-the-world, new-to-the-firm, next generation improvements and incremental improvements), presents evidence of the lack of a relationship between cycle time and success and looks at factors that are associated with differences in the length of product development cycle times. © 2002 Elsevier Science Inc. All rights reserved.

1. Introduction

While a large number of academic papers have investigated factors that are associated with changes in new product development (NPD) cycle time and quite a few firms have published cycle times for particular projects, there is a dearth of information on just how long NPD takes. This information is highly useful to firms managing portfolios of product development projects [13] and trying to develop aggregate project plans for current and future projects [11]. Without an understanding of how long different types of product development projects take to complete, estimates of the resources necessary to complete project plans and the timing of product release dates to customers may be based more on fantasies or wishful hoping than on reality.

The purpose of this article is to summarize past research on the subject, to present one analysis of how long NPD takes, in general, for business-to-business (B2B) products and how various factors are associated with changes in absolute development cycle times. The analysis uses a sub-

set of the data gathered for the Product Development & Management Association (PDMA, www.pdma.org) 1995 New Product Development Best Practices study [25,26].

Section 2 of this article reviews the literature on product development cycle time. Particulars of the survey research that was conducted are then presented, followed by the descriptive results of the relationships between product development cycle times and various factors. The article closes with implications for management.

2. Literature review

For the last 15 or more years, firms have worried about, and tried to shorten, the time it takes them to get new products¹ to market [4]. These efforts have been driven by both academic findings suggesting that those who are first to market reap structural benefits [25] as well as by increased, and increasingly international, competitive pressures [44]. Initially, anecdotal accounts of individual firm results started

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¹ In this article, the term “products” refers to both services and physical goods.

to appear in the business press in the late 1980s [15,41]. These typically touted a reduction in development time for a particular project of 20–50%, compared to the firm’s experience with previous projects.

As these firm announcements began to appear, academic researchers started pursuing case-based and small sample research to better understand the mechanisms that firms might use to lead to decreased development times [33,36,41]. Ultimately, the output of these efforts were numerous factors hypothesized to be associated with cycle time, including issues of project strategy (product complexity, strategic intent, level of innovativeness and technical difficulty), development process characteristics (formality, process structure and steps included), organizational characteristics (team use and assignment level) and firm characteristics (leadership, size and innovation level) [19].

Then, in the mid-1990s, several researchers proposed conceptual models of the composite of factors that influence product development cycle time [8,17,27,30,45], and two teams tested at least part of their frameworks [30,46]. Other researchers empirically tested parts of these frameworks [19,20,31] or relationships between specific factors and cycle time with larger samples [16,37]. In general, the empirical tests of NPD cycle time have looked for associations with project strategy, development process characteristics, organizational factors or firm characteristics (Fig. 1). Exhibit 1 summarizes results from the empirical studies of NPD cycle time.

Nearly all the empirical results relating to project strategy are unsurprising. Newer, bigger, more complex, more technically challenging and more innovative projects are all associated with longer development times or increases in time [1,5,16,19,20,23,28,30]. This suggests that to depend primarily upon strategy to shorten average development times, a firm would need to develop simpler, less complex,

more incremental, less innovative and less technically difficult projects. However, while that strategy may reduce product development cycle time, it is unclear what it would do, in the long run, to marketplace or financial success. Would customers be willing over time to accept and pay for a stream of new products that never change much? In some slow-moving industries, perhaps, but certainly not in faster-moving ones.

The valence of the relationship between increased product quality and NPD cycle time is unclear at this time. One research team [24] has found that higher product quality was related to decreases in cycle time, while another found it was associated with increases in time [5]. More research is needed to understand this relationship.

Development process characteristics produce a more complex picture. Many changes in the processes by which products are developed have been implemented over the last 20 years [3,7,22,29,38,39]. Some changes have been made to improve the effectiveness of product development (getting the successful products to market), like new idea screening models [13]. Other changes, such as concurrent engineering [26], have been made to improve the efficiency with which products move to market. The ideal would be process changes that simultaneously improve both effectiveness *and* efficiency, and research shows that some aspects of processes, such as using a formal process and increasing the concurrency of the process [9,10,19,26,32] have indeed improved both dimensions simultaneously. On the other hand, several other actions that have been taken to improve product development processes, such as increasing the number of customers involved in product development and increasing outside assistance from nontechnical experts, are associated with longer product development cycles [14,30]. Additionally, one process factor has produced conflicting results across two

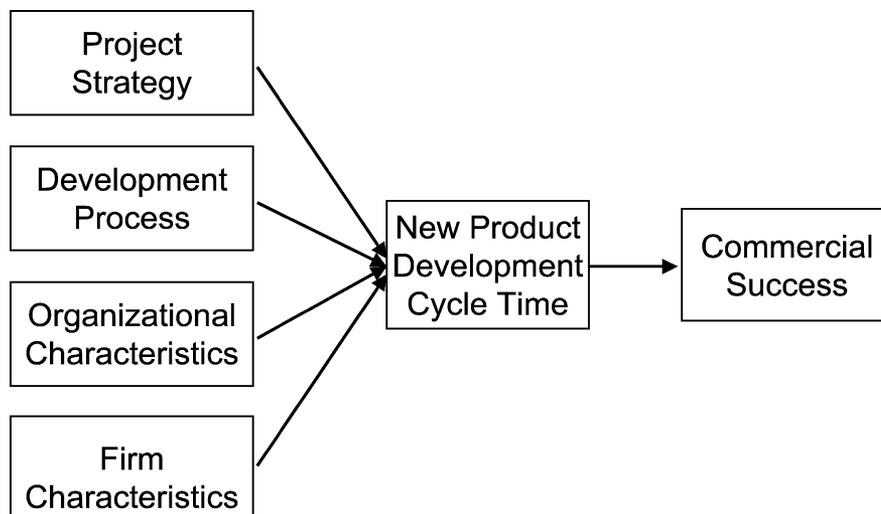


Fig. 1. General factors investigated in relationship to product development cycle time.

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