

Title:Product Development Cycle Time & Commercial Success

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Abstract: The purpose of this report is to analyze the conflicting opinions of those who say fast new product development time increases the odds of success with those who say it doesn't.

Product Development Cycle Time & Commercial Success

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Commercial Success

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New Product Development Individual Research Paper: Product Development Cycle Time and Commercial Success

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ABSTRACT

"Proponents of time-based competition argue that a firm will be most successful if its development times are shorter and product generated faster than its competitors." [1] However, there are intensive researches that clearly shows that rapid development times are not correlated with expected commercial success, and that forcing rapid development when technological and market uncertainties are high may produce failure. The main purpose of this paper is to analyze both of these arguments and identify the factors involved to successfully reduce product development cycle time. Study cases as well as articles and other sources available in the literature are used in this paper to support the arguments above mentioned.

INTRODUCTION

The development of new products faster than competitors do is a formidable strategic weapon to succeed in an increasingly turbulent market. As more research is done on reduced cycle time, it appears that reduced cycle time does not guarantee success in the market place. One view point is that reduced development times with higher quality extends the life cycle of the product, increasing market share and profitability. This also allows leaders in their chosen industry to set the standards in technology. However, other research indicates that some companies, such as pharmaceutical companies, can be late in that clarity of use and efficiency are more valuable development than accelerated product development, especially in a highly technical product.

Customers do not want a product that is too cumbersome to use. It seems to be important to continually update existing products through out their life cycle by ensuring greater quality while providing enhanced functions in the product of a reduced cost. Another area companies should look at is the ability to create a large assortment of products that share a basic product manufacturing process. The product should be carefully developed with more value for the money for the customer, while reducing the cost of manufacturing the product. Also, if the market being entered is unfamiliar then the degree of uncertainty for the new products success is considerably higher. It is for this reason that development should proceed slowly with little investment until the market is fully understood.

It is the overall purpose of this paper to prove that there is not a relationship between product development time and commercial success in new product development.

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METHODOLOGY

In order to prove that there is no correlation between product cycle time and commercial success and organizational performance, two investigations are considered in this paper. Meyer and Utterback concluded that rapid development times are not necessarily correlated with expected commercial success and that trying to force rapid development in situations of high technological and market uncertainty may produce failure. [1]

Ittner and Larcker found that faster cycle time alone is not associated with higher accounting returns, sales growth, or perceived overall performance. Stronger support is found for the hypothesis that some product development practices, such as cross-functional teams and advanced design tools, interact with accelerated product development to improve performance, whereas other practices, such as reverse engineering of competitors' products, suppress the potential benefits from lower cycle times. Finally, interaction effects for other organizational practices, such as customer involvement in the product development process and the extent to which new technology is obtained from external sources, appear to vary in the industry. [7]

Marc H. Meyer and James M. Utterback

Commercial Success

Meyer and Utterback studied a firm to determine the correlation between product development cycle time and commercial success. The firm studied has certain necessary characteristics for the analysis. It is an international leader in its industry and has substantial technological strengths in its principal consumer and industrial productmarket areas. However, there have emerged new technologies that might be considered as a threat for these established technologies. Their sales in the market are stocked and the continued growth was realized by management to come from the development of new products. For some of the firm's products, technologies were brought to existing customer application. For others, technologies have been influencing customer applications such as new methods of selling. One of the main management concerns was for the company to quickly bring new product ideas to the market with quality in the product design and manufacture, being conscious about the possible conflict between Product Development 3 New Product Development Cycle Time and EMGT-510

new ideas development speed and the implementation of them. These concerns were faced under a competitive environment for the firm.

The sample of 24 of the company's new product development efforts of the past five years, represented about half of the efforts. Therefore, the sample represented the whole very well. Development time and expected performance were two measures utilized as the dependent variables in the analysis. The measure of development time was calculated from the origin of a product concept to market introduction. Performance was defined as "the overall success of the new product as perceived by company management."

Several characteristics of products were measured in order to compare them with previous studies so they could be adopted as own measurements. The following are the studied characteristics of new products:

- core product technologies,
- customer groups targeted,
- distribution channels used for selling,
- manufacturing processes and technologies,
- product newness to the market and intensity of competition,
- product scope, and
- product development resources, i.e., budget

The information for each product was gathered by interviewees to the project leaders in which the content and degree of newness for many of the measures were obtained. The same approach was utilized in other areas such as manufacturing processes, customer groups, distribution channels as well as cumulative budget. [1]

Results

Based on statistical analysis, no relationship between the time to develop new ideas and perceived performance was found. As a matter of fact, the rapidity of developing new product concepts and bringing them to market should be rushed only if the opportunity cost is high and the development risk is low. Additionally, it could be concluded that in certain market circumstances with extremely high rates of product obsolescence and the need for constant new product introduction, time to market may be a very important factor to succeed. However, opportunity cost, which is determined by the intensity of completion, importantly influences the need for quick product development. In actuality, both reduced cycle time and strong performance are still caused by the nature of the firm's product generation process among other fundamental factors.

On the other hand, there are certain characteristics of the product that notably influence product development times. For instance, the number of product technologies that must be integrated and their newness to the firm, the newness of customer groups and channels, and the overall newness of the product to the market relative to existing products as well as larger development budgets are found strongly related to longer product development times.

Another important contribution of the paper is the explanation for the longer development times associated with the ventures. The strong influence between ventures and product line extensions in their selling channels is a primary explanation of it. In addition to this, the need to integrate multiple technologies in product development is another factor that can extend development time. Although this finding seems to be an evident one, no previous studies had emphasized this important contribution.

Multidisciplinary team management as well as budgeting and testing approaches must be very important factors integrating technology. They adapt the increase in problems and communication requirements accompanying an increase in the number of product technologies incorporated into the architecture of a new product.

Due to the difficulty of learning new customer needs, and building new relationships outside the firms for distribution, newness of customer and distribution Product Development 5 New Product Development Cycle Time and EMGT-510 Commercial Success June 5, 1997

channels increases development times. In order to reduce uncertainty, lower familiarity with either technologies or markets will require greater patience and commitment and demand that the firm work hard to build effective relationships with individuals and organizations on the outside.

Several issues arises for future research with respect to how to better manage the merging of distinct technologies. More effective integration can be hypothesized to result from understanding, following, and helping to establish industry standards. [1]

Christopher D. Ittner and David F. Larcker

The authors develop and test a simple conceptual model linking product development cycle time to organizational performance. Using data from two industries (automobile and computer) and four countries (Canada, Germany, Japan, and the United States), they found no correlation between these issues.

According to Wheelwright and Clark (1992) and Stalk and Webber (1993), maintain that higher performance requires more than being fast and efficient in product development; new products also must meet demands in the market for value, reliability, and distinctive performance. Ittner and Larcker extend these claims to argue that faster development cycles in themselves do not lead to higher performance. Instead, performance is hypothesized to be a function of the interaction between cycle time and organizational practices, with some practices acting as "enablers" that enhance the benefits from cycle time reductions, and others acting as "suppressors" that reduce the potential gains.

Five organizational practices are expected to enhance the performance benefits from accelerated product development:

- 1. *Fit with the organization's strategy:* Contingency theories have long held that performance is contingent on the fit between the organization's strategy and its marketing and product development practices.
- 2. *Greater use of cross-functional development teams:* Studies suggest that cross-functional tems are one of the primary enablers of product development performance.

- 3. *Customer and supplier involvement in the development process:* One of the biggest problems with cycle time reduction programs is that firms often pursue speed without considering how faster product development or increased product turnover contribute to the fulfillment of customer requirements.
- Use of advanced design tools: The product development literature argues that the application of design tools such as quality function deployment (QFD), design of experiments (DOE), and failure mode and effects analysis (FMEA) can improve the probability of new product success.
- 5. *Higher perceived product quality:* Faster development cycles are likely to have little performance impact if the resulting products do not meet customer demands for reliability, performance, and other quality attributes.

In contrast to organizational enablers, organizational suppressors can limit the potential benefits from reduced cycle times. In particular, three organizational factors are expected to negatively affect the relation between cycle time and performance:

- 1. Lower conformance quality: Although a new product design may meet customer requirements, it still may suffer from poor conformance to specifications.
- 2. *Less innovation in product designs:* One method for reducing cycle time is by developing less innovative, incremental designs.
- 3. *Diminished returns to scale for additional resources:* Trade-offs exist between development cycle time and cost in many environments.

The performance implications of product development cycle time was examined using data from a 1991 consulting company survey covering two industries (automobiles and computers) in four countries (Canada, Germany, Japan, and the United States). A total of 249 organizations (85%) agreed to participate. Because of missing observations for some of the variables, the sample size for this study falls to 184 (61%). [16]

Results

The analysis provide little evidence that quicker development cycles alone lead to higher accounting returns, sales growth, or perceived overall performance. Somewhat stronger support is found for the proposition that organizational enablers and suppressors moderate the association between cycle time and performance.

In particular, it was found that the use of cross-functional teams and advanced design tools enhances the performance effects of accelerated product development in both industries. Reverse engineering of competitors' products, on the other hand, appears to reduce the performance benefits from product development, either as a main effect or as an interaction with cycle time. Results for the other organizational practices are more mixed with their impact varying by industry. [16]

OTHER RESEARCH PUBLICATIONS

Companies considering Fast Cycle Time should not attempt to decrease cycle time by simply demanding shorter development schedules or increasing the speed of current work. Instead, an ongoing ability, obtained through continual organizational learning, is preferable over single event capability and will result in long-lasting effectiveness. Organizational learning is important because it requires that a company integrate what it learns on a long term basis. [2]

Fast Cycle Time success rests on a company's ability to redesign its organization into multifunctional teams, with highly visible and measurable timelines, streamlined processes and employee accountability. In brief, the old methods of product development and production do not work within the Fast Cycle Time paradigm. Unfortunately, many companies still believe that increased development speed necessarily yields lower-quality products. [2]

Companies that get products to market faster than their competitors generally capture greater market share. Time to market is specially critical in the highly aggressive in the electronics and semiconductor market, where product designs, pricing, and distribution strategies see some of the most rapid and revolutionary changes of any manufacturing industry. [3]

Product Development Cycle Time and Commercial Success

One of the first phases in reducing cycle time is to examine the ways major companies shorten product-development time. The 10 best practices for product development were then compiled to guide groups and operations in reducing their individual cycle times.

- Total cycle-time reduction. Processes for developing, manufacturing, and distributing products must be continuously improved if the company is to remain competitive in getting products to market as quick as possible.
- 2. New product-development process. The entire process for designing and ensuring high quality and manufacturability of new products must be streamlined for maximum speed and efficiency.
- New products driver. Customer needs, demands, innovations, and expectations must come first in deciding what new products will be developed.
- 4. Engineering metrics. Methods must be established for measuring effectiveness in meeting the needs of both internal and external customers.
- 5. **Robust design and training.** The whole technology platform must be pushed to the edge to make sure products are design using up-to-date methods.
- 6. Engineering tools. Similarly, the most up-to-date technology, equipment, and software must be used to develop robust products.
- 7. Electronic networks and interfaces. It is important to access, exchange, communicate and use information quickly through available sources such as computer networks and the Internet, including the World Wide Web.
- 8. Empowerment and customer visits. Designers are empowered to seek customer input so that everyone is involved in product development.
- Research labs and technology sharing. The technology that is created in groups such as research labs should be shared throughout the company and disseminated throughout industry.
- 10. **Reuse and career recognition.** Projects should first consider using previous processes without reinventing the wheel each time. Individual

accomplishments should be rewarded and recognized. [3]

According to Bob Meng of Caterpillar, cost savings and the opportunity to earn higher margins earlier are the real drivers to reduce cycle time. A major corporate-wide initiative has been a move to global teams. The New Product Introduction teams, while global, are cross-functional, including design, marketing, product support, technical, service, accounting, suppliers, all those functions gathering and sharing information from around the world about customer needs in new products, and doing so faster, up front, with more of the decision-making going on collectively rather than in isolation. [4]

The results from a study of 188 new product development projects indicate that use of non-technical outside assistance lengthens the product development cycle time, where as output control can shorten or lengthen product development cycle time dependent on the market's growth rate and product's innovations. [5]

Reduction of new product development cycle time and improvements in product performance have become strategic objectives for many technology-driven firms. These goals may conflict, however, and firms must explicitly consider the tradeoff between them. A multistage model of new product development process which capture this tradeoff explicitly is introduced. It is shown that if product improvements are additive, it is optimal to allocate maximal time to the most productive development stage. An indication is made of how optimal time-to-market and its implied product performance targets vary with exogenous factors such as the size of the potential market, the presence of existing and new products, profit margins, the length of the window of opportunity, the firm's speed of product improvement, and competitor product performance. I is shown that some new product development metrics employed in practice, such as minimizing break-even time, can be sub-optimal if firms are striving to maximize profits. The minimal speed of product improvement required for profitability undertaking new product development is determined. [10]

According to a study conducted by Pittiglio Rabin Todd & McGrath (PRTM), high-tech companies are developing new products quicker than ever before. The hightech industry's average product development cycle-time was reduced by almost 10 percent between 1992 and 1994, with an average improvement goal of 21 percent

projected by high-tech companies between 1994 and 1996. Product Development Cycle Time and Commercial Success

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Automotive and industrial companies have set less aggressive cycle-time reduction goals compared to companies in other industries. For example, automotive/industrial companies set a goal of reducing cycle times by an average of 14.3 percent by 1996, compared with a 23.1 percent reduction for electronic systems companies, and a 27.2 percent reduction for semiconductor companies.

Though cycle time education goals vary from sector to sector, shorter cycle-times have become more crucial throughout the high-tech industry as companies increasingly use new products-products introduces in the last two years, according to PRTM. Revenue contribution from new products has risen in all study sectors.

PRTM analyzed the practices of best-in-class companies and found that excellence in development can be correlated to management practices such as crossfunctional core teams, action-oriented phase reviews by top management, clearly documented structure for product development, and integrated development tools and techniques. Improvements to the product development process are especially critical in light of shrinking life cycles, rapidly changing technology, and increased customer expectations.[9]

Several empirical studies have shown that a new product's success depends critically on its performance and its value to customers. [10]

CONCLUSIONS

Even though shortened cycle times and commercial success may be associated, pursuing reduced cycle time in isolation from underlying organizational and technical foundations will not lead to improve performance. Including the longer term development and renewal of functional product architectures and manufacturing processes, specific products can be efficiently and rapidly synthesized. Decreasing cycle time may drive the firm out of business whether what is above mentioned or a culture that encourages sharing of technology building blocks between product groups, and a product planning and control system that reaches beyond single product, single period thinking are not included in the process.

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In contrast to claims in the business press and product development literature, there does not appear to be a simple and direct relation between cycle time and organizational performance. The results imply that simply accelerating product development does not guarantee competitive advantage.

The significant interactions between some of the organizational practices and cycle time indicate that efforts to improve performance through cycle time reduction should be coordinated with changes in organizational practices if the potential benefits from accelerated product development are to be achieved.

Researchers in both the managerial accounting and product development literatures argue that development cycle time is a key indicator of organizational performance that firms should incorporate in their performance measurement and compensation systems. However, the results suggest that cycle time is an incomplete measure of development performance, which should be supplemented by additional performance indicators.

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