Title: No

Course:
Term: Fall
Year: 1996
Author(s): L. Nguyen

Report No: P96076

Abstract: Critique of the IEEE Transactions on Engineering Management article, "The Effect of Acceleration Techniques on Product Development Time."

Critique of the IEEE Transactions on Engineering Management article, "The Effect of Acceleration Techniques on Product Development Time."

L. Nguyen

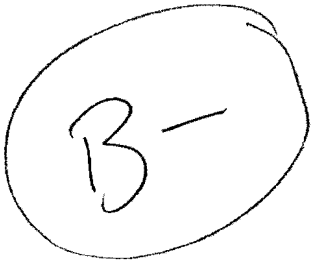
EMP-9676

INDIVIDUAL RESEARCH PAPER

CRITICAL EVALUATION OF

"The Effect of Acceleration Techniques on Product Development Time"

Management of Engineering and Technology
Professor Dundar F. Kocaoglu
Emgt 520



by
Long Nguyen

PAPER SCOPE

The scope of this paper is to review the concept of the research paper by Zirger and Janet, "The Effect of Acceleration Techniques on Product Development Time." The paper will be evaluated in the following manners: the methodology used, contribution of the paper to the literature and the result of the research.

I INTRODUCTION

Most companies are pressure for many high-tech firms to pump out new product at a faster rate to be competitive. Many firms have poured resource to develop techniques to aid them reduce the development cycle time. Giant companies like Hewlett-Packard Co.[3], Honeywell Inc., Intel Corp[1], and Xerox Corp[2] spent tremendous resource to cut their cycle time (as high as 50% cut). These were the few firms that successfully developed techniques to accelerate their product development.

There are countless techniques recommended in some literature on accelerating product development [4][5][6][7][8][9], but these literature base on managerial experience and small sample case studies. However, none of these studies empirical identify which techniques and correlate the fastest product developers of the slowest.

The purpose of Zirger and Hartley's paper is to identify the most commonly product development acceleration techniques in hypothesizes and set out to show which of this hypothesis are significantly relate to development time performance.

II. CATEGORY OF PRODUCT DEVELOPMENT ACCELERATION

Ziger and Hartley categorized acceleration techniques into three areas: 1) product strategy, 2) development process, and 3) development team structures. Please refer to Figure 1. for model presentation.

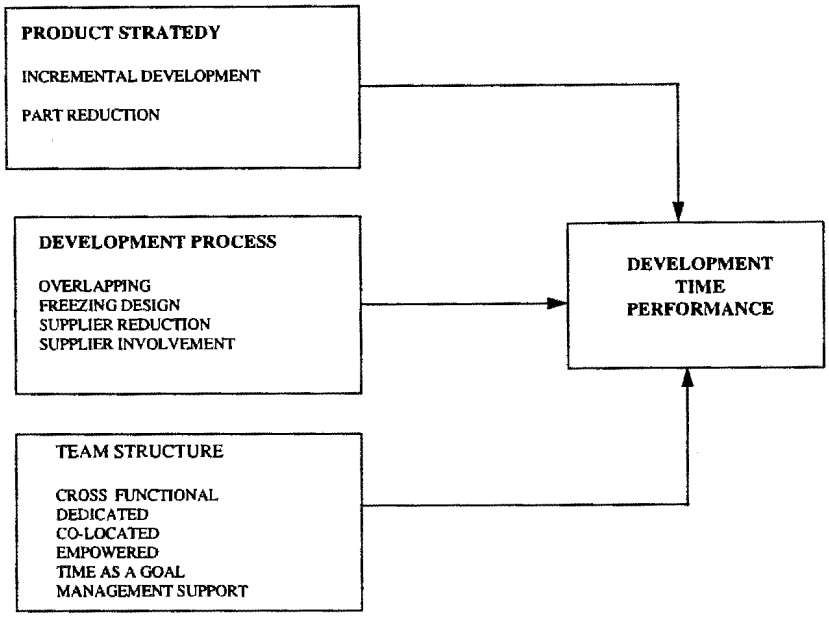


FIGURE 1. A MODEL OF FACTORS AFFECTING DEVELOPMENT TIME PERFORMANCE.

PRODUCT STRATEGY

Product strategy consisted of two techniques: 1) *Incremental Product Change*: Making small changes on the product periodically rather than making radical changes. Kleinschmidt [10] suggested that the relationship between innovativeness and commercial success is a U-shaped. What this mean is the high or low changes of products benefit more than those moderately innovative ones. The second technique in *Product strategy* is *part reduction* by using fewer parts in the product compare to previous products.

Two hypotheses derived from product strategy:

1) *"As the degree of product change decreases, development time decrease."*

2) *"Decreasing the number of product parts relative to the previous model decreases development time."*

PRODUCT DEVELOPMENT PROCESS

Product development processes touch more into the design process aspect.
1) *Overlapping Development*: Providing overlapping activities to cross functional teams may save time due to parallel processing activities, timely task identification and reduce friction between cross functions. 2) *Freezing the Product Design Early*: Freezing the product design concept and allows no additional design changes to the product.
3) *Supplier Management*: Reducing the number of suppliers and the involving suppliers into the design development.

Four hypotheses derived from product development process category:

1) *"Greater number of overlapped activities decreases development time."*
2) *"Freezing the product design early n the development process decreases development time"*
3) *"Reducing the number of supplier decreases development time."*
4) *"Increasing the degree of part design conducted by supplier decreases development time."*

DEVELOPMENT TEAM STRUCTURE

Five techniques are address in the Zirger and Hartley's paper: 1) cross functional teams, 2) dedicated team members, 3) co-location, 4) decision making autonomy, and 5) time as a goal.

Six hypotheses derived from this section:

1) *"Increasing the number of functions represented on the development team decreases development time."*
2) *"As the number of projects to which team members are assigned decreases, development time decrease."*
3) *"Co-locating team members decreases development time."*
4) *"Decreasing the number of decisions for which approval is required outside the project team decreased development time."*
5) *"Increasing the level of senior management support for the team decreases development time."*
6) *"Setting and measuring fast cycle time as an explicit project goal decreases development time."*

III. METHODOLOGY

The method Zirger and Hartley used was a series of subjective question's survey. Hundred and twenty general managers of electronics firms participated the survey and 44 of 120 were usable data. The survey consisted of 29 questions relative to firm demographics, product strategy, development process, development team, development times compare to product existing in industry. The sample consisted of high growth firms ranging in sale $3 million to $2.5 million per year. Financial and commercial success measures in five-point scale.

VI. RESULT

Base upon the collected data, Zirger and Hartley found the following that correlates with development time performance:

1) *The degree of incremental product change is insignificant related to development time performance.*
2) *The number of parts in a product relative to previous product was not related to time to market.*
3) *Development process is not significantly relate to development time performance.*
4) *Freezing product design and supplier involvement did not show a strong relationship with develop time performance.*
5) *Team structure had the most significant effect with development time performance.*
6) *Co-local was not significant with development time.*
7) *Degree of team decision-making autonomy was not relative to development time performance.*

Only four of twelve hypotheses shown strong relationship with development time performance. From the result Zirger and Hartley concluded that team structure and management variables have the most effect on product development times. This was done by increasing the number of functions represented on the team, reducing the number of project assigned and placing priority on time as a goal.