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Insinga, Richard Charles

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Pace University

D.P.S. 1986

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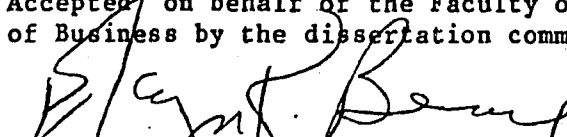
**A METHODOLOGY FOR REDUCING THE RISK OF FAILURE
FOR NEW INDUSTRIAL PRODUCTS**

RICHARD C. INSINGA

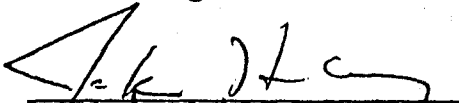
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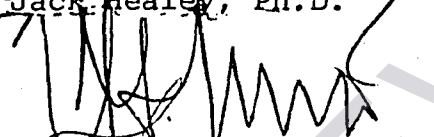
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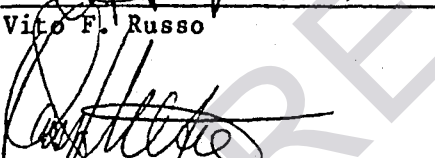
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ABSTRACT

A Methodology for Reducing the Risk of Failure for New Industrial Products

This study considers a key problem faced by managers responsible for developing new products: the decision of whether or not to introduce a new product to the market. Specifically, the study searches for a methodology for evaluating a new industrial product's potential for success in the market. It is desired that this methodology should be based upon measurable inputs and should be empirically verifiable.

Many methods currently are in use for screening new products. Generally, these methods are of three types (which are not mutually exclusive): (1) personal judgment, (2) a checklist of factors, and (3) weighting-and-scoring of factors. In the latter, a list of key factors is created, each factor is graded, and a weighting system is used to arrive at a single number "figure of merit." The factors and weights are determined subjectively.

A review of the literature indicated that several researchers had recommended the application of a discriminant function methodology to this problem. One of these, Cooper, had collected data on 195 new industrial products and had developed a discriminant function.

This study builds upon Cooper's research. The potential for utilizing Cooper's discriminant function is evaluated. A group of thirteen respondents completed questionnaires for eight case studies that describe new industrial products which are about to be introduced to the market. (The respondents did not know the outcome of the market introduction, so the situation approximated the pre-introduction condition.) Because many people completed the questionnaire for the same products, an estimate is obtained of the consistency in responses among individuals.

It was found that the scale utilized by Cooper did not result in normally distributed responses. A smaller, and more clearly defined, scale did produce a normal distribution. Furthermore, the standard deviation of responses revealed that a sample of about 10 to 15 people is required to get a reasonable measurement of the characteristics of a single product. This implies that studies which ask only one person to complete the questionnaire on a product are subject to a wide confidence

interval, perhaps jeopardizing the ability to draw conclusions from the data. Finally, most respondents displayed a small, but significant, bias that would need to be taken into account when combining data from several people.

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INTRODUCTION

That which seems simple often is far from it. You and I make countless decisions daily, but we would be hard-pressed to define the process that we use to make even one.

This study considers a key problem faced by managers responsible for developing new products: the decision of whether or not to introduce a new product to the market. Specifically, the study searches for a methodology for evaluating a new industrial product's potential for success in the market. It is desired that this methodology should be based upon measurable inputs and should be empirically verifiable.

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It was found that the scale utilized by Cooper did not result in normally distributed responses. A smaller, and more clearly defined, scale did produce a normal distribution. Furthermore, the standard deviation of responses revealed that a sample of about 10 to 15 people is required to get a reasonable measurement of the characteristics of a single product. This implies that studies, which ask only one person to complete the questionnaire on a product, are subject to a wide confidence interval, perhaps jeopardizing their ability to draw conclusions from the data. Finally, most respondents displayed a small, but significant, bias that would need to be taken into account when combining data from several people.

A key question is whether a discriminant function methodology is suitable for the task, because it intuitively does not seem to be. To one who makes go/no-go decisions on new products, the methodology appears simplistic and inappropriate. A linear additive function, such as a discriminant function, does not recognize that one weak factor

could jeopardize the success of a new product, no matter how strong it is on all of the other factors. Nevertheless, the management scientist must choose between two paths which appear in the literature: one that uses linear regression and related methodologies to analyze data, and one that expresses the learned judgment of an individual who has extensive experience in new product development. Despite its present shortcomings, the path of building upon data appears to be most productive.

This study sets out to enhance our understanding of the go/no-go decision on market introduction of a new industrial product. How can the important factors be measured? What functional form is appropriate? Until such questions are answered, additional data collection and further analysis of the type already done by Cooper will not prevail.

PREVIEW

CHAPTER I

THE PROBLEM

Introduction

It is generally accepted that new products are necessary for the survival of most companies. Especially in periods of rapidly changing technology, existing products either have (1) to be modified to incorporate new components, or (2) to be replaced by products utilizing an entirely new technology. This changing environment requires continual attention to new product development.

However, new product development is both the boon and the bane of business. We are told of the bright future prospects for a particular company's new products and of its commitment to new technology, while at the same time we hear that business is cutting costs, questioning the payback on research and development, and requiring a near-term focus for new product development. One reason for this situation results from the uncertainty of success for new products and from the poor track record for new product introductions. For example, prior studies have indicated that about one-third of all new products fail shortly after market introduction.

In response, technical managers have sought ways to improve the probability of success for new products. Studies have looked at the causes of success and failure and have pointed to changes in the new

product development process which could improve chances of yielding a successful product. These studies can be put into two classes: (1) those that attempt to change the product development process so it leads to new products which are responsive to the market, and (2) those that seek to eliminate products during the development process which would not be accepted by the market. This research focuses on the latter approach. In particular, it addresses the situation when a technical manager must make a go/no-go decision on market introduction of a new product.

The new product development process is a long one, involving numerous decisions. As the product gets closer to market introduction, the cost of each successive step increases. Hence, managers try to screen out unwanted products as early as possible in the process. Many products, however, arrive at the final decision point, i.e., when the company has to commit its resources to introducing the product, with little chance of being successful. That these "unsuccessful" products could make it through the new product process without being eliminated is a telling sign, but it is of greater significance to note that many of these products are then introduced to the market with predictable (unsuccessful) results.

A method for evaluating new products which have reached the go/no-go decision point prior to market introduction could help to eliminate those with little chance of success, thus reducing losses and leading to increased expenditures allocated to new product introductions which have a high probability of success.