Title:
Course: EMGT 520
Term: Fall
Year: 1996
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Report No: P96068

Abstract: Critique of the IEEE Transactions on Engineering Management article, "A Comparison of R&D Project Termination Factors in Four Industrial Nations."

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EMP-9668

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Prepared for:

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Engineering Management 520

Management of Engineering and Technology

Fall 1996

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December 2, 1996

A Comparison of R&D Project Termination Factors In Four Industrial Nations

Abstract-"A comparison of R&D Project Termination Factors In Four Industrial Nations" analyzes the experience of firms industrially advanced countries in R&D project termination in four countries: the United States, Germany, Japan, and the United Kingdom. The decision making that managers have to do to put an for an ongoing projects by means of obstacles or failure. The discriminating factors from these pools differ from country to country. Many factors had similar weights and similar effects. Other factors had different weights because of cultural differences. These 16 factors were observed in the four countries studied, it is likely the same factors appear in other countries as well, with similar economies, technologies, and methods to R&D. Nevertheless, the weight of individual factors may be different. It is evident that for countries with confined markets and lower levels of technologies the factors might be the same.

Summary of Concepts

Until recently, most of the world's businesses operated in relatively small, dissimilar, protected markets. Today, the countries of Western Europe are adopting uniform economic policies. The world is becoming uniform economically and more wide open to business expansion, relocation, alliance, and partnerships. Companies learn how to manage R&D facilities overseas, and how decisions are made and the factors that best describe those decisions in the different environments. This article investigates and evaluates the factors involved in R&D project termination in four industrially advanced countries: the United States, Germany, Japan, and the United Kingdom.

While every organization has some sort of system for evaluating new improved designs, R&D taking precedence over all other considerations varies widely. Some companies spend aggressively on research and development, while others spend virtually nothing. R&D spending also varies a good deal from nation to nation. In order to be competitive, there is growing opportunities for trade may push low-spending nations to invest more, especially in R&D. The underlying concept is that projects could be discriminated depending on the changes in the values of certain key factors of the project [1]. The study evaluates projects at two distinct points in time, at the beginning and at the time of termination. The projects fell into two categories-success and failure to make the results consistent with US study. Projects that were either terminated or failed are grouped into one category.

"A comparison of R&D Project Termination Factors In Four Industrial Nations" analyzes the experience of firms industrially advanced countries in R&D project termination. According to the author, Balachandra, managers have to make a decision about whether a project will be successful, and if not, end it. The discriminating factors from these pools differ from nation to nation. Many factors had similar weights and similar effects. Other factors had different weights because of cultural differences. These 16 factors were observed in the four countries studied, it is likely the same factors appear in other countries as well, with similar economies, technologies,

and methods to R&D. Nevertheless, the weight of individual factors may be different. It is evident that for countries with confined markets and lower levels of technologies the factors might be the same[1].

Methodology

The main methodology used in this paper is Discriminant Analysis on actual project data from a large sample of successful and unsuccessful projects. The approach was to evaluate these factors at frequent intervals depending on the size and duration of the project.

The study of the article compares the results from four countries-the United States, Germany, the United Kingdom, and Japan. These countries were chosen for the following reasons: 1) They are industrially advanced countries, 2) They are technologically advanced, and 3) They have similar market economies. The study utilizes data already collected for the first three countries; data from Japan was collected separately [1].

The industry focus was electrical machinery the US data includes 114 projects; German data includes 156 project; UK, 43 projects. The Japanese study is similar to the US study, with some modifications. In the Japanese case, the study was conducted in the large central research laboratory of a large Japanese multinational firm. The firm was involved in a number of diverse industries-heavy machinery, consumer electronics, computers, appliances, software, and other industries. The study evaluates projects at two distinct points in time, at the beginning and at the time of termination. The projects fell into two categories-success and failure to make the results consistent with US study. Projects that were either terminated or failed are grouped into one category.

This study used the main framework of the US questionnaire, it focused on three outcomes-success, termination, and deferred. For Germany the US questionnaire formed the basis for the study in Germany with the questionnaire being translated into German. The only difference between the German and US studies was the modification of the scoring. In Germany, all the items were scored on scale of one to seven; in the US items were scored differently depending on the nature of the item. In the Japanese case, the questionnaire was translated by Japanese technical employee. The answered questionnaire was then translated back into English by another individual.

Since the studies in the four countries were not conducted at the same time or by the same researchers. Data was examined in detail to minimize discrepancies between responses by different individuals for the same question. In US and Japanese case, the scales for many items were different depending on the nature-some items was on a scale of one to five, others were on a scale of -5 to +5. In German and UK case, most of the questions were on a scale of one to seven. Over all, some items such as probabilities of technical success were expressed as a percentage value.

Contributions to the Literature

Balachandra was one of the first to examine over 100 projects on which the termination or continuation decision had been made. This study is an extension to several studies made in the field of R&D. It provides more detailed studies in R&D with comparative approach. It evaluates decision criteria for ongoing projects of R&D project's looking for success or failure with reasonable probability in four industrial nations. Balachandra [1] looked at the R&D project termination decisions in a comparative manner between different countries. Most of previous researchers used same factor set for evaluation with different approaches.

Comparison to Other Literature

Decisions to initiate, continue, modify, and terminate R&D projects are that to do the right R&D. Such decisions require careful consideration of: the R&D cost and time; the probabilities of technical, implementation, and commercial success; and the potential value given success [12]. Earlier studies[2] Balachandra and Raelin were focused on US firms, from a wide variety of industries. The question was raised whether a different set of factors is important in different countries. Most of other literature used same factors, but different evaluation methods. Balachandra and Brockhoff [3] found in their comparative studies between Germany and US that as long as the market factors and technology factors are relatively similar, the discriminating factors tend to be similar. Brockhoff [4] found in their comparative studies between Germany, UK, and US that there are differences in the set of discriminating variables for each country data. Also, the discriminating powers of the variables seem to be different.

A similar idea was mention that a large number of R&D projects and derived a few aggregate factors for R&D project success [6]. Many author discriminate between project success and project termination without a success [4], while Balachandra and Raelin focused previously on obtaining the relevant factors to R&D projects [7]. According to Roman[8], project can be terminated for the following reasons: project objectives accomplished, for convenience, and failure of project objectives. However, Balachandra and Raelin classify the failure factors in two groups: Group one is critical factors that will lead to termination; Group two is delaying the successful completion[9].

Recent study has pointed out that work climate and satisfaction have a much stronger relationship with R&D productivity[5]. According to Green[10], top management support may be crucial for large investment projects. Without that support, those projects are more likely to be a target for termination. Top management support is very critical for R&D projects. Projects with lower level of support are found to be terminated more frequently in R&D projects. According to Pinto and Slevin[11], such support might be a useful tool to innovation. The findings support that setting and leadership variables are uniquely related to innovation performance.

From the review discussed in the precedent paragraphs it becomes evident there are not many studies looking at the R&D project termination decisions in a comparative manner between different countries. There are a number of one country study, but few comparative studies.

Strengths and Weaknesses of the Paper

The methodology shows both strengths and weaknesses. The observed strengths can be summarized as follows: the methodology evaluates R&D in a quantitative, structured and systematic way; the methodology can be applied to a large variety of selection processes.

The weaknesses can be summarized in a similar fashion: it is hard to eliminate subjectivity and/or biases of ranking individuals. This is very hard to obtain, several iterations may be required. Perceived meaning of each factor may be different for different country. This could cause them to assign an inappropriate rating score. The Japanese sample, though relatively large, has the weakness that it comes from one large organization and may not be truly representative of the Japanese practices. Also, there is a problem with coordination required to develop and administer questionnaires to the firms in different countries. Therefore, there may be some inconsistencies between the responses in different countries.

There is a high degree of commonality in the factors that could be discriminated between successful and unsuccessful project. Some of these differences are the results the translation used to make the data comparable. Therefore, perceived meaning of each factor may be different for different country. This could cause them to assign an inappropriate rating score.

Conclusions and Implications

I agree that the author has valid conclusion. Therefore, the paper is well stated and in line with the previous research. If we look at the pervious researches of the same or different authors, they try to find out universal factors in the R&D termination process. However, it is hard to do that since there are a lot of cultural factors involved in this decision.

The conclusions of this research is that 16 factors were observed in the four countries studied, it is likely the same factors appear in other countries as well, with similar economies, technologies, and methods to R&D. Nevertheless, the weight of individual factors may be different. It is evident that countries with confined markets and lower levels of technologies the factors might be the same.

Certainly, there are differences in cultural aspects. The Japanese and the European organizations are more hierarchical than US organizations. Consequently there are different effects of factors, and in some cases even the sign. The factors are common. They may have to be estimated for different countries and even for different industries, such functions may have to be developed for individual firms and divisions.

The author suggests that data collection can be systematic as it is focused on the small set of factors. Namely, definitions and benchmarks can be arranged more appropriate to the organization.

It is hard to eliminate subjectivity and/or biases of ranking individuals. This is very hard to obtain, several iterations may be required. Perceived meaning of each factor may be different for different countries. Therefore, subjective factors should be estimated by getting corroborative estimates from two individuals.

Of many other implications of globalization for the firm, there is a great need for researching in both the academic community and in the corporate world about discriminating factors for R&D projects termination in these environments. Because they are increasingly being forced on firms today by new competitive circumstances.

Recommendation

The main methodology used in this paper is Discriminant Analysis. I would like to recommend other possible statistical methods to be used in such a research in lieu of Discriminant Analysis, like multiple regression to identify the significant factors.

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