Title: A Critical Review of "Alignment of A Firm's Competitive Strategy and Information Technology Management Sophistication: The Missing Link"

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Author(s): J. Forrester

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Abstract: A paper titled "Alignment of A Firm's Competitive Strategy and Information Technology Management Sophistication: The Missing Link" is critically reviewed in this individual report.

A Critical Review of "Alignment of A Firm's Competitive Strategy and Information Technology Management Sophistication: The Missing Link"

Janice Forrester
EMP-P98040

1. Introduction

The alignment of information technology (IT) management strategy with a firm's competitive strategy is a critical in today's environment [1]. There are two major components required in making this link, categorization of the firm's management strategy and a firm's competitive strategy. Much of the literature supports Miles and Snow's characterization of competitive strategy into four types [2-4]. However, there is insufficient research on characterizing levels of IT management sophistication. Therefore in order to achieve the objective set forth, it is necessary to first categorize various levels of IT management sophistication, and then derive appropriate methodology to link IT sophistication to the different competitive strategies.

2. Concepts

Competitive Strategy:

As defined by Miles and Snow [5], there are 4 main strategic types, prospectors, defenders, analyzers, and reactors. Prospectors are organizations that are pioneers/innovators in the industry. They have an aggressive competitive strategy that is highly dependent on their ability to be first to market with new ideas. Defenders engage in little new product development and rely mostly on their ability to cost-saving production. Analyzers fall somewhere in between the prospector and the defender. They tend to balance the risk of market reaction to new ideas and the stability of cost effective production. In contrast to all, the reactors have no competitive strategy, hence rely on the current created by market movement. [2-6]

IT management sophistication:

ITMS is first divided into four categories, or modes as they are called by Gupta, planning, control, organization, and integration [1]. Each mode can occur at various levels of sophistication. IT planning represents the degree to which IT planning is integrated with the business planning. The more mature the IT planning structure, the more it is oriented towards technology management rather than computing. IT control mode reflects the management style of the IT

activities. Less mature styles are informal project based whereas more mature management styles are involved in global decisions such as budgets, long term planning, priority setting and resource planning. This notion of IT control is consistent with Nolan's model and supported by Benbaset et al [7]. IT organization is a tremendously important mode in determining the level of maturity of an IT system [8]. In the past, IT was structured autonomously from the rest of the firm. But as a firm becomes more competitive in today's environment it is important to organize IT as an integral part of the firm's structure. Traditional integration management strategies were reflective of an 'as needed' project by project development without regard for project integration. More mature integration policy is reflective of top-down planning for all projects, more expansive technology transfer, and extensive technology integration.

Competitive Strategy linked with ITMS:

The authors claim that ITMS variables explain 66.7% of the variance among the different competitive strategies. The outcome of the analysis recognized that prospectors require, and thus tend to have, higher levels of IT integration, planning and organization. Defenders are associated with higher levels of IT organization and control due to their orientation towards cost efficiency and intensive planning for effectiveness. Analyzer firms tend to minimize risk while maximizing profits through higher levels of IT planning, organization and control. Lastly, reactors exhibit little to no competitive strategy and are influenced by the direction of the market and the management of their IT systems are often poorly architected and usually unstable. The results of Gupta, Karimi, and Somers were consistent with a survey that was completed by Tavakolian in 1989 [Tavakolian, 1989 #3]. To the contrary, Clemens and Row [Clemons, 1991 #5] stated in 1991 that "information systems are vital strategic business tools. However, we have found little evidence that they have conferred competitive advantage in any but few instances."

3. Methodological Discussion and Evaluation

There were four different methodologies employed throughout this paper, a method to determine items that could be used to categorize IT management sophistication levels, verification of IT management sophistication categories, determination of the relationship of sample characteristics on strategic type, and linking strategic type to IT management sophistication.

3.1. Determining appropriate items to be used in categorization of IT management sophistication: Based on the nine-item contingent proposed by Benbasat et al and the 5 item contingent prevalent in other research, the authors prepared a survey aimed at determining the level of IT management sophistication (ITMS) that existed within an organization. Appropriate protocol was exercised and sufficient response was obtained from the surveys. However, the surveys were insufficient in determining the level of the ITMS. The authors were able to use the response information to categorize the level of ITMS by constructing a series of criteria within each of the categories. The authors proposed 4 categories that were identified by several items within each category. Correlation analysis was used to determine the importance of the items and all unnecessary items, those with low correlation values, were deleted.

3.2. Verification of ITMS categories: In order to verify that the items used to identify each category were representative of one and only one category and that there were in fact 4 distinct categories, the authors used factor analysis. A four-factor solution was found and each of the factors contained the items expected to describe that category.

3.3. A combination of chi-square test and f-test to determine if the various sample characteristics were important in linking strategic type. However, I would argue that this type of analysis was inappropriate. Cochran studied the chi-squared approximation for χ^2 in a number of articles. The general rule since 1954 has been; that it is permissible to test for independence if at least 80% of the cells have an expected frequency of 5 or greater [9]. Although the authors do not determine the expected values of the cell

frequencies, in the case of number of employees, 36% of the cells that have low cell counts and the expected values could fall below the n=5 level. In the case of sales, 25% of the cells have low cell counts and could have expected frequencies below the n=5 level. Given this, I would have preferred to see the use of the Fishers exact test. In addition, this methodology automatically dismisses the interactions between the various categories such as the impact of number of employees and sales on strategy type.

3.4. In an attempt to link strategic type and ITMS the authors used an ANOVA model. ANOVA models are great for studying the relationship between a dependant variable and one or more independent variables. The major difference between ANOVA models and regression models is that ANOVA allows for qualitative or quantitative independent variables. I would argue that the model presented in the article is inappropriate in that there is no definitive dependant or independent variables, nor is there an attempt to make this distinction. The purpose of the article is to determine a link between two variables using count data. Categorical techniques such as log linear models or odds ratios would have provided much more information than the ANOVA model. In addition, categorical techniques would have allowed for further stratification of the cross-classification tables to appropriately account for, and test the impact of the sample characteristics.

4. Strengths and Weaknesses

The authors clearly stated the three components necessary to determine establish a link between ITMS and corporate strategy. The authors made appropriate use of historical research to justify the use of preexisting categorization of corporate strategy. Similar use of historical research was evaluated and deemed insufficient for categorization of ITMS. In light of their findings, appropriate statistical methodology was employed to extend the current works and develop well-defined levels of ITMS. The authors performed analysis relating sample characteristics to strategic type. While interesting, this approach failed to make use of this information pursuant to

the goals of the paper. I did not agree with their method of linking ITMS with strategic type. I felt the analysis they used was not appropriate given the amount of information they collected nor did the final analysis provide any concrete information other than to say, for the most part we think the categories are linked. I would have preferred to see more appropriate and informative analysis performed such as the development of an odds ratio or log-linear models.

5. Conclusions and Contributions

The authors provided a sound method for categorizations of ITMS, which was a major finding in the arena of IT management, and was able to support the categories theoretically as well as empirically. Until this point there had only been an identification of the strategic types. In addition, the authors believe that they were able to link strategic type with ITMS. Based on their analysis techniques, I cannot concur with their findings nor do refute them. I simply believe that they were not fully substantiated.

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