THE INFLUENCE OF NEW PRODUCT CHARACTERISTICS: COMPETITIVE STRATEGY AND DEVELOPMENT PROCESS TO NEW PRODUCT PERFORMANCE

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ABSTRACT
There were many researches about new product performance in the past, but some researches results are not same and some researches variables have never been researched. This research tries to measure the new product performance from the new product characteristic new product completive strategy and new product development process and so on.

The research establish the first research frame, go deep into the product that interview new product expert's scholar to develop, correct the first research frame and questionnaire, then carry on the questionnaire. One Thousand questionnaires were released by Mail., And the retrieved valid questionnaires are calculated up to 167 copies.

Empirical results indicate that there is a better new product performance when the new product is discontinuous innovation and make differential competitive strategy; there is a positive relationship with new product performance with market orientation.

KEY WORDS

1. Introduction

New Product Development (NPD) activities in industry are challenged by an increased pace of innovation, shortened product life-cycles, rapid advances in Information and Communication Technologies (ICT), and globalization of NPD projects \cite{35}. In the turbulent business reality, performance measurement in R&D and NPD is gaining increased importance, because the performance of these activities can determine not only a firm’s overall success and competitive advantage, but also its very survival \cite{28}. A review of previous surveys on NPD performance measurement practices shows that these have evolved from non-existing – management should just “have faith” that NPD is a good investment (Brown and Svenson, 1988;) – to a field of scientific rigour and highest strategic importance \cite{25} \cite{29}.

Christensen’s (1997) initial research focused primarily on technological innovations, broadly defined as those that introduce a different set of features, performance, and price attributes relative to existing products and technologies.

Christensen and Bower (1996) state that market-oriented firms cannot create disruptive innovations since “firms lose their position of industry leadership. Because they listen too carefully to their customers.”

How can market leaders avoid the innovator’s dilemma and continually develop disruptive innovations to retain their leadership position? This research tries to look for the answers. The existing literature on NPD performance measurement is, with few exceptions, focused on detailed descriptions of metrics, of principles for design of measurement systems, but tends to ignore the ‘last quarter’ of a potentially virtual circle of performance management, namely the actual use of measurement results and the resulting impact on behavior and organization and subsequently on NPD and firm strategy. The research reported in this study contributes to closing that gap. We conducted in-depth interviews with NPD managers and NPD performance controllers in three large manufacturing firms and questionnaires survey.

2. Literature Review and Research Hypothesis

2.1 Areas of NPD Performance Measurement

The extant literature defines high R&NPD performance in many different ways that constitute possible complementary angles of a performance measurement system for R&NPD. Kerssens-van Drongelen and Cook (1997) base their
classification of R&D performance measurements on the four perspectives of the Balanced Scorecard: financial performance, customer satisfaction, internal process performance, and innovation and learning performance. They argue, based on an extensive literature review and case study research, that these categories constitute and appropriate and distinctive framework for clustering the complex web of R&NPD performance measurement metrics.

Building on these review papers we examined in depth the different areas of measurement used and/or developed in the R&NPD performance measurement literature [35]. The purpose was to distinguish different performance measurement objectives, and verify that each identified area covers both measurements of whether outputs help accomplish objectives – an effectiveness measurement – and whether minimum amount of resources are used in the production of these resources – an efficiency measurement [12]. This research resulted in the identification of the following four areas of measurement that were the most frequently employed in the literature reviewed. These areas also correspond closely both to the categories of [17] and to the perspectives in the balanced scorecard:

1. Financial performance measurements, where performance is defined as maximizing quantitatively measured return on R&NPD investment [7]. Further, financial ratios that compare budgeted and actual expenditures, and costs and investments relative to every R&NPD project are essential in order to maintain projects on the right financial track [5].

2. Customer satisfaction measurements. Where high performance is seen as exceeding or at least satisfying customer expectations [21]. This perspective originates in the need (1) to evaluate market expectations (anticipate success) of a new product and (2) evaluate market success after introduction by measuring parameters such as the conformance to specifications, the product’s appreciation by customers (added value provided), market share, market penetration, brand image, …and relate these measures to R&NPD activities and organization [11] [19]).

3. Innovation measurements, where high performance is considered as the successful transformation of research efforts into new products, in other words as a productive outcome, in the shape of new product concepts and architectures, of the creative application and combination of new and/or existing knowledge. In this perspective, R&D performance measurement mostly focuses on outputs such as number of patents generated, the pace of product development and launch, and the percent of new technology content in new products [8] [24].

Performance measures are typically one or more of the following: (1) new product success; (2) profitability; (3) market share; (4) an aggregate terminal performance measure (e.g., an average of profitability, sales, sales growth, return on investment [ROI], new product success, market share); and (5) aggregate intermediate performance measure (an average of, for example, customer satisfaction, employee satisfaction, customer retention, customer service, product quality perceptions).

2.2 Market Orientation and New Product Success

Firms with strong market orientations prioritize learning about (1) customers (e.g., likes and dislikes, satisfaction, perceptions); (2) factors that influence customers (e.g., competition, the economy, sociocultural trends); and (3) factors that affect the ability of the firm to influence and satisfy customers (e.g., technology, regulation).

More than 100 studies since 1990 have looked at the market orientation-performance relationship [13]. Some studies have identified a mediating role of new product innovation on the market orientation-performance relationship [4] [18]. Market orientation is a value-based strategic philosophy manifesting itself in behaviors designed to keep the firm close to the consumer.

There are two most frequently administered market orientation scales, both of which have three components. The MARKOR scale [26] assesses the extent to which firms acquire, disseminate and respond to customer and market information. The Narver and Slater (1990) scale assesses the extent to which firms are customer oriented, competitor oriented, and interfunctionally coordinated.

Shapiro (1988) and Jaworski and Kohli (1993) recognized that extant organizational structures and processes can impede the implementation of a market orientation. Day (1994) asserted that an effective market orientation requires a synergy between inside-out and outside-in capabilities. In their discussion of market-oriented management systems, firms with strong market orientations are more likely to identify and to respond to new product opportunities than firms with weaker market orientations. They are more likely to be first to market with new generations of existing products and services [14].

Market orientation’s influence on firms’ propensity to successfully innovate is tied to the priority market-oriented firms place on satisfying customers’ present (manifest) and future (latent) needs [14] [26] [34]. Market-oriented firms’ market information-processing capabilities permit them to quickly identify and to respond to customer needs, leading to timely new product introductions. Market-oriented firms are more likely to develop new products that offer unique benefits and that are superior in quality to alternatives [22].
Christensen (1997) stated that established firms are “held captive by their customers” (i.e., they listen too carefully to them). As a result, Danneels (2004) points out that Christensen’s work has often been cited as an argument against a customer orientation. On the other hand, Slater and Narver (1998) drew on an extensive body of research concerning the nature and benefits of a market-oriented culture to argue that market-oriented businesses can avoid the innovator’s dilemma by being committed to understanding both the expressed and latent needs of their customers through the processes of acquiring and evaluating market information in a systematic and proactive manner and to continuously creating superior customer value.

Recent research has shown that a proactive market-oriented culture is more strongly associated with innovativeness and new product success than is a customer-led culture. A proactive market orientation involves a set of behaviors through which a business attempts to discover, to understand, and to satisfy the latent needs of customers. Atahuen-Gima (1995) concluded that “market orientation is more strongly related to new product performance at the early stage of the product life cycle than at the late stage...” Moreover, recent research by Govindarajan and Kopalle (2004) shows that firms able to develop truly disruptive innovations have a customer orientation focused on emerging customer segments rather than on mainstream customer segments. Importantly, these two dimensions of customer orientation are not on opposite ends of a continuum but are independent of each other, suggesting that firms can develop both orientations simultaneously.

New product success refers to the rate of new product introductions relative to a firm’s largest competitor, the perceived success of these innovations relative to their largest competitor, their cycle time relative to competitors, their degree of differentiation, and their ability to be first to market with new applications.

William (2005) research reinforces a strong positive relationship between market orientation and new product success. This leads to hypothesis

**H1: There is a positive relationship between market orientation and new product performance**

### 2.3 New product Competitive Strategy and New Product Performance

A firm’s strategic orientation (in particular, based on the typology of prospectors, analyzers, and defenders) offers useful insights for understanding why some firms are more successful at commercializing technological innovations than others. This typology is well validated and continues to receive quite a bit of empirical attention (e.g., [15] [39]). However, to be successful across a range of innovations (both sustaining and disruptive), firms must also develop skill sets of other strategy types. For example, a firm that tends to be more successful with late majority customers may need a more proactive approach to developing customer knowledge: new techniques of market research may help it avoid focusing myopically only on existing customers and may facilitate the development of disruptive technological innovations. In essence, the capability to develop contradictory skill sets is vital.

In particular, we examine how firm strategy can explain success in the new product Development.

Blending the insights from market strategy with those from innovation management may illuminate why some firms succeed with disruptive innovations and others do not. Importantly, augmenting a firm’s capabilities based on other strategy types can be critical to ongoing success. (Stanley F. Slater and Jakki J. Mohr 2006). This leads to hypothesis.

**H2: There is a positive relationship between new product competitive strategy and new product performance.**
Concept framework is presented in Figure 1.

3. Conceptual Framework

3.1 Measurement

Concerning how to measure NPD performance, Werner and Souder (1997) argue for the usefulness of collection and aggregation of multiple measures of both quantitative and qualitative nature, and for joint estimates of NPD performance between planning, marketing and R&D. Furthermore, they mention the importance of setting comparative performance standards to benchmark quantitative measures against. Their recommendations are based on an extensive review of the NPD performance measurement literature. This research tries to measure NPD performance by quantitative and qualitative method.

In the research, Independent variables, namely, market orientation and competitive strategy are measured by 4 and 10 items, respectively; Items are developed in part by Gruner and Homburg (2000), Kahn (2001) and Kotler, Philip (1994). Dependent variable, new product performance, is measured by 9 factors, to be precise; Items are developed by [6]

3.2 Pretest

An appropriate sampling was used for the questionnaire pretest. Sampling was conducted among big enterprises in Taiwan. Self-rating questionnaires were adopted for this study. In other words, the respondents filled in their questionnaires on their own. A total of 40 questionnaires were distributed. Factor analysis was adopted to extract conceptual factors. After analyzing the retrieved questionnaires, the language and wording used in the pretest questionnaire was revised, inappropriate questions were deleted, and the modified questionnaire was used as the formal questionnaire.

3.3 Research Design

This research is designed to investigate the relationship between market orientation, R&D-marketing integration, team reflexivity, and competitive strategy and new product performance for big enterprises in Taiwan. This study consists of a survey to collect data from Taiwanese 1000 big enterprises. Data is collected by means of mailed questionnaires. The majority of the big enterprises in this study are electronic information manufacturers and machine manufacturers.

Questionnaires were administered to project managers, vice presidents of R&D (or chief R&D officers), vice presidents of marketing (or chief marketing officer for the firm of SBU), and senior executives of SBU managers. For each project in each firm data were collected from all of the aforementioned respondent positions. Therefore, if data could not be obtained from the relevant functional area of position, the project was excluded from the sample. When available, internal company reports and archives were consulted for verification.
3.4 The Sample

Data is collected by means of mailing questionnaire to start-ups in Taiwan in 2004. A total of 171 qualified observations were collected, with qualified respondent rate of 17.1%. And the retrieved valid questionnaires are calculated up to 167 copies.

The industries represented in the sample include electronic information (38.3%), machine (10.5%), biotechnology and pharmaceuticals (16.7%). Of the sample, the majority of the respondents in this study (45.7%) declare that their organization style is functional, 16 percent of respondents spend 1 to 3 percent of total revenue in R&D, while 25.9 percent of respondent spend 4 to 6 percent of total revenue in R&D. It is shown that big enterprises lay great emphasis on research and development. Similarly, 30.2 percent of respondents expend 3 percent of revenue in new product sales, while 21.6 percent of observations spend 4 to 6 percent of revenue in the new product sales.

3.5 Analyses and Data processing

The initial stage of the analysis involved inspecting and checking the raw data. The statistical methods used included descriptive statistics, factor analysis, ANOVA analysis, Scheffe's multiple comparison, regression analysis.

This research uses stepwise regression analysis to formulate the equation that explains the relationship between each concept and new product performance. By stepwise regression co linearity can also be eliminated. With the result of stepwise regression, a multiple regression is conducted in order to assure that the significance level between chosen independent variables and the dependent variable is secured in the finalized regression formula.

4. Main Findings

4.1 Factor Analysis and Reliability Analysis

In the questionnaire, there are ten questions for construct of competitive strategy, the ten competitive strategy items yielded three factors in the factor analysis. All Cronbach’s alphas are over 0.84, which means that the instrument has a robust reliability for measuring the construct being studied in this research. The competitive strategy items, which consist of three factors, namely, marketing differentiation, product innovation differentiation and cost leadership, are utilized in this study.

There are nine questions for construct of new product performance. The nine new product performances, items yielded two factors in the factor analysis. All Cronbach’s alphas are over 0.76, which means that the instrument has a robust reliability for measuring the construct being studied in this research. The new product performance, items, which consist of two factors, namely, new product finance performance and new product non finance performance, are utilized in this study.

Market orientation that Cronbach’s alphas is over 0.74, which means that the instrument has a robust reliability for measuring the construct being studied in this research

4.2 Regression Analysis on new product Performance

In this research, multiple-regression is employed to test the relationship between market orientation and competitive strategy and the dependent variables, that is, new product performance. The regression analysis on new product performance is presented in Table 1.
Table 1: Regression Analysis on New Product Performance

<table>
<thead>
<tr>
<th>Regression Model</th>
<th>Independent</th>
<th>Dependent</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>new product finance performance</td>
<td>new product</td>
<td>new product</td>
<td>new product</td>
</tr>
<tr>
<td></td>
<td></td>
<td>performance</td>
<td>non finance</td>
<td>total</td>
<td>performance</td>
</tr>
<tr>
<td>New Product Development Process</td>
<td>market orientation</td>
<td>0.039*</td>
<td>0.295***</td>
<td>0.165**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>innovation type</td>
<td>0.003*</td>
<td>0.004*</td>
<td>0.006*</td>
<td></td>
</tr>
<tr>
<td>New Product Competitive strategy</td>
<td>marketing differentiation</td>
<td>0.229***</td>
<td>0.073*</td>
<td>0.193**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>product innovation differentiation</td>
<td>0.207**</td>
<td>0.046*</td>
<td>0.164**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cost leadership</td>
<td>0.064*</td>
<td>0.019*</td>
<td>0.053*</td>
<td></td>
</tr>
<tr>
<td>Adj-R²</td>
<td></td>
<td>0.435</td>
<td>0.651</td>
<td>0.654</td>
<td></td>
</tr>
<tr>
<td>F Value</td>
<td></td>
<td>17.226</td>
<td>34.149</td>
<td>26.380</td>
<td></td>
</tr>
<tr>
<td>P Value</td>
<td></td>
<td>0.000***</td>
<td>0.000***</td>
<td>0.000***</td>
<td></td>
</tr>
<tr>
<td>D-W Value</td>
<td></td>
<td>1.217</td>
<td>1.456</td>
<td>1.612</td>
<td></td>
</tr>
</tbody>
</table>

From Table 1, it is also found that the influence of market orientation and competitive strategy on new product performance is positive relationship and significant. It means that market orientation and competitive strategy is better that new product performance is more good.

This provides support to:

H1: There is a positive relationship between market orientation and new product performance

H2: There is a positive relationship between new product competitive strategy and new product performance

5. Summary and Suggestion

5.1 Managerial Implications

In order for a market orientation to be optimally effective, firms must fit their market-oriented learning activities to their business strategy (The result) found that superior performance was achieved among those companies that successfully matched their marketing strategy with their overall business strategy.

Market-oriented activities for prospectors should focus on developing breakthrough product concepts (tapping latent customer needs) and must be accompanied by R&D excellence and promotion and sales excellence (pull capabilities). Market-oriented activities for analyzers should focus on incremental innovations in the form of brand and line extensions in established markets (tapping manifest needs) and should be accompanied by large-scale manufacturing competencies and an intensive distribution (push capabilities).

H1: There is a positive relationship between market orientation and new product performance

H2: There is a positive relationship between new product competitive strategy and new product performance

As has been discussed, the benefits of a strong market orientation are likely to be suppressed in firms whose capabilities inhibit them from translating generative learning into radical innovations or have difficulty realizing market-share gains from new product development programs. It is important or studies the resources, practices, and business strategies that moderate the conversion rate of new product success into market share gains and generative learning into actualized radical innovations. These factors, once identified, are important partners to market orientation that should be integrated into more complete models of new product development and profitability.

5.2 Limitations and Future Research

A few limitations of this study along with questions for future research should be noted. First, the data for this research are cross-sectional rather than longitudinal. As this study demonstrates associations between variables. It cannot fully establish causality. A longitudinal research design using multiple informants would further our knowledge toward both causality of relationships as well
as the development of new product performance over time.

Further research in other countries is encouraged in order to increase our understanding of the possible influences of country contexts on the relationships investigated here.

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Reference