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Marketing variables when launching high-technology products into international markets: An empirical study on Finnish technology firms

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ABSTRACT

While much research has been directed at variables critical to successful R&D of new and high-technology products, much less work has been directed at factors crucial to success of these products when the firm attempts to enter the international marketplace. This study surveys Finnish technology firms and identifies those marketing method variables that are associated with successful versus unsuccessful attempts to enter the international marketplace. The rank order of importance of the different marketing methods will be presented.

1. Introduction

The product development process is long and tedious. Companies put a lot of emphasis on the development of new products. For example during the last three decades the relative amount of R&D expenditure has risen from about 0.7% to its current level of 3.5% of GNP in 2009 in Finland. This growth of R&D expenditure has been among the fastest of OECD countries (Research.fi, 2009) enabling the success of many Finnish firms. The current amount of annual spending is close to 7 B€.

Good performance in product launches can be based on numerous variables. It can for example be achieved because the company is in the right place at the right time, rather than having an effective marketing management program (Kotler, 1994). Marketing has been cited as a neglected area in technology intensive companies (Autio, Kaila, Kanerva, & Kauranen, 1989; Lumme, 1994; McKenna, 1985; Shanklin & Ryans, 1987). The emphasis of this study is on the marketing methods used and their relationship to the outcome of the international product launch. Based on the literature review, a wide variety of various marketing method variables were used in this study.

2. Goals, purpose and scope of the research

The research attempts to determine whether the marketing methods used by Finnish high technology companies in launching new products abroad are related to the new product development (NPD) outcome and also what the relative importance is of the marketing methods during the launch effort. The research contributes to empirically based knowledge concerning product launches into the international market. Thus the research issues can be stated as follows: To what extent do the marketing method variables in Finnish high technology companies impact the outcome of the NPD launch into foreign markets and what is the relative importance of the marketing methods?

The level of sales or profit performance does not necessarily reflect the effectiveness of marketing. Good performance can be achieved because the company is in the right place at the right time rather than having an effective marketing management program. Cooper and Kleinschmidt (1987a, 1987b) indicated that new product's achievement can be measured in many different

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ways such as success/failure, profitability, pay back period, domestic/foreign market share, relative sales/profits, actual sales vs. objectives, actual profits vs. objectives, extent of existing market and new market opportunities. Kotler suggests that various concepts should be used in measuring the effectiveness of marketing practices. The end result will be a measure indicating how well the different marketing tasks have performed. The marketing effectiveness depends on the basis of Kotler's thinking on a combination of five activities: customer philosophy, integrated marketing organization, adequate marketing information, strategic orientation, and operational efficiency.

The purpose of this study is to investigate the relative importance of the various marketing methods and their relationship with the NPD outcome. The marketing methods included were marketing concept, product, pricing, distribution, personal selling, advertising, publicity, promotion, market organization, use of marketing consultants, market share, NPD, market segmentation, positioning, differentiation, marketing planning, MIS/marketing intelligence and market research. The research proceeds as follows. First the sampling frame and the sample of the research will be discussed. Second the research methodology will be addressed. Third the relevant previous research will be reviewed. Fourth the results of the research will be discussed and finally the conclusions and managerial implications will be deliberated.

3. Sampling frame and sample

The scope of this study is on Finnish high-technology companies. The definition of technology intensive companies utilized in this study is based on the Eurostat/OECD's classification, which is based on the ratio of R&D expenditure to GDP or R&D intensity. Total R&D intensities are used to classify industry sectors based on their level of technology intensiveness. Technology intensive companies were defined as consisting of two major groups. The first group, high technology manufacturing, include office machinery and computers, electronics and communications equipment and medical, precision and optical instruments (R&D intensity greater than 7%). The second group, medium-high technology manufacturing, consists of chemicals, machinery and equipment and transport equipment (R&D intensity between 2.5% and 7%) (Beard & Easingwood, 1996; Davis, 1992; Felix, 2006; Hatzichronoglou, 1997; Loschky, 2010; Virtaharju & Åkerblom, 1993). In order to further decrease the problem identified by Cooper and Kleinschmidt (1995) and Reeder, Brierty, and Reeder (1991) pure services, management technology, and process technology were left beyond the scope of the research. For the same reason projects, subcontracted products and consumer products were also excluded.

Information sources from Statistics Finland (http://www.stat.fi/index_en.html) were used to derive a sample population of technology intensive companies known to be active in NPD. The sample contained 230 eligible companies. The number of responding companies was 81 representing a response rate of 35.2%.

4. Research methodology

Data were collected from the managing directors and managers or directors of independent profit-centers of firms, headquartered in Finland, having revenue from both domestic and foreign markets. The reason for using this level of management was an attempt to avoid the intrinsic prejudices that could affect the responses of managers of departments concerning the relative importance of their own departments (respondent bias). Additionally, directors normally are also in charge of strategic decisions, and should therefore have the capability to evaluate new product launches and their results, while department heads often do not have enough information to properly address the strategic issues at hand. The managers were asked to respond to questions about product launch efforts during the last three years. The difference between the successful and unsuccessful product launches was defined as whether predetermined objectives were reached or not.

Chi-square analysis was used to check for relationships between the variables. Relationships between variables measured by categorical data, such as nominal or ordinal data, are typically examined using chi-square analysis. Chi-square analysis is used in the questions where the respondent is asked to circle a number on a Likert scale from 1 to 5 (O'Neal, 1985). Chi-square is the "likelihood ratio chi-square test" of the hypothesis that the model fits no better than fixed response rates across the whole sample. The likelihood ratio chi-square test is computed as twice the negative log likelihood for model in the analysis of likelihood table (SAS Institute, 2010). In order to assess the relative importance of the various marketing methods simple means of the responses were calculated.

5. Previous research

The external and internal environment in the high technology companies can be turbulent due to the fact that in many cases these companies are small, operate in growing and evolving markets, and with emerging technologies (Beard & Easingwood, 1996; Mohr, 2001; Sperry & Jetter, 2009). Due to the turbulent nature of the high-technology market environment, the marketing practices must be adapted and modified to effectively adjust to the complex environment where customers are making the purchase decisions and where the companies are making their marketing method decisions (Mohr & Shooshtari, 2003).

We can argue that the success or failure of the launch is influenced also by internal variables (marketing and business controllables) such as marketing methods and costs, and by external factors (marketing and business uncontrollables) such as competition, customers and business environment. Previous research has indicated that the NPD and marketing practices of high-technology firms deserve greater attention (Mohr & Shooshtari, 2003; Yap & Souder, 1994). For example the findings of Green and Ryans (1990)that variables such as the magnitude of marketing investment as well as the product's competitive

position indicate a positive relation to the performance. The emphasis in this study will be on the internal variables, i.e. on the marketing and business variables that the firm has control over.

High-technology companies frequently have an intense *product* focus (Dugal & Schroeder, 1995; Jobs, 1998; Marcus & Segal, 1989; Rosen, Schroeder, & Purinton, 1998), which could be due to the dynamic market and technological conditions as referred to earlier. Therefore it is no wonder that out of all the marketing variables the relationship of the product as a marketing variable with the NPD outcome has probably received the most attention in previous research. Prior research has discovered the product characteristics to be a multidimensional entity including issues like product's perceived relative benefits, advantages, superiority, uniqueness, compatibility, performance aspects, cost to the user and support/service advantage (Cooper, 1980, 1981, 1983; Cooper & Kleinschmidt, 1987a, 1987b; Yap & Souder, 1994; Zirger & Maidique, 1990). Yap and Souder (1994) concluded that the advantages of cost-effective products and good customer support and *service* were correlated with success. Products requiring high degrees of modifications of customer behaviors were on the other hand negatively correlated with success. Yap and Souder (1994) further deduced that the high/low market and technical uncertainties impacted the launch success. Easingwood and Harrington (2002) emphasized the need for aggressive *new product development* when the product moves through the stages of its life-cycle. This stage during which a major NPD effort is needed is called the chasm by Geoffrey Moore (1999). Thus it is vitally important to be able to develop the product before and during the chasm so that it appeals to the mainstream market after the early adopters. Beard and Easingwood (1996) discovered that in terms of revolutionary innovations, which new products in the high technology industries in many cases can be, marketers are more likely to put more emphasis on the technological aspects in their products and thereby concentrate more on *positioning* and attack tactics than on market preparation or *targeting (segmentation and selection of target markets)*.

Other marketing methods have received less attention in the literature. *Marketing concept* is, however, closely related to the previously discussed product element. Marketing concept is well-established in the marketing literature and was introduced by McKitterick (1957) and simply means adopting an organization wide culture in meeting the customer needs while making a profit for the company. The adoption of the marketing concept has been, however, controversial. Although the marketing concept is well established outside the high-technology arena, this appears not to be the case in the marketing of high-technology products in spite of the fact that the marketing concept has strong intuitive appeal (Cahill, Thach, & Warshawsky, 1994). Practitioners and academians claim that the marketing concept is simply not applicable in the high-technology industries (Brown, 1992; Cahill et al., 1994; Jobs, 1998; McGee & Spiro, 1988; Webster, 1988). It is possible that the high degree of technological uncertainty causes the companies to spend more resources on the development of technology to manage the related uncertainty (Grewal & Tansuhaj, 2001; Slater & Narver, 1994), which leads to the conclusion that the positive relationship between the company performance and market orientation weakens when the technological uncertainty increases (Grewal & Tansuhaj, 2001). There are, however, contrarian views to this in the literature. Some researchers claim that customer expectations are probably more critical in the high-technology markets due to the fact that product features change rapidly, which on the other hand lead to dynamic expectations among customers (Bridges, Yim, & Briesch, 1995; Weiss & John, 1989). It is also claimed that the integration of the marketing process with the technology or R&D function is crucial to the success of the innovation process (Bettley, 2006; Johne, 1994; Schilling & Hill, 1998).

Other marketing methods that have received attention in the prior literature are *marketing research* (Cowell & Blois, 1977; von Hippel, 1986), *marketing organization* (Roberts, 1992), *branding* (Aaker & Jacobsen, 2001; Hamann, Williams, & Maktoba, 2007; Zajas & Crowley, 1995), *channels* (Easingwood & Koustelos, 2000; Sahadev & Jayachandran, 2004), *targeting and positioning* (Easingwood & Koustelos, 2000), *promotion* (Paschalina & Ratneshwar, 2002), and sales (Dunn, Friar, & Thomas, 1991; Gardner, Johnson, Lee, & Wilkinson, 2000; Sharma, Iyer, & Evanschitzky, 2008). In addition the international aspects of launching new high-technology products have been reviewed by some researchers (Bell, 1995; Burgel & Murray, 2000; Crick & Jones, 2000; Kirpalani & Macintosh, 1980). The attention on these methods has been as indicated limited.

Out of these other marketing methods research related to high technology 'marketing research' is interesting since it is related to the previously discussed marketing concept. As mentioned marketing concept assumes the meeting of the customer's needs and wants. In order to be able to do this marketing research in one form or another needs to be conducted. As an indication of the controversial role of marketing concept in marketing and development of high-technology products, it is not surprising that marketing research has not received a lot of attention in prior research. A notable exception is the seminal research conducted by von Hippel (1986) who introduced the lead users whose current needs will become general in a marketplace months or years after the launch of the product. Therefore the identification and targeting of the lead users is important and hence the discovery of their needs through market research. Easingwood and Koustelos (2000) state in this regard that on the basis of the technology adoption life cycle, the objective is to identify innovative adopters (individuals or companies) due to their preparedness to purchase the product without seeing it up and running elsewhere. Moore (1999) indicates that the lead users tend to be hugely influential among the adopter segment (early adopters, late adopters and laggards), and therefore they cannot be neglected.

In terms of distribution, Easingwood and Koustelos (2000) indicate the need to engage in special distribution arrangements, which in many cases might be new channels of distribution in new markets. These new channels might involve competitors in some cases. Furthermore it is possible to use joint ventures and other types of collaborative arrangements of technology and distribution development. Other than this Easingwood and Koustelos (2000) did not, however, discuss the relative importance of the distribution as a marketing method.

In conclusion there appears to be an ample amount of research done in the area of high technology. The previous research has not, however, investigated the marketing methods used in the technology intensive companies and their relationship with the NPD outcome in a comprehensive way but has rather concentrated on the usage of individual marketing methods and their

relationship with the NPD outcome. Thus the research regarding the relative importance of the marketing methods in the context of high technology is practically non-existent. Thus on the basis of the previous literature review, the following conceptual model (Fig. 1) between company related variables and NPD outcome is proposed.

The partial model was developed to study the relationships of the marketing method variables and the NPD outcome. Fig. 1 describes the hypothesized relationships of the selected variables. The effect of the prelaunch stages, although very important, has been excluded from the scope of this research. It is the belief here that the management has the opinion prior to the actual launch that the new product to be launched has every possible chance to make it in the international market place. In addition to the significance of the relationship between the marketing methods and the NPD outcome, the relative importance of the various marketing methods will also be assessed.

6. Discussion and findings

6.1. Background data

The mean turnover of the respondents' companies/profit centers was 43.1 M€. Out of the firms 44.4% belonged to a larger corporation. The average R&D expenditure was 9.6% of sales indicating a high R&D intensity (Alahuhta, 1990; Hatzichronoglou, 1997; Loschky, 2010; OECD, 1994). The average marketing expenditure was 10.0% of sales. The export share was 62.4% of sales indicating high export intensity. The mean number of products launched during the last three years was 6.6. Out of these 5.3 were classified as successful.

6.2. The use of marketing methods

The results regarding the use of the marketing methods set are in the following table. As regards the successful NPD projects one could say that personal selling and new products can be considered very important marketing methods (mean of the responses >4.00), which is not surprising against the sample population of industrial high-technology companies of this research. The discovery of the importance of the new product development is also consistent with the literature (Dugal & Schroeder, 1995; Jobs, 1998; Marcus & Segal, 1989; Rosen et al., 1998). Personal selling has been found to be a relatively important marketing method for industrial companies (e.g. Parasuraman, 1981), which is consistent with the findings of this research. According to this research trait assessing the importance of the promotional tools in the context of industrial marketing, advertising, publicity and sales promotion have been discovered to have relatively low importance (e.g. Parasuraman, 1981), and are more widely used in consumer marketing.

The marketing concept, differentiation, product, pricing, segmentation, sales promotion and distribution were perceived to be moderately important marketing methods (mean of the responses between 3.00 and 4.00). In addition the marketing methods positioning, marketing organization, marketing plan, market share, publicity, advertising, marketing research, and marketing information systems can be regarded as moderately unimportant marketing methods (mean of the responses between 2.00 and 3.00) and finally the marketing method marketing consultants can be seen as a very unimportant marketing method (mean of the responses below 2.00).

As indicated in the literature review section, it has been claimed that the marketing concept is perhaps not applicable in high-technology industries (Brown, 1992; Cahill et al., 1994; Jobs, 1998; McGee & Spiro, 1988; Webster, 1988) due to the high degree of technological uncertainty, which causes the companies to spend more resources on the development of technology to

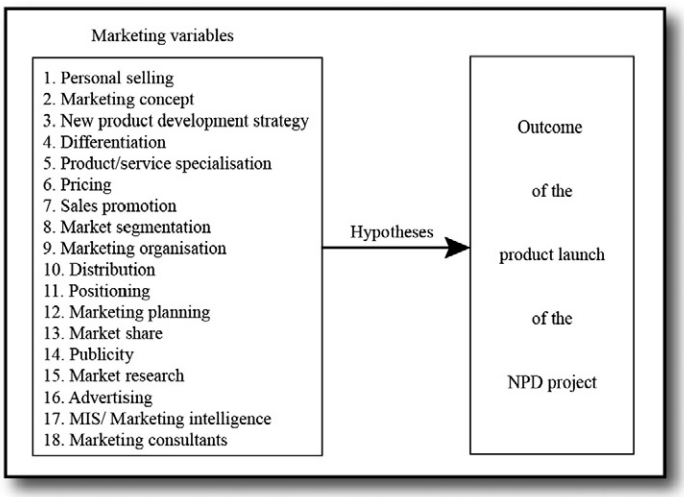

Fig. 1. The hypotheses.

manage the relevant uncertainty (Grewal & Tansuhaj, 2001; Slater & Narver, 1994). It might even be possible that the positive relationship between the company performance and market orientation weakens when the technological uncertainty increases (Grewal & Tansuhaj, 2001). The findings of this research at least somewhat contradict these viewpoints. The managers of Finnish high technology companies perceive the marketing concept to be the third most important marketing method in successful NPD cases among the 18 marketing methods present in this study (see Table 1). Thus the adoption of an organization wide culture in meeting the customer needs while making a profit for the company is perceived to be important in the context of this research. It is possible that the sample of the study has an impact on the results due to the fact that the responding companies in the sample were industrial companies in which new product development tends to be more closely done with the customers, which thus explains the need for close company-wide cooperation between the firms. It is also possible that the reasonably low perceived importance of "formal" marketing research and marketing information systems are also explained by the sample bias in industrial companies. Since the company developing a new product is in close contact with the customer (explained by the importance of the marketing concept) anyway, there is no perceived need to conduct "formal" marketing research.

The marketing method *pricing* was perceived to be a relatively important marketing method and was ranked number 6 in the importance list. The previous research in this regard is scarce. Easingwood and Koustelos (2000) indicate that low prices have been considered inappropriate in the context of high technology products. This is based on the assumption that the best way to recover the high initial investments in R&D is through high prices. They also claim, however, that a good way to alleviate the concerns of the buyers as regards the technological uncertainty, might be the lowering of prices. As an example they quote the cost of just 5$ per device for the use of EPOC from Symbian and 25$ for Microsoft CE. These contexts are, however, in consumer marketing, where it is possible for the companies to recover the high initial product development costs via high volumes, which is not always the case in industrial contexts. The finding of this research supports this since the managers in Finnish high technology companies place a relatively high importance on pricing as a marketing method.

Market segmentation and positioning are related concepts in the marketing theory. Both of these marketing methods were perceived to have an average importance in the high technology context of this research. Previous research has indicated that some new technologies are so specialized that targeting and positioning as marketing methods might be redundant. Some other technologies might be wide-ranging in their applications that strong clues are needed in order for positioning and targeting to have an impact and many products fall in between of these extremes (Easingwood & Koustelos, 2000). In other words it is possible that the use of these two marketing methods is very context specific. The high technology and industrial contexts of this research appear to fall in between the high and low importance of segmentation and positioning indicating not very specialized technology development in the Finnish high technology companies nor very wide ranging applications of the technology either. This lack of wide ranging applications is also confirmed by the relatively low importance of distribution as a marketing method. One would think that if the technology under development had wide ranging applications then there would be a need for wide distribution arrangements and since this is not the case, there is no need for wide distribution networks.

The previous research as regards differentiation as a marketing method in the high technology context is scarce. Overall higher level of product differentiation should enable a firm to achieve higher margins and thus improve its financial performance (Kohli & Jaworski, 1993). Prior research has, however, indicated that differentiation from a marketing strategy perspective, between high technology and lower levels of technology and the resulting implications for marketing are largely unanswered (Gardner et al., 2000). Interestingly, however, the respondents in this research perceived *differentiation* to be a relatively important marketing method since it ranked number 4 in importance. This is an interesting finding in terms of the previous discussion regarding segmentation and positioning. While these two methods were not perceived to be particularly important due to the not so specialized use of technology and not very wide ranging applications of the technology, the managers perceived the need to be

Table 1
The importance of the marketing methods.

Marketing method	Successful cases	Rank	Unsuccessful cases	Rank
Personal selling	4.13 (1.04)	1	4.00 (0.92)	3
New products	4.08 (1.02)	2	4.10 (1.02)	2
Marketing concept	3.95 (1.10)	3	4.20 (0.95)	1
Differentiation*	3.74 (1.20)	4	3.25 (1.48)	7
Product	3.70 (1.13)	5	3.60 (0.99)	4
Pricing*	3.49 (1.15)	6	3.00 (1.17)	10
Segmentation	3.38 (1.24)	7	3.50 (1.05)	5
Sales promotion	3.26 (1.22)	8	3.50 (1.10)	5
Distribution	3.10 (1.57)	9	2.85 (1.53)	11
Positioning	2.92 (1.44)	10	3.05 (1.30)	8
Marketing organization	2.90 (1.65)	11	2.85 (1.27)	11
Marketing plan	2.84 (1.49)	12	3.05 (1.15)	8
Market share	2.51 (1.40)	13	2.50 (1.19)	15
Publicity	2.48 (1.37)	14	2.35 (1.14)	16
Advertising	2.33 (1.19)	15	2.05 (1.05)	17
Marketing research*	2.26 (1.32)	16	2.70 (1.17)	14
Marketing information systems*	2.07 (1.12)	17	2.90 (1.29)	13
Marketing consultants	1.74 (1.18)	18	1.90 (0.97)	18

Mean value (standard deviation), *significant difference (<0.01).

different from the competition. In other words why should a company engage itself in the development of high technology products if the resulting product is not that different from the competition's?

6.3. Differences between successful and unsuccessful cases

As regards the differences between successful and unsuccessful NPD projects the managers seem to have fairly similar perceptions regarding the importance of the various marketing methods. There are some differences, however. The managers in unsuccessful NPD projects seem to perceive the marketing methods marketing research and marketing information systems to be significantly more important in the successful NPD projects. The managers in successful NPD projects on the other hand seem to perceive the marketing methods differentiation, and pricing to be significantly more important in the unsuccessful NPD projects.

The finding that the marketing methods marketing research and marketing information systems are significantly more important in the unsuccessful NPD projects is interesting particularly since the managers also felt that the marketing concept was the most important marketing method in the unsuccessful cases. As discussed previously there is perhaps less need to conduct "formal" marketing research and have an efficient marketing information system *if* the true marketing concept has been adopted. This raises the question of whether the true marketing concept has really been adopted in the unsuccessful NPD cases.

The results of this study are consistent with the previous research regarding the importance of the product and new product development marketing methods. As indicated in the literature review section, the prior research has devoted a lot of attention to the product related activities in high-technology companies. The majority of these prior studies indicated the product orientation to be the driving force in high-technology companies. It is noteworthy that there was a significant difference between the successful and unsuccessful NPD projects regarding differentiation as a marketing method so that the managers in successful NPD projects perceived differentiation to be significantly more important as a marketing method. This is an important finding and indicates that the product and new product development activities as such are important but it is really important to differentiate the product offering from the competition.

The results regarding the importance of the adoption of the marketing concept as a marketing method in high-technology companies were a bit surprising, however. As noted in the literature review the adoption of the marketing concept has been controversial. The results of this study indicate the adoption of the marketing concept to be more important than the product as a marketing method and almost as important as the new product development as a marketing method in successful NPD projects. It is possible that the sample population of this study plays a role here. While it is quite possible that the consumer products customers are not always knowledgeable about their future product needs, it is possible that the contrary is the case in the industrial product markets (i.e. in the sample population of this study) and therefore the organization-wide adoption of the marketing concept is perceived to be essential and necessary by the managers (Capon & Glazer, 1987).

It is somewhat perplexing that the marketing research and marketing information systems as marketing methods are perceived to be significantly less important in successful NPD launches. Lawton and Parasuraman (1980) indicated that since the marketing concept emphasizes marketing orientation, the adoption of the marketing concept implies a greater reliance on marketing research. Again why was this not the case in this research? It is important to note that expectedly personal selling as a marketing method was perceived to be very important. Thus it is possible that the management of high-technology companies receive the necessary information through the personal selling activity, which in many cases has a consultative (Coppett & Staples, 1980; Plouffer, Hulland, & Wachner, 2009; Westbrook & Peterson, 1998; Wotruba, 1991, 1996) and relationship oriented approach in industrial selling (Mulki & Stock, 2003). Therefore it is possible that the need for "formal" marketing research and marketing information systems is perceived to be lower.

According to McKitterick (1957) the adoption of marketing concept simply means adopting an organization-wide culture in meeting the customer needs while making a profit for the company. Against this background it is not surprising that pricing as a marketing method is perceived to be significantly more important in successful NPD projects than in unsuccessful NPD projects, which is a consistent finding with previous research (Grunenwald & Vernon, 1988). Previous research has indicated that in industrial markets competition is often based on differences in product performance, which might experience rapid changes in high-technology markets, and price erosion (Wilhelm & Xu, 2002). Therefore observed or perceived differences in product prices might be explained by differences in product performance (Baltas & Freeman, 2001). As indicated product and NPD related activities are perceived to be important both in successful and unsuccessful NPD projects, but what is really important for the management in high-technology companies, is to be aware of the relevant product performance differences and their implications on pricing of the products.

Finally also the importance of market share as a measure of success was estimated. Market share has been traditionally perceived to be an important measure of success in conventional and established markets (Szymanski, Bharadwaj, & Varadajan, 1993). This was not the case in this research. One could say that this is an expected result since the market can be turbulent in the early stages of the life cycle, and thus the needs of customers and the market are not that well established (Beard & Easingwood, 1996; Mohr, 2001; Sperry & Jetter, 2009). Therefore measuring the success of the high-technology company efforts with the measure of market share is perhaps not feasible.

7. Conclusions

The success rate when launching high technology products into the export markets was in this study 80.4%. Zirkle (1993) on the other hand found in his research concerning consumer products that the success rate was 75.3%. These results are thus comparable with the results of this study (for a more detailed discussion regarding the success rates in various studies please

see Griffin (1997)). Caution should be exercised, however, when comparing these findings concerning new-product success rates between domestic and foreign markets, as well as between consumer and industrial markets.

The present study offers empirical evidence about the importance of the marketing methods as well as about their relationship with the NPD outcome. Expectedly the product and NPD related marketing methods were perceived to be important by the managers in high-technology companies. Somewhat unexpectedly this was also the case with the adoption of the marketing concept, which has been traditionally perceived to be controversial in prior high-technology marketing method research. Regarding the capability of the marketing methods to be able to differentiate successful and unsuccessful NPD projects, the marketing methods differentiation and pricing were perceived to be significantly more important by the managers in successful NPD projects than in unsuccessful NPD projects.

The product related marketing methods were perceived to be important but it was even more crucial to also be able to differentiate the product offering, and take the related product performance differences into account when pricing the product. Similarly the marketing methods marketing research and marketing information systems were perceived to be significantly more important by the managers in unsuccessful NPD projects than in successful NPD projects. It is possible that over-reliance on traditional market research methods and marketing information systems might not be the correct approach for companies operating in high-technology industries. Instead the relevant market information could be acquired through the adoption of the marketing concept and intense personal selling efforts. Previous research has discovered in this regard that access to customers can provide a business with a sustainable advantage (Cavusgil & Kirpalani, 1993).

8. Managerial implications

The results of this research bring important points to the attention of the management of high technology companies. Expectedly they should focus their attention on product and NPD related activities so that the final product offered to the market place is different from the competitive product offerings and priced also according to the performance differences. In addition the implementation of the NPD related activities should be executed with an organization-wide adoption of the marketing concept. Over-reliance on the use of traditional market research and marketing information systems should be avoided and marketing information gathering using personal sales efforts should be utilized.

9. Suggestions for further research

The contribution of this research lies in role of various marketing methods when launching new high technology products into the international market. Several interesting issues for further research arose during the project:

1. Comparative research in other countries on issues at hand would be interesting in order to get broader support for the findings of this study.
2. Addressing a greater number of industries (which would not, based on the definition of the high technology industry in this research, be high technology industries) in a further study, would bring interesting comparative perspectives in the use of various marketing methods when launching products into the international market.
3. The market and technological uncertainty variables (high/low) in the context of the marketing method research should also be investigated.
4. The context of this research was industrial products. Consumer product industries would be another interesting research area to pursue.

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