

PARTICULARITIES OF MARKETING DECISIONS FOR INNOVATIVE COMPANIES FROM HIGH-TECH INDUSTRY

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Abstract:

This paper highlights the specific way for companies in high tech industry to develop their marketing activity. The companies in this industry are struggling to create and then sell a range of innovative products. High technology products are complex and they enhance a certain level of uncertainty regarding their utility. Due to their novelty (absolute or incremental) the products are accepted by consumers harder than the ordinary consumer products. This paper presents the main results of a qualitative marketing research based on the opinions of managers from high technology industry on specific marketing strategies and tools used to create and launch new products.

Keywords: *marketing, qualitative research, high-technology products, innovation.*

Introduction

Over time, marketing was defined from several perspectives: as an economic and social mechanism, as a management tool or through the organization-client relationship. But currently, marketing suffers a series of radical changes due to the actual markets nature and the competition manifested inside them. Also, the evolution of current technological environment has a strong influence on the development of marketing activities through product and process innovations that occur in a rapid pace.

Besides marketing, innovation plays an increasingly important role within those companies which wants to be competitive. Innovation is a big challenge for any business but also is the force behind the creation of sustainable values. By creating innovations, the companies can achieve

products with better characteristics, high quality services, more efficient and greener production processes, improved models of business management systems, modern methods of human resource management etc.

High tech industry is an incubator for innovation - both radical (Leifer, 2000) and incremental (Banbury and Mitchell, 1995) enabling them to grow with amazing rapidity. High-tech products have defining characteristics that distinguish them from ordinary final consumer goods. They require high technology in their manufacturing process and then in their use process. They are perceived as risky because of their novelty level and they generate uncertainty about the benefits they can offer to the customers.

Studying the characteristics of high-tech products, scientists have concluded that is necessary a

customization of marketing in this field, namely: *marketing of high-technology products*. The fact that high-technology products often generates a reserved attitude of potential customers and cause fear, uncertainty, doubt regarding their use determined the marketing specialists to develop a series of specific marketing practice and theory.

The powerful international companies from high tech industry (Samsung, LG, Panasonic, Toshiba etc.) adapted their marketing policies and strategies to the conditions of a complex environment with unpredictable markets. So, they have developed real business models in this area.

For a better understanding of marketing manifestation in the high-tech industry, the paper is structured in two parts. The first part contains the main issues which are the basis for the concept of marketing of high technology products as a new marketing specialization. The second part of the paper contains the main results of a qualitative marketing research conducted among companies that manufacture and sell high-technology products.

The coordinates for marketing of high-technology products

High-technology products require a good understanding of their distinct features and their influences upon the market. The role of marketing specialist is to set the priorities associated to such products and to include them in the complex process of designing marketing activities.

The Ordinance no.21/1992 regarding the consumer protection, published in the Official Monitor no. 212/1992 stipulates that the high-technology product is "essentially a durable product, being actually a relatively complex product made by parts and assemblies, designed and built to be used on medium term and

over which could be performed repairs or maintenance activities."

A high-technology product is defined rather by the perception that consumers have about it than the contribution of technology that the product encompasses (www.3rdperspective.com). This perception is composed of several elements:

- The product is still not easy to accept or correctly understood as a solution to a particular problem;
- There is no certainty about how this product will solve a problem;
- The resources required to develop this product are provided by highly qualified specialists;
- The company that manufacture this product has a technological orientation.

The high-technology products can be defined by five main features they enhance simultaneously (Sahadev, 2004, pg.121-149):

- Short product lifecycle - such products cross the lifecycle phases more quickly than ordinary products. The advanced technology evolution happens very quickly and this leads to a much shorter product lifecycle and to the necessity of making decisions on the moment (Bridges, 1991).
- High level of risk in the users' behaviour changing - using high technology products can generate radical changes in consumption behaviour of users; sometimes, such changes can be destructive meaning the failure of product adoption by consumers.
- Indispensability of infrastructure - a high technology product cannot exist in isolation; the organization should create a real services network to support the product and become an important component of its marketing mix. The infrastructure includes complementary products required for the high-tech product functionality,

installation services, repairs and proper maintenance.

- Lack of clearly defined industry standards - a key feature of high technology products is the fact that they are constantly evolving. As a result of this constant evolution, the products which satisfy the same needs to align to specific but different standards.

- Uncertainty on product functionality - sometimes consumers find difficult to align their needs to the benefits that high technology products can offer.

Many manufacturers consider that the main advantage of a high-technology product is precisely the included sophisticated technology but they neglect the consumers' perception on this matter.

The consumer's perspective is different from the manufacturer's perspective. The following table shows that producer interests seem to be somewhat opposed to consumer interests (Rosen, Schroeder, Puriton, 1998).

Table 1

Producer's perspective and consumer's perspective on high-technology products

Consumer's perspective	Producer's perspective
Consumption	Production
Product technical features	Product design
Ease on operation	Ease on production
The value provided	The total cost
Unique qualities	Unique technologies

Source: Adaptation after Rosen, Schroeder, Puriton, Marketing High-Tech Products, 1998.

The manufacturers are interested in product creation. Some of them start from the misconception that consumers are not able to describe exactly what they want and they are not aware of the products they are looking for. Due to this approach, consumers might consider some products being hostile.

Studying the characteristics of high-tech products, scientists have concluded that a customization of marketing in this area is necessary because of the different ways in which high-tech products behave compared to ordinary final consumer goods. Sometimes high technology products causes fear, uncertainty, doubt regarding the use and the marketing specialists must develop a series of specific marketing practice and theory.

Since the 1980s the literature contains papers including aspects about foundation and development of the concept of marketing of high technology products. The authors W.L. Shanklin and J. K. Ryans (1984, 1987) reported

for the first time in the literature the importance of technological innovation for business and society. They also made a first classification of companies operating in advanced technology area and they have explained the place and role of marketing in these organizations. In "High-Tech Marketing: Concepts, Continuity and Change" (1989) the authors R.T. Moriarty and T.J. Kosnik call into question the need for differentiating the marketing of high-technology products from traditional marketing, highlighting the main features of the high-tech environment, namely: the uncertainty about the present technology and the particular type of market reaction.

In "Fundamentals of High Technology Marketing" (1997) I. Kalb claims that customizing marketing of high technology products is necessary due to their complex nature, but also because high technology is an important factor of economic growth and improves the quality of life. Since 2000,

more and more authors has contributed to the establishment of the role and place of marketing of high technology products in economy, bringing more and more arguments for customization this type of marketing (Mohr, 2001; Viardot, 2004, Mohr, Sengupta and Slater, 2005). Also, is discussed the strong link between high technology and innovation process, and the linkage between marketing activities and research and development activities inside the high-tech companies. In "Successful marketing strategy for high-tech firms" (2004) E. Viardot highlights the importance of segmentation process for high-tech products market, followed by targeting relevant segments and correct positioning or repositioning high-tech products. Mohr, Sengupta and Slater in "Marketing of High-Technology Products and Innovations" sets a suite of marketing decisions at strategic, operational and tactical levels in addition to the role of marketing of high technology products. Regarding the concerns for studying the consumer behaviour in high tech industry, the number of papers is low and the authors' outlook is very different. In "The Emerging High Tech Consumer" A.C. Reddy (1997) emphasizes the importance of creating a profile of the individual consumer of high technology products, taking into account characteristics such as income, age and education level. The author also highlights the effects of the Internet and telecommunications on the consumer of high technology products.

Mick and Fournier present in an article entitled "Paradoxes of technology: Consumer cognizance, emotions and coping strategies" (1998) the results of two qualitative marketing research about U.S. adults opinions on paradoxical characteristics of high-tech products. These researches contribute to improve the profile of high technology consumer products. In the paper from 1998 the authors Rosen, Schroeder and

Purinton made a parallel between producer and consumer expectations in relation to the same high technology product, from which it appears that these expectations are very different and the perceptions are almost opposite.

Adopting high technology products by individual consumers is a complex process that requires a deep analysis. Specific to the lifecycle adoption of a new high-tech product is the concept of "abyss" ("gap" or "valley of death") analysed and explained by G. Moore in "Crossing the Chasm" (1991). This phenomenon is a gap in product transition from early adopters group to the early majority group. If this gap is not exceeded, it leads to product failure. These difficulties have raised specialists concerns about the correct segmentation of high-tech product markets, depending on the characteristics of adoption (Dunn, Hulak and White, 1999; McGrath and McMillan, 2000) and by product absorption capacity (Cohen and Levinthal, 1990).

The particularities of the marketing mix of high-tech products was the main object of study for various authors: the dynamic of marketing mix (Easingwood and Harrington, 2002), the products and services portfolio (Phillips, Ochs and Schrock, 1999), branding (Traynor and Traynor, 2004), the communication of product benefits (Mohr, 2001), using sales force (Dunn, 2003), guarantees and insurance products (McDade, Oliva and Pirsch, 2002).

The research results on marketing activities developed in high-tech industry

High-tech products require a special approach due to their specificity. They are complex products that require high technology for being manufactured. They have a quick rhythm of appearance on the market and a short lifecycle. Therefore, marketing activities

targeting these products have a particular character given by products' attributes. The products approach from a marketing perspective is a specific one, especially because their adoption process by consumers is difficult.

In these circumstances it was necessary to conduct a qualitative marketing research entitled "*Managers' opinions regarding the particularities of marketing assertion in the field of innovation and development of high technology products.*" The qualitative marketing research was based on the method of in-depth interview. The sample consisted of seven managers from international companies which produce and sell high-tech products, and operate in Romania too. The interviews were conducted during January-February 2011 and were based on a list of themes and sub-themes.

The *main objectives* of the qualitative research which aim to identify the views of managers from high-tech industry on the importance of innovation and marketing activities in their companies are:

- Determination of the innovations types existing inside the companies.
- Identification of innovation strategies applied by the companies.
- Evaluation of the role of research and development activity inside the company.
- Determination of particularities of assimilation and launch new high-tech products on the market.
- Identification of the main factors affecting the adoption of innovation from the company perspective.
- Establish specific aspects for the marketing mix of high technology products.
- The *general assumptions* for the qualitative research are:
 - High-tech companies use more and more the principles of Open Innovation model.

- Many high technology companies choose to cooperate with other bodies and institutions in R&D activity in order to create high-tech products and innovative services.

- According to managers from high technology industry, the decision to purchase a high-technology product has a high degree of complexity.

- Many companies in high technology industry have the intention to involve consumers in creating and developing innovative products.

Research projection methodology

To obtain relevant results, the seven subjects who participated to the in-depth interviews were selected based on a set of predetermined criteria:

- The subjects work in companies producing and selling high-tech products for final consumption;
- The subjects fulfil management positions inside the company for at least 6 months;
- The subjects can give information on sales and marketing activities, having the position of general manager, regional sales manager or marketing manager.

The themes and subthemes for the in-depth interview that formed the basis of data collection are structured as follows:

I. Innovation process within the company

1. Advantages and difficulties of the innovation process;
2. The existing types of innovations and their sources;
3. Innovation strategies implemented by the company;

II. The development of new high-tech products

1. The role of research and development activity within the company;
2. Particularities of high-tech products' assimilation and launch on the market;

3. High technology product strategy adapted to the consumers' segments;

III. The high tech consumer behaviour

1. Main characteristics of the purchasing decisions made by the company's customers;

2. The factors affecting the adoption of innovation outcomes proposed by the company;

3. An example of success product and an example of failure produced by the company.

IV. Characteristics of the market and the marketing mix for high tech products

1. The company's marketing decisions about segmentation, positioning and targeting the markets of high technology product consumers;

2. Specific aspects of pricing policy and strategies of the company;

3. Distribution channels used by the high technology company;

4. Marketing communication tools for high technology markets used by the company.

Four of the seven interviews were recorded using a tape recorder and were later transcribed and processed. The other three interviews responses were noted by the moderator during the meeting and were then processed according to the principles of content analysis (Lefter, 2004).

The manager responses were centralized in an analysis grid.

The results analysis and interpretation

The vertical analysis of the interviews

The vertical analysis allows knowing how each manager approached the interview's themes and sub-themes.

The *first manager* believes that the innovation process brings only benefits to the company, beginning with the competitive advantage, and the

implementation of innovation process increases the sales and the company's revenue. The types of existing innovations within the company are: product innovation, services innovation and business solutions innovation, designed differently for each category of consumers. The company chose to use the concept of open innovation, working primarily with consumer behaviour research centres and research laboratories.

The concept of Open Innovation is based on the idea that the organization can't perform with own forces all the research and development activity, so it must exploit the external knowledge that can be purchased. The company applying open innovation develop research projects, but also has access to external projects and could benefit from those results. And in turn, the organization delivers ideas from research and development projects to the external environment. (Chesbrough, 2003).

The main innovation strategies implemented by the company are: innovation strategy differentiated on consumer segments, product types and geographic areas, and integrated systems innovation strategy. The company management believes that a partial innovation of the goods or services is not sufficient, it is necessary to create innovative solutions for customers.

For this company the R&D activity is very important. It has centres and laboratories in various parts of the world: Japan, China, North America, and Europe. The work focuses on specific areas of study: individual consumer behaviour, organizational consumer behaviour, environmental issues. For the assimilation and launch of new products on the market, the company has forged alliances and strategic partnerships for know-how, infrastructure, product development, distribution networks, etc. The company

aims to create flexible product platforms and to obtain eco products which could be recycled after use. High-tech product strategies used by the company are: new global product development strategy, product development strategy for different consumer segments, the integrated solutions strategy.

According to the manager, there are three coordinates depending on which consumers choose high-tech products they buy: eco lifestyle, a safe living and permanent connectivity with other people. On the other hand, consumers choose products by brand and price, and payment methods. The manager believes that the adoption of innovation results may be affected by: the product impact on the environment, the safety and comfort offered to the consumers while using the product, purchasing power of consumers, their desire "to be fashionable" and not finally, the age. In these circumstances, Plasma 3D TV was a success on the market due to the user friendly interface, and the digital cordless phone KX-TG 9333T was a failure, consumers considering it difficult to use and accompanied by insufficient documentation.

Regarding the company's marketing activities, the main concern for the company is finding new markets as well as creating new markets by attracting new consumers for the innovative products. The particularities of the company's marketing mix consists of a price policy established by cost, competition and economic circumstances, a strategy of selective distribution through networks of value-added dealers, distributors and authorized representatives by region and policy promotion based on PR and sponsorship activities, especially in sport, as well as internet communication.

The second manager states that the innovation process "has an incalculable potential but the change

involves risks which must be assumed and a possible failure." The company chose the Open Innovation model based on multiple partnerships and exchanges of experience for product innovation or technology innovation. The main sources of innovation are: customers, employees, universities and industry organizations. The innovation strategies designed by the company are: continuous innovation strategy, creative platforms strategy and the strategy of adjusting design with functionality.

The manager believes that research and development activity is essential for the company, a fact proved by the existence of the 17 research centres on customer satisfaction, over 100 research universities commitments, annual investment in research and development of \$ 6 billion and annual production of over 2500 patents. Another concern for the company is to generate cutting-edge ideas, to assimilate products that consume energy efficiently and selectively launch these products in some retailers' stores. In terms of product strategy, the company applies leader strategy on different segments and the strategy of developing services for innovative products.

According to the manager, the consumer purchasing decisions on high-tech products is based on their entertainment desire and interactivity with the products, but only if these products do not harm the environment. The factors affecting the adoption of innovation outcomes are: the early adopters opinions, "brave consumers, very determined about what they like" and the experience of consumers using the product. This is why HD LED TV was a success through quality and high functionality and Full QWERTY phone had become a failure due to the difficulty of use.

The company's marketing activities aimed a continuous interaction with

consumers through various methods for identifying their motivations and perceptions about high-tech products. Also, efforts are made to create consumer awareness about the brand and for repositioning all products to raise standards in terms of technology and design.

Regarding the marketing mix, the company has implemented a strategy of increase prices after repositioning its products to match this price level with the quality. The company chose the selective distribution strategy, depending on consumer preferences for certain retailers. The promotional tools used for both corporate image and new high-tech products are: sponsoring events and sports teams, PR and CSR actions considered by the manager "crisis strategy", and advertising in media and on the internet.

The third manager claims that the innovation process enables the company to conquer markets, to become a leader in these markets, to create new values and to better meet the consumer demands. The company opted for several forms of innovation (product, process and technology innovation) based on the concept of open innovation. Thus, the main innovation sources are the company's employees and partner organizations. Once adopted the innovation process, the strategies applied by the company became: product differentiation strategy, the development of unique products, and "creative solutions" strategy which combine technology with customer needs.

The manager claims that the company's research and development activity contribute to its status as a leader in innovation and aims primarily to develop high-tech products. The company has a global research system with 30 centres where efforts are made to find new products more rapidly than the competition. The assimilation of these products and their launch on the

market is made with a high speed, pursuing their standardization if the market accepts them. The main product strategies applied by the company are: the strategy of unique products with exceptional performance, "green" product strategy, strategy of selection and concentration on specific product categories.

According to the manager, the decision to purchase high-tech products arises from the emotional contact between the customer and the desired product and the company. This decision is supported by the company's assistance and support received by the consumer. The main factors affecting the adoption of innovation outcomes are: the extent to which the products meet customer expectations and needs, the extent to which the products facilitate their livelihood and make it more beautiful, the extent to which consumers are involved in products creation, the extent to which personal safety is guaranteed during product utilisation.

The company's marketing activities are focused on: research of consumers' lifestyles, targeting markets in developing countries, geographical segmentation based on culture and consumer behaviour, repositioning the company's products as luxury items. The main pricing strategies used by the company are: high price strategy because of the luxury products and the standardized prices strategy for retailers. Regarding distribution policy, the company prefers to have a strong control of distribution channels, placing products through dealer networks and representatives only in big cities in each country. As marketing communication tools are used: outdoor advertising, advertising media, newsletter via internet, PR activities, sponsoring events and organizing locally and globally exhibitions.

The fourth manager believes that the innovation support the company to

become globally competitive through the transformation and restructuring, but this process is difficult because "a singular company can not control an entire technology by itself". The types of innovation existing within this company are: product innovation, process innovation and technological innovation, and sources of innovation are: strategic partnerships with high-tech organizations interested in obtaining the best results. Innovation strategies applied by the company are outlined in the medium and long term and consider permanently protecting the environment.

The research and development activity takes place in centres strategically placed all over the world, each study centre focusing on local markets. For assimilation of new high technology products the company analyse the market trends and strategically allocate resources for finding new solutions. The company have partnerships with various organizations or purchases them to develop new products. Under these conditions, the developed product strategies aim: new products development, product diversification and continuous improvement of their quality.

According to the manager, the consumer takes the buying decisions pretty hard and "only after he understood the product", weighing the risks and assuming them. The decision is based primarily on the quantity and quality of available information about products. The adoption of innovation by consumers is mainly influenced by the extent to which the experience of searching and purchasing the product was easy and pleasant. Also is influenced by the quick understanding of product benefits and the concerns about the degree to which the product will be used. A good example of product accepted by the consumers is the laptop, perceived by them as a product

for the whole family, easy to use and having a fair price-performance ratio. A negative example is Blu Ray Disc player that has not been considered necessary by consumers.

The marketing activities developed by the company are quite aggressive in the manager's opinion. They focus on direct research on consumer behaviour and studies for customer segmentation and products positioning. For new high-tech products, the company generally applies the skimming strategy as price strategy. The distribution channels used by the company are: the short channel producer - consumer through online store and the channel with intermediaries consisting of dealers, distributors, sales representatives. Promotion activity is based mainly on personal selling and advertising to the point of sale, PR activities, participation in trades and exhibitions, and online communication.

The fifth manager believes that the innovation process improves the firm performance helping it to gain the leader position. In other words, innovation "makes the difference between companies". This company is based on open innovation model to develop new products. The sources of innovation come from academic environment, industry, social environment (social networking). The company traces innovation strategies which aims product diversification in terms of protecting the environment.

The research and development activity has an important role for the company and focuses on studying the consumer lifestyles and health issues for the development of new technologies. Also, it focuses on investigating the potential areas of development for the organization. Regarding assimilation, the manager claims that an essential condition for success is that "new products must be compatible with the previous ones and with those that will come". The

developments and transformations must be performed simultaneously and not linear. For the company it is also important the assimilation of products with a reduced negative impact on the environment. The product strategies used by high-tech company focus on developing new products, definitely recyclable, and the development and improvement of design.

According to the manager, the decision to purchase high-tech product is taken according to the priorities, values, aspirations, preferences and aversions. Today, the consumers are individualistic and make decisions after being well informed about the issues they are interested in. The factors affecting the adoption of innovation results are: inconsistent and unpredictable consumer behaviour and their desire to be unique, and the extent to which products save energy and affect the environment. These factors have made the difference between the company's successful products such as Home Cinema or DVD player, or failures - 3D TV has been accepted for only 3% of consumers.

Through the marketing activities, the company seeks to increase market share, encourage preference for the company's products, segmentation based on different criteria (customer loyalty, geographic area). The price strategies applied by the company are: flexible pricing strategy, pricing strategy differentiated by region or product version, pricing strategies for product-service packages. For products distribution, the company use its own distribution networks or business partners networks. The products are sold through authorized distributors both locally and through online stores. Marketing communication is done through promotion at the point of sale and in-store events, through loyalty programs in partnership with hypermarkets, sponsorships and promotion through the media channels.

According to the sixth manager, the innovation process help creating business opportunities and new experiences for consumers. Also, this process makes the company more flexible, competitive and successful. On the other hand, the manager states that "the failure is a part of the innovation process, too." The types of innovations practiced by the company are: product innovation, process and technology innovation and the sources of innovation are: the business partners and the company's innovation centre. Once started the innovation process, the company has outlined some innovation strategies: accelerate innovation strategy, product miniaturization strategy, innovation leader strategy.

Through the research and development activity the company aims to create new values based on combining the concepts of "inspiration" and "shared experience". It attaches a big importance to the planning stages of new products and the establishment of their design. New product launches on the market are dynamic and include product lines. The company's products are designed taking into account strategies as: the strategy of alignment the products to the consumer global requirements, product diversification strategy, design development strategy, the strategy of product differentiation from the competition.

The manager believes that the decision of purchasing high-tech products take into account the available information about products and company and the support the consumer receives in the pre-sale phase. The extent to which innovation outcomes are adopted by consumers depends on factors such as: the consumer perceived risk in product adoption, the product complexity, the compatibility with existing products, product testing opportunity. These factors had a positive influence for the adoption of

PlayStation 3, which is considered a success due to its features and benefits it offers, and negatively influenced the adoption of a gadget - E-maker which was recognizing songs played on radio and was storing them. This product was a failure because consumers did not consider it useful and they didn't buy it.

The manager mentioned as the main marketing activities of the company: identifying new categories of consumers, entering new markets aggressively, providing new experiences for consumers, product positioning by differentiation from competition by adding value.

Regarding the particularities of the marketing mix, the company chose the skimming price strategy and high prices strategy. The distribution policy determined a selective approach of targeted markets and then their intensive coverage. The distribution channel most widely used is manufacturer - retailer - consumer. The promotion of company's products are accomplished by PR, promotion to the point of sale and paid advertising.

From the seventh manager point of view, the innovation process contributes to set new standards of performance and to accelerate the changes within the company. The manager believes that open innovation is the best solution for the company's survival in a strong competitive environment. In addition to different types of innovation (product innovation, process and technological innovation), the company aims the innovation of the relationship with the consumer. The sources of innovations are business partners, research institutes and industry organizations. The most important innovation strategies implemented by the company are: total innovation strategy (eco-systems consisting of products, services and relationships with partners) and differentiated innovation strategy (on products, services, experiences).

In the R&D activity for this company are involved 17,000 employees from 13 research centres worldwide and universities and other research institutes. Regarding the assimilation of new high-tech products, the company try to achieve quality and speed in product execution. The product strategies that the company decided to apply are: the strategy of products and services packages, the customized solutions strategy, the sustainable product strategy, the strategy portfolio excellence, the strategy of product differentiation.

According to this manager, the main features of the decision to purchase high-tech products are: consumers need to communicate and the need to be in constant contact with others. In making this decision, the consumer takes into account the product price and quality, as well as the direct relationship with the company. The factors affecting the adoption of innovation outcomes are, according to this manager: the unique and individualistic nature of consumers, the extent to which the benefits of technology are highlighted, the personal experience perceived by consumers. Under these conditions, a successful product on the market is an innovative mobile phone with a nice design and easy to use, and a failure is the mobile product difficult to use and equipped with too many functions that don't prove their usefulness.

The company's marketing activities focus on the market exploration for new products development, new platforms and new experiences, positioning the products different from competition, a better market coverage with the company's products. The product prices are fixed according to costs and competition. The pricing strategies used by the company, are: the market penetration strategy or skimming price strategy. The company prefers to use its own distribution network for product

placement or retailers who sell only the company's products. Marketing communication tools used by the company are: actions supported by PR, customer loyalty programs, advertising campaigns and direct marketing.

The horizontal analysis of the interviews

The horizontal analysis of the interviews was realised by approaching each theme and sub-themes included in the interview guide by all seven managers.

Theme 1: The innovation process within the company

The interviewed managers consider that the adoption of the innovation process in a high-tech company gives it major advantages: "innovation make the difference between the markets", improves company's performance, contributes to accelerating changes and create new values inside it, supports the company to become flexible and globally competitive, to conquer new markets and then to become a leader on those markets. Less than half of the managers admit that the innovation process could be difficult for the company: the risks of change are high and may lead to failure which must be accepted, innovation requires new technologies and processes that are difficult to control by only one company.

Most high-tech companies have adopted the concept of "open innovation", a way of assimilating new technologies and new processes to develop innovative products. The elements that led to the open innovation model are, among others: the existence of competent employees who have significant knowledge and their availability to the geographical and functional mobility, a bigger importance of the suppliers' role in the development of innovation process, the increased number of alliances and partnerships to

develop ideas and technologies. (<http://www.openinnovation.eu/openinnovation.php>).

The main types of innovation for high-tech companies are: product innovation, process innovation and technology innovation. The managers claim that there are many sources of innovation inside the company (employees) and outside it (customers, business partners, universities, research institutes and laboratories).

The innovation strategies for each high-tech company are tailored according to the customer segments, according to the geographical areas where the company operate, or the types of products that will be developed. The most used strategies are: the creative platform strategy, the creative solutions strategy, the continuous innovation strategy, the product miniaturization strategy, innovation strategy in line with environmental protection, partial or total innovation strategy etc.

Theme 2: New high-tech products development

According to all seven managers, R&D activity is essential to the high-tech companies' success. Globally, each company has in strategic zones, research centres for consumer behaviour and customer satisfaction, laboratories for product development and design concepts.

For the assimilation of new products the companies make partnerships and strategic alliances to obtain know-how, technology, procedures, infrastructure, etc. There is a concern for creating flexible platforms and products which do not affect the environment (either during their production or during the use). A very important element in the competitive environment is the speed and frequency with which new products are launched on the market, without being ignored the quality aspects. One of the managers

said that the solution for assimilation and launch new products which will not become failures is the following: "the new products must be compatible with their previous ones but also with those that will come."

The product strategies used in high-tech companies are: new global product strategy, the integrated solutions strategy, high customized solutions strategy, the strategy of unique products with exceptional performance, "green" product strategy, the selection and focus on certain product categories, the strategy of product and related services packages etc.

Theme 3: High-tech consumers' behaviour

According to the managers, high-tech consumers' behaviour is highly unpredictable and sometimes confusing. Purchasing decisions of high-tech products are influenced by emotional connection that the consumer establishes with the products and the company, the support and assistance that the company provides in the phase of information gathering and product testing. The purchase decisions are taken according to the customers' aspirations, values, perceptions, priorities and preferences. One of the managers considers that there are three concepts at the base of purchasing decisions: eco lifestyle, safe living and lifestyle in a permanent connection with others. From the perspective of another manager, consumers take purchase decisions only after they are sure that they understand the product, they have weighed the risks and they want to assume them.

The factors affecting the adoption of innovation outcomes are usually: the extent to which the products meet customer expectations and needs, the extent to which the products facilitate their livelihood and make it more beautiful, the extent to which consumers

are involved in products creation, the extent to which personal safety is guaranteed during product use, issues related to product complexity, compatibility with existing products, product testing opportunity, the extent to which the products save energy and they are environmentally friendly, and not the least the early adopters' opinions about their first experience using high-tech products.

In these circumstances, the managers gave examples of high-tech products which have been successful in the markets, because they proved their utility to the consumers and so they have been adopted. On the other hand, were given as examples some products that have become failures due to lack of interest that consumers have shown towards them, despite they were innovative products created with leading edge technology.

Theme 4: Characteristics of the market and the marketing mix for high tech products

In terms of marketing activities developed by the high-tech companies, the managers say they show concern for: consumer behaviour researches and lifestyle researches, customer segmentation and products positioning studies, creation of new markets for innovative products or targeting the existing markets, repositioning of products where they are required. Overall, the marketing activities on the high-tech market are aggressive due to the strong competition.

The marketing mix established by each company for its products have certain features. In terms of pricing policy, the pricing decisions are made based on cost, competition and economic situation and the most used pricing strategies are: skimming price strategy, high price strategy (for repositioned products) the strategy of standardized prices for retailers, market

penetration strategy or discounts strategy.

The distribution channels mostly used by high-tech companies are: the direct channel (producer - consumer) through virtual stores, or indirect channel, which includes intermediaries. Generally, the producer wants to have a high control of the distribution channel by selecting the channel members based on specific criteria.

Regarding the promotion of high technology products, companies mainly use the PR actions, sponsorships (especially in sports), the organization of events and presentations, participation in trades and exhibitions. Also, the internet is a powerful marketing communication tool that all companies consider very effective.

The limits of qualitative marketing research

This research method – in-depth interview - has some limitations determined by the respondents or by the organization of interviews:

- Relatively short interviews (maximum 40 minutes) determined by the respondents' lack of time;
- Insufficient details about some important aspects due to information confidentiality;
- Possible errors related to the data processing.

Conclusions

The qualitative marketing research provided relevant information about marketing decisions taken by managers from high-tech. The research objectives are fully achieved. There were identified the *main types of existing innovations* inside the analyzed companies: product innovation, process innovation and technology innovation. There were determined the *innovation strategies* applied by these companies: creative platform strategy, creative solutions strategy, continuous innovation strategy, product miniaturization

strategy, innovation strategy in line with environmental protection, partial or total innovation strategy etc.

R&D activity is essential to the companies' success in the high technology industry. Globally, each company has in strategic areas, research centres for consumer behaviour and customer satisfaction, laboratories for product development and design concepts.

For the *assimilation of new products* the companies make partnerships and strategic alliances with other high-tech companies to obtain know-how, technology, procedures, infrastructure, etc. There is a concern for creating flexible platforms and products which do not affect the environment (during their production or when they are used).

The *factors affecting the adoption of innovation* outcomes are: the extent to which products meet customer expectations and needs, the extent to which products facilitate consumers' life, the extent to which consumers are involved in products creation, the personal safety guaranteed during product use, issues related to product complexity, compatibility with existing products, product testing opportunity, and not the least early adopters opinions on high-tech products.

In terms of *marketing activities* developed by high-tech companies, the managers say they show concern for: consumer behaviour research and lifestyle research, customer segmentation and products positioning, creating new markets for innovative products, targeting existing markets, products repositioning where they are required. The marketing actions are aggressive on the high-tech markets due to strong competition.

The research hypotheses, previously outlined, are confirmed. From the seven high-tech companies, five are using the principles of Open Innovation model. All analyzed companies choose

to work with other organizations and institutions in research and development activity in order to create high-tech products and innovative services. For five of the seven companies, adopting a process of continuous innovation is a competitive advantage in the medium term. According to managers from high technology industry, the decision to purchase a high-tech product has a high degree of complexity and is based on criteria related to: the quantity and quality of available information about products, product quality, the assistance and support received by the consumer during the act of purchase, the customer's emotional connection with the product and company.

In conclusion, the companies which aim to be competitive must constantly innovate because high-tech products cross the life cycle stages faster than ordinary products, driven by the accelerate development of technology. Innovation can be understood as a creative opening towards exceptional ideas, as an activity of creating new or improved products and as a business strategy. Innovation

is present under various forms and manifestations and each organization is aware that only through innovation can adequately address to the market and the environment.

Innovations not only influence the company, but they can model the entire market - consumer needs, participants' structure, channels structure, the rules by which they operate. Innovation means not just creativity but profitable activities. Ideas can be quickly imitated, but what really makes the difference is their application in unusual ways.

It is also important that high-tech companies create a balance between technological and marketing orientation to achieve the competitive advantage and to provide more value to the customers. Marketing have to establish the context and appropriate infrastructure for successful innovation.

The role of marketing of high-technology products is to provide to the consumers and organizations the support for the acceptance and adoption of innovation and new technologies, and convince them that these products are in most cases, a safe investment.

REFERENCES

- Banbury, C., W. Mitchell (1995), "The effect of introducing important incremental innovations on market share and business survival", *Strategic Management Journal*, Vol.16, 161-182.
- Bridges, E., Coughlan, A.T., Kalish, S. (1991), "New Technology Adoption in in an Innovative Marketplace: Micro and Macro Level Decision Making Models", *International Journal of Forecasting*, nr.3, vol.7, 257-270.
- Chesgrough, H. (2003), "The Era of Open Innovation", *MIT Sloan Management Review*, vol.44, nr.3, 35-41.
- Cohen, W. M., D. A. Levinthal (1990) "Absorptive Capacity: a new perspective on learning and innovation", *Administrative Science Quarterly* 35, 128-152.
- Dunn, D., J. Hulak, J. S. White (1999) "Segmenting high tech markets: a value added taxonomy", *Marketing Intelligence and Planning*, 17 (4), 186-191.
- Dunn, D. T. (2003) "Marketing High Tech Services", *Review of Business* (winter), 10-17.
- Easingwood, C., S. Harrington (2002) "Launching and re-launching high technology products", *Technovation* 22, 657-666.

- Hyde, R., *Key Issues in High-Tech Marketing*, disponibil online la [www.3rdperspective.com/documents/ KeyIssues HighTech Marketing.doc](http://www.3rdperspective.com/documents/KeyIssuesHighTechMarketing.doc).
- Kalb, I.S. (1997) *Fundamentals of high-technology marketing (What marketers need to know)*, K&A Press.
- Lefter, C. (2004), *Cercetarea de marketing. Teorie și Aplicații*, Infomarket.
- Leifer, R., McDermott, C.M., Colarelli O'Connor, G., Peters, L.S., Rice, M., Veryzer, R.W., (2000) *Radical Innovation-How Mature Companies Can Outsmart Up Starts*, Harvard Business School Press, Boston Mass.
- McDade, S. R., T. A. Oliva, J. A. Pirsch (2002) "The organisational adoption of high technology products "for use". Effects of size, preferences and radicalness of impact", *Industrial Marketing Management* 31, 441-456.
- McGrath, R. G., I. C. MacMillan (2000) "Assessing Technology Projects using real options reasoning", *Research technology Management*, July-Aug, 35.
- Mick, D. G., S. Fournier (1998) "Paradoxes of technology: Consumer cognizance, emotions and coping strategies", *Journal of Consumer Research*, 25, sept., 123-143.
- Mohr, J. (2001) *Marketing of high-technology products and innovations*, Upper Saddle River, NJ: Prentice Hall.
- Mohr, J., S. Sengupta, S. Slater (2005) *Marketing of high-technology products and innovations (2nd ed.)*, Pearson Education Inc.
- Moore, G.A. (1991) *Crossing the Chasm*, HarperCollins Publisher.
- Moriarty, R. T., & Kosnik, T. J. (1989) "High-tech marketing: Concepts, continuity, and change". *Sloan Management Review*, 30, summer.
- Phillips, F., L. Ochs, M. Schrock (1999) "The product is dead - long live the product - service!", *Research Technology Management*, july-aug., 51-56.
- Reddy, A.C. (1997) *The emerging high-tech consumer (A market profile and marketing strategy implications)*, Greenwood Publishing Inc.: Westport,
- Rosen, D.E., Schroeder, J.E., Puriton, E.F. (1998), "Marketing High Tech Products: Lessons in Customer Focus from the Marketplace", *Academy of Marketing Science Review*, vol.6, available online at <http://www.amsreview.org/articles/rosen06-1998.pdf>
- Sahadev, S., Jayachandran, S. (2004), "Managing the distribution channels for high-technology products", *European Journal of Marketing*, vol. 38, no.1/2, 121-149.
- Shanklin, W. L., J.K. Ryans (1984) "Organizing for high-tech marketing", *Harvard Business Review*, 62, nov.-dec., 164-171.
- Shanklin, W. L., J.K. Ryans (1987), *Essentials of marketing high technology*, D.C. Heath and Company.
- Traynor, K., S. Traynor (2004) "A comparison of marketing approaches used by high tech firms: 1985 vs 2001", *Industrial Marketing Management* 33, 457-461.
- Viardot, E. (2004) *Successful marketing strategy for high-tech firms*, Artech House Publishers.
- Ordinance no. 21/1992 regarding consumers' protection (published in Official Monitor no. 212/1992);
- <http://www.openinnovation.eu/openinnovatie.php>.
- www.oecd.org