Technology-Based Marketing (TBM): A New Competitive Approach for High-Tech Industries

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Abstract

This paper presents an innovative competitive approach for high-tech industries, named Technology Based Marketing (TBM). This approach is compared with other eight business approaches. Nowadays, competition is changing and becoming more dynamic and therefore more difficult. Hence, technology can be leveraged to a source of competitiveness. With the TBM approach, three types of technology can be leveraged - product, production, and management. The success of the TBM approach depends on certain conditions, only some of which are controlled by the firm. Managers are forced to cope with conditions of uncertainty, both marketing and technological uncertainty. Although marketing uncertainty is unavoidable, technological uncertainty can be reduced. Adopting TBM enhances the ability to cope with uncertainty in order to achieve the firm's goals.

Keywords: Competitiveness, advantage, technology, marketing, business approach, strategy, global firms.

Introduction

Across the world, nations and firms are becoming progressively more sophisticated and well-educated. All markets increasingly demand innovative, higher quality products and services due to the pressure for change. Innovative products, processes and management methods are spreading rapidly across the globe (Balwin et al. 1997). Players from low cost economies — can create hyper competition using new technologies, skilled people and mobile capital (D’Aveni and Gunther, 1995).

Electronic commerce is radically changing the way business meets customers’ demands (Totty 2003). Managers in high-tech industries are now more than ever confronted with the question - how to compete successfully in the global, dynamic technological reality? Hence, managers are looking to enhance their firm’s competitiveness, or in other words, to create a competitive advantage.

New perspectives are emerging on classical meaning of competitiveness. Competitiveness is the ability to compete (Ajitabh & Momaya, 2004) and Porter (1985) defines competitive advantage as the ability to create and sustain superior performance. Competitiveness can be defined at a country level as “the ability of a country to create added value and thus increase national wealth”, as was done, also at the national level, for the Reagan administration in 1984 (Cho & Moon, 2005).

Competitiveness is the ability to cause customers, current and new, to prefer the firm’s offers (products and services). It is important to draw a distinction between the firm’s competitiveness and its strengths, as reflected in Andrews’ SWOT model (1971). Competitiveness that produces various kinds of values for customers is always based on marketing significance and strengths. Although marketing significance can change with circumstances, strengths are not always under management’s control but, management may have an impact on them. It is important to emphasize that variables such as market share, company reputation, R&D capacity can all serve as measurements of firm’s competitiveness.

Over fifty years ago, the Dead Sea Works (DSW) was granted an exclusive franchise by the State of Israel to exploit raw material from the Dead Sea. For decades, it was the company’s main strength, but over time many other firms gained access to the raw material of the Dead Sea. This situation has forced DSW to look for other source of competitiveness. DSW offers their target markets various derivatives of Dead Sea raw material, exploiting their unique technological knowledge and ability to improve their products continuously.

Internet technology diminished the effectiveness of 230 year-old Encyclopedia Britannica’s principal marketing strengths % market share, customer satisfaction, pricing, innovation and distribution. Once it established an internet site, its source of competitiveness was renewed.

In many cases, traditional models and approaches are not suitable for the new environment, which is characterized by innovations and technological advances with relevant regulations (Karin & Preiss, 2002). If, during the 1990s, demand for technological solutions outstripped supply and investors put unprecedented faith in the developers upfront, the past five years of the twenty-first century have shown that the demand for technology is not devoid of marketing...
significance. A firm launching any sort of technological innovation on the market must convince the market of its benefit.

**A New Approach**

The Technology–Based Marketing (TBM) approach (Karin, 2003) is aimed at helping firms in their vital mission - enhancing the competitiveness needed to operate successfully in rapidly changing markets. TBM integrates the two key areas in a firm - marketing and technology. Marketing deals with the firm’s relations with the business environment and is aimed at responding to customers’ needs in a way that increases profits for the firm. Technology implements scientific principles in specific areas, draws on applied knowledge, and is intended to make a significant contribution to the firm’s competitive advantage. The TBM approach refines the marketing approaches that have predominated since the 1950s, with additional leverage stemming from the technology which will assist in achieving firm’s goals. With the TBM approach, three types of technology can be leveraged - product, production, and management.

**Six examples, with three different types of technology**

Intel, which won the title “an amazing profit machine” (Kirkpatrick, 1997), is an example of a firm that leverages product technology. From 1965 onwards, every 18 months Intel has doubled the number of transistors in each new processor it brings to market. Intel’s processor, which was proven to be technologically supreme, became an attracting product (buyers demand ‘Intel inside’) and by the mid-90s was installed in over 80% of PCs across the world.

Otis Elevator Company upped its product technology by making its elevators smarter. Instead of pressing twice, outside and inside the elevator, the rider simply keys in the location floor once on a centralized panel. The panel tells the rider which elevator will take him to the requested floor. With this simple change in the command technology Otis has turned every elevator into an express. This remarkable differentiator means a speedier ride and fewer elevators for buildings with a given density of people (Godin 2003).

Toyota, Japan’s leading automotive manufacturer, leverages manufacturing technologies such as CAD/CAM, digital control and robotics. Toyota managed to develop a minivan within nineteen months - eight months less than was formerly necessary. Using advanced design technologies and manufacturing technologies enables their integration and contributes significantly to enhanced efficiency. Toyota has thus managed to preserve its worldwide competitive advantage, even when the yen is strong and despite the fact that its production facility is located in Japan (Bemer & Dawson, 2003).

Manufacturing technologies often cause manufacturing processes to be so efficient that replacing products becomes cheaper than repairing them. Hard goods do not last as long as formerly. It is frequently cheaper, faster and easier as well as time- and money-saving to buy and install a new product than to repair it. The resulting culture is one that uses and accepts disposable products. Electrical appliances such as television sets or VCR used to last seven or eight years but now are replaced every two or three years (Kotler & Trias de Bes, 2003 p. 7).

Cisco, the top manufacturer of routers and switches for internet networks, leverages management technology by effecting 85% of its sales with the help of internet technology. Each year, Cisco saves over 500 million dollars by employing four types of online operations – producing updated training-guides with high frequency, distributing software, customer support, and personnel recruitment. Cisco put together a knowledge-base of FAQs on its Web site and estimates that it handles about 80 percent of the close to four million requests per month for information, saving the company $250 million annually (Corcoran, 2000)

eBay, as stated in its corporate mission, is helping people trading practically anything by leveraging management technology. Consumer trust is the key element of eBay’s success in creating an exchange of $20 billion of goods in 2003. By exploiting the Internet technology, eBay supports commerce between millions of anonymous buyers and sellers, as well as tracking and publishing the reputation of both buyers and sellers on the basis of feedback from each transaction, all made possible by carefully exercising its available technology (Hof, 2003).

**Mode of Implementation**

When an innovative technology, like three-dimensional television or nanotechnology, is launched on the market, TBM is enlisted to create awareness to the technology’s accessibility and its inherent options for various products and uses. In contrast, when awareness and a positive attitude towards an innovative technology already exists, for example – antilock braking systems (ABS) for cars – the TBM approach is less important, since consumers are already demanding products based on it.

The success of the TBM approach depends on certain conditions, only some of which are controlled by the firm:

- Generating awareness among consumers to the innovative technology
- Consumers’ skills, in terms of age and education, in assimilating the technology
- Consumers’ willingness to adopt the technology
- Consumers’ ability to pay for the technology.
Dealing with Uncertainty

Managers are forced to cope with conditions of uncertainty because they exercise only partial control over success factors. Two types of uncertainty are notable in the high-tech industry sphere – marketing uncertainty and technological uncertainty (Gardner, 1990). The former stems from the fact that the market’s experience concerning the innovative technology, which is presented for a short time only, is limited. For example, it may not be clear which needs - out of a possibly wide range - will actually be met by the technology, and how those needs are likely to change over time (Moriarty, 1989). Marketing uncertainty is unavoidable, because a technology-intensive market is part of a dynamic business environment – that is, it possesses constantly-changing characteristics. Technological uncertainty is linked to marketing uncertainty, but can be reduced by means of intensified learning, understanding and experience. This is due to the fact that the scientific principles inherent in a certain technology do not change, but our understanding of them changes – an understanding that deepens with learning and experience: for example, when we grasp the functioning of an existing or new product that is based on an innovative technology. Any industry whose principal (new) product includes information cannot take the time to undertake conventional planning processes, thus it has to function under higher level of uncertainty (Downes, 1997).

Other Approaches

Marketing theory consists of various approaches referring to company orientations toward the marketplace - production, product, selling, marketing, customer, moves, lateral, and holistic.

Production approach: This concept holds that buyers prefer products and services that are widely available and inexpensive. Managers of production-oriented businesses concentrate on achieving high production efficiency, low costs, and mass distribution. In a huge market like China, where the labor pool is inexpensive and the firm wants to expand its share, the production approach can be adopted (Marketing Week, 2003). A firm’s competitiveness stems from the wide availability of its products and inexpensive prices as perceived by the target market, and as compared to its competitors.

Product approach: This concept holds that buyers prefer products offering the best quality and performance, or innovative features. Producers focus on making superior products and improving them over time. The product approach can lead to “marketing myopia” (Levitt, 1960). The firm’s competitiveness stems from its ability to offer superior products as compared to the competitors. When superiority is objective (not what customers think but what nature and physics determine), like in racing-car competitions, there is stronger justification for adopting this approach.

Selling Approach: This concept focuses on the seller’s needs. It assumes that buyers will not buy enough of the products and therefore producers must undertake aggressive selling and promotion efforts. In other words, to obtain greater profits they must sell more to more people, more often, and for more money (Bruce, 1999). The selling concept is practiced most aggressively with unsought goods that consumers normally do not think of buying. The firm’s competitiveness stems from the ability of its sales force to take many orders and create a very high sales volume.

Marketing Approach: This concept holds that the key to achieving the firm’s goals consists of being more effective than competitors in creating, delivering, and communicating superior customer value to its chosen target markets. The focus is on the customer’s needs and the firm must satisfy them by offering the right products or services. Companies that practice both reactive and proactive marketing orientations are likely to be the most successful. The firm’s competitiveness stems from the ability to find the correct products for its customers and maximize their satisfaction (Homburg et al., 1999).

Customer Approach: This concept holds that buyers prefer separate offers, services and messages that are individually designed for them. Here, the firm’s competitiveness stems from its ability to adapt a customized – and, if possible, personalized - solution to each individual (Kahn, 1998).

The TBM approach refines the marketing approaches that have predominated since the 1950s, with additional leverage stemming from the technology which will assist in achieving firm’s goals.

This ability is made possible by accumulating substantial relevant information about each customer. This important resource is enhanced by three additional components - powerful IT systems, the ability to give the correct significance to the available information, and interactivity based on the customer’s good-will. It works best for products that need periodic replacement or upgrading, and are of high value.

Marketing Moves approach: This concept holds that buyers prefer firms that have adopted the sense-and-respond marketing mindset (Kotler et al., 2002: 26). They listen carefully to their consumers’ information concerning their specific requirements, the price they are willing to pay, and the way they want to receive the goods. As a result, firms must deal with two fundamental forces affecting their businesses - supply-side commoditisation, and demand-side customisation. The firm’s competitiveness stems from its ability to cope with the above-mentioned conflicting forces.

Lateral Marketing Approach: This concept holds that buyers prefer new types of satisfaction based on innovation (Kotler & Trias de Bes, 2003). Marketers themselves are facing a difficult challenge - how to innovate in a hypercompetitive, super-segmented marketplace. Customers seem to be immune from any sales promotion tool and perceive products to be homogeneous. Here the firm’s competitiveness stems from its ability to combine several product concepts into an offer that is searched and required.
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<th>Starting-point</th>
<th>Focus</th>
<th>Means</th>
<th>Source of Competitiveness</th>
<th>End</th>
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<td>Manufacturing ability</td>
<td>High production</td>
<td>Efficiency, mass distribution</td>
<td>Availability &amp; inexpensiveness. (of products)</td>
<td>Profits by huge turnovers</td>
</tr>
<tr>
<td>Product</td>
<td>Engineering ability</td>
<td>Product quality, performance, innovative features</td>
<td>Continuous improvement</td>
<td>Superiority of products, as compared to competitors’</td>
<td>Profits by selling products with high margin</td>
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<td>Factory</td>
<td>Products</td>
<td>Selling &amp; promotion</td>
<td>Ability to sell</td>
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<td>Target market</td>
<td>Customer needs</td>
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<td>Customer</td>
<td>Individual customer</td>
<td>Customer needs and values</td>
<td>One-to-one marketing integration and value chain</td>
<td>Ability of the firm to adapt an optimized solution for each individual customer</td>
<td>Profitable growth through capturing customer share, loyalty &amp; lifetime value</td>
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<tr>
<td>Marketing Moves</td>
<td>Individual customer requirements</td>
<td>Customer value, company’s core competencies and collaborative network</td>
<td>Database management and value chain integration linking collaborators</td>
<td>Ability of the firm to deal with the two conflicting fundamental forces affecting its business: supply-side commoditisation and demand-side customisation</td>
<td>Profitable growth through capturing customer share, loyalty &amp; lifetime value</td>
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<td>Lateral Marketing</td>
<td>Choosing two product concepts or ideas.</td>
<td>Enhancing customer benefits</td>
<td>Creating a new offering (not vertically)</td>
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<td>Firm’s micro-environment actors &amp; relevant macro-environment forces</td>
<td>Customer needs, values, wants and demands.</td>
<td>Four components of holistic marketing</td>
<td>Ability of the firm to give the correct relative weight to each of the four components</td>
<td>Profits by satisfying customer holistically</td>
</tr>
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<td>Technology Based Marketing</td>
<td>Understanding the technology in order to identify a target market</td>
<td>Customer needs, values, wants and demands</td>
<td>Leveraging the technology</td>
<td>Exploiting the technology to benefit the target market</td>
<td>Profits by customer satisfaction</td>
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</table>
by the market. Lateral marketing is different from vertical marketing in that it is based on seeking expansion by engaging with one or more unsatisfied needs (Actimel = nourishment + protection www.danone.com) or uses (cyber cafés = cafeteria + internet www.bn.com), or situations (cereal bars = cereal + snacking www.kelloggs.com).

**Holistic Marketing Approach:** This concept holds that buyers prefer firms with a more cohesive approach and that go beyond traditional applications of the marketing concept (Kotler & Keller, 2006: 16-23). A firm’s competitiveness stems from being able to give the correct relative weight to each of the four components of the approach: relationship marketing (Gummesson, 1999) aiming to build mutually long-term relationships with key parties; integrated marketing (Day, 1994), aspiring to build harmony between the marketing variables; and internal marketing (Webster, 1992), ensuring that everyone in the organisation embraces appropriate marketing principles, especially senior management. Social responsibility marketing (Greider, 2003) carefully considers the role that the firm plays in terms of social welfare.

**Comparison of the Nine Approaches**

The table 1 compares TBM with eight approaches - the well-known production, product, selling and marketing approaches, the customer approach (Kotler, 2003: 20; 26), lateral marketing approach, marketing moves approach and the holistic marketing approach.

**Lateral Marketing** Choosing two product concepts or ideas. Enhancing customer benefits Creating a new offering (not vertically) Ability of the firm to combine several product concepts required by the market. Profits by satisfying customers innovatively.

**Holistic Marketing** Firm’s micro- environment actors & relevant macro-environment forces Customer needs, values, wants and demands. Four components of holistic marketing. Ability of the firm to give the correct relative weight to each of the four components. Profits by satisfying customer holistically.

**Technology Based Marketing TBM** Understanding the technology in order to identify a target market Customer needs, values, wants and demands. Leveraging the technology Exploiting the technology to benefit the target market. Profits by customer satisfaction.

**An Example of Technology Based Global Competition with Different Levels of High-Tech.**

The TBM approach is demonstrated in the competition that takes place in the video console market between three different rivals: Nintendo-Wii Japan, Microsoft’s Xbox 360 USA, Sony PlayStation 3 Japan. (WSJ, 15/09/06). Nintendo-Wii strategy is to combine low price with Wii’s innovative features and games are an attempt by Nintendo to take the game industry in a different direction from its rivals. In other words, Nintendo-Wii hopes to capture new group of players with relatively low price based competitiveness (market development strategy). Nintendo-Wii is also exploiting its better production technology by being able to produce and ship more units to the U.S., which is the world’s largest game market. Sony and Microsoft will be focusing on powerful machine with cutting-edge product technology (graphics and sound). Nintendo is aware that its product is less advanced technologically but technology is not a target but only a mean to enhance competitiveness, considering expectations of target market.

**Implementation of the TBM Approach**

One of the most important point of view of an industry understanding is to investigate the existing competition. Learning is to what extent the types of technologies (product, production and management) are an important source of competitiveness. Using a competitive grid that concentrates on the technological aspects of the analyzed competition and that have a marketing significance in the eyes of the target markets. With the competitive grid technological information can be gathered, analyzed and then with the TBM approach give the marketing significance.

The tables below clarify the idea of implementing the TBM approach. The grid consists of a simple matrix where the competitor are listed in the first column and the subsequent columns compare the marketing significance of the three technologies.

<table>
<thead>
<tr>
<th>Competitors</th>
<th>Need to be Satisfied</th>
<th>Core Technology (non drastic)</th>
<th>Marketing Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry competitors &amp; potential entrants.</td>
<td>Reducing the appearance of fine lines and wrinkles</td>
<td>Various skin care creams</td>
<td>Conventional skin care treatment</td>
</tr>
<tr>
<td><a href="http://www.powercosmetics.com">www.powercosmetics.com</a></td>
<td>Reducing the appearance of fine lines and wrinkles</td>
<td>Micro-electronic, super-thin, flexible-non-toxic battery incorporated into a treatment patch.</td>
<td>Immediate results, leaving the skin feeling silky smooth and beautiful.</td>
</tr>
</tbody>
</table>
a product for several years and repairing it occasionally, we of durable goods is about to disappear. Instead of retaining made the business world so dynamic that the whole category everywhere, even if it is latent. Innovative technologies have to marketing, while TBM claims that technology is more socially responsible.

Effective and internal marketing presents more efficient marketing network; TBM makes integrated marketing more TBM can improve the firm's relationship marketing and its holistic orientation. TBM relates to all its four themes: constitutes, together with economy, psychology, and operation, the four dimensions of marketing. TBM mainly includes values, wants and demands as well. Technology tends to replace products as if they are all disposable goods. This is strengthened by the fact that almost all kinds of hardware are constantly getting cheaper. We are aiming toward the point where products will be free and we will pay only for their usage. An immediate outcome would be that owning a product no longer matters, what is important is the ability to use it as requested by the market.

In the business world, awareness is growing to the importance of the TBM approach for a firm's success in the high-tech industries. This approach, which calls for understanding the marketing significance of innovative technologies, helps managers who adopt it to cope with uncertainty in order to achieve the firm's targets. Future research has to consider important trends in the technological environment. Among the eminent trends are accelerating pace of change, unlimited opportunities for innovation, varying R&D budgets and increased regulation of technological change in marketing.

**Implications and Conclusions**

The TBM approach adopts a wider scope than the marketing concept. It expands from customer needs into a wider range that includes values, wants and demands as well. Technology constitutes, together with economy, psychology, and operation, the four dimensions of marketing. TBM mainly leverages technology – an existing or an innovative one – in order to satisfy customers and achieve the firm’s goals.

Of all approaches to the marketing, TBM is closest to the holistic orientation. TBM relates to all its four themes: TBM can improve the firm's relationship marketing and its marketing network; TBM makes integrated marketing more effective and internal marketing presents more efficient results. Finally, TBM assists the firm in its efforts to become more socially responsible.

Holistic marketing recognizes that everything is related to marketing, while TBM claims that technology is everywhere, even if it is latent. Innovative technologies have made the business world so dynamic that the whole category of durable goods is about to disappear. Instead of retaining a product for several years and repairing it occasionally, we tend to replace products as if they are all disposable goods. This is strengthened by the fact that almost all kinds of hardware are constantly getting cheaper. We are aiming toward the point where products will be free and we will pay only for their usage. An immediate outcome would be that owning a product no longer matters, what is important is the ability to use it as requested by the market.

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