

## The Role of Marketing Strategies in Successful Disruptive Technologies

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A disruptive technology (DT) is defined as an emerging technology whose arrival in the marketplace signifies the eventual displacement of the dominant technology in that sector. A potential DT can also facilitate the creation of new markets previously untapped or unserved by the existing products/services to address the unmet need. The identification and commercial success of a potential DT lie in understanding the market in terms of consumer behavior, developing new products/services, and subsequently developing innovative marketing strategies to promote them effectively to the target market. The purpose of this paper is to propose a set of strategies that might aid an organization to successfully market a DT (or a DT-intensive product/service). The proposed strategies are subsequently prioritized based upon empirical studies to determine their relative criticality for successful launch and sustenance of such products/services. The contribution of this paper to the domain of high-technology marketing is two-fold. First, the research conducted is expected to further socialize the notion that DT is unique among the marketing practitioners. Second, the proposed strategies along with their relative criticality will provide a set of guidelines to the decision-makers in the field of technology and marketing to gain a better understanding of DT marketing, which is fast gaining ground in an ever-intensifying competitive marketplace.

*Keywords:* Disruptive technology; disruptive technology marketing; emerging technology; high-technology marketing; technology marketing strategies.

### 1. Introduction

In the modern business environment, effectively responding to changing business conditions and global realities has become an inseparable part of an organization's

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growth and development strategy. Consumer tastes and preferences are changing, requiring organizations to keep reinventing themselves in response. The key to success of a company rests in its ability to constantly innovate as well as correctly assess the technologies that are significant to their growth, along with understanding the uncertainties or risks associated with their commercialization [Evans *et al.* (2009); Ganguly *et al.* (2011)]. However, the task becomes even more difficult owing to the need to constantly keep the customer at the heart of the activities.

The inability to achieve a breakthrough innovation, coupled with an improper assessment of technology on the part of an established incumbent firm, results in its eventual displacement by a new entrant bringing in a technology that renews or rejuvenates business opportunities [Ganguly *et al.* (2010); O'Connor *et al.* (2008)]. Christensen [1997], in his widely acclaimed book “*The Innovator’s Dilemma*”, illustrated this process and termed it as *disruptive technology*, which has become one of the most popular theories for explaining the plight of the incumbent firm facing a significant new technology [Lucas Jr. and Goh (2009)].

Disruptive technologies (or disruptive innovations, as sometimes referred to) are major renewal forces in the society as they present opportunities for economic growth, new solutions to unresolved problems, and overall benefits for multiple stakeholders [Lepomaki *et al.* (2011)]. The failure of an incumbent firm to embrace a technology which is disruptive, both from the viewpoint of a competitor and from that of an internal new product/service development, often signifies it being eventually getting displaced in the marketplace by the company that conceives and brings to market the disruptive technology (DT). Products/services arising out of DT target markets that are either unidentified by the existing technology or are available for completely new products [Linton (2002)], and have distinctive features that allow them to attract an exclusive set of customers [Huang and Sošić (2010)] that are not effectively served by the existing products, at the given time period.

A DT-based product/service creates new connections new-age retailers such as Amazon and Netflix did with the incorporation of the Internet in their business conditions in reaching their customers. The result was the emergence of e-commerce companies, displacing, or at least giving a tough fight to the incumbent companies dependent majorly on brick-and-mortar stores. However, all DT-based products/services do not succeed in the marketplace. It has been seen that a product/service arising out of a DT often fails in the market, primarily because of its inability to break up a pre-existing relationship between the customers and the incumbents [Obal (2013)]. One of the many possible reasons is a lack of effective marketing strategy for the technology on the part of the new entrant.

Technology marketing can be generally stated as a process toward the advancement of marketing practice of technologies and technology-intensive products/services. It is an important step toward product realization to have a proper linkage of technology and marketing. Technology marketing involves a comprehensive assessment of “not-yet-developed” or “to-be-developed” technologies with the intention of their position as a substitute to the incumbent or a new application altogether [Tschirky *et al.* (2000)]. It also involves many well-developed (and sometimes innovative) marketing skills that aid the technology to gain a firm foothold in the

market. Past research has also indicated that there is a positive relationship between innovation and a strong market orientation [Dutta *et al.* (1999); Mohr and Sarin (2009)]. This phenomenon can be stated to be especially true in case of a DT, where the product/service is expected to follow a different trajectory that is its incumbent counterparts. However, despite the critical importance that the concept of DT has gained over the years, there is still a void in the open literature related to commercialization/marketing a DT. This research is expected to shed some light on this important, but sparsely discussed topic.

The aim of this study is to propose a set of strategies that might enable the successful launch of a DT. The relative criticality of the identified strategies is also determined based upon survey results. The research begins with a detailed discussion of the underlying theoretical concepts. A section on research objective is followed by the research framework and methodologies. This is followed by proposing a set of strategies that will aid the practitioners toward successful marketing of disruptive technologies. The proposed strategies are then subsequently prioritized to assess their relative criticality. The paper concludes with recommendations based on the research findings along with providing possible directions for future research. The research contributes to the domain of technology management in the sense that the strategies developed along with their relative criticality are expected to provide a guideline to the technology marketers regarding the process of commercializing a DT.

## 2. Theoretical Exposition of the Concepts

### 2.1. Disruptive technology

DT can be defined as a new form of technology whose emergence in the market often signifies the eventual replacement of the market leader in that industry [Ganguly *et al.* (2010)]. Disruptive innovation happens in a process [Yu and Hang (2010)] and refers to an emerging technology having lower cost and performance measured by traditional criteria, but having higher ancillary performance [Christensen (1997); Utterback and Acee (2005)]; which, in the long-run, destroys an incumbent organization's business model by rendering it obsolete [Dyerson and Pilkington (2004)]. DT can be a combination of existing technologies or an entirely new technology by itself, whose application to problem areas might cause major paradigm shifts in technological products [Walsh and Linton (2000); Kostoff *et al.* (2004)]. Generally, the firm introducing the DT initially concentrates on a niche portion of the market that is the least attractive to the market incumbents [Christensen (1997); Hwang and Christensen (2008)]. However, with gradual advancement in time, the technology starts improving in the value chain and gradually starts getting embraced by the mainstream customers.

Products based on DT often operate in a different value network than their existing counterparts. Value network can be defined as "the context within which a firm establishes a cost structure and operating processes and works with suppliers and channel partners in order to respond profitably to common needs of a class of customers" [Christensen and Raynor (2003)]. It is usually observed that the initial

level of performance for a disruptive product/technology lies well below the value network demanded by the existing customer base, and therefore is neglected by the mainstream customer market. However, this new product/technology attracts the attention of a different set of customers, a set that were previously either under-served or over-served in the market [Christensen (1997); Christensen *et al.* (2004); Hwang and Christensen (2008); Ray and Ray (2011); Wu *et al.* (2010)]. With gradual advancement of time, it improves its performance to a level where the mainstream market segment finds their requirement being met by the DT. The DT, with time, finally reaches a point where it replaces the incumbent technology by surpassing it, thereby facilitating the mainstream customers to switch to the new technology. As a result, the market-incumbents often find themselves void of customers in the long-run and thus are no longer relevant in that market.

The success of a DT can be partially attributed to the fact that an incumbent firm might lack the architectural capability that is necessary to respond to adapting a DT [Roy (2014)]. Therefore, the success of a new entrant can be attributed to its flexibility and market agility, limited commitments to value networks and current technological paradigms [Dan and Chieh (2008)] and their ability to leverage the latent needs and contexts of mass markets [Ray and Ray (2010)]. All of these factors, combined together, can lead to a successful launch of a DT, which eventually might have the potential to capture the market by displacing the incumbent.

In conclusion, it should be stated that there has been numerous anecdotes exhibiting that DTs actually create altogether new industries that might replace the old markets [Walsh and Kirchoff (2000)], following the theory of “creative destruction”, advocated by Schumpeter [1942]. Therefore, a proper analysis of a DT can prove to be far more lucrative for the new entrant than just gaining in market share. It can, over time, elevate the new entrant to the status of the market leader.

## 2.2. Marketing a disruptive technology

Marketing has a very important role to play in the success of all products/services. A new entrant based upon a DT-related product often faces a challenging time in marketing its products or services. The primary objective of any disruptive marketer is to exploit and create change in consumer behavior. The challenge is multifold since this has to be done in the context of a typically emerging product/service, with a substantial risk and time pressure. This necessitates a very carefully-planned timing to market, and meticulous launch and diffusion executions. Given these characteristics, some theorists argue that new and small firms are better-suited to commercialize DTs. Walsh *et al.* [2002], in their seminal work on commercializing a DT, suggested that established firms rarely commercialize DTs and they prefer to use their time-tested market-pull strategies to accomplish this. On the contrary, new firms are more comfortable in pursuing a DT and choose either market-pull or technology-push strategies for commercialization.

DT markets are characterized as being complex and dynamic. These characteristics are sometimes overlooked by the incumbents, who often rely on a product focus [Dugal and Schroeder (1995); Marcus and Segal (1989)], rather than by the needs and

wants of the customer. This has a huge strategic impact while commercializing a DT. Collecting stakeholder requirements in order to understand the customers and their needs is critical to success. In fact, studies have indicated that customer expectations are probably more critical for an emerging product than for its incumbent counterparts [Bridges *et al.* (1991); Weiss and John (1989)]. As a result, a firm developing a DT-based product has to be very careful about the customer requirements, or more importantly, the gaps in customer requirements, that the incumbent technology fails to satisfy, and develop operations and marketing strategies accordingly. Capturing the “voice of the customer” is of paramount importance to a company, particularly during the early adoption phase, in order to ensure that the customer does not switch back to the existing product, after an initial impulsive trial.

It has been repeatedly observed that the product unfamiliarity arising out of innovativeness is a formidable challenge in the success of a new DT-based product/service. Although product innovativeness enhances product advantage, a high level of innovativeness also reduces customer familiarity. In fact, in quite a few cases, product innovativeness has a detrimental effect on new product/service success, more so if customers are not sufficiently familiar with the nature of the new product and if innovativeness fails to improve product advantage to its targeted customers. Therefore, speed and risk form the two very important concerns for a company marketing a DT-based product/service. The importance of speed is driven by increasing competition and the continually evolving expectations of customers [Doyle and Saunders (1985)]. Add to this the huge uncertainty accompanying a DT-based product/service trying to venture in a previously unexplored realm and trying to tap an entirely different market/customer segment. This therefore leads to higher levels of risk for both the customer and the producer — from lack of experience and possibility of competitive imitation, respectively.

The high degree of uncertainty, risk, skepticism, and failures inherent in DT-based product development projects often result in delayed involvement of marketing and industrial design departments. Unless driven by the top management, the marketing and industrial design departments rarely exchange know-how and best practices. “Turf wars” prohibit them from doing this. Other factors such as the degree of product discontinuity, process discontinuity, and process formality seemed to exert a differential influence on the involvement of marketing [Veryzer (2005)]. The delayed involvement might result in a lack of zeal in marketing team to carry out the marketing function for the new product/service. Companies must motivate marketing teams to develop a strategy that will lead to a successful launch. Furthermore, having a set of well-designed marketing strategies would most definitely serve toward the success of a DT-intensive product/service.

### 3. Research Objectives and Methodology

#### 3.1. Research objectives

Figure 1 provides the readers with the basic research model and its associated steps. Though the main contribution of this research is to identify the strategies associated

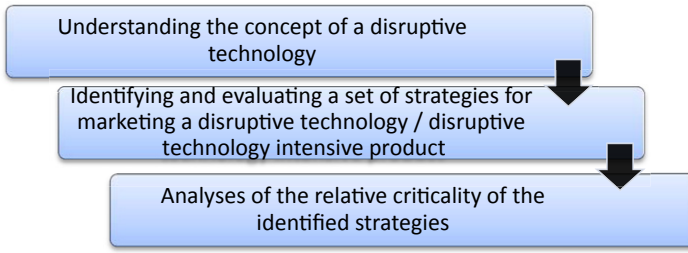


Fig. 1. The basic research model.

with marketing a DT, the authors felt that it was important to socialize the notion of a DT as unique among products and identify various phases of a DT process. Once the stages were identified and listed, a set of important marketing strategies to facilitate their success was determined. The final stage of the research process devoted its attention toward analyzing and prioritizing the identified marketing strategies in order to ascertain their relative importance, which could be vital in designing an effective technology marketing strategy.

### 3.2. Research methodology

Following the development of a conceptual model representing the main ideas of interest (Fig. 1), the next stage was to determine the research methodology. Table 1 exhibits the research stages previously presented and the methodologies followed in each of the stages.

As seen from Table 1, literature reviews, brainstorming, discussions and surveys comprised the main techniques used to arrive at the research results. The subject matter experts (SMEs) interviewed as a part of the procedure to arrive at the DT process stages and the technology marketing strategies were eminent industry professionals having considerable experience in the domain of technological innovation. Their opinion was gathered based on discussions and interviews. Furthermore, the survey respondents, whose opinion formed the basis of prioritizing the strategies, were industry professionals who were associated with marketing of technology and technology-intensive products/services. The SMEs, who formed the base of the

Table 1. Research stages and methodologies.

Stages	Description	Methodologies used
I	Socialize the notion of DT among the marketing professionals	Literature review
II	Proposing a set of important strategies for marketing a DT	Literature review, meta-analysis, brainstorming, discussion and interviews with experts in the area of marketing management, technology marketing, new product development, and technological innovation
III	Analyses of the relative criticality of the identified strategies	Survey of relevant industry professionals with technology marketing experience

survey were eminent industry professionals with vast experience (greater than 10 years) in the domain of technology and marketing. The number of industry professionals who responded was 30 and spanned across various industrial sectors — both manufacturing and service industries. The SMEs had an in-depth knowledge about the concept of technological innovation and emerging/DT as well as technology marketing. While selecting and screening the survey respondents, careful

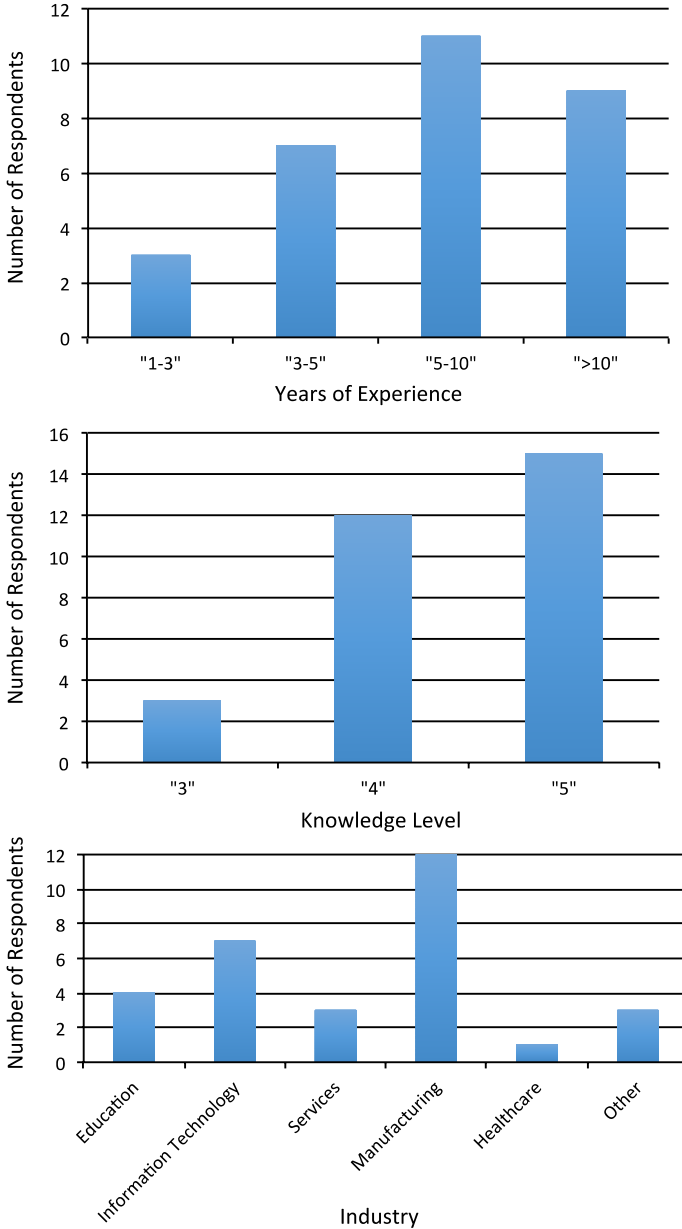


Fig. 2. Characteristics of the SMEs used to assess the criticality of the identified strategies.

attention was paid toward their level of knowledge and experience regarding technological innovation and technology marketing. A careful purposive sampling did this through snow-balling method of selection. The data gathered in the form of interviews with the SMEs, brainstorming sessions was used to design a survey questionnaire for prioritization of the strategies.

The subsequent sections of the paper will devote its whole-hearted attention toward the findings from this research, its analysis and the extent to which it achieved the desired research objective. Figure 2 summarizes the experience and characteristics of the SMEs. Note that DT knowledge level ranged from 1 (little) to 5 (extensive) for the survey.

## 4. Marketing a DT: A Set of Strategies

### 4.1. Importance of marketing strategies for success of a DT

Marketing is one of the most important components in the success of a product/service. This is especially true in the case of a product/service arising out of a DT, which is emerging in nature and generally venture into previously uncharted territories. Therefore, it is imperative for the organization launching the DT-based product/service to encourage and familiarize individuals, often through intense marketing campaign, regarding its features and benefits and the advantage of switching from an incumbent product/service. For example, one of the major reasons why Sony's BetaMax could not succeed in the marketplace was that the company rushed its product to the market and did not combine a customer focus with understanding of diffusion process [Rosen *et al.* (1998)]. Individuals who are properly informed and educated regarding the potential benefits of a new technology are likely to be increasingly satisfied with it [Ratten (2013)]. Unfortunately, this linkage between marketing and the success of a technology is not often recognized by organizations [Gupta *et al.* (1985)]. This is even truer in the case of a DT since it exists under rapidly changing technological conditions that lead to shorter life cycles and the need for rapid decisions [Bridges *et al.* (1991)]. Therefore, it is important to educate the potential target segment as to what the technology means to them and what role it might play in their life [Haddon (2006)], especially since perceived usefulness directly affects the intention to use an innovation [Revels *et al.* (2010)]. A successful *domestication* (i.e. how useful a particular emerging technology is deemed useful by its targeted customer base) can lead to a successful diffusion of the DT among the targeted market segment, thereby leading to its success. Figure 3 illustrates the importance of the marketing strategies in *domesticating* the target market segment.

As evident from Fig. 3, successful marketing strategies can greatly aid the customer base to gain more knowledge about a potentially disruptive product/service, thereby making them more aware of their requirements and any potential gap left by the incumbent technology. This in turn translates into greater understanding of the DT among its initial targeted market segment either over-served or under-served by the existing technology, which facilitates its adoption by the target customer base.



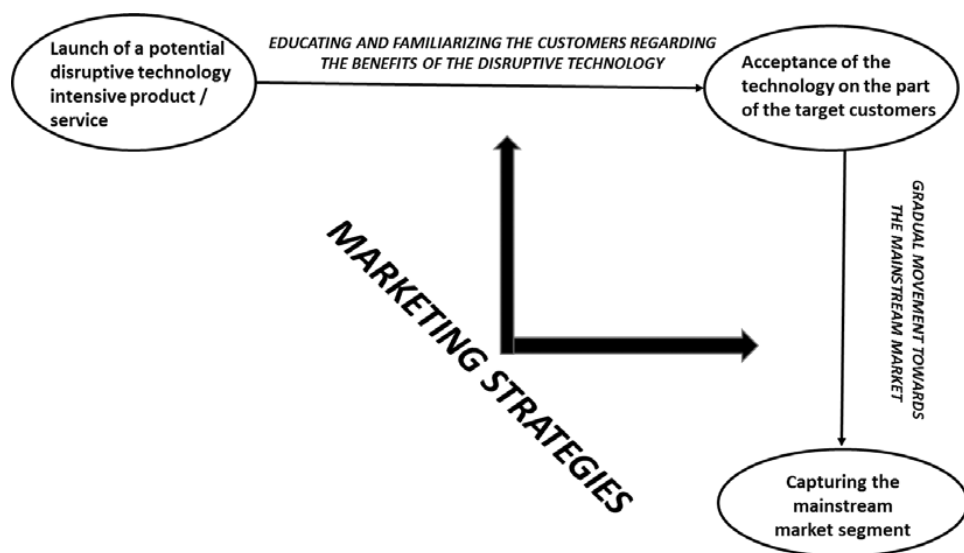


Fig. 3. Importance of marketing strategies in the success of a DT.

The three phases illustrated in Fig. 3 underscores proper understanding of consumer behavior and customer perception toward the DT. The “voice of the customer” needs to be captured clearly for any mid-course correction required during the various phases. Most DT companies get quite obsessed with the technology *per se*; hence, they ignore this crucial voice of the customer to their peril. These DT companies and their products based on the DT are destined to fail in the marketplace [Cahill *et al.* (1994)].

The launch of Philips’ CD-I or Apple’s Newton clearly illustrated the role played by marketing in the success of high-tech products. Diffusion is a time-lock process and companies must have the patience to allow proper diffusion of the innovation process. Clearly, neither Philips nor Apple did a good job on this front. These two of the many examples illustrating the importance to any organization to develop a set of robust marketing strategies that serve as an enabler of the success of a DT, at least in its initial stages when the technology is trying to penetrate the market. The following sub-section of the paper discusses the proposed set of marketing strategies along with their importance in the success of a product/service based on a DT.

#### 4.2. Proposing a set of strategies for marketing a DT

Armed with the knowledge of DT and the importance of having a set of robust marketing strategies, the next stage was to propose a set of important marketing strategies that would contribute toward its potential success. Based on the review of the available literature on DT, technology marketing and marketing in general, the authors held a brainstorming session in order to arrive at a set of probable marketing strategies that should be associated with the successful marketing of a DT. Further brainstorming enabled the authors to reduce the initial set of strategies to a more

condensed, yet critical set — thereby separating the “vital few” from the “trivial many”. In this context, it should be mentioned that the set of strategies identified and proposed in this paper should in no way be considered as a holistic or exhaustive set of strategies. Rather, they should be considered as a set of important strategies that can aid an organization to successfully market a DT. Additionally, the proposed set of strategies can also serve as a strong foundation for future research activities on marketing/commercialization of a DT. Based upon this brainstorming and research from the open literature, a set of six important marketing strategies were identified, as discussed below.

#### 4.2.1. *Developing the optimal blend of technology and marketing*

As new and different technologies emerge, their potential benefits might not be immediately apparent to its customer [Shugan (2004)]. Therefore, it is the responsibility of the company to orient the customers regarding the potential benefits of the technology. However, depending upon the orientation of the promoters or general disposition of the companies, they tend to focus on either the marketing or the technological aspects of the disruptive products. The two aspects of technology and marketing need to be balanced properly for achieving the optimal success of the product/service. The uncertainties involved with the product entail that marketing and technology teams work together, preferably right from the design stage. Earlier the involvement of marketing, better the outcome required for the launch and diffusion of the product. The downfall of the watch and personal computer business of a technologically superior company like Texas Instruments was partly attributed to a lack of linkage between marketing and technology [Shanklin and Ryans (1984)].

#### 4.2.2. *Imperative to administer marketing research*

Marketing plays a significant role in devising methods to elicit feedback from customers early on during the development phase by way of marketing research. This is especially true in the case of DT, which follows an altogether different trajectory for market penetration. Therefore, marketing research is an absolute must for disruptive products. Research points to the fact that customer feedback plays an important role in successful product/service development efforts. Involving the customer and understanding the customer’s perspective right from the development stage helps the company minimize wastage along with determining the gap between the existing and the incumbent technology. Veryzer [1998], in his study of the customer research efforts of firms involved in the development of discontinuous new products, aimed at gaining insight into the research inputs such companies use during the development phase of new products/services, and exploring the critical factors that influence customers’ evaluations of such products. Therefore, by not administering marketing research the company is risking the opportunity of making some modifications in its marketing mix, which could determine its result in the marketplace, by reducing the risk of adoption. Typically, newer and more advanced techniques like lead-user study helps the company achieve its goal of market entry successfully. Polaroid’s instant

movies or RCA's video discs are glaring examples of failures arising out of inadequate research on consumer choice. Wasteful promotions in launching products could have been avoided had necessary marketing research been done before the company offered their DT-based products to their target customers.

#### *4.2.3. Proper selection of target market*

Market segmentation refers to the identification of distinct subsets of customers, where any subset may be selected as a target market to be reached with a distinct marketing mix [Kotler (1980)]. A common problem for marketing strategists is how to segment the market and package differentiated products/services for target segments [Hanafizadeh and Mirzazadeh (2011)]. Firms pursuing DT-intensive products/services place a lot of emphasis on *value innovation*. Value innovation takes place when the firm pursues both low cost and differentiation strategies simultaneously [Kim and Mauborgne (2005)]. This can be done by focusing on the market segment that are not being contested by any of the competitors [Agnihotri (2014)]. Thus, one of the most important strategies the market must adopt is carefully targeting the appropriate market segment of early adopters or adopter categories. This is even truer in the case of a product/service arising out of a DT, since DT initially targets a niche market segment that mostly comprise of customers dissatisfied by the offerings of the incumbent technology. A proper selection of the target market segments is vital since the early adopters are the opinion leaders whose feedback helps the company immensely in placing the products appropriately, designing its promotional messages, and even fine-tuning its design aspects for long-term success and eventual infiltration into the mainstream market.

#### *4.2.4. Graduate the target with the product and the product stage*

Although, during the early adoption phase, handholding the customers might go a long way in ensuring that the customer does not switch back to the existing product/service, but as they mature through the various stages, the target market also needs to graduate, either shifting the user group along or targeting and serving a completely new market segment. Thus, for a long-term success, the company must graduate from a small niche player to a dominant one. Failure to turn early adopters into a market with a size big enough to be of any commercial interest to a company in terms of revenue or profit may finally cause a product to be dumped resulting in premature death, as it happened in case of Philips' CD-I.

#### *4.2.5. Creating a clear perception of the disruptive product in the mind of the customer*

Product unfamiliarity arising out of product/service innovativeness is a formidable challenge in the success of a new DT-based product/service. This difference in the perceptions of the producer and the consumer is a major factor in the process of commercialization of the DT. Many involved in product development claim that

customers do not know what they want, are unable to articulate desires, or are not knowledgeable about products they seek. In addition, research on DT has also indicated that the customers most likely to adapt a DT are the ones who are not satisfied by the offerings of the incumbent technology. Therefore, the promotional messages of a disruptive product/service company must clearly develop and communicate the perception of a “different” product — more of a leap in technology, rather than an incremental improvement of existing products/services, and the advertisements must be designed in keeping this subtle communication strategy in mind. The recent launches of car-hailing services in India (Ola, Uber, etc.) have successfully created a perception of a DT-based service in the minds of the consumer, and at least the initial euphoria centered on a novel service at one’s doorstep has brought in success so very critical in the initial phases of a company.

#### 4.2.6. *Tactical alliances*

Marketing alliances are formalized collaborative arrangements between two or more organizations focused on downstream value chain activities [Das *et al.* (1998); Rindfleisch and Moorman (2001); Swaminathan and Moorman (2009)]. Any DT product marketing company needs a number of tactical alliances, either as channel partners or as design collaborators, whose endeavor make the product delivery complete. This leverages a firm’s unique skills with the specialized resources of its partners to create a more potent force in the marketplace [Bucklin and Sengupta (1993)]. Joint marketing efforts by alliance partners can result in great success of a DT.

#### 4.2.7. *Overall perspectives of strategies*

These six strategies identified are not holistic nor exhaustive. However, they are a set of important strategies that can aid an organization to successfully market a DT. The proposed set of six strategies is also not mutually exclusive. In most cases, a number of these strategies are applied simultaneously. Since to begin with the focus of a DT-based product/service is the technology itself, the company must balance the two apparently divergent aspects of technology and marketing. This underscores the need in the marketing and technology teams working together, preferably right from the design stage. Also, understanding the customer’s perspective right from the development stage helps the company minimize wastage along with determining the gap between the existing and the incumbent technology. Ideally, these customers form the early adopters, who act as opinion leaders whose feedback helps the company immensely in positioning the offering appropriately, designing the promotional messages, and even fine-tuning its design aspects for long-term success and eventual introduction into the mainstream market. But the company must also graduate from a small niche player to a dominant one by turning early adopters into a sizable market. In spite of adopting all these strategies, there are companies that fail in this tricky business of DT-based products/services. Effective implementation ensures success of these strategies.

**4.3. Ranking of the strategies to assess their relative criticality**

As mentioned earlier, the last stage of the research process consisted of a survey of the industry professionals in order to assess the relative criticality of the identified strategies for marketing a DT. In the context of this research, a sample of 30 industry professionals, who were well-versed with the concept of DT and the challenges facing marketing a DT were surveyed for their feedback. The survey conducted comprised of a structured questionnaire requesting the respondents to evaluate the importance of the identified strategies on a 5-point Likert scale, ranging from “very low” (1) to “very high” (5). The collected responses were then subsequently analyzed to arrive at the ranking. Table 2 provides the relative rankings of the strategies.

As seen in Table 2, a proper selection of target market for the product launch was considered as the most important strategy when it comes to marketing a DT-intensive product. Since a product/service that is DT-intensive in nature generally follows a value stream that is different from its existing counterparts, selecting the right blend of customers to target is most definitely one of the most important objectives for its success. Therefore, it was considered as the most important marketing strategy for a DT product/service. This was followed very closely by the strategy of graduating the target market with the product/service and the product/service stages. This would most definitely aid the customers in gaining a more valuable insight regarding the product/service at various stages, thereby making the adoption and adaption processes more streamlined in nature. In order to select the correct target market, it is an absolute must for the organization to indulge in rigorous market research activities, which will serve as the backbone of the target market/customer selection. Therefore, the practitioners considered this as the next important strategy. These strategies were followed by the organization trying to build tactical alliances as well as trying to arrive at an optimal blend between technology and marketing, respectively. In addition, a low value of standard deviation indicated that the respondents, in spite of being surveyed separately, were fairly in agreement with each other.

Note that the strategies presented above should be considered as generic. This set of strategies provided in the paper might be modified, expanded or reduced depending upon the nature of the product/service, the technology and most importantly, the business processes of the organization in question. Finally, it should also be mentioned that the relative importance of the strategies as exhibited in Table 2 could also vary depending on the prevailing business environment and the

Table 2. Relative criticality of the identified marketing strategies.

	Strategy	Mean	Standard deviation
1.	Proper selection of target market for launch	4.27	0.691
2.	Graduate the target with product and product stage	4.17	0.699
3.	Imperative to administer marketing research during design phase	3.83	0.913
4.	Creating a clear perception in the mind of the customer	3.17	0.986
5.	Building tactical alliances	2.37	0.850
6.	Developing the optimal blend of technology and marketing	2.27	0.868

circumstances facing the organization pursuing the DT, most importantly, the maturity of the market in terms of the family of technologies in vogue.

## 5. An Illustrative Example

In order to validate the proposed metrics, the authors chose to examine Uber Technologies Inc.'s taxi-hailing business model in India. Founded in San Francisco, USA in 2009 by Travis Kalanick, and Garrett Camp, it was the former's third venture. Former Google senior executive Chris Sacca and Amazon CEO Jeff Bezos funded the company in its initial stages [The Times of India (2014)]. Uber entered the Indian market in 2013 and gradually managed to disrupt the mainstream market for taxi-hailing services. The secret of its business model was a phone application that made it easy to book, track and pay for rides and tiny management teams which would target new cities [The Wall Street Journal (2014)]. Through the optimal blend of technology and marketing, Uber managed to disrupt the transportation market in India. The remainder of this section will be devoted toward mapping of the identified strategies with the taxi-hailing business.

### 5.1. *Developing the optimal blend of technology and marketing*

It has been observed that an emerging technology that has the potential to be disruptive in nature often enters the market following a different trajectory than their incumbent counterparts. Therefore, when Uber entered the Indian market, they primarily targeted the set of customers who were under-served by the existing taxi cab services. While Uber used the digital media to enable the users to avail a cab service through the phone from the convenience of their living room (rather than thumbing down cabs at street corners), they made sure that their marketing strategies (celebrity marketing and the referral marketing strategies that they followed in India) did not take a back seat and that the concept of "Uber advantage" got through to its target customers, particularly the early adopters.

### 5.2. *Imperative to administer marketing research*

One of the most important strategies for any new business venture is to administer proper marketing research. Marketing research aids the organization to understand the requirement of customers, and in the process determine the target market segment. This is especially true for a DT, whose primary aim as it enters the market is to target a set of niche customers who are either under-served or over-served by the incumbent technology. Uber made sure that through an in-depth market research study, they understand the gap in the customer requirements right from the design and development stage, thereby reducing the adaptation risks in the process.

### 5.3. *Proper selection of target market for launch*

As shown in Table 2, selection of proper target market plays a vital role in the success of a technology. This is especially true in the case of a DT, which enters the

market following a completely different trajectory from their incumbent counterparts, and therefore needs to identify a distinct set of customers. When Uber entered the Indian market, they made sure that the market segment they targeted comprised of the customers who were, for some reason, dissatisfied with the existing service. Uber targeted the customers who were willing to avail the convenience of hailing a cab from the comfort of their home along with other peripheral amenities like the quality of the vehicle, GPS tracking, etc.

#### **5.4. Graduate the target with the product and the product stage**

A product arising out of DT enters the market often through inferior products and then gradually builds its way up to eventually displace the incumbent market. Therefore, it is imperative that the customers are educated regarding the new product along with its gradual improvement over time. Once Uber started gradually penetrating the mainstream market, it made sure that it kept their customers well informed and updated regarding those improvements through emails, text messages and new features on the apps, the heart of the service.

#### **5.5. Creating a clear perception of the disruptive product in the mind of the customer**

Since a product/service arising out of DT follows a different value chain than their incumbent counterparts, there has to be a clear perception of the technology and the stages on its gradual improvement in the mind of the customers. Uber, through their marketing and advertising strategies, made sure that the customers knew exactly what they were getting from Uber and how it differed from their competitors.

#### **5.6. Tactical alliances**

It has often been seen that creating effective tactical alliances can aid the potential success of a DT. Netflix striking a tactical alliance with USPS can be cited as a prime example of this. Uber, in order to infiltrate into the market struck tactical alliances with a plethora of players like PayTM, Android and windows apps, credit card companies and most importantly, the car owners who were willing to rent out their vehicles to Uber. These tactical alliances aided Uber to gradually gain a firmer foothold in the market and subsequently disrupt the mainstream market over time.

### **6. Limitation of the Current Research**

DT is often a subjective term used when new products/services cause major changes in a market segment. Also, companies such as Apple, Tesla, etc., whose competitive advantage lies in coming up with cutting-edge DTs and marketing them effectively, are unwilling to share their perspective on the subject because of marketing advantage. Lastly, developing disruptive technologies requires top-down leadership driven by bottom-up approach to creativity. The question on who is the “keeper” of DT for new product development is an open question. All of this makes identifying

and capturing SME perspective a challenge. The authors acknowledge the profundity of these challenges while attempting to shed some light on the strategies required for successful launch of DTs. The need for speedy concept-to-market cycle for these companies often makes them quite secretive about their strategies and tactics. The small sample size of respondents manifest this challenge. However, professional association-backed study with the objective of best practice sharing can mitigate this challenge.

## **7. Summary and Future Research**

DT can also facilitate the creation of new markets that are previously untapped by existing products/services, leading to the growth/success of companies. The identification of a potential DT lies in understanding the market, developing new products/services, and subsequently developing innovative marketing strategies. The purpose of this research was to propose and rank a set of strategies that might aid an organization successfully markets a DT.

Further research is needed to:

- (i) Study how strategies vary among market segments. For example, studies can find out if services are different from product, or how technology affects the strategies for the same.
- (ii) A more robust survey set may be attempted in future researches. As shown in Fig. 2, our survey set was predominantly manufacturing. The rankings are obviously biased depending upon the domain of the SME.
- (iii) Lastly, future researchers can delve deeper into the execution of these strategies. For example, how do one create a clear perception in the mind of the customer about a DT-based product/service.

Like any product in modern times, DT drives modern business. Those companies that create new and innovative product will prosper. Companies like VAX, RCA, Kodak, Blockbuster, and Compaq are some of the many victims of DT. Smaller, more agile, and hungrier companies that are adequately financed are always looking for opportunities to displace companies that have been slow to adapt to changes in the market.

Since the very concept of DT is time-dependent, yet dynamic, the success of a DT-based product/service will always be a challenge faced by marketers, given the time dimension. Speed-to-market, coupled with the novelty of the offering makes the execution of marketing strategies critical and complex. As newer technologies are emerging from the laboratories or incubators, and as companies are investing their resources for marketing the technology-based products/services, it is becoming imperative for the management of these companies to appreciate and focus on the most critical strategies that would mean success in the marketplace, as fast as possible. The risks of obsolescence, imitation and shifting of customer preference add to the challenges of DT marketers.



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