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BLUE OCEAN OR FAST-SECOND INNOVATION? A FOUR-BREAKTHROUGH MODEL TO EXPLAIN SUCCESSFUL MARKET DOMINATION

BERNARD BUISSON

Institut d'Administration des Entreprises
Université Paris I Panthéon-Sorbonne
21 rue Broca 75005 Paris, France

Orange Consulting, 114 rue Marcadet 75018 Paris, France
bernard.buisson@gmail.com

PHILIPPE SILBERZAHN

Vlerick Leuven Gent Management School
Vlamingenstraat 83, Leuven 3000, Belgium

Ecole Polytechnique, Management Research Center, ENSTA/PREG
32 Boulevard Victor 75015 Paris, France
philippe.silberzahn@vlerick.com

Innovation is widely recognized as a major driver of long-term corporate growth. Successful innovators who manage to dominate new markets enjoy Schumpeterian rents for their inventions. How then can a firm dominate a new market? Two streams of literature have proposed opposite answers to this question.

The First Mover approach indicates that by setting up a strong differentiation strategy, companies are supposed to create a new area where profits abound. This approach is supported especially by Kim and Mauborgne (2004) who coined the term Blue Ocean to describe it.

The Fast Second approach, defended by Markides and Geroski (2005), contends, on the contrary, that companies should not try to become pioneers, but should target the newly created market in second position, and colonize it.

But neither Blue Ocean nor Fast Second are able to convincingly explain successful market domination. Our study of 24 innovation cases suggests that innovation which leads to market domination is instead achieved by using four kinds of breakthroughs, separately of simultaneously.

Keywords: Breakthroughs; strategy; First Mover; Fast Second; pioneer; colonisator.

Introduction

Innovation, defined as the successful introduction of new goods, services and processes to the market, is widely recognized as a major driver of long-term corporate growth. Successful innovators who manage to dominate new markets enjoy Schumpeterian rents for their inventions (Ahuja and Lampert, 2001) as exemplified by such diverse firms as Ikea, Microsoft, Polaroid or Club Méditerranée.

How then can a firm dominate a new market? Two streams of literature have proposed rather opposite answers to this question in considering the order of entry to a new market:

- **The First Mover approach:**
  By entering first into a new market and setting up a strong differentiation strategy, firms can create and dominate a new area where profits abound. This approach has recently gained popularity among the managerial audience thanks to Kim and Mauborgne's (2004) work on so-called Blue Ocean strategy.
- **The Fast Second approach:**
  Almost simultaneously, and also in the managerial field, Markides and Geroski (2005) contends, on the contrary, that companies should not try to become pioneers, but should rather target the newly created market in second position, and colonize it.

There obviously is a real opposition between the two approaches. The fact that Fast Second received less popular attention than Blue Ocean should not mask the fact that the argument between the two approaches is not settled from the academic point of view. Can these two approaches be reconciled? More generally, is this opposition relevant, or should we look for a different framework to explain successful new market domination? To answer these questions is the purpose of the present article.

We start by summarizing and discussing extant theory on the advantage, or lack thereof, for the first mover in achieving new market domination. To answer these questions, we first discuss the theories which preceded the ones brought by Kim and Mauborgne on one side, Markides and Geroski on the other side. We then discuss these theories and show that they raise questions. To reach a better understanding of Blue Ocean and Fast Second, we studied 24 cases of successes and failures (see list in exhibit 1), in different industries, at different times. We started to map Blue Ocean and Fast Second strategies according to submarket creation and submarket domination, using some of these cases. We then asked the following question: If being first of being second isn't the key, what explains the

success of dominant products? This question led us to progressively identify four generic breakthroughs which are behind all these cases. Relying on the "family tree of products" approach and the study of the 24 cases mentioned above, we propose an explanation of successful innovation: the "four breakthroughs" rule. We finally consider the implications regarding the conduct of innovation attempts in the corporate world, and the possible research developments.

Theoretical Framework

For the purpose of this article, we define success as the clear domination of a given market for a significant period of time (probably minimum five years). Domination is broadly defined in terms of significantly higher market share than one's closest competitor associated with high profitability over a long period. Domination is for instance the leadership of Nespresso in the portion coffee submarket which Nestlé invented in the 1970s (Miller and Kashani, 2003); or of Ford in the mass market car industry from 1908 until the 1920s (Evans, 2004); or, to take a longer period, of Ikea in the ready-to-build furniture submarket since the 1950s (Barlett and Nanda, 1996).

By proposing a typology of four possible strategies regarding market entry, Ansoff and Stewart (1967) are among the first authors to introduce the concept of first-mover advantage. They distinguish between four strategies: "first to market", "follow the leader", "application engineering" and "me-too". Several types of first-mover advantages are distinguished in the literature: technological leadership, preemption of scarce assets, switching costs (Lieberman and Montgomery, 1988), political connections (Frynas *et al.*, 2006).

Among the first and strongest advocates of the first-mover advantage in the managerial literature, Foster (1986) shows how traditional technology companies were swept by new entrants, such as sailing ship builders against steamship builders at the beginning of the 20th century, Lever Brothers and their natural detergents against Procter & Gamble's Tide and their phosphate detergents in 1947, or NCR as producer of electromechanical cash registers against manufacturers of electronic cash registers in 1971.

Utterback (1994) makes another determinant contribution. His view is that each new market goes through three phases over time: the fluid phase, the transitional phase, and the specific phase. Each phase has specific attributes, such as the fluid phase being a time of major product innovations and being characterized by the arrival of many new entrants, while the transitional phase is the time of the emergence of dominant design and of process innovation. The argument is that the emergence of a dominant design reduces the possibilities of new entrance in the market, which supports the idea of an early entrance. Subsequent research disputes

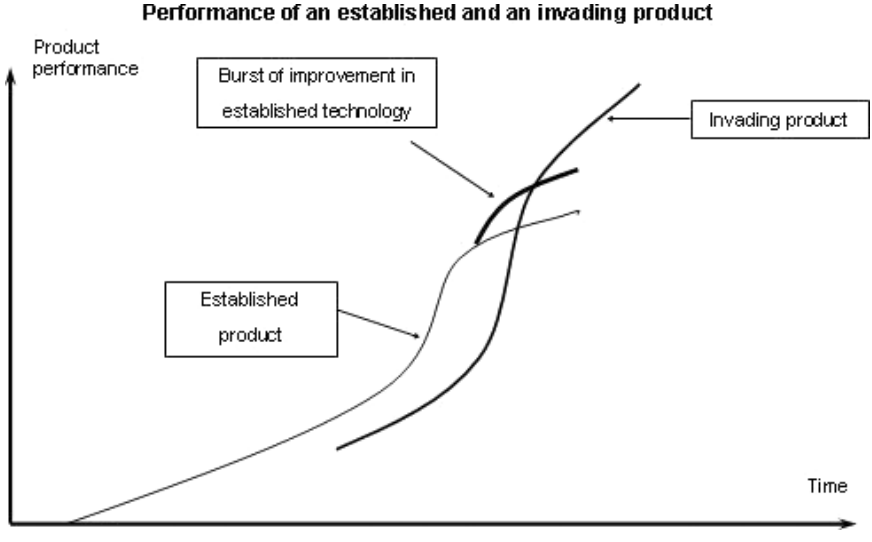
this conclusion and suggests that later entrants that switched to the dominant design enjoyed high survival rates and market positions (Tegarden *et al.*, 1999).

Studying the hard disk industry, Christensen (1997) extends the work of Foster (1986) and coins the term "innovator's dilemma" to describe how incumbent companies succeed with incremental innovation, but struggle with radical innovations, often ceding industry control to new entrants.

From Foster to Christensen, technology was the central driver of innovation and its dominant view was two overlapping S-curves (cf. Figure 1). The new technology S-curve started below the old technology S-curve, but would soon catch up and reach superior performances, whatever the attempts of the old-technology champions, as represented by Utterback (1994).

From this result, it seemed rather natural to conclude that technological innovation was the source of competitive advantage, and therefore of the market domination. The earlier the new technology is introduced, the faster it can ride the S-curve and overtake the incumbent technology: Hence the case for moving first.

The reality of the first-mover advantage certainly depends on the industry characteristics and, in particular, on the technology itself. For instance, because industries characterized by a strong network externalities (Katz and Shapiro, 1985) also show path dependencies, timing of entry clearly can be important (Schilling, 2002). The early entry of Microsoft in the programming languages market (Basic) in the 70s and then in operating systems market (MS-DOS) in the 80s enabled the firm to maintain industry domination to this day, although it should be noted that



Source: Utterback (1994)

Fig. 1. Established product versus invading product performance.

Microsoft was a first mover in neither field (Wallace and Erickson, 1992). The argument is made that first movers are able to set standards, or at least to influence standard creation to their advantage, by taking advantage of their so-called 'installed base'. However, research in this field shows that this is not necessarily the case as the standardization process is more complex (Chiesa *et al.*, 2002; Sahay and Riley, 2003). Worse, the loser of the standardization race loses the first-mover advantage and may have to spend a lot of resources to bridge the technological gap with the winner (Chiesa *et al.*, 2002).

The first-mover advantage theory recently saw a renewed interest among the managerial audience with the publication of Kim and Mauborgne's work on Blue Ocean Strategy (2004). The core argument of Blue Ocean is that rather than fighting in existing markets characterized by intense competition (the so-called Red Oceans), firms should create new markets (the so-called Blue Oceans). Creating new markets, as the Cirque du Soleil did in the entertainment industry (Kim and Mauborgne, 2004) or Swatch in the watch industry (Moon, 2004), is the best way to dominate them and therefore, to reap the benefits of this domination with high profits for the long run.

The reality of the first-mover advantage, however, has long been contested in the academic literature. Based on a detailed historical study of more than sixty industries, Golder and Tellis (1993) contend that the first-mover advantage is an incorrect principle. They identify three primary reasons for it. First, the research that has been done tends to downplay those pioneers who failed. Second, the studies tend to interview current leaders of successful companies who may not have a firm grasp of their industry's history. And third, the research tends to define markets very narrowly. For instance, is Gillette a first entrant in the razor market? If the market is defined as that of shavers, the answer is no. If the market is defined as that of shavers with disposable blades, then the answer is yes. Interestingly, based on different answers to this question, Gillette is defined as a follower by Golder and Tellis (1993) and as a first mover by Suarez and Lanzolla (2005). Golder and Tellis (1993) conclude that the real causes of enduring market leadership are will and vision, not the order of entry. Their work, and particularly the fact that it is based on an in-depth academic study of a large number if industries contribute to the weakening of the case for first-mover advantage.

Indeed, the Blue Ocean approach raises a few questions with regards to innovation. The first is that it is not necessary to create a market to end up dominating it. Google, today's leading Internet search engine, was a late entrant to the market, coming a good two years after pioneer AltaVista Battelle (2005). When Google was launched, there were already several search engines on the market. Similarly, Apple's iPod, today's almost iconic MP3 player, was only introduced in 2001, three years after the first mass-market MP3 players from

companies such as SaeHan and Diamond Multimedia (Shih, 2009). The second is that almost any differentiated product can be cast ex-post as a Blue Ocean strategy. A case in point is the YellowTail wine. While Kim and Mauborgne go to great length in describing how YellowTail's is truly a Blue Ocean strategy, the reality is that for the average consumer, YellowTail is just another bottle of wine with a nice yellow label on a shelf, and the case can certainly be made that it does not amount to more than a smart marketing strategy: how *blue* really is YellowTail?

The third question is that carrying the real Blue Ocean strategy is not without risk. The history of innovation is full of ambitious, ground breaking projects aimed at creating whole new markets, with names such as Iridium, the satellite mobile phone system launched by Motorola coming to mind. Iridium was a $5 billion ambitious, Blue Ocean mobile phone network relying on 66 satellites. Launched amid phenomenal public and industry interest in 1998, it filed for Chapter 11 less than a year later (MacCormack and Herman, 2001).

Following Golder and Tellis (1993), Markides and Geroski (2005) question the very relevance of the first-mover advantage. They studied around fifteen markets, in very different industries, and came up with the conclusion that whatever the industry, the first company to discover a new market (the pioneer) was surpassed by a bigger and smarter competitor (the colonisator). Examples given by Markides and Geroski include Ampex, which pioneered the VCR industry, yet was quickly surpassed by JVC and Sony and became a marginal player, Triumph and Harley-Davidson, which pioneered the motorcycle industry, but were taken over by Japanese players such as Honda, and Compuserve, which pioneered electronic messaging services, but was surpassed by AOL. These results are confirmed by the recent study by Min *et al.* (2006) of 264 new industrial products. In studying various patterns of innovation strategy, Miller and Olleros (2007) also show that in some cases, late entrants can gain substantially if they have the required capabilities and the financial resources. Based on their research, and consistent with academic research, Markides and Geroski (2005) consider that the right strategy for the incumbent firm is to be a "Fast Second", i.e., to let other firms enter first, when the market is not yet growing, and to enter quickly thereafter.

Examples of pioneers ceding to Fast Second followers are indeed numerous. Does that mean that the right innovation strategy is to position a firm as a fast follower? Unfortunately, it is not that simple, as the Fast Second theory is not without its limitations. Firstly, because several market leaders were indeed first movers, and have not been displaced by fast second players. For instance, Nespresso, which undertook the development of its Nespresso home espresso coffee machine as far back as 1974 and took a good 15 years to bring it to market (Miller and Kashani, 2003), is still the market leader. Southwest Airlines, which

pioneered low cost airline in the early 80s, is still the leader in the United States (Lovelock, 1985). The same can be said for RealNetworks, the pioneer in audio and video streaming over the Internet (Sarasvathy and Kotha, 2004). Secondly, because it is certainly difficult to be a fast follower in general. Under some circumstances, a firm might find itself in a position to fast follow a new entrant, as Microsoft did in 1995 for the Internet, a market the company initially ignored (Cusumano and Yoffie, 1998); but it usually is the case because the firm has been active in a related market for some time. Systematically organizing to be a fast follower in all possible markets is difficult and amounts to be rather passive in the face of market changes. A purely passive fast follower might not have the necessary knowledge to be able to address the opportunity successfully (Cohen and Levinthal, 1990).

The conclusion from this literature review is that the distinction between first and second mover does not explain variation in success of new market domination. There is a need to define a different categorization (Christensen, 2006). Other factors seem to play a role in the performance of a firm following its entry into a new market, other than order and timing of entry (Durand and Coeurderoy, 2001). One of the reasons is that success factors can be largely contextual. Suarez and Lanzolla (2007) identify two of these factors as being the pace of technological evolution and market evolution. They note that in most cases, firms are not able to influence these factors. Rather than simply in terms of order or speed of entry, the question must be discussed in terms of environmental change, particularly with regards to the technology, complementary infrastructure and demand characteristics (Schilling, 2002) as well as the different stages of the battle for dominance (Suarez, 2004). The strategy used for market entry also plays a crucial role (Durand and Coeurderoy, 2001), as well as other factors such as the right fit between resources that the firm possesses and that are needed for the target market (Kerin *et al.*, 1992).

Market family trees

In order to go beyond the distinction between first and second movers, we need to gain a deeper understanding of the mechanisms behind market evolution. Interestingly, markets, with firms one of the two central institutions of capitalist societies, have a shadowy existence in the economic literature (Coase, 1988) and have essentially considered as given by the classical economic analysis. Take for example, Arrow's (1974) admission, "Although we are not usually explicit about it, we really postulate that when a market could be created, it would be". (Sarasvathy and Dew, 2005). Even strategic (e.g., Porter, 1980) and marketing management (e.g., Kotler and Keller, 2005) have taken their cues from the exogenous market

concepts of classical and neo-classical economics. But the creation of a market is in no way ineluctable. On the contrary, in disruptive environments, the creation of markets the very essence of entrepreneurial activity. Sarasvathy (2005) gives the example of the Internet, the first components of which were invented in the late fifties and which developed for the next thirty years to become a striving community of researchers and developers around 1985 (Leiner *et al.*, 2002). Yet, one had to wait until the early 1990s for a real commercial activity to start developing. During 30 years, a developing technology did not translate into a market. Innovators start from the "here and now", taking pre-existing institutions and transforming them for new purposes (Sarasvathy and Dew, 2005).

Consistent with this idea of transformation, Utterback (1994) introduce the concept of "family tree" to illustrate that products-market concepts often derive from earlier product-market concepts. He named Table 1 "the family tree of Nineteenth Century photography".

Similarly, Hatchuel and Wei (1999) use the term "lineage" to describe a series of products linked together by an evolving asset that provides both continuity and variation to the design process of new product concepts.

Building on this work, we view markets evolving through successive sub-markets, which together can be represented as a family tree. We choose to name "submarkets" the successive markets of a family tree of products, because they derive from the original market, as all the different PC categories mentioned above derive from the first 1968 Hewlett-Packard. For a given arborescence of technology and products, there is a corresponding arborescence of markets.

Let's see how this applies to the PC market, for instance (cf. Figure 2). The term "Personal Computer" appeared for the first time on October 4th 1968 in a Science Magazine advertising page for the Hewlett-Packard 911A. The PC was more a scientific calculator than a mass market product. From 1971 to 1979, a second submarket appeared: the ready-to-build PC, with companies such as Imsai or Altair. After the "scientific calculator" submarket and the ready-to-build sub-market, the 1977 Apple II initiated the ready-to-use PC submarket. Apple went on

Table 1. The family tree of Nineteenth Century photography

1839	Daguerreotype invented in France. Image produced on a silvered copper sheet
1855	Wet collodion on glass plate
1855	Ambryotype and tintype. Inexpensive variants on wet collodiand technology enjoy some popularity
1880	Dry gelatin emulsion on glass plate
1885	Roll film, first paper backed, then celluloid

Source: Utterback (1994).

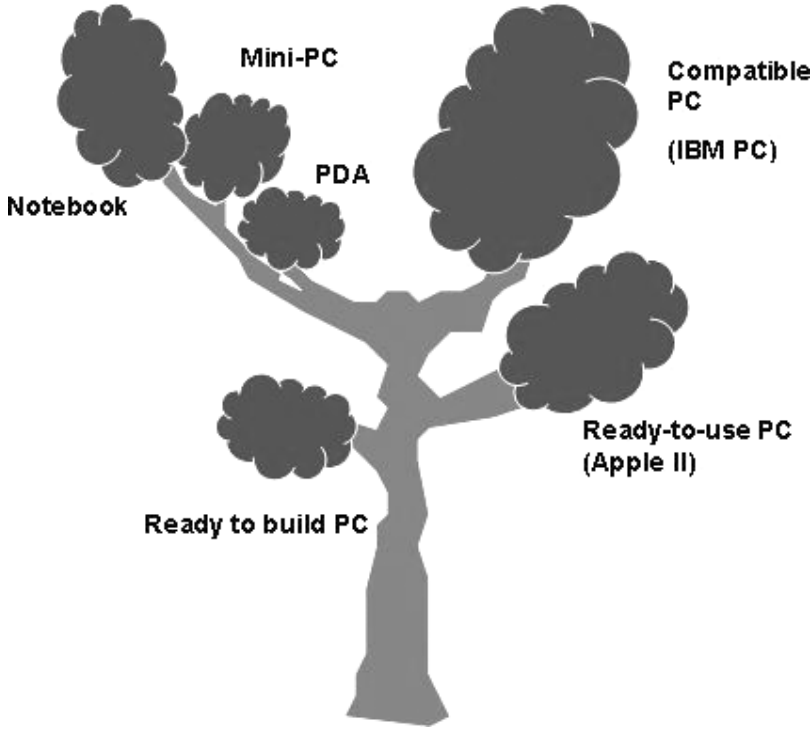


Fig. 2. The personal computer family tree of products.

to dominate it until the mid-80s. In 1981, IBM introduced the IBM PC, whose open architecture enabled the development of the compatible PC submarket (Wallace and Erickson, 1992).

The Personal Digital Assistant (PDA) submarket appeared in 1983, although it was not named so at the time. At the end of the 1980, Dell introduced the "build-to-order PC" and grew this submarket so quickly that it became the first PC producer in 1999. History goes on with the "mini-PC" category, to name one of the latest developments of a PC market born in 1968.

Results

A possible presentation of Blue Ocean and Fast Second

Let's reconsider Blue Ocean and Fast Second with the submarket frame. We use two dimensions to classify various products: whether the product corresponded to a submarket creation or not, and whether the product achieved effective domination of the considered submarket or not? Using a simple matrix where the first

axis represent the submarket dimension and the second one the domination dimension, we can position a few well known products:

- Dyson's bag-less vacuum cleaner, Piaggio's MP3 three-wheeled scooter, and Nestlé's Nespresso personal espresso machine are examples of submarket creation and domination.
- Apple's iPod MP3 player and Google's search engine are examples of market domination of a pre-existing submarket: the MP3 reader market in the iPod case, and the search engine market in Google's case.
- Apple's Newton PDA is a well-known example of failed domination attempt for a pre-existing submarket: although Apple's CEO introduced the term PDA at the Consumer Electronic Show on January 7th 1992, the Casio PF-15155-36, recognized as the first PDA, had been released almost ten years earlier, in May 1983.
- Motorola's Iridium is the mobile satellite market creation attempt by Motorola. Iridium started service on November 1st, 1998, but went into Chapter 11 on August 13th 1999. The IBM Simon Personal Communicator, the result of a joint-venture between IBM and BellSouth, is the less known first smart-phone attempt. It was launched in 1993.

The resulting matrix is shown in Fig. 3.

Using this matrix, we can now represent the Blue Ocean approach. The intent of the Blue Ocean strategy is to escape the red ocean of competition to create profitable growth in an entirely new space. This can be rephrased as "submarket creation" (Figure 4). Although Kim and Mauborgne (2004) list the iPod as an example of Blue Ocean strategy, it is more correct to see it as an example of domination of a pre-existing submarket: the first iPod was launched in October 2001, at a time three different companies had already mass-produced MP3 readers: the Korean SaeHan Information Systems, which sold the MPMan as early as mid

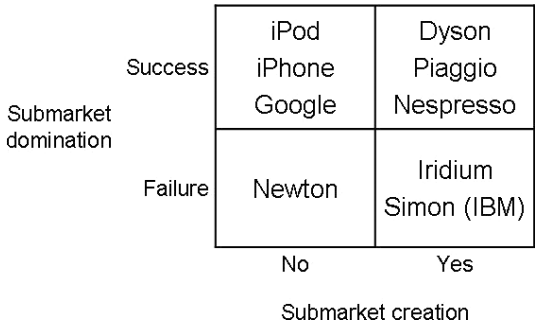


Fig. 3. The submarket creation/domination matrix

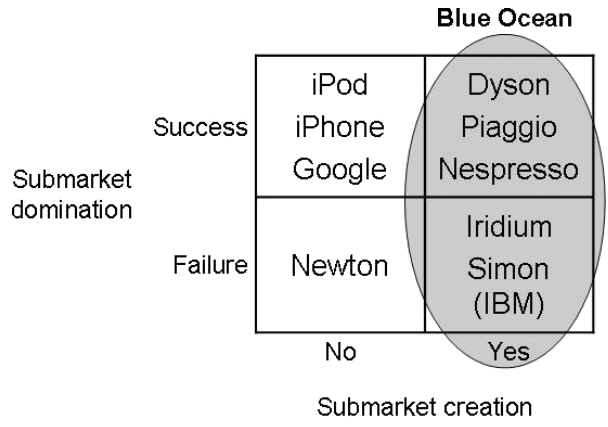


Fig. 4. Blue Ocean Strategy on the submarket creation/domination matrix

1998, Diamond Multimedia, which introduced the Rio PMP300 in September 1998, and HanGo Electronics, now Remote Solutions, which sold the PJB-100 in 1999, using a hard-drive developed by Compaq.

Finally, let's represent the Fast Second approach using the same matrix. Fast Second, by definition, is the domination attempt of a pre-existing submarket (Figure 5).

The "four breakthroughs" rule

Neither Blue Ocean nor Fast Second is able to convincingly explain successful market domination. Innovation is not a uniform process; rather it is characterized by heterogeneous patterns and contingent rules of action (Miller and Olleros, 2007). If successful innovation is more complex than simply a choice between

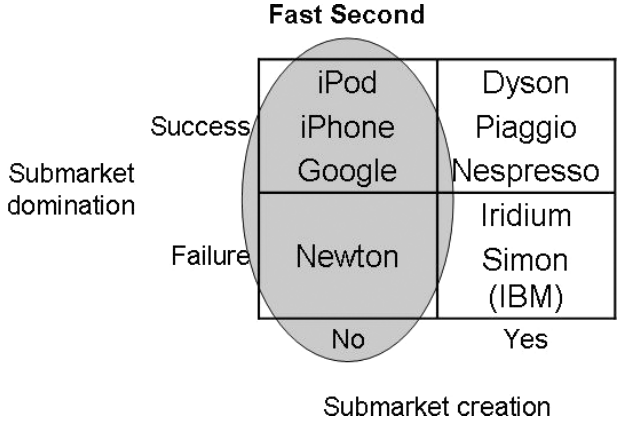


Fig. 5. Fast Second on the submarket creation/domination matrix

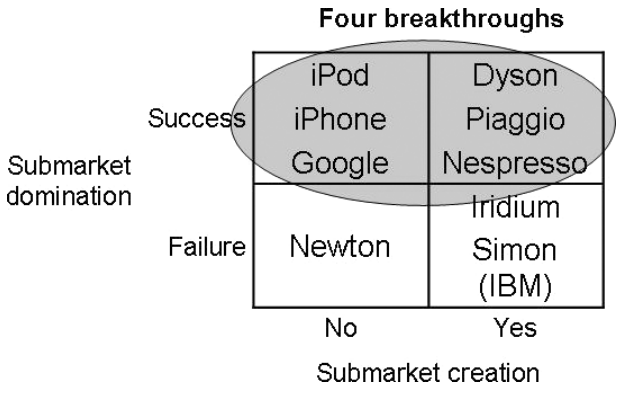


Fig. 6. The "four breakthrough rules" on the submarket creation/domination matrix.

moving first or moving second, how can we explain it? Our study suggests that innovation leading to submarket domination is achieved by using four kinds of breakthroughs, separately of simultaneously. A breakthrough is "a sudden advance especially in knowledge or technique" (Webster). In our context, we define breakthrough as something significantly different from what is currently practiced on the market. The four breakthroughs we propose are:

- Technological breakthrough: A new technology that ends-up dominating the incumbent technology
- Business model breakthrough: A new way to create value through the exploitation of business opportunities (Amit and Zott, 2001; Markides, 2006)
- Design breakthrough: A new way to design a product without changing it profoundly. This related to the interface between the product and the customer, which is an important factor of adoption (Sahay and Riley, 2003)
- Process breakthrough: A new way to do things (manufacturing, logistics, value chain, etc.)

We can now classify our sample cases using the four breakthroughs.

"Single breakthrough" and "multiple breakthrough" innovations

Innovation can be simple and rely on only one breakthrough. The Swatch is a good example of innovation relying on a single breakthrough: a design breakthrough.

In most cases of market domination, however, the successful innovation relies on a combination of breakthroughs. The iPod is an example of innovation relying both on a design breakthrough (a beautiful object showing great attention to detail from its manufacturer) and a business model breakthrough (the iTunes platform

linking the player to the sale of songs online). Apple's iPhone also relies on a design breakthrough because it really changes the customer experience (to such a successful extent that mobile phone producers now try to imitate iPhone's design) but it did not bring any particular new function, and was considered inferior to existing products in terms of features and technology (e.g., no 3G network, no MMS, etc.) and a business model breakthrough (Apple succeeded in getting a share of the telecom operators income).

The Ford T can be viewed as an example of successful innovation relying both on a design breakthrough (Ford introduced the standardization of car parts) followed shortly after by a process breakthrough (the assembly line and the Fordism). Polaroid is also a good example of a successful innovation relying on two breakthroughs: a technological breakthrough (instant photography), but also

Table 2. The "four breakthrough rules" applied to 24 cases of innovations.

		Type of breakthrough			
Company	Product/Service	Technological	Business model	Design	Process
IBM	IBM PC			x	
PIAGGIO	MP3 Scooter	x		x	
IKEA	IKEA shops		x	x	
AMAZON	Amazon.com		x	x	x
IRIDIUM LLC	Satellite mobile phone	x			
APPLE	Newton	x		x	
DUPONT	Kevlar	x			
3M	Post-it			x	
NESTLE	Nespresso	x	x	x	
NETJETS	Netjets		x	x	
GOOGLE	Google search engine	x	x		
CHRYSLER	Voyager			x	
ASUS	EeePC	x		x	
DELL	PC and Notebooks		x		x
APPLE	Apple II			x	
APPLE	iPod		x	x	
APPLE	iPhone		x	x	
DYSON	Vacuum cleaner	x		x	
POLAROID	Instant camera	x	x		
FORD	Ford T			x	x
SOUTHWEST AIRLINES	Southwest flights		x		
MICHELIN	Radial tire	x			
SWATCH	Swatch watches			x	
GEOX	Geox breathing shoes	x		x	

a business model breakthrough (selling film). The bag-less vacuum cleaner developed by James Dyson is the result of a technological breakthrough, combined with a design breakthrough. Similarly, the Geox breathing shoe is sometimes presented as a "Blue Ocean" play (e.g., Camuffo *et al.*, 2008) but it can be more accurately described as a combination of a submarket creation with a design and a technology breakthroughs. Dell is an example of business model breakthrough, combined with a process breakthrough (PC production shifted to Just in Time).

Our findings are summarized in Table 2.

Discussion

We have shown that both Blue Ocean and Fast Second fail to account for all the innovation cases. There are numerous examples of first movers successfully holding on to their initial dominance, but there are also examples of first movers and market creators who weren't successful and who were taken over by fast followers. With the concept of four breakthroughs, we propose a framework that goes beyond the opposition between Blue Ocean and Fast Second in explaining dominance of a new market.

The four breakthrough framework builds on well accepted research results. The notion of breakthrough builds on the work on disruptions by Christensen (1997). The notion of technology breakthrough builds on the work of Foster (1986) and Utterback (1994), among others. Business model innovation is an increasingly popular concept, which has been discussed by Hamel (2000) and Chesbrough and Rosenbloom (2002), among others. However, none of these approaches explains why some companies can reach successful submarket domination, building on innovation, and that we might look at the question with a different angle: findings common characteristics behind these innovations.

Our categorization is consistent with the work of Miller and Olleros (2007) who also try to provide a synthesis of the different taxonomies of innovation processes. They use the concept of "Games of innovation" to characterize the different coherent patterns of innovation strategies used by firms, although their work is more general as we focus on the market creation phase as per Suarez (2004).

The framework, therefore, provides an integrative way to explain market domination. Interestingly, Utterback analyses the IBM PC case in a way which is consistent with our breakthrough concept. He wrote:

> "In the judgment of most experts, the IBM PC was no technological breakthrough, but that fact did not stop it from quickly grabbing 30 percent of the business market" (1994).

The IBM PC is among the cases we studied and we range it among the "single-breakthrough", a design breakthrough in this case. Utterback's (1994, p. 15) understanding was similar:

> "IBM's use of an open architecture and policy of making operating system information available to the public created a center of gravity for application software developers. The fact that it was built largely from non-proprietary components opened the door to many imitators who created "IBM compatible" machines and peripherals. Before long, the vast majority of personal computer users were operating equipment that shared the same operating characteristics as the dominant IBM PC".

According to Hamel (1996), "rule makers" and "rules breakers" enjoy much higher performances than "rules takers". Hamel suggests ten principles to help companies "liberate their revolutionary spirit" and nines routes to industry revolution. We think that the "four breakthrough rule" provides a simpler, but powerful framework to help companies reach superior performances, whether they intend to become "rule makers" (the submarket creation road) or "rule breakers" (by dominating an already existing submarket). Markides (2008) also stresses the importance of breaking the rules, but clearly focuses on business model breakthroughs, discussing cases such as Amazon, Starbucks, Ikea and Dell.

The "four breakthroughs" framework certainly has some limitations. Apple's Newton, as well as Motorola's Iridium, are both examples of product which relied on some of the four breakthroughs (design breakthrough and technological breakthrough — recognition of handwriting — in the Newton's case, and technological breakthrough in the Iridium case). Yet they were clear failures for their respective companies.

The Apple Newton and Iridium are well known examples of innovation failures, but they are not alone; unfortunately, examples abound of products which relied on a technological breakthrough and failed. The research does not suggest that relying on any one or any combination of the four breakthroughs guarantees success. Rather, it suggests that success (temporary or lasting domination of the company's chosen submarket) always relies on one or more of the four breakthroughs.

Implications

Implications for managers

If urging to be the creator of a new submarket, or trying to be the smart Fast Second on an existing submarket are not relevant approaches, what strategy should companies embrace?

If the company's goal is the domination of a given submarket, our research suggests that changing the rules of the game is a required condition. And we have shown that this can be achieved by leveraging one or more of the four breakthroughs: technological, design, business model, or process. Porter's (1980) generic strategies such as differentiation can be relevant to explain Google success, but we think Google's strategy can also be described as a combination of technological breakthrough (the "Pagerank" algorithm) and a business model breakthrough, the "Adwords" system (Battelle, 2005). Nespresso also relies on a technological breakthrough (the original patent bought at the Geneva Battelle Institute in 1974 and subsequent technology development) and a business model breakthrough: direct distribution, and partnership with the coffee machine makers (Miller and Kashani, 2003). And a way to characterize the iPod can be to describe it a mix of business model breakthrough and design breakthrough.

Obviously, aiming at submarket domination is a high-risk/high reward game. Submarket creation is not exactly an easy journey: James Dyson, for instance, went through about five thousand vacuum cleaner prototypes. Similarly, it took more than twenty years to Nestlé to succeed with Nespresso on the market. And the domination of an already existing submarket in a Red Ocean approach is probably an even tougher challenge. But the rewards are huge: after years of double-digit growth, Nespresso still enjoyed a 25% sales growth for the first half of 2009, despite the recession. Two years only after its beginnings in the smartphone market (a submarket at the time already 14 year old; created in 1993 by IBM and BellSouth with the Simon Personal Communicator mentioned above), Apple enjoys a stunning growth for its iPhone, and has reached a 13.3% market share. For the first semester of 2009 only, Apple had sold 9.5 million units worth approximately $5 billion, and is said to have made a profit of roughly $2 billion more than Nokia, the world market leader, and active in this market since the late seventies, for the same semester. But Nokia had to sell 200 million mobile phones for the same result!

Implication for research

Our research was conducted based on case studies and secondary documents. It provides interesting insights and suggests a few directions to further understand the dynamics of emerging markets and the conditions under which firms can dominate them in order to reap the benefits of this domination.

There are several ways this initial work might be extended: The first has to do with the definitions. There is a need to define and assess more precisely the notion of submarket. What is a submarket, when does it appear, and to what extent is it different from a market. The same applies to the concept of domination.

Domination is easier to acknowledge and study than to define, and it is rarely defined precisely in the literature. What does "domination" mean? Is an 80% market share required or would 40% be enough? Could profit be a more relevant criterion to assess domination? Similarly, what exactly is a breakthrough? We have drawn on Christensen (1997) with the concept of disruption, but when exactly does change become a breakthrough? Is there any scale which might be implemented to assess whether a design change is informal, important or fundamental?

A second way to further this work would be to extend the size of the sample and the research method. We found the 24 cases interesting, because they are well known and easy to understand, but the "four-breakthrough" approach needs a larger sample to be assessed properly.

A third way to extend this work is to conduct conceptual research on the concept of breakthrough. Are some breakthroughs more relevant than others, for a given stage of market maturity? Utterback (1994) suggested that process breakthroughs are more likely to happen during the transition phase, and that's how we can understand the Ford T case. But could we define more systematic rules? Similarly, do breakthroughs happen simultaneously? To come back to Google's case, the business model breakthrough came some three years after the technological breakthrough (Battelle, 2005). Is this an exception? Which breakthrough(s) should companies try to activate? When? Further work is also needed to better integrate our findings with the efforts of Miller and Olleros (2007) to provide a systematic framework of innovation strategies.

We think the "four-breakthrough" approach is a promising way to understand the innovation dynamics on a new market, and we will try to develop the framework to come up with relevant answers to these important questions in our future research.

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Exhibit 1

The 24 cases studied for this research are:

- the IBM PC
- the Piaggio mp3 (the Piaggio product is called the "mp3", the first three-wheel motorbike, which has an enormous success in Europe. We chose to keep the name of the company rather than the product name, to avoid confusion with the MP3 readers)
- IKEA
- Amazon.com
- the Iridium mobile satellite service
- Apple's Newton
- Dupont's kevlar
- 3M's post-it
- Nestlé's Nespresso
- Netjets
- Google
- Chrysler's Voyager
- Asus EeePC
- Dell PC and notebooks
- The Apple II
- Apple's iPod
- Apple's iPhone
- Dyson's bagless vacuum cleaner
- Polaroid's instant camera
- The Ford T
- Southwest Airlines
- Michelin's radial tire
- Swatch
- Geox