

The Role of Imitation in Global High-Tech Product Development*

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Abstract

Innovation is historically linked to the creation of large departments of Research & Development (R&D) that require large investments in assets. With markets globalization, the department of R&D remains one of the pillars of innovation, but it needs a rethinking of the management. The new R&D department needs to change by a vision of closing within the corporate boundaries to an opening view to the outside. Product development is carried out through several conducts taken by companies ranging from Reverse R&D processes to collaborations with direct competitors for the sharing of risks and knowledge.

Generally, and more precisely in high-tech industry, technological advancements and the ability to develop fast-cycle processes by followers are generating an abatement of the timely barriers that allowed first movers to maintain competitive advantages; so, in global markets, the management of imitative strategies becomes of primary importance.

Keywords: Product Imitation; Product Innovation; Global Competition; Global Product Development; High-Tech Industry

1. Global Product Development

The ability of an enterprise to introduce successful products or services in a timely manner is of paramount importance in generating the firm revenues and profitability and key to creating shareholder value. In recent decades, product introduction has become a synchronized occurrence across global markets¹, tackling multiple countries/markets simultaneously. Synchronizing government approvals, product localization, customer support services, etc. so that the product can reach the market at the same time across the globe is an enormous feat of great complexity. Any problems with the product or an execution failure during the global launch can jeopardize the product and cause severe loss of value to the corporation. Hence, companies must

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successfully execute both product development and product introduction, and the associated logistics, in order to cover their flanks from potential competitors.

Furthermore, global competition has put tremendous pressure on prices and margins. Hence, corporations need to optimize the way they source components and subsystems globally by seeking to obtain unique advantages in terms of cost, time-to-market, access to highly skilled human capital, minimization of risks of supply chain disruption, access to government incentives and subsidies, etc.

The complexity of this process is heightened by the fact that multi-disciplinary teams (real, virtual, co-located, and dispersed all over the globe) need to come together with the purpose of delivering a new product or service within the agreed-upon budgetary and time constraints. The product team will be measured by its ability to deliver on the promises made to key stakeholders of the firm (i.e. shareholders, customers, employees, and the surrounding community) in terms of revenues, market share, profitability and customer satisfaction.

While global market introduction and global supply chain management are critical, the product vision at the crossroad of technological innovations and market needs is the corner stone of everything else. While being first deriving a new product from first principles and scientific discoveries, which in turn provided all the technology required sounds ideal, in the real world, companies invent a bit, innovate another bit and copy quite a bit to succeed, moreover speed is often more important than originality. The iPod was not the first digital-music player; nor was the iPhone the first smartphone or the iPad the first tablet introduced to the planet earth. Apple imitated others' products but made them sexier, easier to use and cooler looking. Furthermore, integrated their own innovations with innovations they acquired from others as well imitations. In all cases each product was not 'first-to-the-world' but certainly 'first-to-the-firm'. Many highly recognized global corporations have joined the copycats, recognizing that being a 'fast-follower' is more important than to be the 'creator'.

Recently published provocative book on the subject 'Copycats' (Shenkar 2010), demonstrates how imitators do at least as well and often better from any new product than innovators do. Followers have lower research-and-development costs, and less risk of failure because the product or services they imitate has already been market-tested and the customer adoptions issues well understood. Many studies have addressed this market dynamics including a landmark research (Golder, Tellis 1993) which confirmed that pioneer innovators captured only a small fraction of the market share for their product over time, while imitators, copycats and others gain the lion share of the available market.

2. The Role of Innovation vs. Imitation in Global Product Development

Here is the question. What is the role of innovation vs. imitation in new product (or services) development?

Some corporations take a purist approach obsessed with their own inventions, and requiring innovations have to be home brewed and if absolutely needed acquired through licensing, Mergers & Acquisitions (M&A). Often these same companies when their economic fortunes change subject the R&D&I (Research and Development and Innovation) budget through intense scrutiny demanding higher return on their investments in this areas and if not met, slashing significantly its budget.

Others take the opposite approach when the entire company is based in imitation, copycats and reverse engineering, praising and promoting the staff who borrows market opportunities ‘by all acceptable means’. Though copying is fairly common, lots of companies fail to do it effectively. American firms tend to rely heavily in their own ability to innovate. By contrast, Asian companies—such as Panasonic, whose former parent, Matsushita, was nicknamed *maneshita denki*, ‘electronics that have been copied’—have excelled at legal imitation (*The Economist* 2012).

Global Development of Hi-Tech Products, depend heavily of initial spark of creativity to envision the future, create new technologies or identify an emerging unmet market need. It is critical that these risk takers are able to harvest the rewards when those ideas materialize its economic success. For this reason the imitators need to be kept at bay, granting legal protection through the various legal protection tools offered by the market economy: patents, copyrights, trade secrets and trademarks.

However, these protections need to be global due to the global nature of the development, and hence the Achilles heel since no entity can grant this kind of global protection.

Since these protections are offered country-by-country, the costs of filing in all possible markets is costly, laborious and complicated, and for reason firms, especially small ventures, limit their legal expenses to the most likely or key markets, leaving the rest of the world unprotected; including, those countries with very poor enforcement track record.

The pace of change of modern technology is staggering, and it’s not hard to see why the incumbents who have benefitted from the ‘old order of things’ are resistant to change. Especially when that change means letting go of old paradigms and embracing new ones that have not always been fully tested. Adapting to the ‘new order of things’ means changing investment priorities and shifting skills, which often leads to laying off workers, waking up out of the peaceful ‘auto-pilot’ and the agreeable, static comfort zones (Baradello 2012).

Imitation, will continue having a role in product development, legal or illegal, ethical or unethical, it will happen. The best defense is for corporations to kill their own last generation products (or services) with the next generation of better, faster, sexier gadgets.

However, in this global race one fact remain constant:

□ *‘those firms that rest in their laurels in the comfort zone of their successful past will find themselves in a world of hurt very quickly in the uncertain global future!’.*

3. High-Tech Industry and Product Development

Innovation is historically linked to the creation of large departments of Research & Development (R&D) that require large investments (Chesbrough et al. 2006) in assets. With the globalization of markets, which has led to the need of reviewing the conducts used by companies for product development, the department of R&D remains one of the pillars of innovation, but it needs a rethinking of the management. The new R&D department needs to change by a vision of closing within the corporate boundaries to an opening view to the outside. Product

development is carried out through several conducts taken by companies ranging from Reverse R&D processes (Levitt 1996) to collaborations with direct competitors for the sharing of risks and knowledge (Ouchi 1989).

Innovation is of paramount importance for the survival, development and prosperity of enterprises (Shenkar 2010), but not all good ideas come from the organization, nor the best products on the market are the result of innovations introduced by the pioneer. In typical competitive global markets, where the competitive pressure is heightened, companies emphasize the critical importance of business policies of innovation and imitation for the continuous development of the intermediate and final demand (Brondoni 2010). Levitt (1966) captured the essence and the substantial presence of imitated products in the different markets and, in a positive exception on imitation, stated that *'a simple look around us will... shows that imitation is not only abundant than innovation, but actually a much more prevalent road to business growth and profits'* (Levitt 1966, p. 63).

Technological advancements and the ability to develop fast-cycle processes by followers are generating an abatement of the timely barriers that allowed first movers to maintain competitive advantages; so, in global markets, becomes of primary importance the management of imitative strategies.

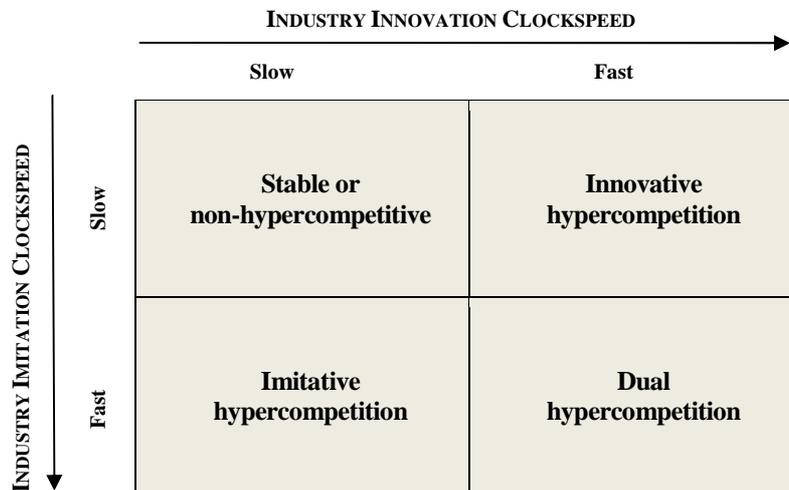
Moreover, in global markets technology is a key factor for the growth and competitiveness of enterprises. As shown by the OECD (Hatzichronoglou 1997), companies that are technology-intensive innovate more, use available resources more productively, are of international nature and their dynamism allows to increase the performances in other areas (spillover). In particular, the high-tech sector² is characterized by rapid change, heightened competitive intensity, high levels of uncertainty (Amabile 1997) and richness of innovation.

In this field, the speed of imitation means that the products are on the market with similar levels of quality and with technology almost standardized. The choice of the time value - the introduction of the product on the market - is often according to requirements for the disposal of earlier versions of product. The research for innovative solutions requires a high monetary expenditure and the first movers' competitive advantage is often raised because the rapid response of competitors which is due to reverse engineering operations, speed of learning in the industry and imitation (Lee et al. 2000). Be the first to launch a product on the market does not guarantee success. In global markets, companies need to implement the best strategy for market penetration with the goal to maximize profit and avoiding additional costs resulting by early entrance in an immature market, or a late entrance with resulting loss of opportunities (Kim 2005).

In high-tech industry, the traditional logic of the market's dynamic based on firm-to-firm competition is exceeded by the competition network-to-network (Arrigo 2009), with the advantage for companies to share know-how, problem solving and opportunities. The innovation process is shaped among the participants in the network that contribute to the creation of knowledge from monitoring, comparison, selection and imitation of innovations and strategies chosen by competitors. Within the network is thus created technology interdependence for the production of tangible (hardware) and intangible (software) assets necessary for the development of the product. The competitive intensity within the network and among competitor-networks implies the need to invest simultaneously in strategies of imitation and innovation. In the model proposed by Pacheco de Almeida (2010)

competitive intensity within an industry depends on two main variables identified in innovation clockspeed and imitation clockspeed.

Figure 1: *Hypercompetition Based on Innovation and Imitation Clockspeed*



Source: Pacheco-de-Almeida (2010, p. 1503)

The first quarter, stable or non-hypercompetitive, presents a stable condition that is typical of the industries where firms operate with the control over the entire market, with the consequence that the speed of imitation and innovation is very slow. An example is from the sector of the oil extraction in which innovations are almost absent, or related to new processes of extraction. The control of the market, the lack of innovation to imitate, the limited availability of resources, or the high barriers to entry, make this sector impossible to access for the imitators.

The second quarter, innovative hypercompetition, is typical of the industries where the introduction of new products is rapid and constant, but the imitation is limited by the use of patents or simply for the speed of the product life cycle. Examples come from the pharmaceutical industry where few companies control the market by continuously innovative medicines with formulas that can't be imitated until the expiration of the patent. The use of an active substance discovered by a company cannot be copied without incurring on an infringement of industrial property rights, nor is it possible to circumvent the law. When the patent expired, competitors launch on the market the imitated alternative by leveraging on their ability to persuade prescribers who advise the use to end customers.

The fourth quarter, imitative hypercompetition, presents a condition in which the speed of imitation is high but the introduction of innovations is almost nothing. In this condition, the investments made from the innovator and from the imitator are equivalent (Pacheco de Almeida 2010), and can be associated to those industries producing commodities goods which demand is constant, and they have no qualitative differences. The product is therefore the same regardless of who produces it, and there are not incentives to innovate as the functionality remains constant over time. Imitators may enter the market constantly and at any time by force on their distribution channels. Thinking of the sector of the production of

power adapters, in which the products and processes of production are equal since the moment in which the product has been developed. Except for a few minor changes, the product is perfectly replicated and innovation is in marginal elements related to basic design and color.

The third quarter shows the condition of hypercompetition typical of high-tech industry, called dual by the author since the speed of innovation and imitation creates the highest level of turbulence seen in a competitive arena. In a condition of dual hypercompetition, innovation and imitation are considered two strategies on which companies need to focus in equal measure to conquer, or at least not lose, its leadership in the market. In order to maintain its ability to arrive first on the market (market-driven management), the company jointly implements the two strategies, innovation and imitation, which allows it to gain the competitive advantage otherwise difficult to maintain in an industry characterized by continuous technological turbulence.

4. Imitation and High-Tech Product Development

The product introduction in a market doesn't occur exclusively as a result of an innovation, in fact there will be only a pioneer for each product, and the rest can be considered imitations (Zhou 2006). In the high-tech industry there are high risks faced by the pioneers in terms of choosing to follow the true technology, and of product acceptance by the demand. Waiting and observing of the development trend and of the definition of the standard reduce the risk of channeled in the mistaken technological trajectory (Lee et al. 2005); therefore, imitation is not adopted as a random choice but according to specific strategic planning.

Although the innovators create the market, perceive the needs of the consumers, and would lead to the adoption of new consumption patterns, the imitators start from a position of advantage due to the acquisition information from existing products (Schnaars 1994) that permits the development of products with superior performance for the creation of added value for consumers.

Also, in the high-tech industry the technology replacement occurs with a high speed, and the substitution of a new technology with the old one allows imitators to neutralize the competitive advantages of the leader. The success of high-tech companies depends on their ability to don't fall into the trap of the incumbent inertia, according to which the companies do not accept the cannibalization of their own existing product lines (Lieberman et al. 1988; Schnaars 1994, Zhou et al. 2006).

The incumbent inertia is a great chance to entry into a market because the imitators have the opportunity to invest directly in the realization of factories for the development of products of the latest generational technology. If the incumbent will not activate innovative processes for the defense of its product, the result will be the loss of market share or, in the worst case scenario, the exit from it.

Entering the market as a result of an intuition of the technological trajectory, and of the possibility of a vacuum of supply, requires substantial investments both for the creation of R&D laboratories - useful to fill the knowledge gap that separates the incumbents - and for the realization of expensive production plants. The initial capital for the development of a new high-tech product often requires government intervention through the creation of research consortia involving several private companies. The Government supports and subsidizes big plans for the study and

the importation of technologies from other companies that operate across national borders. In the development of high-tech product there are numerous cases that confirm the positive role of governments and of their research centers for achieving and exceeding of the leader by the followers (Kim 2001; Lee et al. 2003). Once the goal is reached, the initiative of the government is dissolved and the future success of a firm will depend on entrepreneurial management capabilities of the involved companies.

Entrepreneurial skills, owned technologies and strategic decisions are elements that describe the use of imitation by firms. Researches on innovation lead to resolve the question about what is meant by innovative product (at sector/company/market level), but the literature leads to the classification of two main types of product imitation: duplicative and creative.

Duplicative imitation (Kim 1993) refers to the transfer of technology for the production of identical goods to those of the competitor. In the consumer electronics, products of this type are called clones (Schnaars 1994) and are sold at a lower price of the competitor by not very prestigious brands. The strategy is activated in a lawful manner in the absence or expiry of property rights and does not bring a sustainable competitive advantage for the imitator (Bolton 1993).

The innovative or creative imitation (Kim 1993; Levitt 1966; Schnaars 1994), also called 'reflective' (Bolton 1993), provides an active participation at the process of production by firms that have focused the business not only to the simple copy of existing products, but make improvements to the previous versions of the product or adapt it to new uses.

□ *For example, the technology LCD (Liquid Crystal Display) was already known to the industry for the production, at the first stage, of small size displays (watches, calculators), then for the production of FPD (Flat Panel Display) for PCs and laptops, and finally, for the production of screens for TV. The adaptation of technology in this case is considered creative imitation because it has been borrowed the idea from a different environment (clocks/computer screens for PC/TV) within the same industry (display).*

The rapidity of change, the competitive intensity, the high level of uncertainty (Amabile 1997), the technological advancement, and the ability of companies for reacting to competition with fast-cycle development processes imply a continuous instability in the definition of technological trajectories to follow, and making the imitation an optimal way to be followed to reduce the risk of failure.

Timing defines a new strategic behavior by firms that deal in the high-tech. For these companies it is necessary to conduct a continue restructuring of the business, which means they need a total renovation of the company that is feasible with the reinterpretation of the time dimension in a context characterized by high dynamics (Rancati 2005; Corniani 2005). The management of the change requires sophisticated techniques which allow interpreting reality in its diversified interactions, to imagine and design appropriate strategies in order to understand the nature of complexity and to interact with it. Time management becomes a key strategic decision in high-tech sector, especially for imitation that plays a major role.

It is clear imitators enter the market at a later stage than innovators, but time-to-market is not due just to the delay for seeing an opportunity or for lacking of ability to innovate, it can occur as a result of a strategic planned choice.

4.1 Imitation Opportunities in High-Tech Industry

According to the classification given by Lieberman et al. (1998) and taken up by Abel (2008), the innovator, the first to enter the market, enjoys some advantages classified into two categories. The first group of benefits is related to the market and demand in terms of corporate reputation: conquest of the best segment, opportunity to claim the product as standard, and development of switching cost. The second group of benefits is related to the enterprise and its ability to create knowledge based on experience, protection of patents, preferential way on distribution channels and on procurement of scarce resources.

The theory of first mover advantages is not applicable at all in an industry such as high-tech, because there are an abundance of cases (Abel 2008; Christensen 1997, Christensen et al. 2003;) where small first-movers were exceeded by large follower, and other cases (Abel 2008; Christensen 1997; Christensen et al. 2003; Lee et al. 2005; Schnaars 1994; Shenkar 2010; Gnyawali et al. 2011) in which industry giants had lost their strategic leadership for misconducts. Innovation in high-tech can become a disadvantage that reduces the chance of survival (Bolton 1993) for some companies, especially for those are small and lacking of a solid history.

Imitation occurs in any business, but the high-tech industry is a competitive field where there is the concentration of a large number of imitations. According to Drucker (2001), the sector in question is a rich ground for imitation as firms focus more on technology than on the needs of the market, opening the doors to clever imitators who already have own customers to serve, to producers of clones, and to those able to create differentiated products. The imitators capture opportunities and are attracted by the industry for (a) the weakness of industrial property rights; (b) the technological interdependence; (c) the uncertainty of the technological trend.

The protection of industrial property rights is a weakness in the high-tech because of the rapid spread of knowledge, and of the ability to develop products with complementary features (Shankar 2010) that make the product available in a different way. The publication of patents can be a disadvantage as it becomes an instrument of communication of product characteristics, and thus facilitates the understanding of the technical elements.

The technology interdependence facilitates the flow of information that lead to imitation within the industry. The development of a high-tech product requires the collaboration of more firms that, independently, produce a component that will constitute an essential part of the final product. Consequently, it will be impossible to think that an enterprise can be so large as to be able to produce all the main components, because the totality of knowledge for the development of the product is distributed throughout the industry (Levitt 1966). The network relations developed within the industry for sharing projects, the exchange of knowledge, the mobility of skilled staff, scientific publications, etc., they are just some of the determinants that facilitate the flow of information within the industry and between industries.

□ *As Mr. Murayama from Sony said ‘[...] in consumer electronics, it’s hard to keep secrets long anyway [...]’ (Gnyawali 2011, p. 657).*

The uncertainty of the technological trend, as well as the acceptance of the product by the market, makes unattractive the choice to be first. Companies wait, look and enter in the market at a favorable moment which can be, for example, a generational change in technology, during which the imitators have the ability to neutralize the competitive advantage of the leader.

□ *For example, the formation of the joint venture S-LCD between Sony and Samsung for the production of LCD's seventh-generation enabled Sony - a company that was not manufacturer but buyer in previous generations - to capture, in a few months since the start of the production, the leading position in the market (Gnyawali et al. 2011).*

The continuous contacts with other companies within the value network, the absence of a global regulation to defense industrial property rights, and the uncertainty about the industry are the determinants that stimulate the activation of company imitation strategies. We analyze now which are the strategies applied by imitators in relation at the optimal decision of entrance in the market for the acquisition of leadership positions.

4.2 Imitation Strategies in High-Tech Industry

Time value, which refers to the time of entry into the market, is an important decision for the success of the product. Time management becomes of paramount importance for imitators. The delay of entrance in a business, so the imitative strategy to be pursued, it may be related by: 1. *strategic followership*, which means the delayed entry of large companies to quickly gain market share; 2. *strategic leadership*, which means a delay due to the time required for the acquisition of higher knowledge through processes of learning by interacting and learning by learning.

The strategically planned entry, or strategic followership (Bolton 1993), is carried out by companies that purposely wait for the right moment before entering the market. Studies in the field of various types of high-tech products (Golder et al. 1993; Olleros 1986, Abel 2008) have shown that innovative products are usually introduced to the market by new small/medium companies. The introduction of a new technological product involves a period of turbulence where the competition intensifies and many companies claim the title of innovators. At the end of the period of turbulence, the leadership of the category of product is typically attributed to large companies that strategically entered the market during the growth phase of the product life cycle (Abel 2008).

As mentioned above, the iPod was not the first portable MP3 player, as well as iPhone was not the first smartphone, or iPad was not the first tablet (*The Economist*, 2012), but they are three products that dominate the category. Apple's products are successful for the company's ability to quickly identify and resolve the major problems that had had early versions of product introduced into the marketplace by competitors. The case iPod (Abel 2008) is useful for clarifying the dynamics of the sector at the moment when an innovation is introduced into the market and for which it is to lash turbulence for the domain of the category.

The introduction of a new high-tech product in the market suggests a new technological trajectory that causes the response from the incumbent of the category for the consolidation of its competitive position, and also creates an opportunity for large neighbors of the industry. The portable music market was dominated by Sony that did not get the opportunity which involved the cannibalization of its product (compact disc player) and the activation of new processes for the production of a completely new one product. Sony felt the product feature the market required, referred to the opportunity to be able to carry a lot of music by a small device, but in attempt to defend their product the company launched the mini compact disc digital player, thus it missed the opportunity to maintain its leading position due to channel in the wrong direction.

Differently from Sony, Apple felt the technological trajectory and it was proactive to enter the market, with little effort, for the success of their product. It was because the competition was weak and the giant of the portable music was not riding the wave of technology. Apple activated a strategy for vertical integration in order to enter the market with a product in which all the components necessary for the product (the player of MP3, the virtual music store, iTunes software for PC) worked together, with the aim to create added value for customers. A good advertising campaign, innovative design and the use of its marketing channels were important for the success of the product creatively imitated. The iPod case is an example that shows a condition in which a new product is introduced in a market and a large company rapidly activates processes for imitation through their relationships network. In other words, the imitator has little to observe and learn, only has to act quickly.

In the development of high-tech product may arise conditions in which the knowledge possessed by the firm, including that diffused in the network in which it is inserted, is not sufficient to obtain positions of leadership. So, companies may activates an action of strategic leadership which involves a period, more or less long, necessary for the acquisition of knowledge for the development of imitative product. Learning takes place through processes of learning by interacting and learning by learning. Both processes are related to the competitive benchmarking, which is a strategic action that aims to observe and absorb the best practices of successful business competitors. *'The idea is that quality can be increased by doing at least as well as the best in the business'* (Schnaars 1994, p. 10).

Learning by interacting is a learning process that takes place during the interactions within the firm and networks in which it operates. Strategic alliances, partnerships, etc., are collaborations enabled by the sharing of knowledge and resources to achieve a common goal. Alliances (equity and non-equity) are established to act on the cost structure and to achieve economies of scale through the sharing of research and development, production, and organizational activities (Gnecchi 2009). In the high-tech industry, alliances are often activated in form of co-competition (Gnyawali et al. 2011) and it consist in the creation of partnerships between large companies that work together to share and develop technological knowledge for the creation of new products, and at the same time, compete with the same offer. Gnyawali et al. (2009, 2011) identified three main causes that lead high-tech companies to enable alliances of this kind: shorter product life cycles, technological convergence and high spending on R&D. For these reasons, the alliances with a co-competition orientation are chosen by large companies, which, through the sharing of

resources and higher capacity, can reach one of the most important advantages of the high-tech sector: the establishment of the technological standard in the sector.

□ *The joint venture named S-LCD between Sony and Samsung created great value for the two companies; with an aggressive and proactive behavior in terms of technological development and marketing were able to impose LCD technology as a category of mass-market product for large TV at the expense of the Plasma technology (Gnyawali et al., 2011).*

The product produced by co-opetitive alliances creates reaction from the competitors operating in the same industry; in fact, they develop products according to the standards emerged and create further alliances with the aim of bridging the technological and timely gap, as well as exceed the performance of the product in successive generations. The succession of imitative actions leads to the introduction of new products and improvements of the older, with the goal of increasing the performances.

Learning by learning refers to the capacity to learn from innovations introduced elsewhere. This capacity will help companies in the development of improved imitative products but also for the adaptation of the technology to new uses. Companies collect information in two main activities: first, the reverse R&D; second, activities that concerns to borrow technology from other environments. The reverse R&D is not simply the breakdown of the competing product for the identification of key components and phases of the production process, but it is an activity that provides an active contribution of companies in the search for alternatives use of technology within existing products or new concepts. The mobilization of personnel among neighboring areas also facilitates the flow of information and productive knowledge for the use of technologies in different ways of the initial use (Shenkar 2010).

□ *Vizio Inc. (Palepu et al., 2011) is an example of firm that entered into a mature market with the ability to serve a vacuum of offer that allowed the success of its product. That was possible thanks to the knowledge and the abilities of the founder William Wang. Wang have had an extensive knowledge of the value chain of the PC monitor - which use the same basic technology of the TV - and when the U.S. government drew up the plan for the transition from analog to digital, he spotted an opportunity. Wang used the knowledge he had among the manufacturers of components for PC in Asian countries, the knowledge in the distribution channel, he found that was the vacuum in the market (flat screen TV at a reasonable cost) and he led Vizio Inc. to the success as market leader in sales of LCD TVs in North America.*

In summary, imitation in the high-tech becomes feasible through various strategies implemented by companies. Given the skills and knowledge possessed, companies may decide to enter the market by implementing a strategy of fast following (strategic followership) or through a strategy that needs a period, more or less long, to acquire the information necessary for the development of a product with superior performance (strategic leadership). In the latter case, the position of leader is

achieved through the development of products that are the result of learning processes both by voluntary interaction among firms (learning by interacting), and by higher learning capacities (learning by learning) owned by firms that attract human resources from other areas for the adaptation of existing technology to new uses or through decomposition, understanding and improvement of the direct competitors' products.

5. Conclusion and Emerging Issues

In the high-tech industry, the role of imitation is of primary importance, since the speed of introduction of new products, or with better features, determines the inability to develop constant innovative products.

In the development of high-tech products, companies implement imitative strategies depending on their objectives, resources, capabilities and technologies, and are organized in collaborations with the direct competitors to win the definition of the standard technology in the market. This implies an extension of imitation opportunities that are connected to three main areas: 1. Absence or limitation of industrial property rights; 2. Pioneer's size and market power; 3. Collaborations and shared experiences.

The first, absence or limitation of industrial property rights, allows to the late entrants establishing themselves as first entrants in a geographical areas where the competitor's product hasn't any protection, or with different actions to elude the industrial property rights. In the case of patents³, the publication could be an advantage for the imitator because it is a vehicle of communication about the technical characteristics easily replicable in a high-tech product. The imitators activate different strategies to reach the market as the use of different materials, design, production processes. These strategies allow eluding the laws by the principle '*same destination by different routes*' (Schnaar 1994, p. 230).

The second, pioneer's size and market power, reflects the importance of imitation in the high-tech sector where there are large companies that have the dominium of the market because of strategic followership actions. The market introduction of an innovation by a small company is an opportunity to succeed for large imitators. The size of the companies is important because only a large company has the capabilities to activate a rapid imitation strategy. Indeed, imitators need high competences for the development of imitations (Shenkar, 2010), which are recognizable on: high capacity of competitiveness analysis; efficient infrastructures for reverse engineering; flexibility in production processes; optimal supply relationships; excellent R&D capacities. Big followers have good advantages in the activation of imitative strategies and they quickly grow barriers to avoid the entrance in the market by others big competitors.

Finally, the imitation in the high-tech sector is important because of the multitude of companies involved in the product development. Knowledge sharing and collaborations become an additional opportunity for imitation. They are considered as comparison and cooperation to achieve common targets that are feasible due to the acquisition of the best technology owned by the partner. Therefore, imitators adopt a proactive behavior in the acquisition of knowledge about products and processes made by other companies and, on the basis of the capacity possessed, they can succeed in the achievement of a market leadership position.

In high-tech product development the factor *time* implies a new strategic behavior by firms that need to have a flexible organizational structure for the continuous restructuring of the business which sometimes leads to a renewal of the overall enterprise. Four words used by Bolton (1993, p 42) contain the essence of imitation: 'Be smart, not first!'. This motto has long been followed by companies located in Asia, which have made imitation the way to follow in order, firstly, to close the technological gap with Western companies, then to maintain the positions reached and to overcome the leader becoming the new innovators.

Imitation is a strategy used to obtain knowledge from those who are already better, a culture that if transmitted with pride to the company, it triggers the urge to do the same number of competitors operating successfully in global markets. Firms in the industrialized economies of Asia (Japan, South Korea, Taiwan, China, etc.) can be considered giants in the market for high-tech products, which since the 80s has become the most important industry from the point of view of the quantity of exported goods, personnel involved in the manufacture, and technological development (Hobday 1995). In the last decades the Western economies have moved the production of high-tech products to Asian countries for saving on production costs and basic research, but in fact, as noted by Pisano et al. (2009), the process of outsourcing has not happened exclusively for the operations of low specialization, such as the simple assembly, but were transferred engineering capabilities and production which are the foundation of innovation. Failing these abilities, companies have difficulty in conducting advanced research on processes for the production of next-generation products. It means that Western companies have lost, or at least are going to lose, their ability to innovate. The high-tech industry has undergone a reversal of the rules of the market; the Asian companies have conquered through imitation the label of innovators and over time have not abandoned the culture of imitation that is still the driving force of strategic policies business.

The next challenge for Western companies will be able to look at the Asian competitors, and learn from them, by imitation.

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Notes

¹ The WSJ on March 8th 2012, reported the on the launch of ‘the new iPad’ made by Apple on the prior day, and commented on the simultaneous availability in 10 countries of this new product on March 16. Think on the catastrophic consequences if the product would suffer a last minute glitch either due to a problem of any sort (i.e. design, manufacturing, quality, regulatory, marketing/PR, etc....)? Could you think of the impact on the revenues and profits for the quarter?

² In this paper we refer to companies that are focalized on consumer electronics market. At the moment doesn't exist a definite classification of high-tech industries, furthermore the OECD (Hatzichronoglou, 1997, p. 17) identifies 4 tipologies of industries based on technological intensity: (a) aerospace; (b) office & computing equipment; (c) drugs & medicines (pharma); (d) radio, TV & communication equipment.

The Commission on Strategic Development Executive Committee (2007, p. 2) of Hong Kong shows a different classification using different parameters based on technological intensity and knowledge intensity: (a) electronic information technology; (b) aerospace and aeronautical technology; (c) biological engineering and new medical technology; (d) new materials and applied technology; (e) new energy and high efficient energy conservation technology; (f) new environmental technology; (g) ocean engineering; (h) advanced manufacturing technology; (i) nuclear application technology; (j) modern agricultural technology; and (k) other new process or new technology applicable in the traditional industries.

³ Patents regulation is different and it depends about the country they are registered. For example, patents registered in USA are assigned at the first-one who invents, but in other countries they are assigned at the first-one who deposits them. In USA the law can be surpassed by someone who claims the idea was thought previously by someone else (e.g. scientific publication). In this case the invention can't be assigned to who has registered the patent and it is free to use by everybody.