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Drivers and Constraints of Innovation

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Summary

Managers of innovative companies should have in mind the economic drivers of profitable innovations such as sunk R&D costs, marketing time lag and interface costs, and their relation with margins and the life cycle of the product. The main conclusions are: look for minimization of investment–recovery time of the borne costs rather than profit maximization; as a leader, invest in entry–detering innovations (differentiation) with high sunk costs; as a follower, concentrate on cost–savings innovations; and keep close to your clients to save on R&D, marketing and interface costs.

If you disdain innovation, you die.

If you fail to innovate, you die.

If you innovate or market your innovation too slowly,
others do it before and you die.

If you market your innovation too fast,
you may cannibalize yourself and you die.

How can we survive in the era of continual innovation?

Introduction

Most academicians and researchers declare the strategic necessity of innovation in order to create substantial competitive advantages. Bankers and accountants know innovation is costly. Marketers continually preach about product business cycles and profitability of new products. But there is still a lack of a holistic approach towards innovation.

“Innovate or die”, is often said. It’s true. But it is also true that you may die while innovating. This article explores what are the main economic drivers for profitable innovations and how to avoid suicide by innovating.

1. Sunk costs and probability of innovation

Every entrepreneur knows that if he wants to innovate, he has to incur costs. Most of these costs are related to wages for specialists and specific equipment and, therefore, are very difficult to recover and can be computed as sunk costs.

Increasing your investment in attracting talents and buying cutting-edge equipment, on the one hand increases the probability of innovation, but at the same time, on the other hand, worsens the financials. Achieving an innovation is a desire, while costs are a fact: something real, measurable and hard.

The bigger the estimated sunk costs are, the bigger the entry-detering barriers (bigger capital requirements) to the sector and the lower the competition is. The lower the potential competition is, the bigger the margins and profits are and, as a consequence, the capital accumulation of incumbents for future research in innovative products. However, high margins increase the attractiveness of a market and foster new entrants. Thus, smart incumbent firms may charge higher than competitive, but lower than profit maximizing margins to retain their position.

Capital-demanding innovations (for example, hi-tech and bio-tech) create a tendency towards market oligopolization and monopolization (count how many car producers are now, and how many were a decade ago). At these circumstances, there is always a dead-weight loss incurred by the society (margins over zero economic profits) and thus, a reduction in the supplied value.

For that reason, innovation creates value (new products, better quality) and –at the same time– destroys value due to monopolization.

2. Marketing of new products and time lag

Every innovation creates a new market and affects existing ones. The first thing to establish is whether the new product is profitable – by itself and by the synergies it creates with other firm's products. For instance, when EADS launched its A380 development project in 2001, it was also weighing how it will affect orders for smaller aircrafts because of the same flying concept –“fly-by-wire”– and thus saving training costs by airlines. In the subsequent years, after launching the A380 development project, for the first time in history, orders for Airbuses surpassed those for Boeings.

However, marketers should also look wider: how the innovation affects competition's market share and own existing products' market share. Competition pressure to innovate can easily shift into hyper-competition and hyper-competition into cannibalization. However, at Henkel, the answer to the question when to introduce the new soup is always “Now!” (Otherwise, competitors would do it.)

What would be incomprehensible is to cannibalize products without external pressure. Therefore, companies retain innovations as call options they can exercise when necessary and manage their time lag between new products so as to maximize the amortization of the previous technology and sunk costs. The blue-ray CD/DVD entry will be

delayed until patents for ordinary CD/DVD are amortized. The same policy is followed by Apple: releases of a new operating system have to wait to the previous investment to be recovered.

A simple observation of the above reveals that the market leader in terms of innovation has more time and liberty of movement and followers have to run without the liberty to manage time lag. Furthermore, the case of so called the "Browser War II", when in 2003 Microsoft announced that Internet Explorer 6 would be the last standalone version of its browser, shows that the market leader (or monopolist) should never neglect continuous introducing of new innovative versions of its products, because otherwise competitors might become those who are in front.

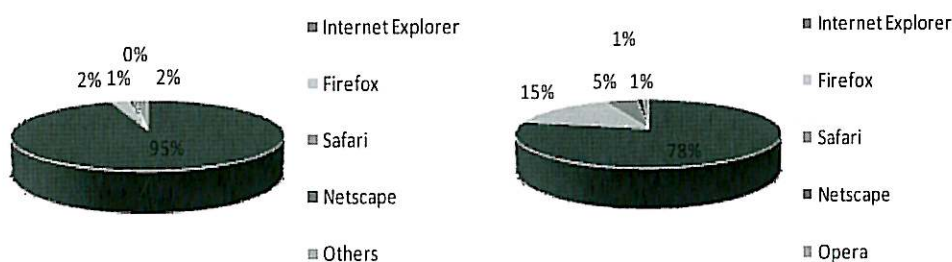


Figure 1. Browser market structure in the beginning of 2004 and 2008

Source: www.upsdell.com (2008)

3. Interface barriers

Interface barriers are the difficulties to take advantage of an innovation by consumers. They can be either technological or human (psychological), or both. Technological interface barriers appear when an innovation is not harmonious along the whole supply chain from the producer to the customer. High definition television (HDTV) was ready a long time before its commercialization, but there were not neither broadcasting nor receiving sets at an available price. Here is another more prosaic example. Once, a president of a water supply company told me with a note of pity, that people in his city complain about water quality. Unfortunately, he cannot supply better quality water, because the pipes would not endure and would get corroded. Before supplying higher standards of water, the company would have to change the pipes.

Psychological interface barriers are the barriers that users find towards using a new technology or product. An example could be how quickly the implementation of a new accounting system in a big company can be performed. Technically, from the moment the technology appears to its implementation, two days; in reality, two years. Users have to be able to take advantage of it, learn new processes and the technology itself. For this very reason, better educated societies can more easily become familiar with innovations.

Interface barriers are everywhere in every industry. Take the automotive industry: not only the physical cars, but a constellation of other co-operative industries and services, from petrol stations, tire producers and road construction to driving courses and street patrols. If suddenly a new technology makes helicopters cheaper than cars and car producers switch to helicopters, it would take more than the simple difference in the production line to shift. For instance, we neither have heliports at every building, nor enough fuel stations for aircrafts and pilots, and many people fear flying.

Figure 2 shows a life cycle of an innovation. In the early stage the market is mainly driven by innovators and enthusiasts, because they demand technology, but they constitute only a small percentage of the market. In the next stage, the pragmatists and conservatives start to dominate, because they want solutions and convenience and the big market is with them.

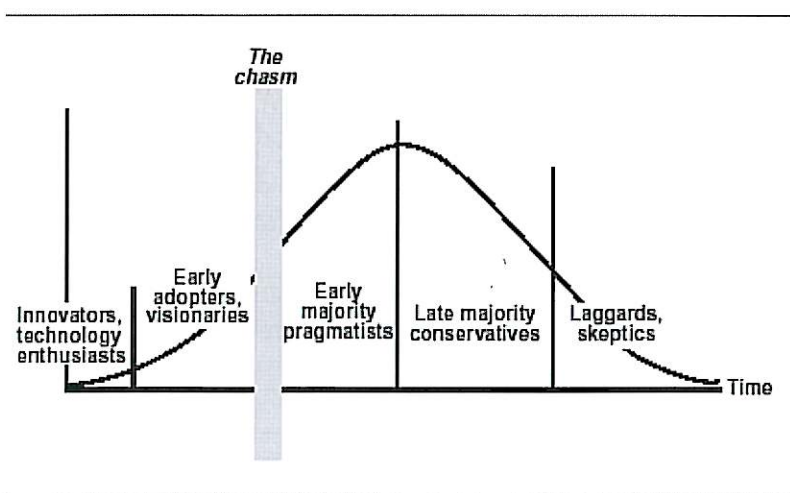


Figure 2. Life cycle of an innovation

Source: Rogers (1995).

The chasm, showed in the Figure 2, is the shift in market-driven acceptance. Practice shows that the life cycle of innovation is driven by the consumers and not by the inventors or innovators.

There are two good news and two bad. The good news is that interface barriers give the innovator time to make profit from previous products and plan the marketing of the new one. Besides, non-innovators can find a niche for their products, something like a stay-aside strategy, since there will be always a market for old-boys (for example, for LP record players).

The bad news is that the presence of interface barriers delays the gainings from marketing the new product. Moreover, during this period, competitors may catch up the innovator, and lever on the fact that the innovator educates the society at his expense.

4. Innovation and sustainability

As Drucker pointed out “to survive and succeed, every organization will have to turn itself into a change agent. The most effective way to manage change successfully is to create it”. A sustainable innovative company is the one, which is over break-even. Total costs divided by margins and by unit price give the number of units to be sold. If the total costs rise because of sound sunk costs and the number of units or the time you will be able to sell is uncertain, then you have to increase your margins. Globalization appears as a magnificent chance for innovative firms, since the critical number of consumers of specific products to break even can be gathered not only in geographically limited markets, but worldwide.

Figure 3 shows the mutual relation between economic drivers of innovation.

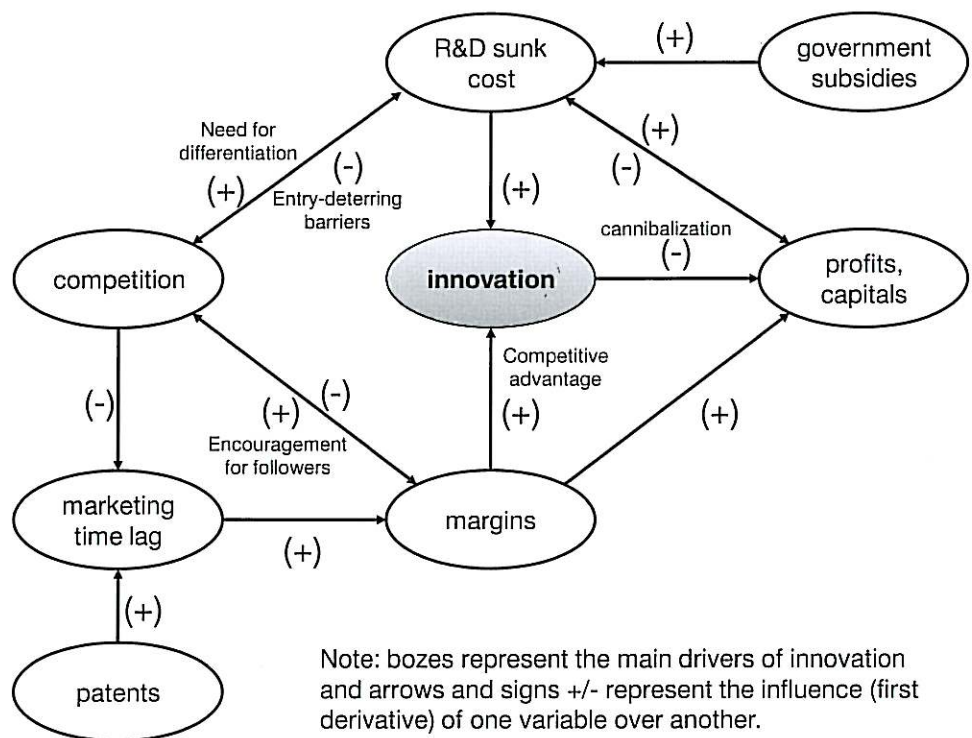


Figure 3. Inter-relation between economic drivers of innovation

Source: author's elaboration.

A successful innovation from the corporate point of view is a profitable innovation. Many revolutionary innovations never succeeded, although they were technologically better than their rivals. Beta-Cam vs. VHS in the massive video industry or OGG vs. MP3 as a music compression format are well known examples.



Continual, faster innovations induce higher margins over costs. To finance the incremental prices, productivity should grow at least as fast as prices. Otherwise, we as a society may fall in a “luxurious poverty” trap (decreasing number of better goods and services). But productivity is also a function of innovation and rises with it, softening the pressure on margins and prices.

The role of the government can be wrapped in subsidizing and guarantying patents protection. If the government subsidizes innovative companies, it should do it without favoring any in particular. It should deliver systemic help (through tax incentives, infrastructure preparation, etc.), especially where positive externalities can be identified (as may be the case, for example, of cheaper, faster data transfer using Wi–Max).

Protecting patents, the government lowers transaction cost involved in intellectual property and know–how protection, and sets the legal framework necessary to foster research and bear substantial development costs.

However, persuasion to innovate has two sides: the “supply side” (grants, subsidies, tax incentives, legal framework) and the “demand side”, which has been so far neglected. If we admit that companies are affected principally by the market, then we should work out ways of stimulating demand for innovative goods and services.

5. Strategic recommendations

As a conclusion for entrepreneurs, three strategic recommendations can be drawn. Firstly, innovative entrepreneurs should not seek profit maximization, but rather look for minimization of investment–recovery time of the borne costs. They should market the innovation as soon as possible, and charge relatively high margins.

Secondly, if the innovative company is a market leader, it should plan its product portfolio and invest in entry–detering innovations (differentiation) with high sunk costs; if it is a follower, it should better concentrate on cost–savings innovations so as to increase market share and strengthen the firm’s business fundamentals.

Thirdly, innovative companies should keep close to their clients: they are their most valuable innovation center. Listening to clients lowers research and marketing costs, shortens interface time and, therefore, lowers risks of failing when innovating.

6. Final remark

This article does not deal with innovation–regulated sectors (army) and social–sensitive sectors (human health). In the first case, the main drivers are not economic and in the second, drivers should not be economic.

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