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Will Microsoft be able to disrupt Windows before one of its competitors does?

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INTRODUCTION

Microsoft Corporation is an American multinational company headquartered in Redmond, Washington that develops, manufactures, licenses and supports a wide range of products and services related to computing.

The history of Microsoft began on April 4, 1975 when it was founded by Paul Allen and Bill Gates to develop and sell a computer-programming interpreter for an innovative microcomputer called the Altair 8800. MITS had built the hardware of the Altair 8800, but needed to contract with another company to implement a software interpreter. Allen and Gates saw the power of the microcomputer, developed and flawlessly demonstrated their interpreter to MTIS which agreed to distribute it under the name Altair BASIC.

This was the start of one of the most successful company in the world. Gates and Allen had small resources but a huge vision -- a computer on every desktop and in every home[1]. Since then, Microsoft licenses software to individuals and companies and grows fast. At the end of its third year, in 1978, Microsoft had already exceeded $1 million sales year-end[2] but the real breakthrough came in 1980, with the decision to develop its own Operating System.

After an attempt of a UNIX based Operating System in 1980, for which Microsoft created its famous software Word, they were awarded a contract by IBM in 1981 to develop its Personal Computer Operating System. Because the IBM PC release date was approaching fast, Microsoft bought an existing Operating System developed by Tim Paterson and renamed

[1] Source: http://windows.microsoft.com/en-US/windows/history
[2] Source: http://download.microsoft.com/download/7/e/a/7ea5ca8c-4c72-49e9-a694-87ae755e1f58/keyevents.doc

it MS-DOS (stands for “Microsoft Disk Operating System”), which stayed the basis of Windows for 25 years[3].

At this time, leveraging the fact that Microsoft had the only Operating System actually working on the IBM Personal Computer, Gates negotiated a clause with IBM that made the success of his company and became its business model – Microsoft could sell its operating system not only on IBM PCs but also on other companies’ devices.

Few years later, Microsoft launched its first version of Microsoft Windows, which became the most widely used User Interfaced Operating System in 1993, without any serious competition, as Apple was designing its own Operating System to run only on the hardware it designed and Linux was focusing on the server market. Many other companies like HP and Compaq started to compete with IBM on the PC market, all of them using Microsoft’s Operating System.

Microsoft had then realized that it needed to control not only the Operating System but also the software running on it. They started with office productivity applications, such as Microsoft Word, Microsoft Excel and so forth, willing to become industry standards and suspected to hide some of their innovations to be the only one using them, which is illegal. Novell, a Word competitor during the mid-eighties, filed a lawsuit claiming that Microsoft left part of the capabilities undocumented in order to gain a competitive advantage[4].

The Novell case was first of a long list of lawsuits of abuse of a dominant position. In the mid-nineties, Microsoft faced its first antitrust lawsuits that will be part of its history until nowadays and will give the company bad press being sometimes considered as “the devil”, abusing its monopoly position. For instance, on July 1994, Microsoft was recognized guilty of

[3] Source : http://books.google.co.uk/books?id=w_OhaFDePS4C&lpg=RA2-PA18&pg=PA16&redir_esc=y#v=onepage&q&f=false
[4] Source : http://www.theregister.co.uk/2004/11/16/novell_microsoft_wordperfect_analysis/

antitrust by the U.S. Department of Justice, Antitrust Division for executing anti-competitive licensing, where PC manufacturer had to pay royalty for each computer it sold, whether it had Windows installed on it or not[5].

Being in monopoly has its side effects, like lawsuits, but, in a fast growing market, it also brings cash. With cash, you can react efficiently to market evolutions by investing a lot quickly. Since the mid-nineties, the history has seemed to repeat for Microsoft: they lack long term vision to anticipate what will or will not work, but they are able to react with an unprecedented strength each time they realized they were wrong. It first happened with the Internet and Windows 95 (Internet Tidal Wave memo), the video games market and the Xbox or the smartphone market and Windows Phone.

Microsoft will always be late compared to its competitors but when it has a product, it knows how to market it and make it a success. It was the case with Internet Explorer, which has long been the most used web browser; it was the case with the Xbox, which is the most popular and most bought game console nowadays, and analysts predict that Windows Phone will be the second most popular Mobile Operating System in 3 years from now.

Therefore, Microsoft has shown that when it wants to win a market, it involves all its resources to do so and it most of the time succeeds. Today, what has been the company's milk cow for more than two decades – Microsoft Windows, is somehow at risk.

Technology has evolved faster than ever before these past ten years and technology is more and more present in people's life. Nowadays, people want to experience their digital life with their fingers, are being more and more nomads, connecting to the internet from their PCs or laptops but also from their phones, their tablets. They expect "always on" connectivity, receiving instant notifications from their social networks, uploading a picture

[5] Source : http://www.justice.gov/atr/cases/f0000/0045.htm

right from where it was taken, and have more and more choice, more options and flexibility from their everyday technology usages.

Ultimately, the barrier between their personal and professional life is decreasing. People want to use the same technology at work and at home and to be able to have their personal life on their professional devices, having their personal applications, and use websites such as social networks during their day at work. In fact, according to a study by Unisys[6] (conducted by IDC), "95% of information workers use at least one self-purchased device at work". This means that the professional devices are not suitable anymore for how people want to consume technology.

Microsoft has a key role to play in this transition while potential new entrants are eager to take advantage of these new possibilities. To answer these new usages, Microsoft would have to come back on its basics, including Windows. Windows suffers from one of its strength – its universality: it has been made both for productivity and entertainment, for homes and enterprises. For years it has been the universal way to discover the new era of information technology. Having a product used for every need and everybody was the essence of Microsoft and Windows.

With new ways to consume information that the industry has known these past few years with the emergence of smartphones and tablets, Microsoft has lost the drift and was not up to date to compete in this era, until Windows 8. Microsoft has done a tremendous work using all its strengths to reinvent Windows – billions of dollars were invested in Research and Development to prove and impose its vision on markets where its competitors like Apple and Google have already convinced consumers with their solutions. The question

[6] Source : http://www.unisys.com/unisys/ri/pub/bl/detail.jsp?id=1120000970004010071

is then, would Microsoft disrupt Windows in the following years before one of its competitors does?

I will first describe the key challenges for Microsoft on Windows, in terms of strategy and innovation. To this purpose, I've reviewed the literature regarding concepts like how innovation is managed in the technology industry, how a company can gain a competitive advantage leveraging its strengths and opportunities while reducing its weaknesses and threats, and how a platform leader should work with its ecosystem to reinvent its portfolio of innovations. Then, I will explain what I have learnt from the interviews I have done at Microsoft and why I thought it would be the best mean at my disposal to answer the issue of this thesis. Third I will try to give my vision of what Microsoft should do to reinvent Windows and keep being the leader in the computer world, providing the best softwares and products.

1. LITERATURE REVIEW

1. THE PROCESS OF INNOVATION

Innovation is a process of transforming the technology frontier into the commercialized product/process innovation in a competitive market[7]. It was demonstrated[8] that the innovation process has a pattern that is frequently referred to the S-Curve. In the microcomputer industry, new disruptive innovations are often happening– Internet was democratized 20 years ago, Google didn't exist 15 years ago. It's necessary to keep innovation going. The different S-curves are coming from the evolution from the innovator to transform the technological development (invention) into an innovation (commercial product). In the computer industry, many S-curves succeed each other which comes from the innovation life cycle theory, every old innovation is replaced, substituted by a new one. The technological improvement follows the S-curve to reflect technology progression from mainframe, minicomputer, PC, client services, broadband, mobile web/WAP technology. The innovation process as shown in the figure also shows technology substitutes to extend the life cycle of the operating system.

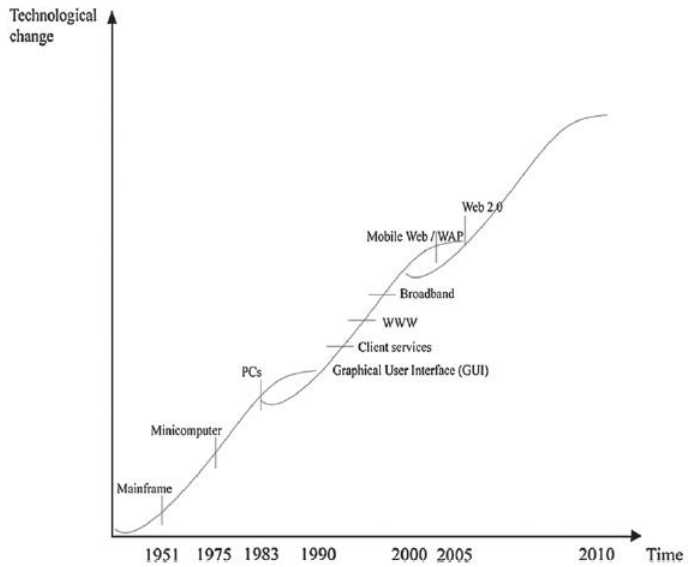


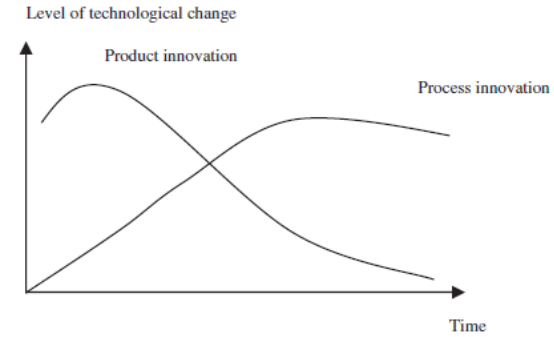
Figure 1 - tech industry S-Curve

[7] Daft, R. L. (1982). In S. R. Bacharach (Ed.), Bureaucratic versus nonbureaucratic structure and the process of innovation and change. Research in the sociology of Organisation, Vol. 1. (pp. 129–166).
[8] Utterback, J., & Abernathy, W. (1975). A dynamic model of process and product innovation. Omega, 3(6), 639–656.

The innovation process can be described by the forces of technology push that Schumpeter has highlighted in 1939 and demand pull or their interaction, demonstrated by Freeman in 1982 as triggers of innovation. Both technology push and demand pull see the innovation process as linear and sequential but we empirically say that it comes closer to an S-curve. They distinct in the way that technology push emphasizes on research and development while demand pull emphasizes on the market.

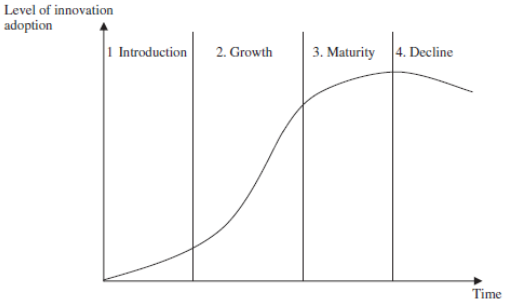
Given the competitive environment of the innovation/diffusion process in the industry, Utterback and Abernathy (1975) modelled the innovation life cycle to describe the degree of technological change and the process of innovation. The analysis of the innovation is based on the concept of innovation life cycle since the model provides a basis to understand a process of commercialization. I will refer to that model later when talking about Windows.

The Product Life Cycle (PLC) model developed by Vernon (1966) explains how the substitution of old products appear (and make the S-curve pattern). Every product will know four stages during its lifetime. First, the introduction into the market, but it is not adopted by many, then, growth where the product is acquired by the market. The third step is maturity – the product has gained it maximal market penetration. This stage is the longer in time. After some time, the product will decline and be substituted by another one, creating a new disruptive innovation in the S-curve.



Source: Utterback and Abernathy (1975)

Figure 2 - Product Innovation Lifecycle



Source: Vernon (1966)

Figure 3 - Product adoption over time

2. TYPES OF INNOVATIONS

According to Schumpeter[9] there are five types of innovations: introduction of a new good, introduction of a new method of production process, opening of a new market, acquiring a new source of raw material or create a new business or market structure.

According to Tidd, Bessant and Pavitt[10], innovation can take four forms: product innovation, process innovation, position of innovation in the organization or paradigm innovation. These types are related and it's difficult sometimes to see the interaction between process innovations that brings product innovation for instance. They have also proven that innovation can be divided regarding their degree of novelty involved and we are going to emphasize on this later in this literature review.

[9] SCHUMPETER, J.A. (1934). The theory of Economic Development, Harvard University Press, Cambridge, Massachusetts.

[10] TIDD, J., Bessant, J., Pavitt, K. (2008) Gestão da inovação. Bookman. Porto Alegre.

3. INNOVATION STRATEGIES

In the case of technical innovation seen in the previous part, Slavik[11] says companies can invoke two types of innovative strategies that depends on the entrepreneurial power of the company over the industry:

- Offensive – the firm is an initiator in creating new markets and needs and influence the S-Curve of technical development of the whole industry. Offensive strategy can be either creating disruptive innovation, addressing markets that didn't even exist before ("blue ocean strategy") or adaptive strategy where it adapts to the mass market addressing it with high-end products but not leveraging huge R&D investments.

- Defensive – the firm uses and incorporates existing trends into the product and ensure its diffusion. Defensive strategy can be either imitative, license or accepting strategy. The imitative strategy is linked to the offensive-adaptive strategy but differs from the market it's trying to address. Typically imitators arrive when the product life-cycle is in the maturity stage. Without any R&D, by using franchise, the firm will use a license strategy. Last, the accepting strategy will show up during decline, when the market is still up but first movers have left it.

With these definitions, we can say that Microsoft with Windows is more in the offensive-adaptive mode. Windows isn't disruptive for the moment but it still forges the whole industry using its huge installed base as a first argument.

[11] Slávik, Š. (1999). *Strategic management of firm*. Bratislava: Sprint.

4. BARRIERS TO INNOVATION

There are a lot of perceived barriers to innovation and the types of barriers differ from one industry to another. But some patterns are present in every industry and can be separated into two types: corporate barriers and customer barriers. While the first one is internal, the other is imposed by your market[12].

Corporate barriers can be divided into five major categories:

- Overspecialized R&D – while innovating, you might go too far from the market needs and eventually not be able to address it. Another way of seeing this, is that you cannot capture new market because you are unable to innovate on other products that you are specialized in.

- Overspecialized operations – This is closely related to the R&D overspecialization. Your operations are specialized to address only one market and is unable to address new market because it can't understand it.

- The resource barrier – Innovation requires money and resources. Scarce resources discourage innovation and few organizations have sufficient funds to innovate properly on their markets.

- The regulation barrier – it can take the form of corporate and business ethics.

- The market-access barrier – It refers to the reach you can have on the market as a company, linked to distribution, competition, switching costs (the 5 forces Porter model that I will study next)

[12] S. Ram And Jagdish N. Sheth. "Hurdling the barriers to technological innovation" http://www.jagsheth.net/docs/Hurdlining%20the%20Barriers%20to%20Technological%20Innovation.pdf

Customer barriers are even greater that corporate barriers, because customers mostly resist to changes and everything that breaks away their routine. Customer barriers can be divided into five categories.

- Change barriers – this is the most common reason for customer resistance to an innovation which seems at first incompatible with current habits and practices
- Price/performance barriers – which value does this innovation will bring me compared to existing alternatives?
- Risk barriers – innovation represents uncertainty and pose side effects.
- Tradition barriers – innovation can bring changes in the cultural traditions in a society.
- Image barriers – this is more perceptual than real and it comes with corporate culture and image. Innovation can break social taboos or stigmas and customers will repel it.

5. FIVE FORCES PORTER'S APPROACH

The influential work in innovation strategy is owed to Michael Porter (1980, 1985). Porter emphasized the use of competitive strategy as the way to achieve competitive advantage in the 1970s and 1980s. His notions are based on the resource-based approach which argues convincingly that strategies to cope with a changing competitive environment are associated with the firm's capabilities. The firm's capabilities have been described as amalgam of resources — technology, organizational capabilities, experiences and relationships[13]. Porter pioneered the 'Five Forces' approach for analyzing the firms' strategic position. The five forces of competitive position model are: relations with suppliers; bargaining power of buyers; threats of new entrants; threats of substitute products or services; and rivalry amongst existing firms.

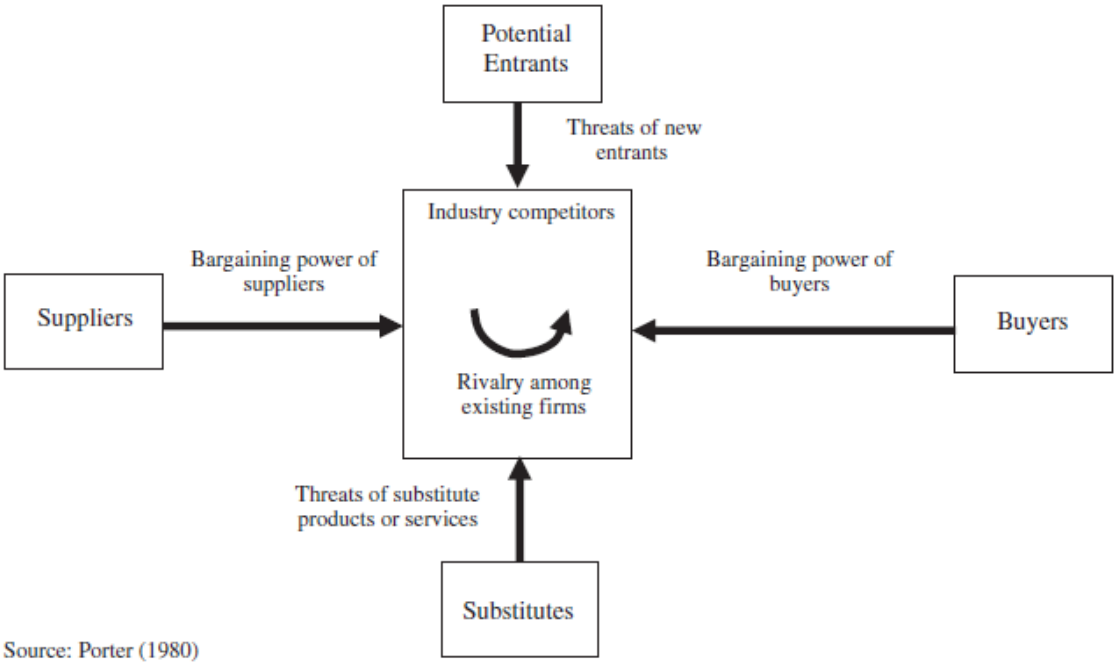


Figure 4 - Porter's Five Forces Model

Porter argues that a firm's strategy is influenced by these forces and suggests the firm to find a position in an industry to defend itself against the forces or to influence them in its

[13] Fahy, J. (1996). Competitive advantage in international services: A resource-based view. International Studies of Management and Organization, 26(2), 24–37.

favor[14]. Later, I will apply this model to Microsoft Windows to understand what is at stake for Microsoft today. The most important force comes from the substitute because Windows has established a platform that many customers depend on, but has not taken so much into account the threat of substitute: how people consume digital today is starting to change.

While the market is changing, Microsoft must adapt to it. But Microsoft has created a platform on which many consumers and partners depend. Therefore being a platform leader comes with issues that I am going to study now.

[14] Porter, M. (1980). Competitive Strategy. New York: Free Press.

6. Platform Leader's Dilemma

As Jarunee Wonglimpiyarat (2012) defines it, the term 'platform' is used to describe a cluster of capabilities or competencies capable of creating competitive advantage for a firm in terms of subsequent innovations[15]. Platforms involve an ability to excel at the innovation process itself by generating a continuity of commercially successful innovations.

To understand the dilemma of Microsoft with the Windows platform, I chose this definition: "Platform leaders are companies that do not just sell standalone products. They have a foundation technology that is sufficiently open so that outside firms can provide complementary products and services"[16] (M. Cusumano, 2011). Microsoft Windows completely enters this definition and goes way further as Windows is, in fact, in the middle the value chain: companies manufacture devices (mostly PCs) designed to work with the product and then, Windows provide tools for developers to promote applications and games allowing people to work or entertain on the device they bought.

This "network effect" makes the platform and the complements increasingly valuable as more users, applications developers, service providers, content providers, device makers and other ecosystem players adopt the same platform. Once the platform is setup, it is more and more difficult for competitors to dislodge the products and for customers to switch to another platform, while standalone products come and go.

By becoming a platform leader and being successful, it is increasingly difficult to change, even though their technology must evolve or become obsolete[17]. The risk is that new platforms emerge and change the game in the first industry that becomes obsolete.

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[15] Jarunee Wonglimpiyarat. Journal of High Technology Management Research 23 (2012) 90–102 Technology strategies and standard competition — Comparative innovation cases of Apple and Microsoft

[16] Michael A. Cusumano. Communications of the ACM. June 2011 .« Technology strategy and Management : The platform Leader's dilemma »

[17] Michael A. Cusumano. Communications of the ACM. June 2011. « Technology strategy and Management : The platform Leader's dilemma »

Platform leadership can be both a blessing and a curse because a whole ecosystem needs your product and make it very successful, but when it is time to change, you have to motivate your ecosystem to move with you. Today's trends and wars are around mobile phones, social networking and Cloud Computing. Microsoft must adapt to this and make its Windows product available on every platform.

Bill Gates' major mistake (back in the late 1990s) was probably to insist that Microsoft remain a Windows company, rather than become a broader platform company. That is why Microsoft has worked during the early 2000s to force Windows onto new devices, like mobile phones, media centers or the Internet, which made software not qualified for these new devices or services, rather than take the device or service and adapt or link it to back the existing Windows Platform. It has been the case with Windows CE for instance, that made smartphones run very slow because they didn't have the hardware to support the software. Microsoft should have created optimized software from scratch, as it was the case for the Xbox.

Of course, Windows on the desktop is the modern-day equivalent of a gold mine. It is not difficult to understand why Bill Gates and Steve Ballmer, Microsoft actual CEO have been so reluctant to cannibalize this business and move much beyond the PC platform. This comes from the fact that Windows and the Office Suite still account for nearly 80% of Microsoft's revenues and almost all its profits.

Apple, by contrast, was never wedded to the original Mac platform, which failed as a business in the 1980s and 1990s anyway. It later replaced the first Mac OS with NeXT software, which was based on UNIX. But Apple did remain wedded to its remarkable capabilities in user interface design and visionary product innovation. Those skills are the

basis for Apple's business success with the iPod, iPhone, iTunes, and iPad and its remarkable transformation into a global platform leader on multiple integrated devices[18].

I here understand that it's very difficult to position a platform and to make it evolve over the years. This comes from the fact that as a platform, you must entail your partners and ecosystem to move forward with you and that's the concept I am going to study now.

7. Innovation and Ecosystem

As I said it earlier, Microsoft has created a platform for Windows on which many partners depend to reach their markets. On one hand, PC makers need the software to exploit the hardware they are offering and on the other hand, developers need Windows (and the tools made available to them) to reach their market. This ecosystem gathers many actors that need each other to achieve their goals. The principle of an ecosystem is that it creates the value that no single firm could have created alone[19], but it requires that the all ecosystem works together. Or it can bring a costly failure; the innovation work made by one and not followed by another actor in the value chain break to dynamics.

For many companies, the attempt at ecosystem innovation has been a failure because innovation always brings a new set of risks that each actor has to accept and be ready for. Moreover, when companies imagine their potential return on investment, they mostly consider how much money the firm can create on its own. When in an ecosystem, you must assess how much the innovation will impact your ecosystem. The success of the innovating

[18] Michael A. Cusumano. Communications of the ACM. « Technology strategy and Management : The platform Leader's dilemma », June 2011

[19] Ron Adner, Harvard Business Review. April 2006 : « Match your Innovation Strategy to You Innovation Ecosystem »

company growth strategy hinges on how well it assesses the whole ecosystem's risks. These risks need to be assessed in a structured, systematic way to understand how they impact the markets and the partners in the ecosystem the product will grow.

According to Ron Adner (2006), fundamental risks in an ecosystem can be regrouped in three categories: initiative risks; interdependence risks and integration risks. These risks are related to the market where the product will be launched.

The process of innovation strategy taking into account the risks can be summarized as in the figure below:

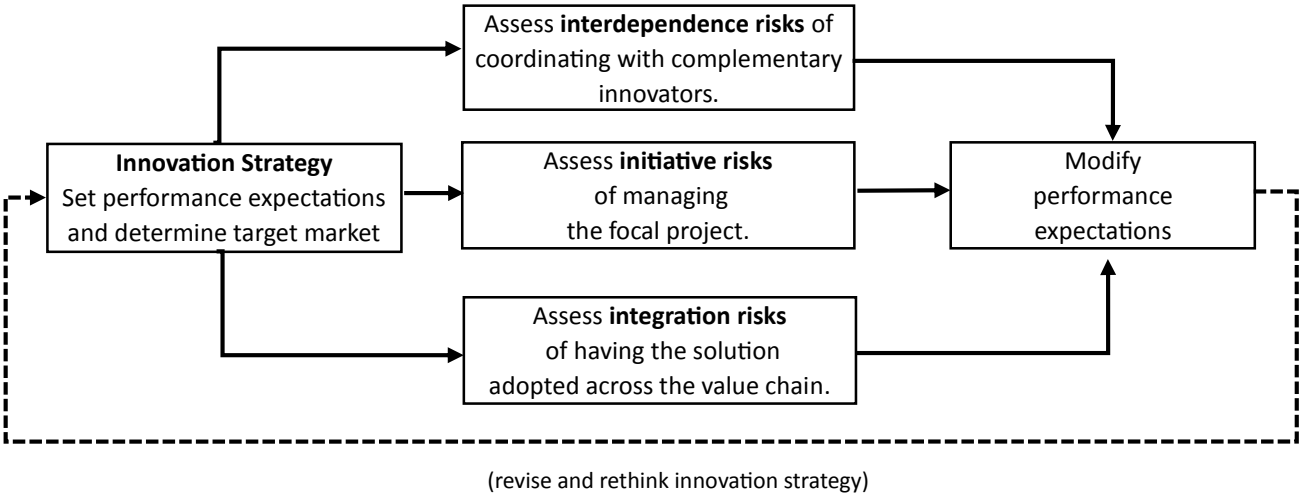

Figure 5 - Process of innovation strategy taking into account risks

What is really important to understand here is that strategy making in an innovation ecosystem is iterative because actors and products are interconnected. After having developed the idea of the product and the market it would reach, managers set up a strategy to achieve this goal, assessing the performance they want for the product and how it will be a success. While doing this, they also provide information on the mains risks (interdependence risks, initiative risks, and integration risks) the project will know and how much it could impact its launched. Too often, this step is done only internally and doesn't take into account the ecosystem.

But this assessment process forces managers to revise their thinking on the performance of the product to better adapt it, while it might provoke accepting lower targets for performance.

In Microsoft's ecosystem, it has always been the case. Microsoft needs to engage the device makers and the developers to embrace its innovations and serve its strategy. Microsoft must drive the whole industry forward, assessing the three risks. Interdependence and integration risks are the most important because moving technology forward requires abandoning some features to make it evolve but some partners or customers may have built their own solution on it.

For Instance, many large companies have software licenses for Microsoft Office that entitle them to upgrades at no additional cost. But other factors make them wait before upgrading from Office 2007 to Office 2010. Transition costs to assess and adapt specific applications built to run on older versions of Office can take some time, and these costs may be considered greater than the new features brought by the new version.

This must be taken into account by Microsoft when delivering a new version of the Operating System and it has been a real problem when Vista was released and no company would buy it. When Windows 7 came, it has been 7 years that companies built applications on Windows XP that wouldn't work (or that need to be audited) on Windows 7. These transition costs are the most important factor to be taken into account by Microsoft during its innovation processes.

The PC industry is flat for many years and growth comes from other markets that Microsoft want to embrace in Windows. To do that, it needed for Windows some transformational innovation that creates new risks for the ecosystem. It is therefore important to understand how a company must manage its innovation portfolio.

8. MANAGING INNOVATION PORTFOLIO

There are three types of innovation according to Bansi Nagji and Geoff Tuff (2012)[20]:

- Core innovation initiatives which are incremental changes to existing products and incremental growth into new markets. It can be made by new packaging, slight reformulations or added service convenience. As a matter of fact, that's exactly what a Windows update is : Through the age, Windows has evolved to deliver better services to answer new market needs

- Adjacent innovations which can share characteristics with Core innovation and the third innovation type – transformational. Adjacent innovation can be defined as adapting into a new market something that the company does well. Adjacent innovations takes into account the existing assets of a company and adapt the linked capabilities to new usages.

- Transformational initiatives are designed to create new markets and products, or even a whole new business to answer new identified needs. These are the black swans and other disruptive innovations that revolution how people consume on a market. Apple for instance has made three of them: the Mac, back in 1984, the iPod that revolutionized the entire music industry or the iPhone that reinvented phones, creating new usages. But it is the case to for Google Search, Kinect, designed for the Xbox and many other innovations. These innovations are often called game changers or breakthrough and come from startups or companies hidden assets (not the ones they were counting on) and are confronted to markets that are not matures.

[20] Bansi Nagji and Geoff Tuff, Harvard Business Review. May 2012 : « Managing Your Innovation Portfolio »

Bansi Nagji and Geoff Tuff (2012) have found that expected return on innovations and types of innovation are related and rely on a 70-20-10 ratio repartition. Most of the projects are core innovations, and they represent roughly 70% of an innovation portfolio. Adjacent innovations correspond to 20% of this portfolio and unfortunately, only 10% of innovations can be defined as transformational. Achieving a 70-20-10 ratio repartition for the innovation portfolio make the company around 10 to 20% more profitable than other companies[21]. This 70-20-10 ratio is also valid for the innovation portfolio return on investment. Bansi Nagji and Geoff Tuff (2012) say that transformational innovation contribute to 70% of company growth, while adjacent are around 20% and core 10%.

These results show highlight the importance of managing its portfolio of innovation and to always invest in transformational initiatives which can prove to be the more profitable, even if they are the most risky. Most companies rely on their core innovation, which can sustain growth for a while but cannot reinvent the company's core business. Linked to the Product Life Cycle, market and customers will eventually neglect the product,

The state of Microsoft Windows nowadays it that it needed real change in how the Windows platform is built. Whether it's a transformational or adjacent innovation is a question that I will answer later when studying Microsoft Windows particularly.

Concepts are set up now. The question is then, how Microsoft should work to leverage its tremendous Research and Development power and partner ecosystem to gain a competitive advantage on new markets defined by new ways to consume information. Does Microsoft need to disrupt Windows in the following years before one of its competitors does? Or would transformational innovation be sufficient? I will now explain what I have done to answer these questions.

[21] Bansi Nagji and Geoff Tuff, Harvard Business Review. May 2012 : « Managing Your Innovation Portfolio »

2. METHODOLOGY AND INTERVIEWS

I have been working at Microsoft for two years and have seen how the expectations for a renewal of Windows have been high from its customers but also its partners. Microsoft needed to adapt to new markets, new ways to consume digital life and to do that, needed a beautiful new product. Windows 8 has been released on October 26th, 2012 and technically answers most of the consumer needs. But will it be sufficient? To answer this question, I have made a literature review of the most important concepts like how innovation is managed in the technology industry, how a company can gain a competitive advantage leveraging its strengths and opportunities while reducing its weaknesses and threats, and how a platform leader should work with its ecosystem to reinvent its portfolio.

To understand further what is at stake and what the present and future of Windows is, I have interviewed Olivier Ribet, Windows Business Group Lead at Microsoft France for two years. I have asked him ten questions on the expectations of customers and partners over Windows 8, what it needed what is its position right now. How do they see the future of Windows, does it need new innovations again?

Asking to professionals working at Microsoft allowed me to successfully understand the vision of Microsoft's strategy around Windows. Olivier Ribet was the best choice because they work closely with the product every day and apply the strategy to sell the product. Marketing at Microsoft is really close to sales (for instance, the Marketing teams are responsible for the revenue metrics on their products) and to customer needs, while requiring to understand the global strategy set up for the product in the coming years. Olivier has worked at Microsoft for many years and perfectly knows the company and how it works.

These are the 9 questions I have asked him, for 45 minutes:

1. Windows 8 has been built to answer which market trends?
2. Why port Windows on ARM architecture?
3. How hardware partners (OEM) are seeing Windows 8? Do they entail to it?
4. Is it difficult for a developer to develop both for ARM and x86 architectures?
5. Will it become a problem to understand for consumers that there are two Windows that can't have the same Apps? How to address this risk?
6. How does Windows answer both Enterprise and Consumer market needs?
7. Has Microsoft only come back or has it taken some space beyond?
8. What is the strategy of Microsoft on the Windows Store?
9. Will Windows 9 exist?

You can find hereafter what I can conclude from this interview (and find the verbatim of the interview in appendix). What really made an impression on me is that even if Windows was late on some technologies, it seems clear that building Windows 8, Microsoft has investigated on every actual and coming trends to deliver a solution to answer both the consumer and enterprise markets. To do that, Microsoft had to compromise with older features from Windows and for instance, to break the famous "Start button" which can reveal a bit unsettling at the beginning but was made to deliver the right information at the right time by changing the way user interfaces are made. User Interfaces need to be more intuitive, faster and able to display more and more digital information people receive every day.

3. RESEARCH RESULTS

I will now try to study the case of Microsoft to answer the question asked in the introduction – Will Microsoft be able to disrupt Windows before one of its competitor does?

To do that, I will study how Windows has become the most successful software ever designed and how Microsoft has managed a fast-paced changing industry during the first twenty years of its existence. I will explain the strategic errors that Microsoft made during the painful years of developing and releasing Vista while not seeing the emergence of an all new market – the smartphones. Then, I will study the situation now, with the launch of Windows 8 and what is the strategy of Microsoft today. Is Windows 8 sufficient to overcome the strategic backwardness? Finally, I will study the future of Windows and what is coming in the next years and how Microsoft should (re)act to let Windows being the best operating system and Microsoft one of the most profitable company for the next years.

1. WHAT ARE THE KEY FACTORS THAT ALLOWED WINDOWS TO BECOME THE MOST SUCCESSFUL SOFTWARE EVER DESIGNED? HOW DID MICROSOFT MANAGE A FAST-PACED CHANGING INDUSTRY? WHAT WERE WINDOWS (AND ITS ECOSYSTEM) BEST WINS? WHAT WERE THE STRATEGIC ERRORS THAT MICROSOFT MADE?

1. BACK ON MICROSOFT'S HISTORY

As I mentioned it in the introduction, the strength of Microsoft Windows comes from its licensing product strategy. At the beginning of the Personal Computer industry in the mid-70s, software was designed for specific hardware – and you had to rewrite the software each time you changed the hardware. It was how Bill Gates and Paul Allen created Microsoft based on the distribution by MITS of their software interpreter marketed as the Altair

BASIC[22]. But designing a new software (or tweaking it) for each hardware would make Microsoft only a provider for hardware companies, that adapts its offer to them.

Gates and Allen had another strategy: provide an operating system. An operating system (OS) is a collection of software that manages computer hardware resources and provides common services of computer programs[23]. The thing is, hardware for every computer changes, every Personal Computer has a different hardware set, but the Operating System knows how to adapt to it. Microsoft entered the Operating System (OS) business in 1980 with its own version of UNIX (an OS core called the kernel, that is licensed for free by Berkeley University) called Xenix. But it wasn't a success.

What solidified the company's dominance was their second OS called MS-DOS (short for Microsoft Disk Operating System). Gates and Allen bought it from Seattle Computer Products to respond a request from IBM in 1981 to deliver an operating system for its IBM PC range of personal computers. Originally MS-DOS was designed to be an operating system that could run on any 8086-family computer. Each computer would have its own distinct hardware and its own version of MS-DOS, so MS-DOS was designed with a modular structure that loaded only the basic drivers at boot and then, adapt the software to the hardware.

Having the software that can adapt to the hardware was leveraged by one of the best vision in the entire industry made by Bill Gates. When negotiating with IBM to integrate MS-DOS into their PCs, Microsoft signed a clause allowing them to license it on other PCs with the same hardware architecture. IBM PCs were the reference at that time but other companies reversed engineering the hardware to create their own PCs.

[22] Source: http://en.wikipedia.org/wiki/Microsoft#Early_history
[23] Source: http://en.wikipedia.org/wiki/Operating_system

By being uncommitted to IBM, Microsoft could license its MS-DOS software to other PCs makers. It was how Microsoft began one of the most profitable business in the world.

Microsoft Windows was released in 1984 as a graphical extension for MS-DOS and Windows NT was released in 1993, being the renaissance of Windows with many improvements following the new technologies (like 32-bit processors for instance).

How can we assess the success of this strategy? We are going to study it until the release of Windows 7. The case of Windows 8 will be studied in part 2.

2. MICROSOFT'S SUCCESSFUL LICENSING STRATEGY

By pursuing a low-cost licensing strategy, Microsoft could license its Windows via OEM arrangements with the PC manufacturers. Microsoft also used a product bundling strategy to include software applications running on its operating system in the OEM deal which further increased the value of Microsoft Windows to PC users, increased the demand for its products and reduced the scope for competing suppliers. The distribution strength of global PC manufacturers and the value of application programs running on Microsoft Windows enabled Microsoft Windows to reach wide adoption and become a de facto standard.

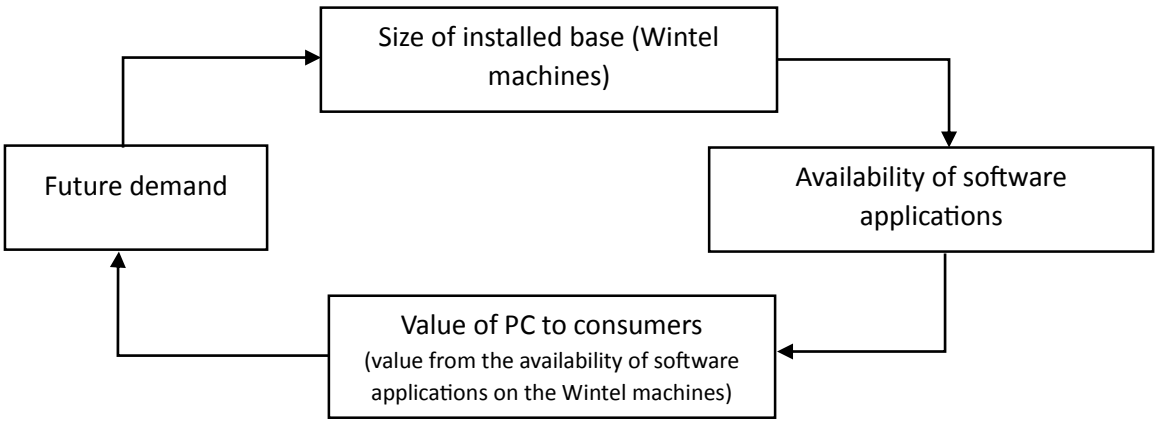

Figure 6 - Virtuous cycle of Windows ecosystem

The figure above shows the self-reinforcing standard creation of Microsoft Windows. Regarding this mechanism, Microsoft's pursuit of low price licensing strategy to the PC manufacturers led to the growing installed base of PCs running Microsoft Windows operating system. Since Microsoft Windows operating system and Intel microprocessor were mainly used in the PCs, this defined the PCs based on Microsoft's Windows and an Intel microprocessor as Wintel machines.

A larger installed base of the Wintel machines leads to a greater availability of software applications since software developers place importance in writing applications programs for the bigger market — users of Wintel machines. Since there were more applications available for Wintel machines, consumers increasingly placed greater value on Wintel machines, and purchased them in larger numbers. In turn, this results in the increase of the installed base of Wintel machines. The network externality effect shown by this mechanism enabled Microsoft Windows to become the de facto standard operating system in the PC industry. Microsoft could enjoy a continuing competitive advantage from its ability to dominate the PC industry with the extension of Windows standards.

By becoming a platform leader, you have all the ecosystem that comes closer to you and wants to make business with you because, they can reach a larger audience than by doing it alone. In the operating system market, Microsoft successfully established a technology platform which allows it to launch further related software products including scalable operating systems for intelligent devices, PCs and servers, software development tools and Internet and intranet software and technologies. Microsoft also established its business platform by pursuing a low-cost licensing strategy to license its Windows via Original Equipment Manufacturer (OEM) arrangements with the PC manufacturers.

Microsoft's platform was reinforced by a product bundling strategy to include software applications running on its operating system in the OEM deal which further increased the value of Microsoft Windows to PC users, increased the demand for its products and reduced the scope for competing suppliers. The distribution strength of global PC manufacturers and the value of application programs running on Microsoft Windows enabled Microsoft Windows to reach wide adoption and become a de facto standard. The wide adoption and the de facto standard of Microsoft Windows operating system then served as a strong platform that helped Microsoft to successfully launch subsequent Windows products such as Windows 95, 97, 98, 2000, Windows NT, Windows CE, Windows ME, Windows Media, Windows XP, Windows Vista, Windows 7, Windows 8, Microsoft.Net, Windows.Net and enter the new businesses such as the Internet browser, web TV business, computer game.

3. PORTER'S FIVE FORCES ANALYSIS

I will now conduct a five forces of Porter's model for Windows before Windows 8 to understand how it has been so successful and become in a quasi-monopoly, allowing us to know the competitors on the operating system market and why Microsoft lacked vision on substitutes, which is the biggest threat in this environment. The operating system market is complex, with three main actors: Microsoft, Linux and Apple. Apple is not a direct competitor as its offers are combining hardware and software but it is the main substitute threat for Microsoft.

Let us recall the five forces in the next figure:

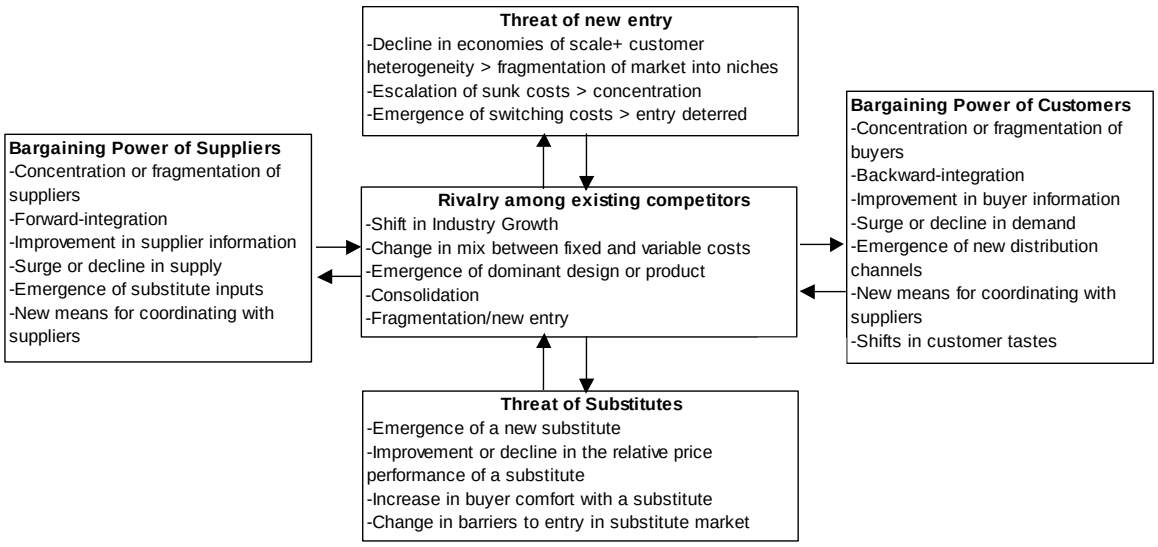

Figure 7 - Porter's Five Forces Model

Bargaining Power of Suppliers - Low

Windows doesn't have suppliers as it is created from scratch and the main supplier of Windows is developer's labor. And Microsoft has understood this and gives its developers one of the best conditions to work – project development processes established for 30 years, great places to work. Developers want to work for Microsoft, therefore, their bargaining powers (as "suppliers") is low.

Bargaining Power of Customers - Low

When you buy a computer, it comes loaded with Windows and there is not much you can do. If you want to buy only the hardware or Windows direct competitors – Linux distributions – you must go in a specialized shop. Otherwise, when you buy a PC, you buy it with Windows on it and you don't have the choice. This is because Microsoft has negotiated with OEM upper in the value chain.

Threat of new entrants – Low

In this industry the threat of new entrants is low. The switching costs from one to another operating system are too high. Even if the competitors have tried make great solutions to switch from one platform to another, people are still thinking that they will lose most of their data.

One example of this is Chrome OS, an operating system developed by Google to run in the Cloud. This operating system was a failure because of other reasons than being a very good OS that could have taken significant market shares. If it has failed, it is mainly because the hardware it was designed to run on (netbooks) are in decline, but the operating system is good and could have become a real threat.

Rivalry amongst existing competitors - High

Although Windows has created a platform ecosystem no other company could have created, rivalry amongst competitor is very high. Innovations are going at a fast pace to gain market share to other competitors. Linux has been able in the 2000 to take some shares. Apple is quite in the same case.

Threat of substitutes – Very high

Every day or so, a new device comes out with new usages or new hardwares that requires new software. Either from mobile phones, tablets, MP3 players, netbooks, Microsoft and Windows can lose market share. On the PC market, Windows is in good shape and has 90% of the market share for more than two decades, but PCs, aren't the only way now to consume digital life and substitute products can come every day.

This is a real risk for Microsoft and it has already known it when the iPhone was released. At that time, Windows was the leader in the smartphone industry and when asked

if the iPhone was a threat, Steve Ballmer would laugh at it[24]. Three years later, Windows for Phones was discontinued and today the iPhone has 18.8% now and Windows Phone 3.5%[25].

I think that the biggest risk for Windows comes from the threat of substitutes.

I am now going to study the SWOT analysis of Microsoft Windows.

4. SWOT ANALYSIS

The SWOT analysis of Windows strategic position is inevitably linked with the whole Microsoft's strategic position because most of the products are around Windows and are linked to it. Conducting a SWOT analysis highlights the inner value proposition of Windows and what are the main opportunities and threats it had to face before the launch of Windows 8. With Windows 8, the fact that every consumer product at Microsoft is designed to reinforce the value proposition of Windows is truer than ever before, but we are focusing on the timeline before Windows 8. Below is a recap of Microsoft's Windows SWOT:

Strengths	**Weaknesses**
Powerful technology leader in the operating system market Broad portfolio of integrated offerings and bundling (Media Player etc.) High operating margins and cash position Ability to forecast technology trends	Weak product line and low perception on cellphone's and tablet's markets. Low perception of software security Unreliable and slow network connections and devices
Opportunities	**Threats**
Growth of cloud offering catalyzed by positive market trends Enhanced technology of Natural User Interfaces (voice, touch, face, etc.)	PC shipments indicate negative trends Free and open source software packages Software piracy Microsoft must drive innovation for the whole industry and find reluctant OEMs

[24] Source : http://www.youtube.com/watch?v=eywi0h_Y5_U

[25] Source : http://finance.yahoo.com/news/worldwide-market-share-smartphones-220747882--finance.html

Strengths

As it has been stated earlier, Microsoft has built a powerful ecosystem around its operating system which is installed on most of the PCs sold. The analysis has shown that Microsoft achieved competitive advantage from its control over the technology platform and de facto standard for operating systems. The acquisition strategy to purchase software firms (acquiring software designers to work on specific Windows operating system industries) allows Microsoft to remain competitive in the operating system business. The ability to establish Windows OS as industry standards enables Microsoft to control the delivery channels, own the customers and enjoy a continuing advantage in the operating system market.

Its ecosystem is one of Windows' best strength and threat. Many software and hardware require features from Windows and they might need deprecated features. Windows has to drive innovation forward to overcome its weaknesses but might find OEM that are not up to move forward. If they do, having the industry following your innovation is Windows best strength.

Another strength that comes from the whole company strategy is its incredible strike force when it comes to forecast technology trends. At the beginning of the Internet, Microsoft needed to win the web browser war against Netscape. At this time, Microsoft didn't have something to compete against Netscape. They bought Mosaic from Spyglass[26] and made tremendous work to make it available on Windows, first for a fee and then adding it for free in the next versions of Windows. This way, they could make Internet Explorer the default software for browsing the Internet and they have literally killed Netscape at the beginning of the 2000s. Microsoft has done the same thing with Windows Server, where

[26] http://en.wikipedia.org/wiki/History_of_Internet_Explorer

Linux was leader for many years and where in ten years (until today) they have gathered more than 72% of the server market[27].

Last but not least, Microsoft enjoys strong margins and cash flow conversion rates. The company's operating margins in Fiscal year 2011 were 38.8% while its net margin was 33.1%. Microsoft converted 116% of its net profits into free cash flow. Comparatively, IBM's operating margin was 18.8% and net margin was 14.8%in FY2011.

Strong margins indicate that Microsoft's costs are better aligned to its revenues. It indicates the inherent strength in the company's business model which is dominated by sticky revenues requiring lower cost of acquisitions, pricing power associated with products that command high switching costs. The company also enjoys strong cash flow generation capability which supports the company's growth prospects. Strong cash flows and margins provide resilience to the business operations and reduce vulnerability to market declines. High margins also equip the company with ability to better address price competition. Cash flows enable the company to further finance growth at feasible costs. High margins compared to peers also indicate that the company has been able to sell products at a premium[28].

Opportunities

Natural User Interfaces (NUI) are defined as human-machine interfaces that is effectively invisible or becomes invisible with successive learned interactions or based on nature or natural elements[29]. They are the future of technology and Microsoft has already successfully brought some of the best NUI that has ever existed – the Kinect which was built for the Xbox, the video game console of Microsoft and that uses gestures for interaction

[27] Microsoft internal source
[28] "Microsoft Corporation SWOT Analysis." Microsoft Corporation SWOT Analysis (2012): 1-9. Business Source Complete
[29] http://en.wikipedia.org/wiki/Natural_user_interface

instead of a game controller. It has already been installed on Windows and dozens of applications are able to take advantage of it.

Another opportunity comes from the Cloud – you want your data everywhere for instance. On your smartphone, Pc or tablet. The Cloud allows you to that, between other enterprise-scale innovations.

Weaknesses

Before Windows 8, Microsoft just didn't have a solution for tablets. The touch interface made for Windows 7 was inefficient and didn't convinced much the customers. With a flat PC market and growth coming from tablets and smartphones, Microsoft had to react.

Another weakness is that Windows is perceived as low on security, compared to its competitors. This is a switch factor for many people.

Threats

The PC market is witnessing significant headwinds. The market is estimated to grow at 1.9% in 2012. The company's Windows division's revenue growth is largely correlated to the growth of the PC market worldwide, as approximately 75% of total Windows division revenue comes from Windows operating system software purchased by original equipment manufacturers. These factors will limit growth opportunities for the Windows PC operating system and Office applications[30].

[30] "Microsoft Corporation SWOT Analysis." Microsoft Corporation SWOT Analysis (2012): 1-9. Business Source Complete

5. Conclusion

Before Windows 8, Windows had great strengths and opportunities but suffered from a competitive backwardness for not having envisioned the tablet and smartphone markets. This mainly comes from the fact that when everything was moving, Microsoft delivered on of the worst product that it has ever designed: Windows Vista. Unfortunately, this product was unable to convince users that rather liked to continue on Windows XP. That's why Microsoft urged the development of Windows 7, but couldn't adapt to the changing environment around how people consume their digital life.

Microsoft has missed the smartphone revolution in the first place, when Apple successfully released its first iPhone which was a revolution, followed by Google's Android mobile operating system and two years later, the apology of tablets with the iPad as a leader. These new devices change the way people consume their digital life and Microsoft had to answer these new usages. We are going to see in the next part what Microsoft has done for Windows with the release of Windows 8.

2. What has Microsoft done to overcome its Strategic backwardness? The Windows 8 case

1. What are the "big bets" for today and tomorrow?

Windows has originally been made for Personal Computers. It began with the tower containing the computer hardware linked to a screen, a keyboard and a mouse. It evolved to laptops, that required less power to live longer, smaller screen but have the same applications as traditional PC had. Once again, the game changed with touch displays. Windows was built for the mouse-and-keyboard usage, not finger or stylus. This had to change in Windows because people want to consume digital with their fingers. Actually, when designing Windows 8, Microsoft made an inventory of what are the requirements today for a modern operating system, the trends that are growing but also the ones that are coming in the next years (as natural interface for instance). Windows 8 is the result of the best answers Microsoft can give to these trends.

We can divide these trends into three main parts:

- Usage – how people are consuming their digital life now and tomorrow
- Hardware – what are the main trends and innovations in terms of hardware improvements
- Software – how people consume software, what do they want and how you should build software from now on.

I'm going to detail what are these trends, and how Windows 8 answers them.

Usage

People have new ways to consume their digital life and they share more and more. Here are the main trends in the new usages that we call at Microsoft: the consumerization of IT.

Social Networks: 10 years ago, facebook didn't exist and has now one billion members that share tons of data every day. Twitter has 500 million users. People are sharing all the time.

Cloud: First thought as a way to make economies of scale for computing power by creating huge datacenters, its usage has move from the enterprise to the consumer and people want to use it more and more – having all your data stored in the cloud allows you to sync it on every device or accessing your webmail. It's a real part of what's happing in the tech industry right now.

Multiscreen: For many years, people had their PC or Mac with their files on it that were not shared. The way it was designed is: you have hardware, software, applications and services on a machine that can connect to the Internet. Now, you have your computer, your (smart)phone, your tablet, your TV on which you want to consume videos from another of your device. You want facebook and mails on your phone, your tablet and computer at the same time.

Nomadism: For many years, nomadism was reduced to: if you're an executive, you can have a Blackberry and if you are in the field as a sale, you can have a 3-kilogram PC or if you were lucky, you could have an ultra-thin laptop. But when you look at how people work today: you see partners, clients, have internal meeting in the same day, you need to have devices that connect fast, that are light in weight. For sure, there are some jobs that don't need to move as accounting, but most of them need to be nomad.

Fusion between professional and personal life: this nomadism comes with the need to have both your personal and professional life on your computer. People want to be able to switch from the sales forecast on their Excel file to check a new message on their social network.

Apps & Stores: People want to have online stores where they can find all the apps they want to use. Buying softwares in a brick and mortar shop, manufactured on a CD-ROM is not anymore how people are consuming. They want a one stop online shopping experience.

Hardware

Battery: Nobody thinks about it, but batteries have made tremendous innovations to support more computing power on smartphones, tablets and laptops. You can now watch high-definition videos, share on your social networks and receive instant notifications when you have a new message. People want their devices to be fast and to hold the charge for long.

Networks: The Internet is taking a bigger part of our life every years. People want to access the Internet faster and from different devices. While the Internet via cable network has great quality in France, people are asking to access the Internet from their mobile devices (tablets and smartphones) from everywhere. This explosion of data consumption has been a great challenge for telecom operators and for device makers to follow the trend of innovation to deliver best service.

Sensors: mobile devices integrate a lot of sensors like GPS, gyroscope, Near Field Communication (NFC), proximity sensor etc. that the software has to exploit.

Screens: not so long ago, you had to pay for a good screen. Today, every screen has a good quality, is available in every shape and size you want, with or without touch capabilities.

Connector standardization: technology evolves but connectors are the same (USB 3.0)

ARM/x86: For 30 years now, x86 processor chips have dominated the market, with Intel being in quasi-monopoly for providing these chips. These chips are extremely powerful, and answer every need a computer has (and most of the time is not used at its capable power). When Apple launched its iPhone, they made the choice not to use an Intel x86 chip, but rather use the architecture made by ARM, another processor designer, that has been used most of the time for embedded systems because of its low power consumption – which is exactly what mobile devices require because of their battery life. To be able to use software on ARM architecture, software designers need to rewrite it from scratch, because the code is incompatible between ARM and x86 architectures.

Software

Open-source: Collaborative developments stays a trend in the software industry.

Waterfall: The ways companies develop softwares are evolving to. We are now moving toward Agile and Rapid Application Development that changes the way people develop the apps and their usages (it is easier to move a part of the infrastructure in the Cloud for instance).

HTML vs Apps: With growing access to the Internet from every device, developers have the choice to address their market whether from the web or from a native application (that need to be developed for many operating systems and devices because the mobile operating system market has no clear dominant). This is good for developers that have more work, but it is more expensive for companies.

Natural User Interface (NUI): this is tomorrow's trend that Microsoft is already able to address. One product exploits this NUI – Kinect – which was built for the Xbox, the video game console of Microsoft and that uses gestures for interaction with the user instead of a game controller. This product has been launched after long research thinking on how to interact with a screen in a room. Many industries have been impressed by this technology, not for creating games, but to adapt it to their own needs. And Microsoft has developed a Software Development Kit (SDK) to let companies exploit these capabilities.

2. Microsoft's answers for Windows

When Microsoft looked at all these trends, it had to integrate each and every one of these concepts. But not so many companies are able to address sufficient Research & Development on all of them. Microsoft has done its best to address all these trends, even if they are not in its original scope. For instance, networks and cellular data usage, enhancements and new services don't seem to be worth being taken into account to design an operating system. But it does now, because it is interconnected with other trends that are very important for Windows, like nomadism and confusion between personal and professional life. Therefore Microsoft had to understand all these trends, their issues, needed to "speak these languages", include these concepts.

As we have seen it in the literature review, technology progresses following an S-curve. Every new innovation breaks or adapts the previous one to a new trend. Actually, technology is evolving in many directions, following many S-curves at the same time that spread the features and services an operating system should incorporate. Including the concepts cited above made Windows 8 not only an operating system – a platform exploiting some hardware and giving tools to develop and support applications on it – but also a

provider of an online store (Windows Marketplace), a free-streaming music platform (Xbox Music Live), a native mapping service (Bing Maps), a native social networks integration for contacts and chat services, and many other answers to trending topics.

One of the things that Microsoft was expected to deliver for Windows 8 is a good touch experience. Touch-screens have revolutionized how people interact with digital, using fingers instead of a pointing device was a real breakthrough. Microsoft, until the release of Windows Phone 7 in late 2010[31], didn't have a user interface efficient enough for finger touch. Microsoft worked really hard to deliver an intuitive and put-useful-information-first interface based on a design language called Metro – now Modern UI – for its mobile operating system. For Windows 8, it decided to adapt its Modern UI interface for desktop computers and tablets.

Journalists and innovation researchers have been suspicious about this choice[32], offering both the "classic" Windows desktop and a touch-optimized Modern UI interfaces in the same operating system, where you can switch between the two with a simple click. Microsoft justifies this choice by delivering one operating system able to take advantage of both tablets and desktop computers, and both touch and pointing-device interactions. The user has the choice to use one or another. This comes from the platform leader dilemma that I will cover in the next section and the fact that people are resistant to changes[33].

Will this work? Will it be sufficient to overcome Windows competitive backwardness? Will the ecosystem follow? Fortunately, the first figures have arrived which give some insights on whether it is a success or a failure.

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[31] Source : http://en.wikipedia.org/wiki/Windows_phone
[32] Source : http://www.huffingtonpost.com/larry-magid/microsofts-future-looks-g_b_2207903.html
[33] Source : http://blogs.hbr.org/kanter/2012/09/ten-reasons-people-resist-chang.html

3. PLATFORM LEADER: WILL THE ECOSYSTEM FOLLOW?

We have discussed earlier about the fact that Windows is part of a huge ecosystem and serves as an intermediary between hardware manufacturers and developers to reach a tremendous market for computer consumers. With Windows 8, Microsoft has changed the game for everyone. PC manufacturers must follow the touch and nomadism trends often reduced as tablets and developers must adapt to this new way to interact with digital. How did Microsoft manage to drive forward innovation?

First internally. Software developments are processed and follow well defined rules and this is why Microsoft has been so successful in developing software for so many years. But for Windows 8, developments were so big that they needed another way. Directed by Steven Sinofsky, Windows 8 developments have been made in 18 months (twice the pace of other versions) and a new version of Windows – called Windows RT – was entirely rewritten from scratch to run on ARM architecture processors[34].

Then with partners. First, with Intel. Microsoft Windows and Intel were so closely related that people talked about Wintel machines. When Microsoft announced that they were opening their platform to other processors to recover a market segment that Intel chips couldn't address (tablets and smartphones), Intel said that it wouldn't change its market, as people would rather like its platform where older softwares all work than new architectures where only entirely rewritten softwares would work[35].

Then, with other hardware partners. PC industry has not been much innovative about new hardware these past years. They deliver PCs that follow the Moore's Law[36], without much hardware innovations. The ones that have been increasingly successful in delivering

[34] Source : http://en.wikipedia.org/wiki/Windows_RT
[35] Source : http://www.engadget.com/2011/01/13/intel-ceo-paul-otellini-addresses-microsofts-arm-move-in-the-wa/
[36] Source : http://en.wikipedia.org/wiki/Moore_Law

best hardwares are competitors coming from the cellphone industry. Think about Samsung for instance. These competitors are coming from the "small-screen" and getting up in the tablet market, where PC manufacturers hadn't any solution at their hand (if you forget HP that bought Palm and its powerful WebOS to shut it down a few months later[37]).

What Microsoft has done for the first time in its history, to lead the path in the designed-for-Windows tablets, is secretly developing its own tablet – Surface. When your ecosystem isn't ready to move on with you, you can show them the way by going on their market. It was one of the best moves Microsoft could do to relaunch its ecosystem – entering as a competitor of its partners.

Last, with developers. To address their needs, Microsoft has released some powerful tools to develop faster and once for every environment (processor architecture, touch/non-touch devices). The value proposition is: develop once for every device. Microsoft has even talked about developing once for Windows and Windows Phone. This reduces the development costs while widening the reachable market.

So Windows 8 has been one of the biggest bet for Microsoft in its history. Did it work? Yes. First results are showing that Windows 8 is selling at a faster pace than Windows 7, with 40 million licenses sold in one month[38] and over 1500 devices labeled "designed for Windows 8". Partners are believing in Windows 8. What about developers? Developers care too. More than 20,000 apps have been validated on the Windows Store.

As a conclusion, we can say that Windows 8 is a success and Microsoft has overcome its competitive backwardness answering all the needs that people want from their digital life

[37] Source : http://www.washingtonpost.com/blogs/faster-forward/post/hp-ceo-shutting-down-webos-difficult-but-necessary/2011/08/18/gIQAjNXMOJ_blog.html
[38] Source : http://blogs.windows.com/windows/b/bloggingwindows/archive/2012/11/27/windows-8-40-million-licenses-sold.aspx

now. And they have succeeded in entailing their ecosystem of partners. This is a big victory for Microsoft.

3. What is the market now and how analysts see it in the coming years? What are the next challenges for Windows?

We have seen that Windows 8 has overcome its competitive backwardness and is now up to date to deliver one of the best operating system in the world. But industry is moving faster than ever, and more and more trends have to be taken into account. First, we are going to study what are the analysts' views on the future of the computer and tablet markets and then how Microsoft should act to deliver the best operating system in the future.

1. Analysts on future of computer and tablet markets

The PC Market has shown to be quasi-flat for the last years. It will still be growing at a slow pace for the next years.

In comparison, tablets will grow as much as to represent 60% as many units as PCs by 2015 and Apple's iPad will remain dominant in this market with almost half of it, according to Gartner forecast[39].

[39] Source : http://www.guardian.co.uk/technology/2011/sep/22/tablet-forecast-gartner-ipad

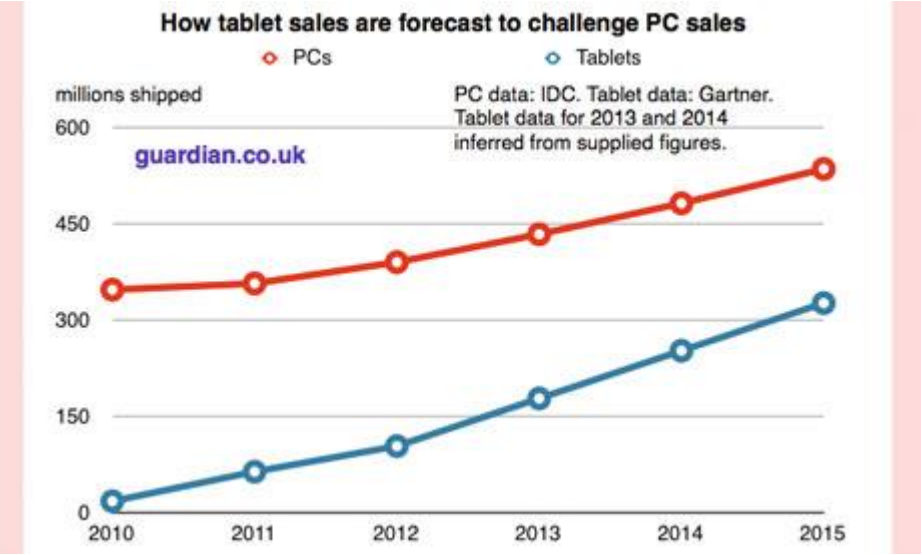

Figure 8 - PC Market Growth from 2010 to 2015

The predictions for Google's Android tablets are not as good as iPad's because they are expected to be in the middle market with no real differentiator, while keeping high prices and weak user interface.

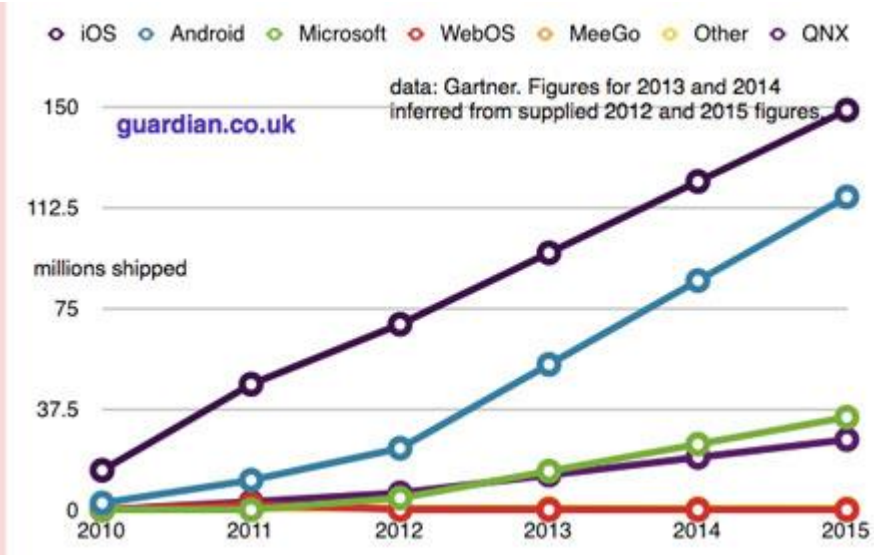

Figure 9 - Tablet Market Growth from 2010 to 2015

For 2015, Gartner forecasts that Microsoft Window will make up to 34 million units sold, running on ARM processors rather than Intel processors. This figure is very low compared to the outstanding 148 million iPad sold in the same year by Apple. IDC's most recent forecast also confirms these trends.

"The late arrival of Windows on tablets might limit its appeal, especially to consumers, as Apple and Android will be more entrenched by then. Microsoft's platform will find its biggest opportunities in the enterprise segment, where IT departments could benefit from smoother integration with existing Microsoft software." Gartner's vice-president Carlina Milanesi commented in a research note.

This is actually the strategy of Microsoft for the future. They have a wide installed base in enterprises and it's easy to migrate applications to Windows 8. But Windows will lack market in the consumer market.

So how should Microsoft act to double its investments and reinvent Windows to reach a greater market or to be up to date not only once in a while but all the time?

2. A FIRST ANSWER: WINDOWS BLUE

First rumors are already showing up about the way Microsoft will deliver updates of Windows in the future years. The company is planning another completely different approach to develop and price its operating system, for computers and for smartphones (Windows Phone), codenamed Blue that will provide more regular updates to consumers. It has been said that an update of Windows will arrive as soon as mid-2013 (less than a year after Windows 8 launch) that will include user interface changes and modification of the entire platform and ecosystem. Even Pricing. Microsoft might price its next Windows release at a very low cost.

To accelerate adoption when "Windows Blue" is out, Microsoft might also block applications from the Windows Store that are designed only for Windows 8, pushing developers to create apps. Yearly updates will be the norm for Windows. Microsoft will kick

off an annual upgrade cycle for Windows that is designed to make it more competitive against rival platforms from Apple and Google[40].

As a conclusion, we can say that Microsoft will do everything to stay in the race and has changed the way it designs its softwares to be more competitive. I think that it is the path to follow for letting Windows a leader in the operating system competition, whatever the device.

3. Will Microsoft be able to disrupt Windows before one of its competitor does?

When considering the smartphone renaissance in 2007 and the tablet market creation in 2010, that both were made by Apple with the iPhone and iPad, we can see that the strategy to create these products was to take the core of Apple's operating system (Mac OS X kernel) and build a whole new operating system leveraging touch displays on top of it. By doing so, Apple reinvented their software to imagine how people will interact with the device with their fingers. It was first designed for the iPhone and then adapted to iPad. Right now, Apple's strategy is to make their desktop computer operating system integrate the innovations made for iPad and iPhone, but keeping apart their desktop computer operating system. Google didn't have a desktop operating system. They used a UNIX kernel to build their solution for smartphones and tablets.

Microsoft on the other hand chose another strategy. They had a version of Windows designed for phones called Windows CE that was the core of Windows Mobile operating system. They killed the product to create their Windows Phone operating system in 2010. To address the tablet market, where we have seen that the growth will come for the computer

[40] Source : http://www.theverge.com/2012/11/28/3693368/windows-blue-update-low-cost

industry, they could have done like the other competitors on this market: leverage their phone operating system to run on tablets, considering them as “big phones” with a set of features developers can use but with a controlled system for users. For instance, you don’t have access to a file explorer on Apple’s iOS, Google’s Android or Windows Phone. By doing so, tablets are considered as a hybrid between a phone and a computer.

Microsoft’s milk cow for 20 years has been Windows, designed for desktop computers, where it is in quasi-monopoly. Windows Mobile has once been a leader in the mobile operating system, competing with RIM mostly for enterprises. But when the iPhone came in, game changed. The iPhone allowed both productivity for professional life and entertainment for personal life, segment where RIM and Windows Mobile couldn’t handle the competition. And they have lost leadership.

When designing how to address the tablet market, Microsoft had two choices:

- Base its software solution on a mobile product where it hasn’t convinced the market
- Base its software solution on Windows for desktops computers and make the tablet market evolve toward a desktop usage rather than the phone and smaller screen usage.

For Windows 8, they obviously chose the second solution and leveraged their tremendous installed base on desktop computers to conquer the tablet market. As innovations were classified in the literature review, Windows 8 is an adjacent innovation of Windows. It leverages existing product to address new markets.

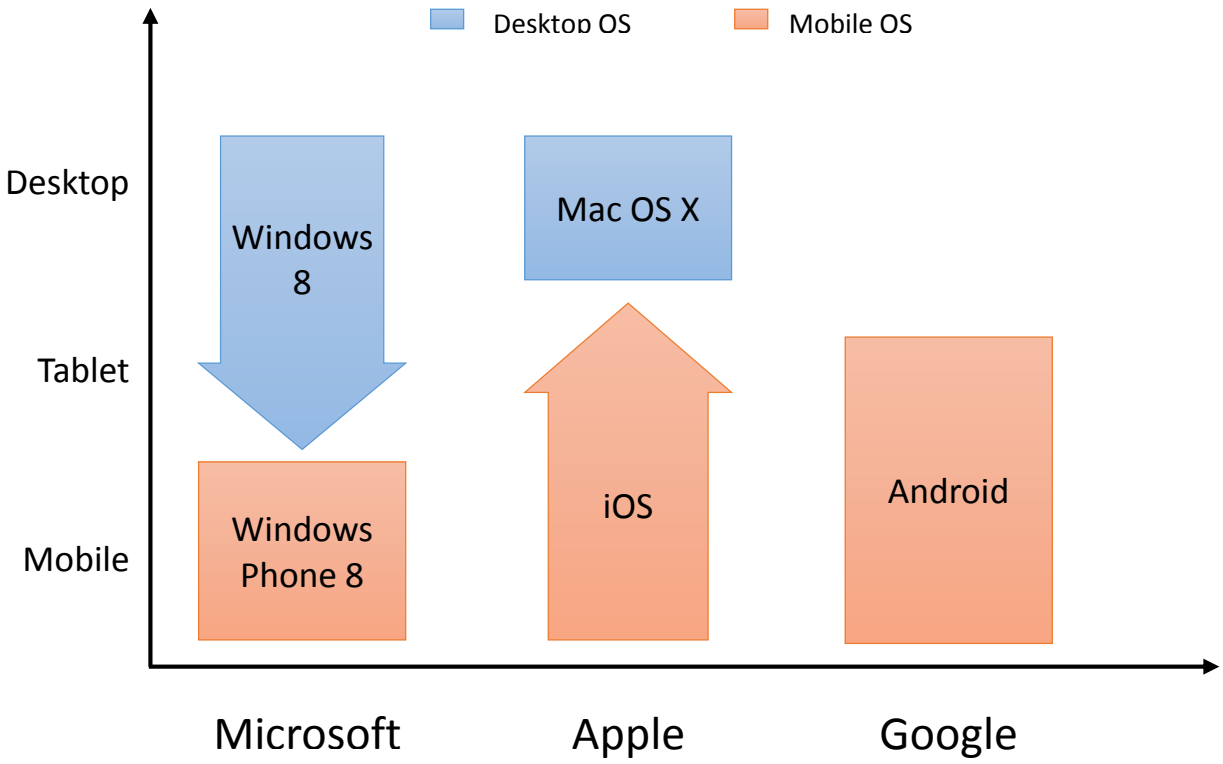

Figure 10 - Operating system positioning to address the tablet market

The figure above explains what happened in the industry in the previous years. By launching the iPhone, Apple reinvented the smartphone market. They have then used this disruptive innovation to create the tablet market, in which nobody believed because existing solutions (mainly Windows tablets) were not focusing on the right usage.

Apple's strategy is to leverage its disruptive innovation made for iPhone to address new markets, in the "upper/bigger-screen" markets and eventually, replace its Mac OS X operating system with the one originally designed for smartphones. Rumors saying that Apple is considering the ARM architecture rather than computers' Intel x86 processors for its next generation of Mac OS computers are confirming these trends.

Microsoft on the other hand, as we have seen it in the previous section, is rather considering making Windows to be available on smaller devices, and eventually even phones. This strategy can be very powerful – having only one operating system to address all

the needs and devices. Both Apple and Microsoft are using their strengths (iOS and Windows) to address new markets. The main difference is that iOS was a disruptive innovation where Windows (8) is an adjacent innovation, leveraging 20 years of software design that adapts to new usages, not reimagined from the start.

Therefore, we can conclude that no, Microsoft will not be able to disrupt Windows before one of its competitors does. Windows will stay on the foundations it has built for 20 years. But this doesn't mean Windows will not be successful. Windows has tremendous strengths (enterprise penetration, vertical offer across consumer needs, …) that it can leverage to address every screen and device from top to bottom with one solution. This can be really appealing for consumers and enterprises to have the same software and solution across every device. The link between all of these devices is the Cloud that allows data to be stored on every connected device. With the Cloud, you externalize the matter of storage and data and Microsoft has been a precursor on these technologies and has one of the best solutions (it is so good that Apple is using a part of it for one of its cloud services).

Microsoft might not be able to disrupt Windows, but it can definitely integrate some disruptive innovations into it. On longer terms, Microsoft can count on its power of Research & Development to innovate on the global trend that new technologies era brings: externalization[41]. People are evolving toward externalization of the information, their skills and memory to store them virtually. To interact with data, the suggested ways are pointing device or finger, which are not efficient enough and we are moving toward Natural User Interfaces (NUI) to interact with digital. Microsoft has a great card to play with Windows on this matter and regain a competitive advantage and not being substituted by new usages or devices.

[41] Michel Serres, December 2007 : The evolution of technology : http://interstices.info/jcms/c_33030/les-nouvelles-technologies-revolution-culturelle-et-cognitive

4. MANAGEMENT RECOMMENDATIONS FOR WINDOWS

With rumors saying that Windows will be updated more regularly, I think Microsoft is going in the right path for letting Windows be a huge competitor in the operating system market, whatever device it is. Industry is moving really fast and Microsoft should continue to push its partners and competitors to innovate. Delivering Surface – a homemade tablet – allowed Microsoft to show its partners what they should do. Microsoft must continue to do so and integrate new features in its operating system faster than ever before. The whole industry has quicken the operating system updates (starting with Linux on the quarter basis and Apple on yearly basis) to stay up to date delivering the best answers for the new S-curves in technology that we have seen spreading in different directions.

Based on previous conclusions, I will now give my strategic recommendations to Microsoft to address the potential threat of being substituted.

I recommend that Windows leverages its strengths seen in the SWOT analysis and Microsoft's tremendous cash and R&D resources to innovate and to integrate the market trends when they are in the "Growth" stage in the Product Life Cycle model. Windows can be a fabulous innovating actor in the technology industry.

1. RECOVER THE MARKET WINDOWS HAS LOST

If Windows is still the leader on the desktop operating system market, it lacks penetration from markets implying new usages and devices. The last release of Windows is the direct answer to these new trends. With this release, Windows has recovered its strategic backwardness but consumers have already switched to existing offers from competitors. People want to use the same technology at home and at work and they want to

be nomads. Microsoft's strength comes from the enterprises where it has a solution no one can replace or substitute on a few years basis. They have built the best software solution for companies that allows productivity, security and management. Leveraging this strength and the confusion between professional and personal usage of devices can make Windows come back at home where others (Apple and Android, mostly) have taken the place. If Windows accelerate its integration of personal new usages on a yearly basis and convince the Enterprise, they will recover the consumer market.

Competitors on the consumer market are very aggressive and move fast, updating their products for smartphones and tablets on a yearly basics. Microsoft has to change its operating system development processes to get the same pace, delivering less groundbreaking releases of Windows on a yearly basis but that embrace the market variations. This is another innovation strategy.

2. OFFER CONSISTENT EXPERIENCE ACROSS ALL DEVICES

Today Windows is divided into 3 main products as an operating system: Windows Server, Windows Client and Windows Phone. We have seen that Microsoft has already made Windows available on tablets. With computing power always more efficient on mobile devices, I think that Windows should also embrace Windows Phone and integrate it for smaller screens. This way, Microsoft will be able to offer a consistent experience across all devices, which is where the industry is going. But Microsoft can be the first, for one time.

3. LEVERAGE AND DEVELOP THE WHOLE WINDOWS ECOSYSTEM

We have seen that too often companies' innovation portfolio is centered on core innovations, that doesn't create growth. Windows RT (for ARM processors) is an adjacent innovation that will bring revenues from where the industry's market is growing: tablets. Microsoft has tremendous R&D power that it needs to leverage to be first on innovation, as it has done with Kinect for instance. Windows is the center of the whole Microsoft's ecosystem, therefore it can leverage other products innovations to integrate them into Windows. Internally, Microsoft has built a vertical solution of products answering most of the needs people have today, that integrate with Windows. For instance, Skydrive is the public cloud storage offering that works seamlessly on every devices, from Android devices to Macs passing by PCs and tablets. This is an example, but Microsoft has a comprehensive set of tools that make Windows way more than a simple operating system. The marketing at Microsoft is organized by product, not solution. I would recommend to market all of these products as solutions. People are not aware of how rich the ecosystem of Microsoft's products is.

Microsoft has suffered from bad publicity from their first anti-trust law suits in 1994 to Windows Vista which was a bad release of Windows in 2007. Things have changed. People are ready to reconsider Microsoft if the value proposition is great. Windows has one of the best vertical offers for consumer products, but people aren't aware how great their products are. Microsoft needs to invest on marketing and not to be ashamed of its solution.

Last point, with Surface, Microsoft has done what they have always refused to do before: design their own hardware to run their software. By doing so, they have shown the way to create great products to their partners and the whole ecosystem. When being a

platform leader, you must entail your partners and compete with them may be a good solution to accelerate innovation from them.

4. GO FURTHER, FORWARD, FASTER

For the past ten years, Microsoft has lost slowly but surely the consumer market, letting it to substitutes like tablets. Since Windows XP, it has always been in reaction mode. Today, efforts to bring Windows 8 have proven that Microsoft is a really big competitor. Microsoft needs to change the mode and become proactive in innovation and bring new solutions to Windows, before its competitors do it. Natural User Interfaces are a way to achieve this, but it can also be true by envisioning new usages leveraging the future technologies Microsoft masters: the Cloud.

5. CONCLUSION

This master thesis tries to answer the issue: Will Microsoft be able to disrupt Windows before one of its competitor does? To answer this question, I have reviewed the literature available regarding concepts like how innovation is managed in the technology industry, how a company can gain a competitive advantage leveraging its strengths and opportunities while reducing its weaknesses and threats, and how a platform leader should work with its ecosystem to reinvent its portfolio of innovation. These allowed me to better understand what is at stake.

Then, I have interviewed Olivier Ribet to have the point of view of Microsoft for Windows' strategy for now and tomorrow.

Last I have studied why Windows became one the most successful software ever sold, leveraging an ecosystem representing hundreds of billions of dollars every years and saw how Microsoft successfully overcome its competitive backwardness with Windows 8, but the operating system market has increased the pace of development these past few years – thanks to the smartphone revolution and Microsoft has to do the same for Windows to be up to date every year or so, and not one year over three – which was its regular innovation pace before.

I believe Microsoft is living one of the biggest shift in its history. Windows, its milk cow is currently at risk, letting to other hands the consumers' digital life that it has trusted for so many years. With Windows 8, Microsoft has shown it can react and be strong about innovation when necessary. Microsoft is showing good will to become closer to its consumer needs and needs to continue its efforts.

I also believe that Microsoft will not be able to disrupt Windows but I don't think it needs to. We have seen that the main threat for Windows is to be substituted by another

product, coming from new usages or device. With Windows 8, Microsoft has shown that it can adapt to any kind of innovation and to do so, to start from scratch. On one hand, Microsoft has the ability to react really strong to recover a market, on the other hand, it has assets for the future that no other company has, like a powerful Cloud solution, a natural user interface solution and one of the most complete vertical solutions for both the enterprise and the consumer markets.

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8. APPENDIX

1. VERBATIM OF MY INTERVIEW WITH OLIVIER RIBET

Quand tu regardes ce qu'on a dit il y a quelques semaines pour le lancement de Windows 8, on a dit : C'est un Windows réinventé /Windows Reimagined. Ce n'est pas seulement un positionnement marketing, c'est une réécriture complète du code de Windows de A à Z. Pourquoi ? Parce que dans les 5 dernières années, il s'est passé un certain nombre de choses dans les usages de l'informatique:

- Réseaux Sociaux
- Cloud
- Multi-écran : pendant longtemps, tu avais un PC ou Mac avec tes fichiers sur ton ordi. Les gens ne veulent plus avoir ce combo : Hardware software Apps and Services sur une machine, ils veulent leurs services et données partout : Avoir Facebook ou leurs mails sur le téléphone, la tablette, l'ordinateur en même temps.
- Le nomadisme avant, c'était : si t'es un top exec dans une banque, t'as le droit à un Blackberry. Point. Si tu es un jeune cadre hyper dynamique qui voyage beaucoup, tu vas peut-être avoir le droit à un PC de 30 Kg. Pendant longtemps, l'ultra nomadisme a été vu, si tu prends l'avion souvent et il te faut de la légèreté et de l'autonomie
  Mais quand tu regardes même ce qu'il se passe dans ce bâtiment aujourd'hui, on a besoin de mobilité, de nomadisme, tu vas voir des clients, des partenaires, des réunions internes. Donc le temps que tu passes assis à ton bureau, est beaucoup plus faible. Alors bien sûr, il y a des jobs qui ne sont pas mobiles, comme la comptabilité, le traitement de

notes de frais, les personnes ne sont pas mobiles. Mais de plus en plus les gens sont nomades, mobiles.

- Et ça vient avec une autre tendance : la fusion entre le pro et le perso. Tu veux pouvoir passer du forecast du mois et ton tableur excel à internet pour checker tes réseaux sociaux.
- Apps & Store : Aujourd'hui, tu dois trouver tes Apps sur un store qui les regroupe toutes.

Volet d'innovation dans l'industrie IT (hardware)

- Les batteries : il y a eu une révolution dans tout ce qui est batterie pour les appareils électroniques. Aujourd'hui, tu trouves normal d'avoir de la vidéo, de la haute def, des réseaux sociaux avec notification instantanée. Tu ne supportes plus que ça prenne plus d'une seconde. Mais il faut de la puissance et de la batterie pour cela.
- Gros travail sur les réseaux, notamment réseaux télécom
- Capteurs au sens large : quand tu vois aujourd'hui des gens comme HP des qui encapsules Beats Audio, ça garanti la qualité audio. Tu as le NFC, le gyroscope en standard etc.
- Evolution sur les écrans: (venu de pair avec les batteries) l'augmentation de la qualité des dalles tactiles et non tactiles. Il y a 4 ans, il fallait faire un gros chèque pour avoir un bon écran. Aujourd'hui, ce n'est plus vrai, tous les écrans sont de bonne qualité.

- De plus en plus, la connectique est devenue importante: il faut la standardiser, USB 3.0 etc.

- ARM/x86 : Il y a deux ans, Microsoft dit : le monde a changé et va changer. Tout baser sur une architecture qui a des caractéristiques exceptionnelles pour faire plein de choses mais qui a des limitation sur les réseaux, sur les batteries, sur le nomadisme et autres tendances actuelles, ce n'est pas la meilleure chose à faire. Les gens ne veulent plus de performance, ils veulent du beau. C'est puissant mais c'est moche - ça ne marche plus comme cela. Recherche de l'esthétique qui n'a pas été déclenché par l'industrie, mais par Apple : on va faire du beau et intégrant tel usage. Aujourd'hui, on recrute des ethnographes, des designers pour du hardware, ce n'était pas le cas il y a 5 ans.

Software :

- L'open source continue de rester très important. Le développement collaboratif reste une tendance de fond dans le software

- Waterfall, qui a été la façon de développer des logiciels pendant longtemps. Qui évolue aujourd'hui en Méthodes Agiles, Rapid Application Development (RAD) qui sont des approches par unit de logiciel et pas spec. On découpe le produit en discrete units avec des Product Managers des développeurs etc. et de cette façon, on peut déporter certaines parties d'un projet pour les mettre sur le Cloud ou ailleurs

- HTML vs Apps : Est-ce que lorsque tu as une App il faut faire du HMTL ou l'inverse ? En fait, il faut faire les deux. Ca relance l'industrie des

développeurs, mais cela est une galère économique. HTML5 dit : 1 partout la balle au centre. Si vous voulez porter l'un vers l'autre c'est possible : aujourd'hui on arrive à des résultats beaucoup plus riches, notamment avec les outils Microsoft qui exploitent le HTML5 et les Apps.

- Natural User Interface. Tu me disais, vous avez réinventé Windows, ok mais what's next ? Toutes les tendances discutées auparavant sont toutes encapsulées dans Windows, à date et pour les évolutions futures. Ce qui veut dire que lorsque tu regardes un produit comme Kinect (qui a 2 ou 3 ans), qui a été lancé suite à une réflexion de fond sur l'interaction avec un écran et conçu pour un salon. Très vite, on se rend compte qu'au-delà des joueurs etc. il y a des industriels qui disent, je veux pouvoir développer là-dessus, ça m'intéresse. Très vite, un peu sous la pression des utilisateurs on va créer un SDK. Aujourd'hui il y a des dizaines d'Apps qui exploitent NUI.

  Maintenant, les développeurs et industriels demandent pourquoi vous limitez cette utilisation avec un champ à 2m et un grand écran. Pourquoi ne pas élargir à des capteurs avec un champ à 40 cm comme sur les smartphones ?

  Et aujourd'hui les smartphones, les tablettes ont tous une ou deux caméras et donc là il y a plein de choses qui sont en train de se passer sur cette tendance-là.

  Pareil pour le son : il y a une semaine, on a traduit en real time une conversation anglais chinois. Ça fait 30 ans qu'on en parle, mais personne n'a réussi à le faire. Et c'est Microsoft qui le fait. Car MS investi beaucoup en RD, un de ceux qui le font le plus.

Quand tu regardes tout ça, il n'y a pas vraiment de choix dans cette industrie, tu es obligé de parler toutes ces langues, tous ces concepts, toutes ces tendances. Il y a très peu de sociétés qui sont capables de faire de la R&D sur tout ça. Microsoft est présent sur beaucoup de choses.

Pour Windows 8, il y a assez peu de cailloux qui n'aient pas été retournés et qu'on ait pas vraiment touchés.

Pendant longtemps, on a eu le sentiment qu'on était à la bourre à la ramasse, ce n’est pas faux.

Aujourd'hui, les gens sont surpris avec la sortie de Windows 8, WP8, WS2012, de voir que toutes les pièces du puzzle sont en train de s'emboiter avec la partie émergée de l'iceberg qui est Modern UI (Metro) qui est l'élément le plus visible de ce changement. Mais ceux qui ne regardent que cette interface, ratent quelque chose.

On lance le nouveau W8 le 26 octobre, et 27 novembre, on a déjà franchi les 20K Apps. 1500 machines certifiées W8. 40M de licences vendues. L'écosystème est vraiment ne marche. Nos concurrents disent c'est le nouveau Vista, fine mais on a déjà vendu 40M d'unités. On ne se vante pas car la concurrence est très rude: Samsung excellent partenaire, mais gros concurrent avec leur offre Galaxy qui tourne sur Android. Apple, mais les études montrent qu'il semble qu'il y ait un essoufflement, mais ils savent très bien se relancer.

Windows 8 est un vrai projet industriel qui a été développé en 18 mois. C'est beaucoup plus qu'un OS, car il y a les services qui vont avec, une plateforme ecommerce (Store) et un service de Musique gratuite (Xbox Live), service de cartographie natif, l'intégration des contacts des réseaux sociaux, le chat intégré quel que soit le tunnel utilisé

(facebook, Gmail, MSN etc). Essayer de s'approcher d'une expérience "One stop", où tout est intégré, déjà inclus.

Le logiciel n'était pas sur modèle là. Aujourd'hui, tu caches la plomberie, tu caches la complexité, ce qui est important, c'est l'usage pour l'utilisateur, qu'il accède à l'information le plus rapidement possible. Prenons l'exemple de la recherche : ce que tu veux c'est le résultat, ce n'est pas sur quelle application tu vas pouvoir trouver cela. Tu veux simplement le résultat, ou l'information.

2. EVOLUTION OF TECHNOLOGY

Michel Serres est un philosophe français. En décembre 2007, on lui a demandé d'analyser le changement de la technologie aujourd'hui42.

Stocker, traiter, émettre et recevoir de l'information, voici la base de l'homme. Il s'agit donc du couplage entre un support et un message. Au début : seulement l'oral. Ensuite, écriture, qui est la première externalisation du corps humain. Ici, change le couplage support message par l'écriture. A ce moment, tout change. Invention du droit écrit, invention ensuite d'un état. Puis, invention de la monnaie, grâce à l'écriture, ce qui supprime le troc.

Conclusion : si nous sommes aujourd'hui les contemporains d'une nouvelle révolution sur le couplage support message. Crise concernant la monnaie (volatilité de la monnaie). Crise concernant la religion. Même spectre que la révolution de l'écriture.

Les révolutions viennent du dur/hard, qui change le traitement de l'information / soft.

[42] Michel Serres, December 2007 : The evolution of technology : http://interstices.info/jcms/c_33030/les-nouvelles-technologies-revolution-culturelle-et-cognitive

Hier, si on demande l'adresse : 133 rue de la république. C'est un espace Cartésien, euclidien. Espace des réseaux, des coordonnées (réseau maritime, routier, aérien). Réseau de latitude et de longitude. Aujourd'hui, adresse : c'est le téléphone et l'adresse mail. Il n'y a plus de rapport avec l'espace. Les nouvelles technologies ne réduisent pas les distances : il n'y a plus de distances. Nous avons changé d'espace.

Nous n'avons pas conscience qu'en changeant d'espace, nous changeons les relations humaines, culturelles. Sur internet, vous pouvez toucher 100 000 personnes en quelques jours, là où il fallait des mois auparavant.

Stade oral, écrit, imprimé, puis le nouveau stade des nouvelles technologies aujourd'hui. Comment stocke-t-on l'information ? Au stade oral, on écoutait les aèdes qui avaient des mémoires gigantesques. A l'écriture, perte de mémoire considérable, on prend des notes etc. Puis nouvelle révolution de l'imprimerie. « Je préfère une tête bien faite à une tête bien pleine » Montaigne. Après l'imprimerie, plus besoin de savoir par cœur.

Aujourd'hui, devant les nouvelles technologies, nous n'avons même plus besoin de savoir car une recherche sur internet permet tout simplement d'avoir la réponse à porter de la main. Ainsi, qui nous reste-t-il ? Il ne reste à nos cerveaux qu'à innover, créer, réfléchir. Les autres tâches sont externalisées.