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雙邊市場的競爭平台：試論智慧型手機產業動態競爭市場

Platform Competition in Two-Sided Markets: Implications of Dynamic Competitive Strategy for the Smartphone Industry

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English Abstract

In its limited scope, this paper endeavors to combine current knowledge of Industry Structure, Two-Sided Markets, Product Platforms, Innovation and Strategic Management in a single integrative and easy to apply framework that addresses recent technological and societal trends. Whereas most platform management literature revolves around the view of the platform leader and what strategy he should adopt to consolidate the power of his position, the aim of this study is to develop an alternative model that addresses the needs of any stakeholder that does not have any significant power to influence a dominating platform but wants to benefit from being part of its ecosystem.

The Product Platform Development Model (PPDM) developed in this paper is the base for our analysis. Thus it is by combining concepts of Business Plan Generation, the Power Tower for Platform Building and the Stack Model for Industry Structure that the case of a single firm –HTC- in the smartphone industry is elucidated and a tailor-made set of propositions developed. Thus it is by drawing on the Business Model Canvas [33], that the key trends, market and industry forces are identified. In a second stage, by drawing on the PPDM Model, an extensive analysis of the ecosystem is carried out. This analysis means to determine the degree of integration in the ecosystems where a single firm operates, how value is created and shared between the different levels of these ecosystems' value chain, and to what degree companies are able to benefit from adopting various strategies. This integrative model not only exposes the importance of open vs. closed platform development, but also the imminent conflicts with adjacent industries from where new entrants often originate.

The external market analysis is followed by a company internal resource-based approach to better understand which organizational competencies and capabilities the firm needs to draw on and leverage from its partners to develop its own coherent product platform. By drawing on three major building blocks from the main organizational functions, i.e. consumer insights, product technologies and manufacturing know-how, the firm is able to develop its own product line and ideally product platform composed of an efficient subsystem-mix. Thanks to this efficient distribution of resources and leveraging of partner-capabilities, the firm is able to better identify market opportunities and develop a matching strategy and product offering. This constitutes the last step in the PPDM model.

To conclude, this study has made some progress in advancing platform management thinking, innovation management and two-sided market dynamics on one hand, while applying it to a concrete case example –HTC- on the other. It has proved the increased importance of industry consolidation in the technology industry, while proposing an analytical framework for "market takers" to insure increased chances of survival in an ever more competitive environment. It is paramount that further quantitative studies be carried out to substantiate causality effects and improve the predictability and accuracy of the PPDM Model. In the meantime, we hope to be able to give a better insight to the reader into the importance of platform based thinking.

Note to whom already possesses extensive knowledge of the aforementioned issues and the structure of the smartphone industry: Chapters 3 and 5 will likely be more insightful.

Dedication

This thesis is dedicated first and foremost to Natalia Chang 一張譽馨, who pushed me to pursue my interests, gave me the courage to follow through my studies, and who has made me feel at home in a country very far away from my own. I would also like to thank my family, especially my parents Roberto José Joos and Elizabeth Diane Joos-Chappers, for their unwavering support and sacrifice, as well as their wise suggestions throughout my studies.

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Table of Contents Page

English Abstract i
Dedication ii
Acknowledgments iii
List of Figures vi
I. Introduction ..... -1-
Part I: Exploring New Business Models ..... -4-
II. Literature review ..... -4-
2.1 Books ..... -4-
2.1.1 "The Age of the Platform" by Simon (2011) ..... -4-
2.1.2 "The Power of Product Platforms" by Meyer and Leynard (1997) ..... -6-
2.2 Academic Papers ..... -7-
2.2.1 The economics of Platform Markets ..... -7-
III. Model for Effective Platform Management ..... -12-
3.1 Globalization is pressing the need for Conceptual Contributions in Management Science ..... -12-
3.1.2 Geography ..... -12-
3.1.3 Rise of Information Technology ..... -13-
3.1.4 Rise of the Knowledge Economy ..... -13-
3.1.5 Building New Conceptual Frameworks ..... -14-
3.2 Company External Strategic Analysis ..... -14-
3.3 The Product Platform Development Model (PPDM) ..... -16-
Part II: Applying Theoretical Concepts in Practice ..... -25-
IV. Smartphone Industry Review ..... -25-
4.1 Key trends in the smartphone industry ..... -26-
4.1.1 Background ..... -26-
4.2 Dynamic Industry View ..... -27-
4.2.1 Industry Forces- Supply ..... -27-
4.2.2 Market Forces- Demand ..... -31-
V. Practical propositions for HTC ..... -33-
5.1 A brief history ..... -33-
5.2 Key Trends ..... -34-
5.2.1 Patent Lawsuits ..... -34-

5.3 Industry and Market Forces ..... -35-
5.3.1 Consumer Insight- Lack of excitement by customers ..... -35-
5.3.2 High costs ..... -35-
5.4 Propositions ..... -36-
5.4.1 Ecosystem View- Leverage Platform Resources and Multi-home ..... -37-
5.4.2 Using the stack model ..... -38-
5.4.3 Building the product platform ..... -52-
VI. Conclusion ..... -52-
Bibliography ..... -55-
Books, Journals and Other Academic Papers ..... -55-
Periodical Articles, Reports and other Online Sources ..... -59-
Appendix ..... -65-
1. Concept Definitions ..... -65-
1.1 Business Model ..... -65-
1.2 Capabilities vs. Competencies ..... -65-
1.3 Platform ..... -65-
1.4 Ecosystem ..... -65-
1.5 Platform Strategy ..... -66-
1.5.1 Coring Strategy ..... -67-
1.5.2 Tipping Strategy ..... -67-
1.5.3 Multi-homing ..... -68-
1.6 Dynamic Stability ..... -68-
1.7 Thought architecture ..... -68-
1.8 Common Building Blocks ..... -69-
1.9 Subsystem Interfaces or Planks ..... -69-
1.10 Product Line ..... -69-
1.11 Product Family ..... -70-
1.12 Product platform ..... -70-
1.13 Derivative Products ..... -70-
2. Static View - Snapshot as of June 2012 ..... -70-
VIII. Autobiography ..... -84-

List of Tables

Table 1: HTC Propositions -37-

List of Figures

Figure 1: Thesis Analytical Flow……..-14-
Figure 2: Key Drivers of Strategic Actions in High-Tech Companies [5]..……...-16-
Figure 3: Virtuous Cycle of Platform Openness…….. -18-
Figure 4: The IEPF Model…….....-19-
Figure 5: Building Blocks……. -20-
Figure 6: Product Platform Template [29]…… -22-
Figure 7: The iPod has seven buttons to the Nomad's fifteen……..... -22-
Figure 8: Google TW vs. Yahoo TW…… -23-
Figure 9: Market Segmentation Matrix [29]…… -24-
Figure 10: The Product Platform Development Model (PPDM)…….....-24-
Figure 11: Windows 8 Roadmap……... -28-
Figure 12: HTC Gross Revenue per Region, Datamonitor……-51-
Figure 13: Levels of Platform Development …… -67-
Figure 14: US Smartphone Penetration: Nielsen 2011……..-71-
Figure 15: Top Five Smartphone Vendors Worldwide Shipments 2011…….. -71-
Figure 16: Top Five Smartphone Vendors Worldwide Shipments Q4 2011……-72-
Figure 17: Smartphone OS Share Worldwide, NPD Group…….... –73-
Figure 18: Smartphone OS Share USA, NPD Group…….....……... -74-
Figure 19: 1Q11 Smartphone OS Worldwide USA, Gartner…… -75-
Figure 20: Smartphone OS Share USA 2011, NPD Group…… -75-
Figure 21: Smartphone OS Worldwide 2011, Gartner…….. -76-
Figure 22: 3Q11 Smartphone OS Worldwide USA, Gartner…… -77-
Figure 23: Smartphone Manufacturers Worldwide, IDC (February 2012)……... -80-
Figure 24: HTC Business Model Canvas, Pigneur et al. …….…… -83-

I. Introduction

During his last visit to National Chiao Tung University, HTC CEO Peter Cho [57] mentioned how he and his partners had started a business with the determination to make a difference in the world. He mentioned that during many steps, the company took considerable risks and as it was likely to perish; it managed to rise out of its ashes. HTC has managed since its humble beginnings in 1997 as an Original Equipment Manufacturer (OEM) to become Taiwan's most valuable brand in 2011 according to a recent report by Interbrand [65]. This is an outstanding achievement. Nonetheless when confronted with the recent Intellectual Property debacle with Apple, Mr. Cho openly admitted that this was something that the management team had not foreseen. This is part of the day-to-day challenges of managers in the IT industry. Mr. Cho later stated that in his view the best school of life is experience, and that one needs to learn from trial and error. However, even in Mr. Cho's experienced hands, it is debatable whether or not HTC can afford to adopt such a wait-and-see approach in a multi-sided market that is becoming increasingly competitive, crowded and complex. Nevertheless, Mr. Cho has a point that in an industry that is so volatile, experience is a useful heuristic to come up with fast decisions. HTC, however, remains in stark contrast with its main rivals Apple and Samsung. While its rivals are engulfed in legal battles of their own, they seem to set the rules of the game and follow their strategy full-speed ahead. In contrast, HTC has been struggling to set the pace since 3Q2011 and is struggling to find a niche for itself.

This study aims to give the reader a brief overview of the most current theoretical concepts related to business strategy, multi-sided markets, platform creation and management in the high-tech industry. Whereas most platform management literature revolves around the view of the platform leader and what strategy he should adopt to consolidate the power of his position, the aim of this study is to develop an alternative model that addresses the needs of any stakeholder that does not have any significant power to influence a dominating platform, but wants to benefit from being part of its ecosystem, while applying it to a factual contemporary case –HTC-, as this is the best way to illustrate the findings and implications of the PPDM model developed in this study.

The flow of this study will go from a so called 'macro' or industry view, to a 'micro' or company based view by incorporating both a company-external industry analysis and a

company-internal resource-based analysis. In the first part of the thesis, we will explore and develop a series of conceptual models that address the needs of such a fast, dynamic and complex industry as the smartphone industry. In the second part, further insight will be shed into the industry dynamics and company specific situations. Finally, we shall congregate this knowledge into a series of actionable company case propositions.

Chapter 1 consists of the introduction into the main concepts involved in technology management in the smartphone industry. A more detailed set of definitions is to be found in the Annex, for those who are not familiar with two-sided market and platform terminology. Chapter 2 aims to review the literature used to analyze the smartphone industry. Chapter 3 aims to integrate all this knowledge into an easy to implement model for Technology Management, which can be used by practitioners and scholars alike. The latter is meant to give decision makers a set of tools to analyze industry structure and to make informed decisions. We acknowledge that not every company has the capacity to build a sustainable ecosystem, but we believe that even the smallest ones can develop a product platform of their own to better address the needs of their customers and partners.

Part II endeavors to shed light into the structure and dynamics of the smartphone market. The smartphone industry is particularly compelling because as Qualcomm Senior VP Rob Chandhok [55] remarks, it is at the forefront of the Internet of Everything. As lives are being transformed, people are turning to their smartphones and tablets as the new hub of digital life. This market is becoming increasingly relevant as we are entering a post-PC world dominated by portable devices, a term coined by the late Steve Jobs [66]. This industry is all the more complex because it is a multi-sided market being served by two main types of ecosystems, namely a number of software ecosystems, which are the main integrators in this industry, as well as a set of less impactful hardware ecosystems. Expected future trends in this industry will be explored, as old behemoths such as Microsoft and Nokia aggressively enter this market with alternatives of their own. The consolidation of the PC, IT and mobile industries is also paramount to understand the challenges faced by incumbent firms. Furthermore, the increasing importance of Social Networking or Social Media and its expansion and challenges into the mobile realm are issues that require additional inquiry.

Finally, in Chapter 5, the knowledge gained in the above mentioned sections will be utilized to give a set of company specific propositions. By using the concrete case of the handset

manufacturer HTC, the aim is to apply the conceptual construct developed throughout this thesis to immediate issues faced by one of the only Taiwanese companies that has a shot at making a dent in this industry. The ensuing propositions are thus not only aimed at management executives, but also at government policy makers, whose duty as public servants is to uphold a business friendly environment for local firms to prosper. Even though it is hard to predict if HTC can become a market leader in its own right, we shall aim these propositions at improving its current business processes and practices, and ultimately give it further insight into the best practices for delving with the challenges of contemporary technology management.

Part I: Exploring New Business Models

II. Literature review

2.1 Books

2.1.1 "The Age of the Platform" by Simon (2011)

In his book the Age of the Platform, Simon [37] gives an insightful overview of the evolution of the IT industry in the last 20 years, explaining the rise of Web 1.0 in the 1990's and its crash in the early 2000's, its subsequent rebirth in the shape of Web 2.0 as well as the deep impact of social media on society. The book also addresses other trends such as the consumerization [79] of IT and the so-called rise of the prosumer that refers to the increasingly marked tendency of customers to be involved in the evolution, shaping and development of the social web.

Simon [37] goes on to explore the challenges faced by today's corporations in a digital revolution that is accelerating with the widespread adoption of mobile. These firms need to find new ways to monetize their services in a world where local advantages are disappearing and where content is becoming a commodity. This has given rise to a score of new business models such as Freemium.

Other important trends include the evolution of IT from a single to a multi-hub industry. This is the case for example in computing, where yet unrivaled Wintel is lately being besieged on all sides by new players in mobile computing. Apart from the rise of the social web, the move into the cloud is another trend that is helping mobile to take hold.

Finally, the author goes on to mention that there needs to be a paradigm shift within modern society and corporations. Whereas it was previously possible to make long-term plans, remember Toyota's 100 year strategic plan [86], the modern world is such that even the largest corporations need to remain flexible and nimble to survive. The world has become much more volatile, this is also reflected in companies' revenues that in many cases have become hard to predict.

Thus it is becoming the goal of an increasing number of enterprises of all sizes to leverage the power of platforms by providing planks that are useful to the final customer. The author goes on to describe the difference between today's platforms and the powerful monopolies of yesteryear. Whereas the 'robber-barons', building vertical economies of scale managed to fix prices, had to be reined in by strong government, today's platforms, with the exception of Microsoft and

Samsung, seem to be adopting a different approach by realizing the gains that are possible with openness and are striving to find ever newer ways to monetize their businesses.

1. What makes a Platform Successful?

Simon [37] points to the fact that at inception, companies such as Amazon and Google were not platforms but "one trick ponies". As time went by, these companies were able to see business opportunities and evolve into the powerful platforms we know today. Another important factor that Facebook was keen to acquire in its humble beginnings was the ability to scale. It is by providing more services to users and customers, and by having more planks that you can become a powerful platform.

A lot of today's platforms success lies in their ability to quickly expand into the cloud, by providing faster capacity and internalizing software processing via the cloud. The author mentions that today's most successful platforms such as Amazon, Apple, Facebook and Google, which he refers to as the 'gang of four', owe their success to their ability to grow powerful ecosystems via dynamic stability, a term coined by Boynton and Viktor [37].

A huge advantage for the 'gang of four' is the amount of detailed and intimate information that they have managed to amass about their customers. The aim of the platform is to embrace outside innovation and eliminate the 'not invented syndrome'. The gang of four has been extremely astute in promoting tolerance, fairness and openness towards potential partners. Another advantage that played into the gang of four's advantage is the extreme simplicity of their websites, products and services that have been made to be extremely intuitive. The author of the pursuit of elegance, Matthew May [37] refers to the fact that simplicity, elegance and ease of use are all key to product adoption.

Conceptually important is the fact that a platform does not constitute a business; rather it is a means to reach new customers and to sell to existing ones. Platforms support and extend businesses; however they do influence the view of customers of the company. Thus the core business of a corporation and its platform are closely intertwined, but do differ in certain aspects.

An important factor of platform success is related to its stickiness factor, i.e. its ability to keep customers. The best way to do this is through product excellence, by surprising customers. Apple and Google are champions at this.

The gang of four has another commonality in the shape of iconic and visionary leaders, who are hard to differentiate from the company. These executives have managed to become sources of inspiration.

However, the world is only so big and platforms are often found to collide. For example, in recent years Apple and Google have clashed in the smartphone industry, and Amazon has recently entered Google's path by offering its own Appstore for Android. This brings into being the relevance of terms such as the frenemy: "one who pretends to be a friend, but is actually an enemy", also coopetition describes the ability of businesses to cooperate and compete simultaneously.

2. Opportunities and threats of platforms

The obvious advantages of platform building include: risk mitigation and diversification, brand building and extension, creation of virtual barriers to entry, increased innovation, accidental lines of business, reaching overwhelmed consumers, superior understanding of customer and user bases and increased organizational agility. Some threats posed by platforms may include: increased government scrutiny, misuse of platform power, angering others, increased competition and plank providers may become competitors.

3. Tips to platform building

The author includes some tips for building platforms including: adopting a collaborative approach, seeking intelligent acquisitions, extensions and directions, make little bets and embrace uncertainty.

2.1.2 "The Power of Product Platforms" by Meyer and Leynard (1997)

Meyer and Leynard [30] mention the example of Black & Decker who gained market leadership and economies of scale by reengineering its complete product line into an intertwined product platform. The authors explain how Black & Decker saw new regulation –double insulation for power tools- as an opportunity to gain market leadership instead of an obstacle. It is during this capital and time consuming project, an ongoing effort on three fronts: redesigning consumer power tools, redesigning manufacturing processes and offering more for less –i.e. offering double insulation at no extra cost- that B&D managed to modularize its entire product

line by using common components in everything from drills to leaf blowers. It is by doing so that B&D managed to drive out many of its competitors that could no longer compete on cost. The authors mention a few key success factors such as ongoing commitment from top managers, forming a "hit team" whose sole task was aimed at this reform and a change in basic structure .This change however risky, gave B&D a lean cost structure as well as faster cycle time than most of its competitors. Another example mentioned by Meyer [30] is the case of the Honda Motors Company. Honda has since inception been obsessed in modularizing as many components as possible. This, according to the author, is due to an ongoing paranoia in company culture that modularization of subsystems is the only way to compete and survive against larger competitors.

The main contribution of their book is the Power Tower, which will be used later as the basis for the Product Platform Development Model in Chapter 4. Meyer and Leynard use this tool to illustrate the importance of linking building block thinking to competency building, building product platforms out of a common subsystem-mix and turning this acquired knowledge into a coherent market strategy.

2.2 Academic Papers

2.2.1 The economics of Platform Markets

1. Two- sided markets

Eisenmann and Hagiu [10] address the issue of how companies should manage two-sided platforms by either subsidizing Suppliers or Customers. They also explain the difference between a two-sided platform resulting from a vendor or merchant orientated business model. The issue is whether the company should fund its business on the hand of the final customer or of the supplier. Think of Apple iTunes: Apple needs cheap music to subsidize its sale of iPods. Thus it will ask for concessions to record labels to grant them access to iTunes, while offering cheap music to customers. The authors also point out the main barriers to network risk, including: standing risk, holdup risk, integration risk, favoritism risk, relationship risk, competitive risk.

Hagiu [17] in another paper explores the economic foundations and strategy of multi-sided platforms (MSPs). He discusses the crucial role of MSPs as an intermediary and an integrator and the importance of the indirect network effects and economies of scale. He divides the

economic functions performed by MSPs by reducing search costs as well as shared costs. The first refers to the ease of finding the desired product on a platform, whereas the second refers to the gains in setting up a common payment system. Again the difference between MSPs and pure merchants is explored, mainly on the capacity of MSPs to use their influence to make suppliers keep a larger quantity of stock and taking on a larger chunk of risk.

Another issue addressed is which sides to focus on and what timing should be taken into account by MSPs. It is sometimes possible to go after many sides, but not necessarily profitable to do so. The trade-off of who to ask for subsidies is also addressed.

Another paper by Marc Rysman [36], notes that the reason that two-sided markets emerge is to alleviate or serve an externality that exists between two sets of players. The strategies at hand by two-sided markets include pricing and openness. As two-sided markets turn into dominant platforms, the issue of antitrust often arises. As companies enter this stage, the public realm steps in to regulate prices, which is not a desired result for any company.

Gawer and Cusamano [15] address the crucial concept of a coring strategy to create and establish a platform. The choice of the design of the platform is immediately related to the structuring of the relationships between members of the ecosystem. Gawer and Cusamano identify four levers of coring: firm scope, technology, design and Intellectual Property choices; relationships with external firms; and finally internal organization and processes.

In another paper by Gawer and Cusammano [16], the authors mention not only the principle of coring but that of tipping, i.e. the practice to win platform battles by building momentum. They separate strategic options in technology and business actions. Tipping involves pushing the market into the direction of a certain platform. Technology actions might include trying to develop unique and compelling features that are hard to imitate, or to absorb or bundle features from an adjacent market. Business actions on the other hand include providing more incentives for complementors, rally competitors to form a coalition, or consider pricing and subsidy mechanisms that attract users to the platform. Tipping is mostly about setting industry standards.

A paper by Chesbrough and Appleyard [8] discusses the challenges posed to conventional business strategy in the realms of open innovation. The tradeoff between open and closed innovation resides in the trade-off between value capture and value creation. The authors also developed a classification system for firms active in open source industries by business model.

2. Structuring the Smartphone Industry

Kenney and Pon [22] offer a comprehensive model to analyze the smartphone industry. With regards to horizontal and vertical integration, they use a tool referred to as "the stack", defined as where firms operate and lock customers along the value chain. An interesting concept introduced is that of Industry architecture, defined by Jacobides et al. [quoted in 22] as identifying the roles played by firms in an industry, and how these roles affect division of labor and the share of the value generated. These forces according to Tee and Grawer [quoted in 22] determine to a large extent the background structure to the platform ecosystem. Jacobies points out to designed factors and emergent factors to lock in customers. The former refers to lock-in by design, i.e. due to technological incompatibility (for example GSM vs. CDMA), the latter to lock-in by subscription based usage.

Kenney and Pon [22] point out that the business models and strategies in the smartphone industry reflect to a large extent the backgrounds and core competencies of the players. Whereas Nokia, RIM, Apple and Palm remain highly vertically integrated, Microsoft and Google seem content to remain content providers and thus remain more horizontally integrated. Handset-only manufacturers such as HTC, Samsung, LG and Sony-Ericsson need to make a strategic decision with regards to which OS it should chose to remain relevant on the market place. Network carriers also remain a force to be contended with, especially for handset manufacturers who have less clout.

Finally, the authors address the issues of open vs. closed platforms, and the different approaches taken by the competitors. Whereas Nokia founded the Symbian Foundation, licensing its OS to a plethora of other competitors and thus encouraging innovation, Apple adopted the exact opposite approach by using a 'walled garden strategy' and keeping a high degree of control over its platform. Android seems to be taking an intermediate approach by leaving its platform relatively open to change, however, pushing handset makers to keep their quality up and potentially sanctioning rule breakers. Android remains an open platform and licensing the OS is free to handset makers around the world. Whilst Google is not earning any revenue on licensing its OS, it is likely planning to compensate this lack of revenue by offering smart advertising solutions and data mining tools for corporate customers. They mention that the move to go into mobile is probably orientated at reducing the market clout of Apple. If a large majority of phones run on iOS, in a model where users are increasingly likely to access the web

through apps, there is nothing to stop Apple from ring fencing search with another company than Google, as witnessed by its recent announcement to lock out Google Maps from its iOS 6.

Finally, the authors mention the main challenges for all the major competitors/complementors in the smartphone industry, geographic considerations as well as the impact of various constituents on the supply chain.

Simon [37] points out that an important opportunity is to harness the power of your lead users. This view is echoed by Hippel, Ogawa and De Jong [18] in a recent article argue that we have entered the age of the consumer-innovator. Based on recent research, they see a clear trend of consumers collectively generating significant amounts of product innovation, which they argue should be a wake-up call for both companies and consumers everywhere. This new trend is related to the important changes in technology. One of them is the so –called consumerization of technology [79], whereas in the past most innovation required heavy public sector investment, it is now at the reach of most people. Surveys in the UK, US and Japan show that consumers spend considerable time and financial resources on product development, these figures sum up to a whopping 144% in the UK, and to 33% and 13% of the amount commercial enterprises spend on R&D in the US and Japan respectively. But what motivates these users? After studying the demographic variables of this group, we can conclude that these lead-users are much more likely that the average population to have a high-education, to have a technical education and to be male. When an individual has all these three characteristics, he is 260% more likely to innovate in consumer products in the UK, 210% in the US and 140% in Japan.

This trend requires a paradigm shift in understanding innovation. Hippel et al. [18] point out to three stages in product development. At the first stage, markets for innovative products and services are both small and very uncertain. This is usually the stage where lead users jump in to pioneer entirely new products. Past examples include the skateboard and the washing machine. At the second stage, early adopters evaluate the product and contribute improvements of their own. Today, much of this exchange of information is done via the web, which allows companies to scan the horizon for the next big thing. In a third stage, the company having identified a demand for the product or service and estimating that the risk of failure is acceptable makes the effort to make the innovation available to the many.

New trends are making it easier for consumers to innovate. Think of Open Source software for both PCs and Mobile devices, the development of which is usually aided by computer-aided-

design (CAD) programs. In the physical world, solutions for computer-aided-manufacturing (CAM) also exist. This trend has become even more widespread with the dip in price for 3D printers.

Of course, this trend has huge implications for firms worldwide; however, they can catalyze change by using some of the following alternative strategies:

- Set-up user communities through developer kits and company support. These steps will make customers more loyal to the company and more willing to share the fruits of their labor.
- It is important to identify high potential contributions early on, and to secure talent by finding out what the user wants. This might include a position in the company, a financial reward, or simply credit for the invention.

Osterwalder and Pigneur [33] developed a truly innovative way to analyze, represent and communicate Business Model Innovation. It takes into account recent Business Model Innovations such as Freemium, Multi-sided Platforms, Open Business Models, etc. The strength of this model is that it takes into account both internal and external competencies and resources, and aims to leverage them in a way to best serve the needs of the customers while also taking into account the issue of monetization. We will use some of these tools to give more targeted propositions to HTC in terms of Business Model Innovation and Strategy.

Landsman and Stremersch [quoted in 27] made and interesting research of multihoming in two-sided markets. Their main finding was that the negative effect of platform level multi-homing on platform sales was stronger than the positive effect of the number of apps on a platform. Younger platforms were more likely to limit multi-homing that older ones. Furthermore, age and market share are the most important drivers pushing sellers to multihome. On the side of platform owners, high market share mature platforms allow more multihoming than high market share nascent platforms.

III. Model for Effective Platform Management

Existing knowledge in management science, economics and finance has recently put in question because of the 2009 global financial crisis and the ongoing troubles in the Eurozone. Business science belonging to the field of human science remains largely imperfect. It is based on incremental knowledge that has been aggregated since the late 19th century when business education started to gain legitimacy. Causal relationships and models need to be continuously questioned and updated. Even though huge steps in quantitative analysis have been made in recent years thanks to greatly improved computing power and data aggregation capacity, the time is ripe for a conceptual rethink of management theory.

3.1 Globalization is pressing the need for Conceptual Contributions in Management Science

As Zaltman [quoted in 27] states: 'The quality of our primary research follows that of our ideas, however the quality of our ideas needs improvement'. Whereas huge advances have been made in quantitative analysis with the increased processing power of computing and the aggregation of information through data mining, this empirical research has far outpaced conceptual advances in the last 30 years. This study seeks to address three limitations that have been largely omitted and which we believe should be central to this century's management science.

Most of the changes in management science can be traced back to the most recent period of globalization. Whereas Globalization is not something new, today's rush to globalization differs in crucial ways, which should be included in today's business science.

3.1.2 Geography

The most obvious sign of globalization is a blur in geography. This includes the issues of national sovereignty, the recent surge in World Trade, the increased free flow of information, talent and capital including the integration of global Financial Markets, are some of the most significant factors driving modern globalization. As individuals and corporations enter a brave new century, management science which has been dominated by Western schools of thought will need to consider the linguistic, cultural, legal, economic, political and economic barriers related to expansion in unchartered markets.

3.1.3 Rise of Information Technology

The surge of the internet age followed by the mobile revolution has increased the marginal productivity of people worldwide to the extent that even political leaders are making broadband internet access a priority to increase the competitiveness of their local economy [83]. Most importantly, the Worldwide Web has torn down the barrier of time. As noted by Qualcomm senior VP Rob Chandhok [55], the new catchword today is "always on, always connected". This has huge repercussions for society, as younger generations are growing accustomed to ubiquitous internet and mobile computing from early childhood. The mostly untapped potential of these technological revolutions have already started to engender a plethora of new business models that utilize the Internet to disintermediate incumbent firms by offering more efficient organizational structures. These structures are often built on two-sided market relationships, which appear in situations where an intermediary can more efficiently serve a market by reducing transaction costs between the parties in a given market. The leading firms in these two-sided markets have built powerful platforms that in turn dominate the transactions in that market. Thus the crucial importance for modern management science to incorporate two-sided market and platform management thinking.

3.1.4 Rise of the Knowledge Economy

We are in the throes of a digital revolution. Whereas most people have acknowledged that services and goods are shifting to the digital realm, now even manufacturing is becoming digital thanks to powerful yet accessible 3D printing technology. The Economist reckons that we are in the midst of the Third Industrial Revolution, and that as we enter a more knowledge centric economy, governments should stick to basics by focusing on: "better schools for a skilled workforce, clear rules and a level playing field for enterprises of all kinds" [83]. In the past, national economies jealously protected technologies and resources, and put a lot of effort into building economies of scale. The digital revolution is breaking down these divides and putting developed and emerging economies on an increasingly equal footing. Today most technology, including both hardware and software, can be replicated thanks to the knowledge sharing via the Worldwide Web. Except for some extremely resource extensive industries, business models and knowledge can be replicated almost anywhere.

3.1.5 Building New Conceptual Frameworks

As the high-technology industry for both material and immaterial products –i.e. software and hardware- is molding global societal development, we believe it is particularly important to develop a series of conceptual frameworks that will incorporate the far-reaching changes resulting from globalization, technological progress and the spread of digital knowledge mentioned above.

In the following sections, a holistic approach inspired on diverse literature on multi-sided platforms, product platforms, business model generation, strategy and innovation, is aimed at giving the reader a more powerful tool to analyze an industry as complex and as fast-moving as the smartphone industry. The aim is to identify the opportunities engendered by the recent technological and societal trends mentioned above by developing a single framework that takes these into account.

3.2 Company External Strategic Analysis

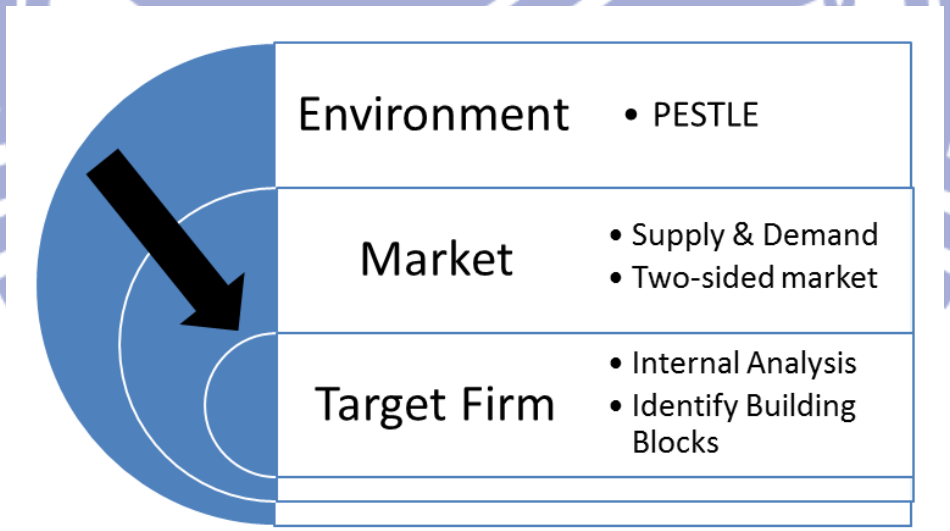


Figure 1: Thesis Analytical Flow

The reasoning in this section is mostly based on Osterwalder and Pigneur's [33] Model Canvas. In a first stage, we shall identify macro-factors which for simplicity's sake I shall regroup under the term of (1) key trends. Key trends are in essence the rules of the game to

which all firms in this industry must comply and they are meant to give foresight to managers as to how the industry is evolving and where is it going. Key trends include macro-economic forces, societal, legal and technological trends. In order to reduce cognitive pressure on the reader, we shall resort to use the PESTLE Model, which is already a widely spread tool. PESTLE stands for Political, Economic, Social, Technological, Legislative and Environmental. As for the order of importance of these factors, it is determined by an industry-to-industry case. In the case of smartphones, we can already predict that societal, technological and legislative trends are likely to stand out. The analysis of key trends will be carried out in Chapter 4, where more attention will be paid on social, technological and legal trends.

In a second step, we aim to carry out an (2) external strategic analysis by exploring the dynamics of supply and demand, which are dependent on the key trends mentioned above. While basing ourselves on micro-economic theory, the goal of the target firm will be to balance supply and demand by maximizing customer utility while ensuring that the individual cost function of the firm remains under the market price equilibrium and that thanks to a price-feature bundle that can offer a higher indifference curve than that of the competition. We shall separate these factors into two sections: (2.a) industry forces which sum up the determinants of supply and (2.b) market forces which sum up the determinants of demand. A useful tool to sum up the supply side is the Porter's Five Forces model. In a second stage, by building upon Osterwalder and Pigneur's [33] customer need diagram as well as other tools, it will be easier for a target firm to keep a customer centric focus, a crucial factor for continued success.

Sinfield et al. [38] point to the importance for firms to systematically explore new approaches to value creation. The authors argue that by so doing firms can find new growth opportunities. Companies such as Amazon and Google have excelled in identifying alternative ways to serve unmet customer needs and leverage on their resources to make more income through network effects by identifying the power of platforms. This goes back to addressing wicked strategy problems which are identified by Camillus [6] as having innumerable causes, having no right and wrong answers, involving a plethora of stakeholders and evolving constantly. This is quite striking in high-technology, an industry that is well known for its volatility. To sum up, Sinfield et al. [38] point out that the majority of business model researchers try to constantly address several core questions to better understand business models and their dynamic nature, including:

- Who is the target customer?
- What need is met for the customer?
- What offering will we provide to meet that need?
- How does the customer gain access to this offering?
- What role will our business play in providing the offering?
- How will our business gain a profit?

It is by remaining focused on these questions that a firm can quickly identify and predict new market trends and develop a matching business model to serve customers' unmet needs in a more efficient way.

3.3 The Product Platform Development Model (PPDM)

According to Burgelman and Siegel [5], technological development, product development and business strategy are the three most important steps in building a strong technology platform. As defined by the Minimum Winning Game (MWG) Theory, technology firms need to balance these three drivers to ensure that they survive in an extremely complex and fierce environment.

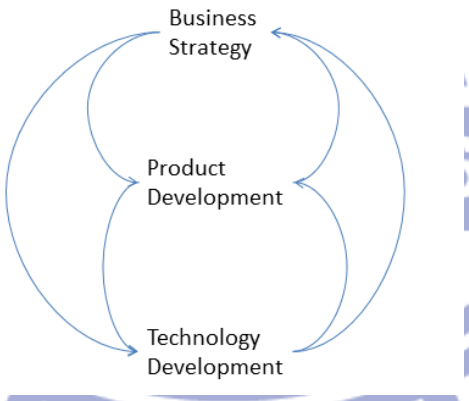


Figure 2: Key Drivers of Strategic Actions in High-Tech Companies [5]

The Product Platform Development Model (PPDM) is set to compile the findings of previous multi-sided platform research into a single model, from the point of view of a company is trying to choose a given platform over which it does not have control and enjoy the benefits from a given ecosystem. We will base our logic on Bon and Kenney's Stack [22]. This essential tool is a simple graph that allows the user to see which company dominates which part of the value chain

in a given ecosystem. By adding a 3D visualization, it is easier for the user to understand the market share and strategic importance of each player, while taking into account a broad enough view to consider the option of multi-homing. By transforming the stack into three dimensions, it is also possible to compare different ecosystems and to predict eventual clashes between two converging adjacent industries. In the case of the smartphone industry, there is clearly an imminent conversion of the PC, IT and mobile industries.

The PPDM is meant to address the fact that many firms active within a given ecosystem have difficulty in forging a distinctive image for themselves. This is often because these companies have a product-to-product focus and fail to take into account the huge potential of resource synergies to foster efficiency and innovation. By integrating the Stack [22] with the Power Tower [29], an Integrative Model of Product and Process Innovation developed by Meyer and Leynard [29] , we aim to give multi-sided platform stakeholders a tool to outshine competitors by: (1) better understanding the dynamics of mutli-sided platform competition and (2) efficiently using company internal and external resources (i.e. building blocks) and developing resource-based synergies, to develop a (3) powerful product platform composed of highly-modulable subsystems, (4) serving the latent as well as perceived needs of the target customer. The influential Power Tower is thus adapted to better comply with the dynamics of ecosystem and platform management.

The PPDM is composed of 4 successive stages, as mentioned in the paragraph above. The first is composed of the IEPF Model (IEPF stands for Industry, Ecosystem, Platform, Firm Model). As mentioned, we believe that 3D visualization addresses some rampant needs of the high-tech industry including three particular characteristics: the (1) highly fragmented nature of component sourcing, (2) the importance of integration to gain power in a given ecosystem and industry, (3) the importance of scanning the strategic landscape not only for existing competitors, but for product and process disruption from adjacent industries.

As seen in this example of the smartphone industry, each side of this asymmetric cube represents a different industry. The companies that by using a Coring Strategy gain a high level of vertical integration are often better situated at capturing value by building powerful platforms of their own [15]. Examples that immediately spring to mind are Apple and Samsung. These companies are central to their respective industries, because they have managed to understand the levels of the value chain that were the most important value creators.

An alternative way to control industry value creation is by through horizontal integration, as for example Intel in the PC industry. This company has managed to dominate one specific stage of the supply chain in the PC industry for the last two decades. This kind of company tends to compete in capital intensive industries for undifferentiated goods, where it can starve the competition through technological superiority and price pressures through economies of scale.

Both of these kind of firms are increasingly vulnerable to disruptive open source models. The firms or entities that control open source models to innovation tend to be able to create more value by capturing less of it by leveraging the knowledge and resources of a broad partner community. They tend to have a powerful effect in fragmented industries. Thus, even though Google has only recently gained ability in manufacturing since to its recent purchase of Motorola Mobility, it has managed to build a powerful consortium out of a highly-fragmented mobile industry. The same is true for ARM, who has unfortunately for Intel, managed to regroup a fractured semiconductor industry to follow a new open standard for Chip production.

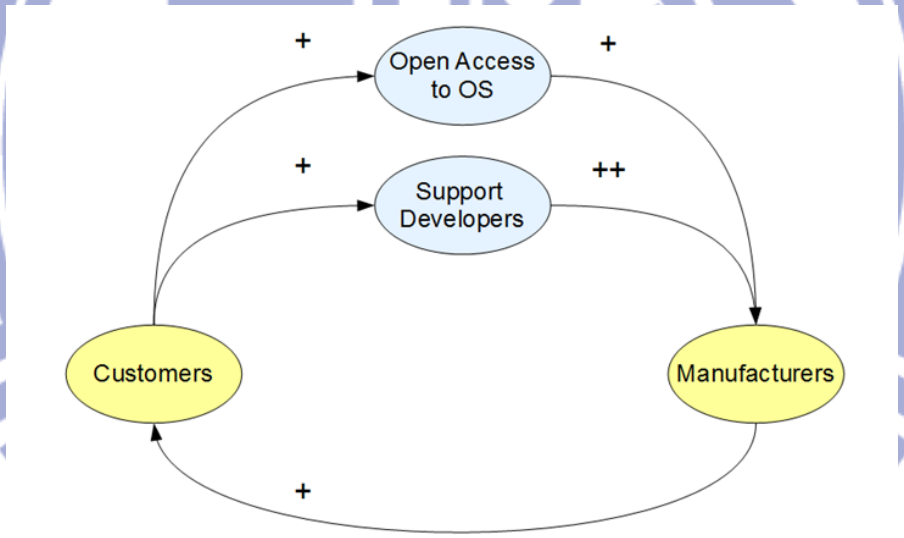


Figure 3: The Virtuous Cycle of Platform Openness

Going back to the IEPF Model, each side represents a given industry. The reason we adopted a cube and not a more complex shape, is for simplicity's sake. A model with more than 6 parallel industries is possible, but would be hard to conceptualize. As in the Stack, each horizontal level represents a single level of the value chain. Spreading-out throughout a horizontal level would imply horizontal integration, whereas spreading out through vertical steps implies vertical integration. The edges between the sides of the cube represent the zones of potential conflict, for

example we can see that Intel or ARM might very well make a venture into the other firm's realm. In this paper we do not refer to the vertical levels of the stack as a supply chain, since they are all an integrative part of a final customer solution, we thus use the term of value chain, which better represents the power of given players within an industry.

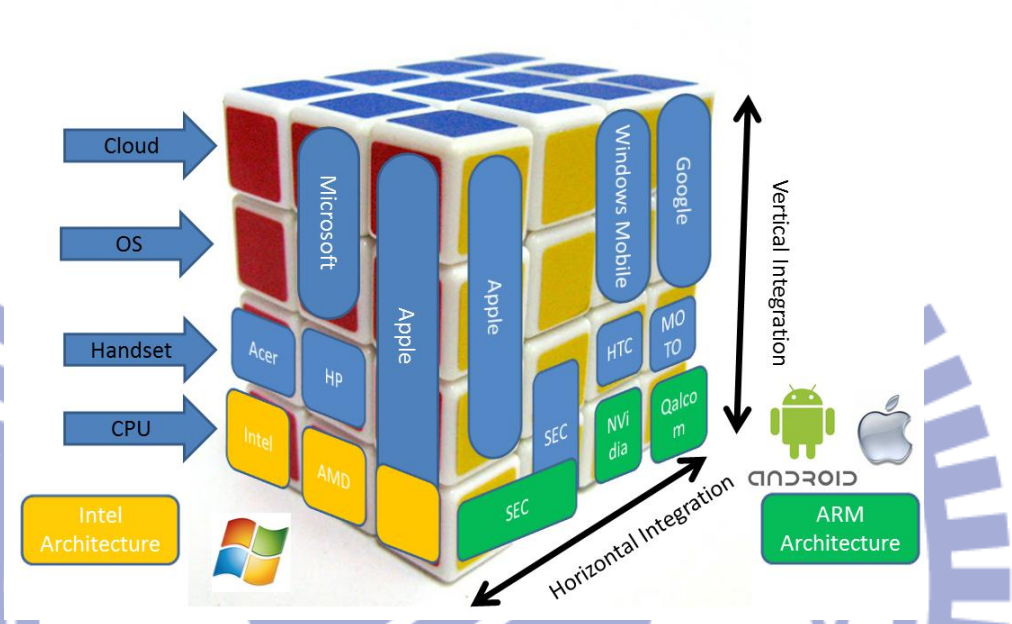


Figure 4: The IEPF Model

The second step sets to combine the IEPF Model based on the Stack to the Power Tower introduced by Meyer and Leynard [29], by first exploring the common building blocks behind the new product platforms. We can distinguish four kinds of blocks: (1) consumer insights, (2) product technologies, (3) manufacturing processes, all of which represent the organization's core competencies and are linked by processes coined (4) organizational capabilities. Some of the building blocks are available inside whereas others need to be acquired from outside the firm through partners and external suppliers. It is by leveraging these common building blocks into the management of one or various product platforms that the company can truly hope to gain a sustainable competitive advantage. The chosen combination of building blocks, i.e. a combination of organizational competencies (hard skills) and capabilities (soft skills), results in the creation of sub-systems. It is by combining these subsystems that a powerful product platform can successfully be created [29].

It is important to measure these building blocks objectively. The main aim of any going concern remains to gain as much from the positive network effects while minimizing transaction costs within a given ecosystem. The component of multi-homing [27] makes this decision more dynamic, as the company needs to consider the fallback from expanding its market on a rival platform.

The Building Blocks address a critical conflict within B2C high-technology companies that is the often explosive friction between the main management functions: Marketing & Sales, R&D and Manufacturing [14]. Close collaboration and understanding between these corporate functions, resulting in the seamless and efficient implementation of corporate objectives that directly address customer needs is one of the most important key success factors for consumer electronics firms to become top-tier companies, as witnessed by the rise of Samsung in the last decade [16]. Thus the effective streamlining of Product Technology Development, Manufacturing Processes Optimization and Consumer Insight, result in unique organizational capabilities i.e. formal and informal processes that match core competencies together, these in turn insure the timely coordination of Core Competencies to effectively accomplish organizational goals [29].

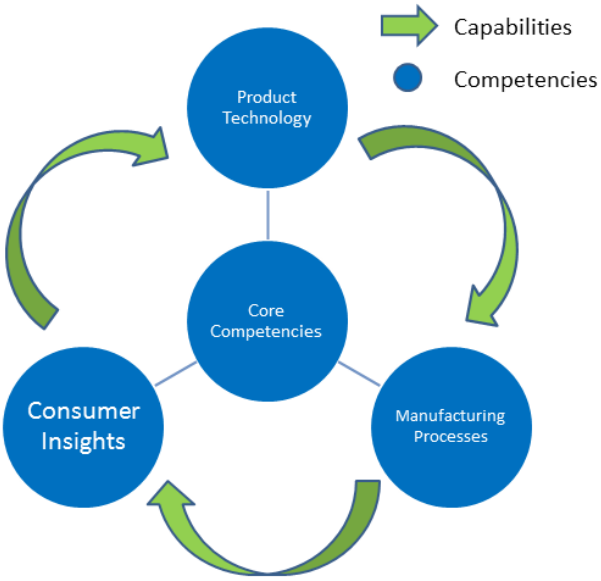


Figure 5: Building Blocks

We have just noted that it is by combining the building blocks relating to Sales & Marketing, R&D and Manufacturing that a company can fully utilize its Core Competencies to create a sustainable competitive advantage.

Let us illustrate this theory by a concrete example. Imagine you are an engineering company that currently manufactures gear boxes for motorcycles. Imagine now that you see an opportunity for a new kind of gearbox that could be installed in sports cars. Your company already has engineers that are aware of the modifications that need to be made for automobile gearboxes to be feasible (Subsystem P), it has a mature customer base with local motorcycle producers, some of which also produce sports cars (Subsystem X-Sales & Marketing), finally it has a production line making new generation gearboxes for motorcycles that could be tweaked to accommodate automobile gearbox production (Subsystem A- Manufacturing). A very illustrative case of how to use subsystems is the case of the Honda Motors Company mentioned in the Literature Review. Honda has since inception been obsessed in modularizing as many components as possible, which is using as many common subsystems as possible for its different products. Honda itself was a motorcycle manufacturer, which decided to produce cars, since it already had the technical knowledge, the manufacturing capability and the distribution channels to do so [30]. In Figure 6, you can see how a company will try to use many common subsystems as possible in order to streamline activities and thus reduce operating cost and increase the utilization of its resources. The red and blue arrows indicate two distinct product lines, which nonetheless utilize most of the same subsystems. The intersection of the two product lines points to the product platform. Resources that are neither utilized for the product platform, nor for an individual product line can be liquidated.

The authors emphasize the importance of coupling product renewal with thought architecture. In the case of Black & Decker, this new thought architecture involved having a macro-perspective by identifying power tools as a category instead of drill, leaf blower, lawn mowers, etc. as a single product. The second step was in bridging the traditional divide between engineering and manufacturing, by promoting product and process innovation. Last but not least the long-term commitment of the management team [29].

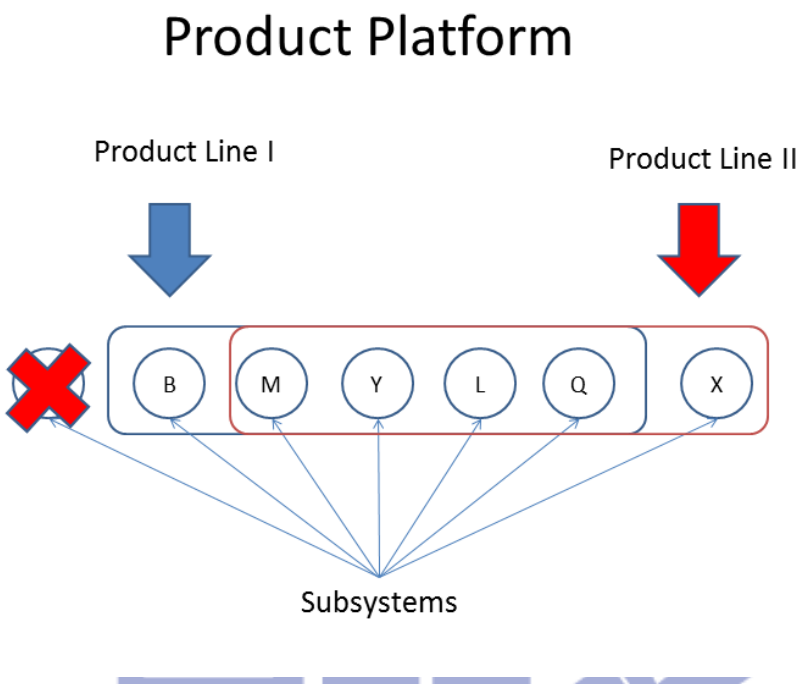


Figure 6: Product Platform Template [29]

Platform thinking goes even as far as product design, as Meyer [30] notes that a product with less subsystems, whether it be a physical product, an immaterial product such as software, or a service is more likely to impress the customer through "elegance" as well as reduced cognitive strain [29]. Please refer to Figures 7 and 8 that illustrate the importance of product elegance.

Figure 7: The iPod has seven buttons to the Nomad's fifteen [61]

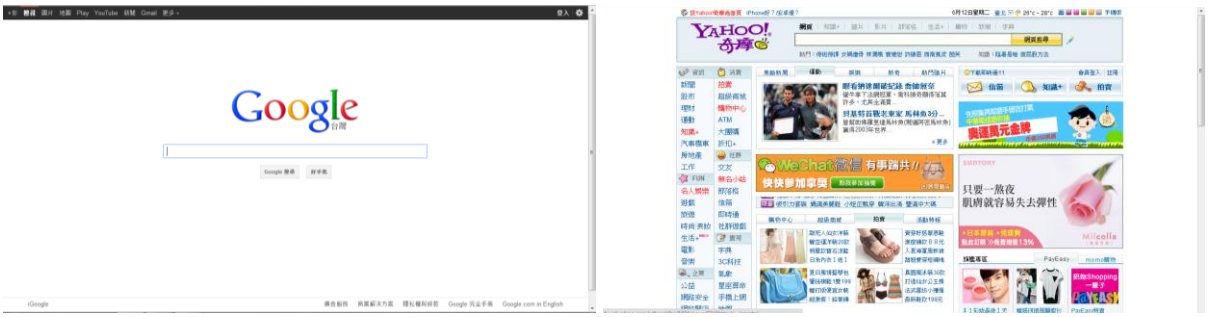


Figure 8: Google TW vs. Yahoo TW

After analyzing a firm's position in its Ecosystem, matching its Core Competencies and Capabilities, and turning these resources into Product Lines/Platforms, the last step is to develop a launch strategy. The market segmentation matrix is an easy yet insightful way to screen for market opportunities and threats, and to develop a launch strategy. The advantage of developing a product platform is that we can reach more varied segments thanks to the increased modularization in operations which combine economies of scale and scope, or in layman terms mass production and customization. Meyer [30] states four criteria to evaluate whether a segment is promising or not. Before investing considerable resources in a line extension, one should consider (1) the market size, (2) the market potential for growth, (3) the number of players and their respective market share and finally (4) the ability of the firm to develop a competitive product offer [30].

In order to determine a platform strategy, it will be important to consider whether the firm wishes to have a high-end or low-end consumer focus that matches the market dynamics. This can lead to divergent strategies, such as bottom-up or top-down market expansion. In the long term, decision makers can propose alternative growth strategies by leveraging a product platform within and between market segments.

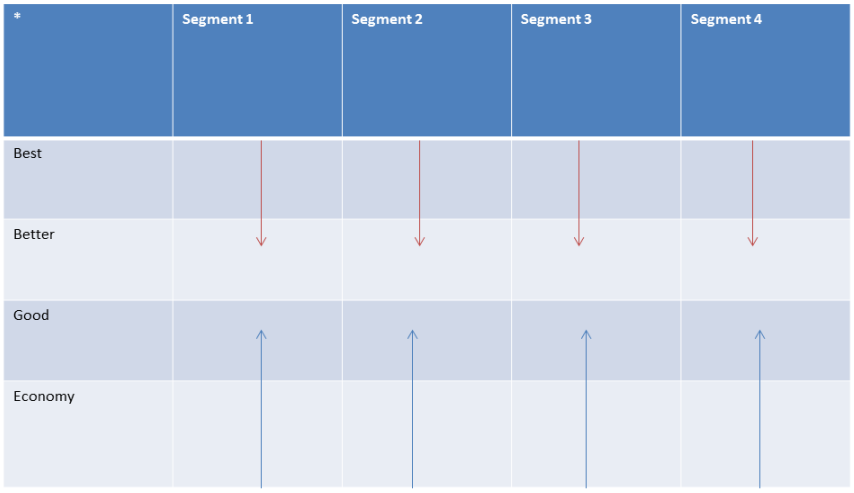


Figure 9: Market Segmentation Matrix [29]

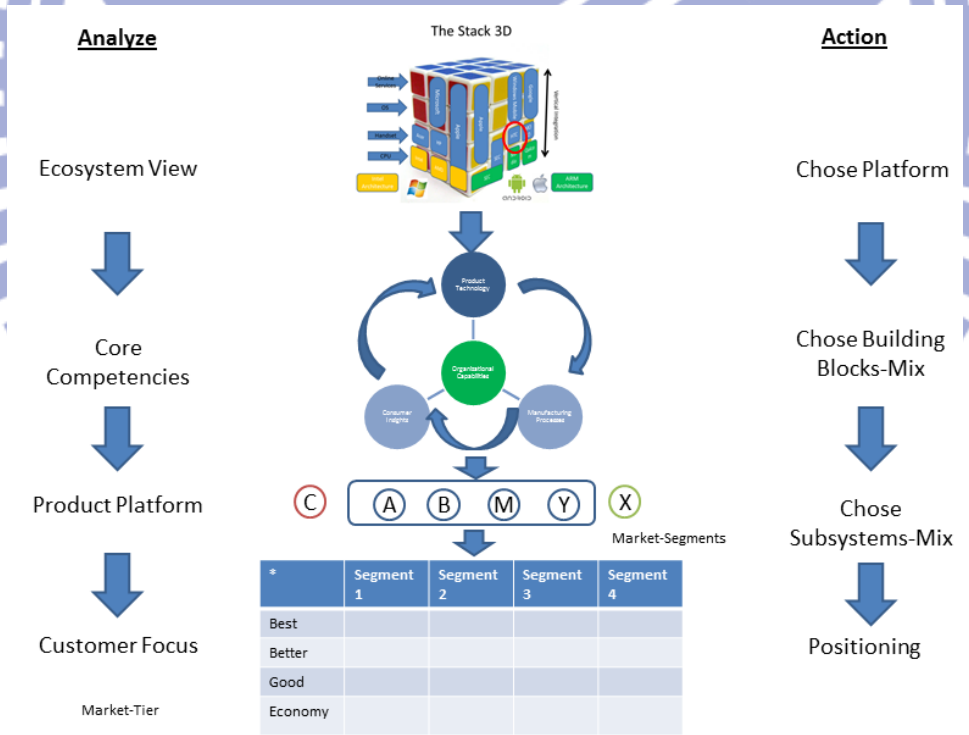


Figure 10: The Product Platform Development Model (PPDM)

With the PPDM, companies that do not exercise significant control within a platform or ecosystem will hopefully find it easier to analyze the industry dynamics, identify their own strengths and weaknesses and develop an adequate strategy to their situation. While this model works well for less influential firms, it can nonetheless be used by platform leaders. However more emphasis would have to be put in including Coring and Tipping strategies.

Part II: Applying Theoretical Concepts in Practice

IV. Smartphone Industry Review

Whereas literature about the smartphone industry is very popular at this time, not much attention has been given to the nature of the ecosystem and the symbiosis between the operating system developers and especially handset manufacturers. The question of vertical integration (illustrated in the PPDM in Chapter 3), whereas it is more profitable to control the entire supply chain, such as may be the case for Apple, or to create an open ecosystem where individual firms specialize in their core activities, needs to be decided by which is more profitable for individual firms and more importantly in the eyes of the customers. By using the PPDM in the two following Chapters, the aim is to demonstrate the use of the PPDM for a handset manufacturer active in the smartphone industry.

Due to the highly volatile nature of the smartphone industry, it is sensible to start making an updated assessment of who are the main players and what resources they use to compete amongst each other. Kenney. and Pon [22] mention that there has been a large geographic shift of the mobile phone industry from Scandinavia and East-Asia to Silicon Valley after the disruptive entry of Apple and Google. This is due to a convergence of smartphones, personal computers (PCs) and IT, where players of these industries are fighting to gain market share.

There is an important convergence on the content side as well, with new entrants such as Amazon extending its Kindle platform to Android devices. In order to give the most up to date view of the industry to the reader, we will review the most important milestones in this industry's development.

For an analysis of the evolution of the Personal Digital Assistant (PDA) of the early 2000's into the smartphones we know today please refer to the Appendix. Since the smartphone industry is composed by both a software –a mobile operating system- and a hardware component, it will

be important to distinguish who are the main players in both markets. We shall identify which are the existing platforms in both market segments and whether or not they compose a sustainable ecosystem as new entrants foray into the smartphone industry. Finally, we shall analyze how the value added resulting from this symbiosis of software developers and hardware manufacturers is spread within the value chain, and what current and future strategies these players are bound to follow[1].

4.1 Key trends in the smartphone industry

This section will address key trends within the entire smartphone industry. As value is distributed unevenly, more emphasis will be put on the parts of the value chain that are controlled by platform leaders. Thus the value chain will be analyzed from top to bottom, i.e. from Software to Hardware Components.

4.1.1 Background

There are currently two platform leaders in the smartphone industry, namely Apple and Google. Apple introduced the first iPhone with iOS in 2007 which completely disrupted the smartphone industry due to its innovative design and a completely new interface to access information: an advanced touchscreen. Apple's greatest innovation was arguably not the handset itself, but the bundle with a content platform through the App Store and iTunes. Apple built a platform and managed to build lock-in barriers in the form of high switching costs for the user. The digital content purchased by an Apple customers including music, games and a large number of applications, implied that most of the purchased content would not be transferable to any other device outside the Apple Platform.

In 2007, Google announced it would distribute a free open source mobile OS called Android; it instantly attracted a large community of developers to make applications that extended the functionality of handsets. This diametrically opposed open source mobile OS was also an instant success for handset makers due to the free nature of the OS, the large amount of developers and attractive apps, and of course a way to get back at Apple. Thus most of these companies including HTC, Samsung, LG, Motorola, and Sony Ericson adopted Android.

[1] Note. We use the PPDM as a framework for industry analysis and setting strategy in terms of propositions in Chap

4.2 Dynamic Industry View

4.2.1 Industry Forces- Supply

4.2.1.1 New entrants in OS

Microsoft, the main precursor in the PC market has been very slow to consolidate its position in the smart phone industry. Despite forays into Windows Mobile in the early 2000s, disquieted competitors, developers and consumers afraid to see a new monopoly arise as in the PC industry have remained lukewarm. Microsoft has remained unable to build a sustainable ecosystem in the mobile industry, but this might change with the recent introduction of Windows Mango (also known as Windows Mobile 7.5) and the upcoming launch of Windows RT (Windows 8 for ARM powered devices).

In February 2011, Nokia and Microsoft first announced a new broad strategic partnership[2] with the ambition to leverage Microsoft's expertise in software development and Nokia's competence in manufacturing sturdy and well-designed handsets, to create a brand new global mobile ecosystem. Although Nokia had already developed its own mobile OS originally in response to the launch of Windows Mobile (i.e. Symbian and Meego with Intel), Nokia agreed to opt for Windows Mobile in order to compete with Google's Android OS and Apple's iOS.

Windows has managed to introduce a clean ergonomic user interface called Metro UI and characterized by two columned tiles. Starting its mobile platform basically from scratch, its Marketplace counted a mere 30,000 apps and counting as of November 2011. Furthermore, it managed to iron out the bugs that existed in earlier versions of its Window Mobile OS and introduce a few new goodies [59].

Microsoft has huge potential in Smart TV where it enjoys a head start with its XBOX console. Microsoft already has 66 million users to date, among them 40 million XBOX Live users and has, despite itself, managed to make a big success of the Kinect where it can boast 18 million users. This is miles in front of Apple TV's 3 million user landmark. It has recently launched XBOX TV, which allows users to stream content from Hulu, Netfilx and the BBC. Thus, even though its position remains relatively week in mobile, it remains the market leader in PCs and a pioneer in the Smart TV market[58]. If Microsoft were to manage to effectively offer interoperability and cross-selling between PCs, mobile and gaming systems, all these product platforms could offer a

[2] http://www.telegraph.co.uk/technology/nokia/8317896/Nokia-announces-Microsoft-deal.html

sustainable user friendly ecosystem. Despite itself, Microsoft might even be better positioned than its rivals than have a head start in mobile [45]. Due to recent developments, it is increasingly likely that Microsoft's strategy is to focus its Windows 8 and RT launch on the Tablet market, and then foster PC and smartphone sales in that order.

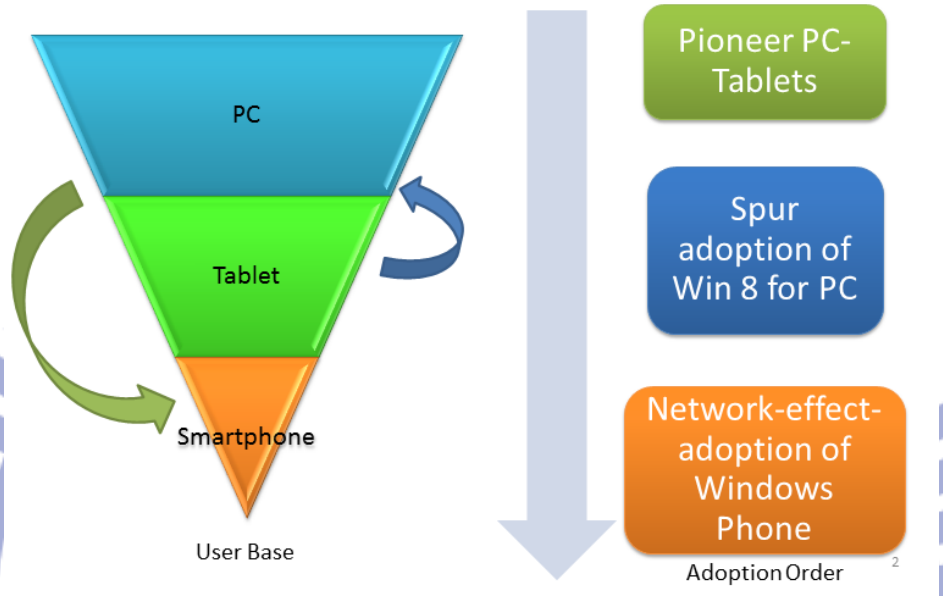


Figure 11: Windows 8 Roadmap

As argued by economist David Ricardo in the 19th century, individuals get increased utility from increased product diversity. This was one of the main arguments from liberals in the second half of the 20th century which resulted in the latest wave of global trade liberalization. Whereas we have argued for the value of platforms which build upon the gains from network effects ion multi-sided markets, we believe the importance of the quest for product distinctiveness should not be omitted. As both Apple and Android have been gaining market clout in recent years, we have seen many app developers starting to multi-home in order not to forgo opportunities in neighboring platforms. Thus the aggressive push by Windows to enter the mobile market should not be shunned as a desperate attempt by an industry behemoth of yesteryear.

As noted by Murray and Haubl [31], Microsoft's fame and vast partner network in the PC industry will probably be a huge advantage for its entry into the mobile market. With initial surveys of Windows Mango smartphones coming in, it seems users of this new platform are much more satisfied than their peers using both iOS and Android. However, PC magazine [73] emphasizes the importance of winning over technical influencers that remain reticent towards

adopting Windows Mobile, no doubt for fear of finding themselves in the grip of a monopolizing closed system OS developer, is crucial. Apple's dominance and semi-closed approach to platform management might also result in customers being turned off in the medium to long term in a phenomenon coined psychological reactance. However, it would seem that iOS customers are still the ones receiving most positive externalities from participating in iOS in terms of both App choice breadth and superior content access.

4.2.1.2 New entrants Apps and Multimedia Content

In the PC era, applications were usually hosted on the developers' website. With the revolutionary introduction of Apple's iOS everything changed. Users became less concerned about flexibility, and more concerned about convenience and security. As even Microsoft is reverting to the App Store Model, we will see how new entrants are trying to enter this lucrative market.

Open Source, has its strengths and flaws. Google, which contrarily to Apple and Windows Mobile, not only allows third party developers to have their own App Store, but has permitted powerful players namely Amazon to get into this market. Amazon, which in the past only offered a Kindle Application for all mobile OSs, has now expanded its scope with its own Appstore for Android. In addition, it has developed such flagship products as Amazon MP3 & Cloud Player (allows users to stream or download any music purchased or uploaded to the Amazon Cloud), Kindle (for print: books, newspapers and magazines) and Amazon Cloud Drive (a virtual disc software similar to Dropbox, Skydrive and Google Drive). After noticing the limited market for its own e-readers, Amazon has bet big in developing applications on competitors' platforms. In the meantime, it has also introduced its own Android powered Tablet, the Kindle Fire, with Amazon Silk, a web browser similar to Opera, which compresses web content before sending it back to the tablet.

Windows has a lot of potential and a great advantage as opposed to incumbents Apple and Google. As the world of the PC and mobile are integrating, Microsoft has a strong position in productivity apps most notably through its Office Suite. Before its scheduled Windows 8 launch, Microsoft has forged new alliances with past foes. It announced it was investing $300 million in a technology venture with Barnes & Nobles' to develop a Nook application exclusively for Windows RT. The joint venture will be owned 82.4% by B&N and 17.6 by Microsoft. In doing

so, Microsoft is undoubtedly aiming to use B&N's Nook content platform to enrich its Windows RT ecosystem and leverage existing B&N customer base [50].

There is also news of Facebook, the social network giant making efforts to enter this market with its own Appstore. It is very likely that the company will try to leverage its own games and move them to the mobile realm. It will likely succeed for Android, as other players such as Amazon have already adopted a similar strategy, but is less likely to prosper on iOS and Windows Mobile, whose owners tend to exercise much more control on their platform. Facebook has also come up with a more collaborative approach to enter the Appstore market with App Center. It is becoming an intermediary between the customer and the developer, who might be inclined to multi-home on different Appstores. Thus a user can check the ratings of his friends before being redirected to Apple, Google or Microsoft's Appstores [54]. This competition for content might be the next frontier for OS platform leaders to innovate and create lock-in points for the customer.

4.2.1.3 Hardware Market Consolidation

As discussed earlier, there are many consolidation trends such as that of the PC, mobile and smart TV industries. An even more dramatic change might occur in setting up a brand new sort of product line. Since 2011, we have seen an effort from PC makers to avoid market erosion. Thus Intel has put a lot of pressure on computer makers to develop a brand new generation of Ultrabooks to compete with Apple's MacBook Air and ultimately the iPad and other Android Tablets. As Western consumers brace themselves for more challenging economic times, they will often need to make a trade-off between a laptop and a tablet. Due to their lower price, tablets seem to be taking the upper hand. They constitute in fact a disruptive innovation that better serves the needs of consumers regarding such dimensions as price, weight, size and user-friendliness.

Various traditional PC manufacturers have started to venture into the production of mobile devices. The most daring has been ASUS, launching successful products such as the Eee-Pad Transformer Line and the PadFone that take advantage of the advantages of a full-blown Laptop that can be dismantled into a Tablet and even into a Smartphone for convenience. It remains to be seen if ASUS will be approached by Microsoft to develop its own convertible Laptop-Tablet.

So called Ultrabooks, which are in essence Clones of the MacBook Air, are laptops that enjoy the lightweight and convenience of a laptop, without the advantage of a touchscreen. Intel is finding itself increasingly pressed into a corner by computer manufacturers on one hand and software developers on the other, as they develop products that are compatible not only with its old competitor AMD products, but increasingly with the British fabless company ARM in the mobile domain. Intel itself has started to commercialize its own smartphones in India with the Lava Xolo X900, the UK with the Orange San Diego, and China with the Lenovo LePhone. All these devices are currently powered with Android however, Hermann Eul, president of Mobile Communications Group at Intel, was quoted saying at the Taipei Computex that Intel might introduce Windows Mobile Phones, if the new platform was successful [74]. However, the best chance resides in Microsoft's Windows RT and Windows 8 powered Surface Tablets.

4.2.2 Market Forces- Demand

4.2.2.1 Mobile Advertising

The increasing capabilities of smartphones have not been ignored by advertisers, with new players such as Mula and LeadBolt showing the way by turning mobile advertising into a multi-billion dollar industry. Google, a champion of online advertising for the last decade, is clearly trying to subsidize its software development business of Android by using it as a portal not only for online advertising but mostly data collection. In order to avoid a backlash from users, Google is treading carefully in this new terrain, trying to make advertising as conspicuous as possible, for example giving game developers better deals for hosting advertisings.

Chuck Martin points out to the rise of a brand new customer relationship, that of the untethered customer [28]. Whereas in the past customers acted with limited information, the rise of the World Wide Web has empowered the customer to compare prices and product features worldwide (Web 1.0), and later to exchange information with his friends and fellow users through social networks (Web 2.0). The latest revolution of the past few years revolves around mobile. The newly empowered customer is now not only able to access all the above mentioned information, but he is able to do so anywhere and anytime thanks to the advanced capabilities of his smartphone. Tools such as barcode tracking and geo-localization allow him to compare prices in real time and to get location based offers and discounts.

4.2.2.2. Social Networking

According to Gary Vaynerchuck [42], author and creator of winlibrary.com, we are entering the New World of the "Thank you Economy". Thanks to technology, we are going back to the way things used to be in our grandparents time, with strong networked communities surging not geographically but online. Due to the amazing potential of social media, individuals are able to communicate directly with large corporations on the same footing and to make them accountable collectively. Think about the role of social media in mobilizing people during the Arab Spring and the Occupy Wall Street protests. Today, even the largest corporations are at the mercy of unhappy customers. The truth is that both happy and unhappy customers talk, and in the age of social media, an individual complaint can quickly turn viral. Due to network effects, a small splutter can quickly turn into a tidal wave. That is why companies, large and small, need to engage into this 'second life' that is social media.

Mobile phones are becoming increasingly social and a preferred channel for customers to do their research. Thus in April 2012, 160 million people were accessing their Facebook account regularly though their mobile devices, up from 60 million in February 2012, representing a staggering increase of 166% in a single month [91]. Steve Madden [28], a shoe brand, was the first company to think about adding the Facebook "Like" on mobile. Today, they are investing heavily in mobile. Steve Koven, President of E-commerce and Customer Experience at Steve Madden believes in a customer centric approach by leveraging m-commerce. He believes that m-commerce will take 3 years to take hold, whereas e-commerce took a full 10. M-commerce fuelled by social media, also known as SoMo or social mobile, is becoming a paramount way to increase brand equity. Koven believes "Mobile, like no other force before it, is poised to influence billions of dollars a year in retail sales as an industry.", "It creates vital energy and excitement" he boasts. Koven has a 50 employee strong e-commerce team, and he is planning to leverage those employees to strive into m-commerce. Chuck Martin [10] talks about a paradigm shift where "mobile is not incremental, it is transformational". According to Martin, the customer has gone from being rather passive, in receiving advertisements and communicating by word of mouth, into being "totally in the driver's seat and each interaction is unique in the interplay between customer, business and brand".

For incumbents such as Facebook and Twitter which seem to dominate the social networking online, both are facing much stiffer competition on mobile, where application providers such as

Foursquare and Path are challenging them head-on. Foursquare, whose functions were soon imitated by Facebook and Groupon Mobile, managed to merge location-based capabilities with the social network. This is only one single use in a world of near unlimited possibilities. Both OS developers and handset makers are trying to make their products increasingly social in order to win over customers. Thus iOS, Android and Windows Mobile have all included photo-sharing, feed-reader and the like incorporating direct access to social networks imbedded in the operating system itself. These features have even been expanded by handset makers in their graphical user interface, such as HTC (HTC Sense) and Samsung (Touchwiz).

V. Practical propositions for HTC

5.1 A brief history

HTC Corporation, formerly High Tech Computer Corporation, is a Taiwan-based manufacturer of smartphones. The company initially made smartphones based mostly on Microsoft's Windows Mobile operating system (OS) software, but in 2009 it began to shift its core focus away from Windows Mobile devices to devices based on Android OS, and in 2010 to Windows Phone OS as well.

HTC was founded in 1997 by Cher Wang and Peter Cho. Initially a manufacturer of notebook computers, HTC began designing some of the world's first touch and wireless hand-held devices in 1998. The company has a rich heritage of many world premieres; including creating the first Microsoft-powered smartphone (2002) and the first Microsoft 3G phone (2005). Their first major product was made in 2000 and was one of the world's first touch screen smartphones. In 2009, the company launched the HTC Sense interface for the platform with the HTC Hero.

HTC's troubles began in March 2010 when Apple Inc. filed a complaint against it with the US International Trade Commission (ITC) claiming infringement of 20 of its patents covering aspects of the iPhone user interface and hardware. HTC disagreed with Apple's actions and reiterated its commitment to creating innovative smartphones. HTC also filed a complaint against Apple for infringing on 5 of its patents and sought to ban Apple products imported into the US from manufacturing facilities in Asia. Apple expanded its original complaint by adding two more patents.

In June 2010, the company launched the HTC Evo 4G, the first 4G-capable phone in the United States. In July 2010, HTC announced it would begin selling smartphones in China under its own brand name in a partnership with China Mobile. In 2010, HTC sold over 24.6 million handsets, up 111% over 2009.

HTC was named the "Device Manufacturer of the Year" for 2011 by the GSMA at the Mobile World Congress on 16 February 2011. In April 2011, the company's market value surpassed that of Nokia to become the third largest smartphone maker in the world, only behind Apple and Samsung.

When HTC was founded it was strictly an original design manufacturer, selling devices such as the HTC Wizard, the T-Mobile MDA and the Cingular 8125. The company focused on telecom operators who were willing to pay a contract manufacturer for customized products. The same was the case in Europe. Today, many HTC devices (e.g., Sensation, One, etc.) are marketed and sold under the HTC brand, though its main focus is still smartphones.

On February 17, 2010, Fast Company ranked HTC as the 31st most innovative company in the world. Bloomberg reports that HTC is studying whether to create its own mobile operating system to compete with Apple's iOS, Google's Android, and Microsoft's Windows Phone 7.

5.2 Key Trends

5.2.1 Patent Lawsuits

While most components are the same among Android handset makers, HTC's main innovation has happened in the development of its Sense Interface. Since its first launch of the HTC Sense in 2007, HTC has introduced many innovations such as lock screen, a flip over phone silencer, a quick contact search, etc. Apple claims to be the most innovative firm in creating its multi-touch gestures and has openly claimed that HTC was infringing its patents the most important of which were related to lock-screen, contact search and power saving management. Other patents that Apple alleges HTC is infringing are related to the iPhone's graphical user interface, and iPhone's underlying hardware and software design. The company is asking for a permanent injunction, which would prevent HTC from importing and selling infringing devices into the United States. This ITC ruling limited exclusion order prevented AT&T One X and Sprint EVO 4G models to be imported due to a small user interface feature

that Apple claimed was proprietary, namely clicking a phone number in an E-mail to start a call or send a message [46]. It is believed that the real purpose behind Apple's lawsuit was against Google. Its ongoing war with Google is also visible in its new version of iOS6, which blocks the use of Google Maps [72]. Apple's claim that HTC's Android phone violates at least 20 of its patents seems like simple corporate maneuvering. Android is the iPhone OS's strongest competitor, so it should not come as surprise that Apple would throw up some legal hurdles. On April 19th, an injunction order was put in force which denied the import of HTC One X models to the United States [69]. This is all the more serious because of the strategic importance of this model, which was meant to re-launch the HTC Brand Name [78]. It is common knowledge in the smartphone industry that the first two months of a product launch are critical to its success. In the case of the HTC One, the above mentioned legal hurdles have already delayed its wide-spread launch by two weeks. As of May 15th, customs had allowed a trickle of HTC models to enter US soil [68].

HTC has seen its profitability dwindle as IP royalties and lawsuits have started seriously draining funds from their core business.

5.3 Industry and Market Forces

5.3.1 Consumer Insight- Lack of excitement by customers

Since 4Q11, HTC has seen its revenue and profit take a nose dive. Analysts noted that the smartphone market was becoming more crowded and that HTC was finding it increasingly hard to compete to the likes of Samsung and Apple [79]. In fact, this coincides with the launch of the iPhone 4S on October 4th 2011, which managed to create a lot of buzz among smartphone customers. PC Magazine notes that the iPhone remains a safe bet to most customers who are not “techies”. Android phones tend to appeal more to technical folk, who are much pickier about product specifications. As long as HTC is unable to appeal to a larger breadth of consumers, it will always have to suffer price pressures from other Android handset makers and Apple.

5.3.2 High costs

Samsung was an early entrant in the feature phone industry, which allowed it to grow its customer base from the bottom to the top market segment. Its volume and expertise in many crucial technologies such as LCD, CPUs, memory, etc. has allowed Samsung to develop superior

integrated products at lower cost, fully profiting from gains in vertical integration and economies of scale [35].

HTC by contrast has started by aiming for the top market segment, and has financed its gains through high prices for its high performance models, but it has little to show in the sense of economies of scale. However, HTC and other manufacturers will remain unable to compete on prices, which put them in a predicament, as Apple and Samsung seem increasingly willing to drag down the industry prices, which HTC cannot afford. HTC will be unable in the foreseeable future to enjoy the synergies that Samsung currently has, at it depends on partners for almost all of the components of HTC phones.

Samsung's model revolves around the capacity to create synergies and can only remain competitive so long as it can produce in bulk. Samsung has in fact managed to build a very powerful product platform by leveraging technology, manufacturing abilities and channels from its parallel product lines such as TV. Samsung's dominance in the smartphone market has been long coming, but as it has managed to gain market share, it has also managed to push down cost and become impregnable.

5.4 Propositions

HTC's Problem	Taken Action?(Y/N)	Solution	Effectiveness
Niche Player	1. N 2. Y	1. Coring and Tipping Strategies 2. Increase product line breadth	1. 0 2. +
Cannot compete on scale or scope	N	Leverage partnerships in content and hardware	- Dragged down by price pressures
Suboptimal use of resources	N	Instill Building Block Thinking	-
Increase IP portfolio	Y	Patent alliances, Corporate take-overs	0
No flagship product	Y	Launch HTC One Product Line	0
Misunderstanding consumer needs	N	Promote SoMo, Include Lead Users in Product	0

		Development, Keep it Simple	
Dependency on platform leader	Y	Multihoming	+

Table 1: HTC Propositions

5.4.1 Ecosystem View- Leverage Platform Resources and Multi-home

Proposition 1: "Continuously reinvent the business model by identifying multi-sided market opportunities and building a powerful product platform."

Firms such as HTC operate in a complex environment, and thus need to develop and constantly review strategic objectives by monitoring product development, technology and strategy [29], given the wicked nature of problems and issues they face [6]. HTC operates on the fringe of various ecosystems and by effectively multi-homing its products on different OS platforms, it is diversifying its revenue source by making Windows Mobile as well as Android compatible handsets. This is an advantage for HTC, who has been able to play both firms against each other, in an effort to get better terms for itself.

The economics of two-sided markets imply that one partner will receive greater concessions than the other to enter the platform. In the case of multi-sided markets, the platform leader is usually involved in parallel business activities, which gives him more leverage to create incentives and spread wealth as he sees fit. HTC's value chain includes component manufacturers (HW), OS developers (SW), Operators, other distributors, and then the final customer. Due to its strong relationship with operators, these often subsidize HTC's phones to customers in order to lock them into 18 or 24 month subscriptions.

HTC in the last few years has not managed to lead a successful coring strategy [15] as opposed to Apple. By creating its own OS platform and a sustainable ecosystem revolving around content in the form of Apps and Music, Apple has managed to keep its profit margin high. HTC on the other hand finds itself increasingly dependent on both Google and Microsoft. In the words of Simon (2011), HTC has in recent years remained a "one-trick-pony" due to its unwillingness to rethink its business model and search for the higher value-added activities involved in managing multi-sided platforms.

5.4.2 Using the stack model

5.4.2.1 Analyzing the Ecosystem and Choosing a Platform

Proposition 2: "Build strong links with suppliers to bridge the gaps where the firm does not have enough expertise or resources to build a product platform."

As a device manufacturer, HTC combines software, in the shape of its graphical interface (Sense), as well as hardware, as an aggregator of components from partnering manufacturers including CPUs, Memory, Display, among a range of other ones.

In the case of the HTC One platform, to distinguish itself from other Android handset makers, HTC has built Sense for Android, it has partnered with Dropbox to give users an extra 25GB after the purchase of a One Phone, with KKBOX and other music providers to offer seamless music integration, with Beats to provide authentic music and with Sony to offer a PlayStation compatible Phone [56]. As for the lower steps of the value chain, it has worked with LG for the Display, both NVidia and Qualcomm for the processor technology, and a set of other players for all of the other components involved. HTC has in the past been a successful component aggregator, but has failed to core the market.

Proposition 3: "Leverage partnerships to provide consumer content."

Almost all Android handset manufacturers, with the exception of Sony, face the problem of ramping up content platforms, which is increasingly dominated by the platform leaders. Many customers are willing to accept the Apple tyranny just and mainly because of its immense content library. Google is playing catch-up by providing not only Apps but Music, Books and periodicals through its Play Store. As iOS 5 was introduced simultaneously with the iPhone 4S, Google had to struggle to quickly build up its Google+ and Google Drive Apps, which mirror Apple's renown iCloud in file sharing and content synchronization.

To differentiate its product offer, HTC has built its own software package in the form of Locations (its own GPS App), News, News & Weather, Reader, Stocks, Tasks Polaris Office, Watch, etc. It has also built a close partnership with both Dropbox, Facebook and Twitter to make the Sense UI more distinctive. HTC's motto is integration, for example in music, Sense 4.0 is now capable of integrating different music streaming software and files under a single music program. However, this is still no match for Apple's iTunes platform. Nevertheless, this product

diversification seems poised to failure in the long-term, as the OS platform leaders start internalizing all of these features into their own operating system.

As a result, HTC could deepen its links with Amazon to offer a viable alternative to iTunes, in return for its technical expertise in handset manufacturing, in the same way that Google collaborated with ASUS to develop its new Nexus 7 tablet. Google currently allows Android users to use Amazon's Mobile software, however, it is taking an increasingly aggressive stance by launching its own content store to compete with the Amazon MP3 Music Store and Cloud App.

<u>Proposition 4</u>: "Build alliances or joint ventures with suppliers to guarantee access to key components."

In 2012, the handset maker tier of the smartphone industry is turning into a two company show, with Apple and Samsung gaining ever greater market share. It is not only handset manufacturers that are finding themselves isolated, but component manufacturers as well, as Samsung and Apple tend to jealously develop their own hardware and software in-house. Processor manufacturers Qualcomm, NVidia and TI are also feeling the squeeze with both Apple and Samsung developing their own line of processors. A computer review columnist even notes that Google might find itself threatened in the event that Samsung backs an alternate Operating System such as Windows Mobile. This might explain its recent take-over of Motorola Mobility.

All this uncertainty calls for some strategic alliances if not industry consolidation. Motorola after years of misfortune is finding a niche for itself in the US market as it has nothing resembling a global distribution channel. On the contrary, HTC is being edged out of the US market by patent litigation preventing it free unrestricted access. Whereas some players lack in expertise and global distribution channels, others lack in intellectual property. Thus if HTC and Motorola sealed a strategic partnership similar to that seen in the Auto Industry, this would make perfect business sense. Another scheme might be to develop patent pools, which would allow manufacturers to counter IP claims made by Apple and Samsung.

Whereas Qualcomm, NVidia and TI all belong to the ARM ecosystem, they would all profit from a more level playing field in the smartphone industry, as they will be less likely to be driven into irrelevance in the event of an ever more influential Apple and Samsung. Even LCD manufacturers would enjoy more clout if they could be part of an alliance.

Downstream, operators do not enjoy being bullied by Apple and Samsung. As operators already enjoy a longstanding cooperation with HTC, Nokia, Motorola and Blackberry, they might also welcome a counterweight to Apple and Samsung, by fear of becoming a commodity data-pipeline.

But how could these handset makers make synergies? Synergies would involve closer cooperation in graphical interface, where HTC excels, joint investments in building production lines would also be a great advantage to foster economies of scale. In the recent climate of IP litigation, co-branding such as that in the auto-industry could be a reliable option.

5.4.2.2 Building Blocks

By using a resource based-view, HTC needs to figure out where its strengths and weaknesses lie. It needs to use its own competencies and complement them by leveraging partners.

First, referring to (1) consumer insights, HTC seems to have a good understanding of customer needs mainly through its close collaboration with local operators who are able to better understand the needs of their local customers. This bottom up approach makes the firm closer to the final customer. As witnessed in the Honda case, it is important for all the functions of the company to understand its final customer, to give them insight, drive and conviction. Second, referring to (2) Product Technology, HTC should not fall into the function creep trap. It needs to ensure strait talking between sales and marketing and R&D, to ensure that engineers develop product to address the customer needs. Third, referring to (3) manufacturing processes, it is crucial for HTC to keep strong relationships with both upstream suppliers and downstream customers, and to include them in the development process. It is by ensuring strait communication within a product development team composed of members from the main organizational functions that the solutions that best serve the customer can be developed. Fourth, referring to sales (4), these need to clearly communicate the value proposition to the customer and to find a business model that can increase the revenues of the company. Steps one to four need to happen in loop, and communication between each organizational function (i.e. building block) needs to be smooth and efficient.

<u>Proposition 5:</u> "Include lead-users in product development and harness the creativity and work of 'prosumers' to increase organizational efficiency and innovation at lower cost."

Hippel et al. [18] referred to the paradigm shift in innovation, where customer innovators are actually taking into their own hands the task to develop new products. As in the case of the Android and iOS's App Stores, which have managed to increase the value of both ecosystems by engaging a plethora of App developers, HTC could redouble its R&D efforts by embracing innovation from outside the firm, thus actively fighting against the "not-invented-here" syndrome that is so common to most hardware manufacturers. As mentioned previously, many customer innovators develop new solutions for products that HTC could cash upon. Think of the example in adjacent industries such as gaming, where Microsoft managed to increase its product platform by letting customers develop their own applications to use the Kinect functions of its XBOX. In a similar approach, HTC could encourage its customers to develop solutions for its smartphones and tablets. Think of iRig for iOS, which allows users to connect their Guitar to an iPod, iPhone or iPad and to use it as a makeshift amplifier. Such innovations remain untapped on Android; HTC should consider lending these producer-customers a hand, to make it possible on the Android ecosystem. Only this way can it remain a fast-follower and avoid market share erosion.

On the software aspect, HTC prides itself on its superior customizable graphical interface: Sense. However, customization remains exclusively in-house, as both Skins and Scenes are only available on the HTC Hub (HTC's Appstore). An effort to open-up the Sense graphical interface could be an effective strategy to involve these so-called prosumers, thus playing a difficult hand to Apple which allows no customization of its interface whatsoever.

<u>Proposition 6:</u> "Strengthen HTC's intangible asset base. Building Patent pools or Patent Alliances to increase the Breadth of HTC's Patent Portfolio"

HTC's best opportunity to secure Intellectual Property presented itself with a potential purchase of Palm in April 2010. However, as talks waivered, HP stepped in on April 28th to purchase it for a whapping $ 1.2 Billion. This venture crashed with the introduction of the HP tablet. On May 23rd 2012, it announced that it was cutting 27,000 jobs worldwide. With sales of PCs slowing down, and a shift of demand to mobile products, it remains unclear what its future strategy will be. This brings us to the question of whether it would make sense for HTC to be

acquired by a larger firm, than for it to acquire a plethora of small companies with relatively insignificant IP.

Patent Pools

When building up an IP portfolio, it is more important to take into account Pipeline Impact (i.e. patents are more likely to be referenced as prior art) and Pipeline Generality (i.e. patents are more generally applicable than average). HTC is still lagging in both and will not resolve these issues so long as it does not have closer ties with other handset and component manufacturers.

A solution which is quite common in the health industry is for partnering firms to build patent pools. HTC has already entered a patent alliance with Microsoft, for which it needs to pay an average 2 USD per handset sold. Engaging fledgling manufacturers such as Nokia, Sony, RIM and Motorola, or component manufacturers, might make all firms more price-competitive by reducing licensing and royalty fees.

Proposition 7: "Use resources more efficiently through targeted investments"

In the considerable future, HTC is unlikely to be able to compete with the big boys (Apple and Samsung) on either scope or scale. Apart from organizational and structural barriers, HTC will need to remain lean and mean in its operations as well as in innovation management.

According to Nagji and Tuff [quoted in 32], research points to the fact that the most innovative firms that outperform peers tend to allocate investments according to the following ratio: 70% for safe bets (incremental innovation), 20% to less certain business initiatives in adjacent spaces and 10% to high-risk transformational initiatives. On the return on investment perspective, you might be surprised to find that the exact opposite trend is true. Investments in incremental innovation contribute a mere 10% of revenue, while investments in adjacent spaces and high-risk transformational initiatives contribute 20% and 70% respectively. Nagji and Tuff point out that this finding does not originate from a misallocation of resources, but rather from the marginal revenue of more and less risky projects [32].

Back to the case of HTC, after its revolutionary rise to grace in 2007 with the HTC Touch, the only rival to the iPhone and that time, and the introduction of the Sense interface, a landmark in Android devices, HTC has failed to deliver the WOW factor. In recent years, with visionary Steve Jobs at its head, Apple has managed to take the breath of customers, hard-headed Wall

Street financiers as well as competitors away. Contrarily, HTC who had a head start in Android, has in a few quarters seen its market share erode with larger firms banging at the gates. Whereas it has made its phones increasingly smart, due to a lack of communication among others, it has failed to woo its followers. Again the HTC One launch is a promising and welcome move, but it might not bear fruit.

HTC can learn much from its main rival, Samsung. One move has been to separate people involved in transformational innovation from the core business, financially, organizationally as well as physically in some cases. Knott [23] points out to new fixes to better determine R&D budgets include RQ quotient, a measure derived from classic regression analysis which allows managers to make judgment calls.

An idea that was toyed and ridiculed by the PC Magazine seems nonetheless to have promising potential for HTC. With its share in Android as well as Windows Mobile taking a bashing, it might very well secure a new market by helping Facebook to develop its own operating system. Whereas the patent issues might be overwhelming, market potential is still untapped for a more consumer friendly way to tap into SoMo (social mobile). HTC's proficiency in user interfaces with Sense puts it in a good position to hand Facebook a new way to monetize mobile. The very nature of Facebook could bring into being a new Mobile OS to be reckoned with. Such an OS might be able to merge texting, e-mail, and multimedia sharing on Mobile. Furthermore, such collaboration might even give HTC the shot of creativity it needs to resolve its current woes. A recent survey leads to mixed results about the viability of such a model, as many users might be turned off by privacy issues, while others are attracted by the sharing potential of such a solution.

5.4.2.3 Product Platform

As for the selection of the product platform, this involves selecting the optimal solution both strategically within the ecosystem (i.e. determined by the stack analysis) and operationally (i.e. thanks to the right mix of building blocks). This is a thorough exercise, but needs to be carried out. We are aware that the smartphone industry moves extremely fast, however, when developing a product platform, some middle to long-term strategic decisions that require immobilizing company resources must be made. This decision should thus not be made lightly.

On one hand, it is by maintaining long term solid relationships with suppliers, that HTC can expect help and loyalty in its hour of need. On the other hand, the company resources that will be invested inside the product platform will likely be immobilized for a considerable period, which makes investments in parallel projects less likely, all of which indicates that the firm will lose some flexibility.

<u>Proposition 8:</u> "Consider merging with a larger group that has vertical integration. This could give HTC the material and intangible resources to build a powerful platform."

Today's climate of market disruption, with increased global competition, product innovation and shorter time cycles would indicate near perfect conditions for further market consolidation (Cassiman and Colombo, 2006) [quoted in 2]. Where many firms remain underperformers that require market discipline (Bertoselj, 2006) [quoted in 2], it is increasingly likely that there will be a certain extent of market consolidation. HTC needs to scan this environment for a company that could provide it more tangible or intangible assets. Access to a larger company's resources could give it better access to financial markets and higher returns on investment projects through reduced borrowing costs (Weston and Weaver, 2001) [quoted in 2].

There are many firms, mentioned above, that could greatly benefit from HTC's competencies in Smartphones, these include other handset manufacturers, PC manufacturers, consumer electronics firms, OS proprietors, etc. As in any mergers & acquisition, many factors need to be considered as most of them are prone to failure. Bertoselj [2] points out to a series of so called soft and hard key success factors (KSF) illustrated below.

A likely candidate might be Samsung's main rival Sony. It has made some forays into Smartphones, but lacks the product excellence of HTC. On the other hand, HTC could benefit from Sony's immense patent portfolio (it filed a record 2417 US utility patents in 2010), renown design (Soft KSF), as well as from synergies from components already produced by Sony such as cameras, displays, memory, etc. (Hard KSF). Furthermore, cultural links between Taiwan and Japan are strong (Soft KSF). Sony having a more global reach and consumer base, it could enrich HTC's current market understanding. This remains an imperfect match, but it is meant to illustrate the possible advantages of joining a larger consortium especially since both firms are already collaborating closely in product development and manufacturing.

5.4.2.4. Positioning

Positioning involves the 4Ps: Product, Price, Place and Promotion. HTC needs to go from a global to a local strategy, following the motto: “”Think global, act local”. By leveraging its strong relationship with operators it can get a better feel for the local consumer needs and deploy products more attuned to local customer needs. It needs to determine what product line strategy it wishes to adopt.

Customer Insights

Proposition 9: “Keep it simple stupid (KISS)”

According to Spenner and Freeman [39], most customers seemed overwhelmed by the wealth of information they are submitted to every day, a key success factor for companies has become to “Keep it simple”. This implies a rethink not only of advertising practices, as mentioned in the article, but in the case of smartphone OS providers and handset manufacturers, a simplification of the user interface. Companies need to address three dimensions to safeguard product simplicity, by minimizing the number of information sources customers must confront, provide trustworthy sources of product information and recommendations, and offer tools that allow consumers to weigh their options by identifying the features that are more relevant to them.

In advertising, HTC has been eager to serve a large breadth of customer segments by offering a complete smartphone product platform. This approach completely clashes with that of industry leader Apple, which has contented itself to promote and advertise a single flagship product. It is important to find out if HTC in its effort to address the needs of a diverse consumer base has overcomplicated product choice. Whereas this practice used to be widespread 5 to 10 years ago, at a time when the then industry leaders Nokia and Eriksson used to each have a complete range of handsets to serve different users, today this trend seems to have reversed with top firms focusing their effort on 2 to 3 flagship products with differentiation mostly focused on software and accessories.

Proposition 10: "Develop an iconic product"

Iconic products or so called WOW products create envy because they are unique in their own particular way. Holt (2004) notes that people identify strongly with cultural icons and often refer to these symbols in everyday life. On the other hand, what constitutes a brand? Is it a name? A trademarked logo perhaps? Or is it defined by unique packaging or other design features? The answer to what constitutes an iconic brand, lies somewhere in between. Iconic brands are brands that have managed to enter the cultural sphere. Think of Coca-Cola, a brand that became famous after the US war effort in WWII. Another example is Harley Davidson that reached its zenith after the release of the cult film Easy Rider. If a company can make people associate its brand with a specific cultural icon or a pain that the whole of society faces, it has a chance to become truly unique and to stir consumer emotion. Holt refers to this new branding model as cultural branding. This discipline of cultural branding is the most effective for products through which individuals can express their identity. In these kinds of markets, advertising usually revolves around quality, trust and distinctive benefits, which makes advertising all the more fierce and the gains momentary. To stand out of the bunch, Holt notes that companies need to create a myth that is hard for competitors to imitate. This myth revolves around a story that comes into the mind of the consumer whenever he or she uses the product. HTC has gone around this the wrong way. First of all, its product names do not inspire any strong image for the exception of the HTC Diamond and Tattoo. A product needs to have a story, an identity of its own. Names such as Evo, Sensation, Sense or Status, do not confer any such image and remain overly abstract. Furthermore, other brands do confer a sensual image, with Samsung referring to the Pebble shape of its new Galaxy SIII. Iconic brands are such symbols of identity, that they often address the collective anxieties and desires of a nation. Thus these iconic brands usually originate from flagship products that have marked society for a certain reason. Think of the Sony Walkman, a symbol of individuality and revolution for the X generation.

In the smartphone industry, the only brand to have reached the level of an iconic brand is arguably the iPhone. This is mostly due to its association with Steve Jobs, a cultural icon in his own right. There is also a strong cultural Halo Effect associated with Apple's previous successes such as the Macintosh, the iPod and iTunes. All this results in a self-reinforcing cycle that raises the customer perception of this iconic brand. Due to the accelerating trend of globalization,

cultural icons that were previously limited to nations now touch a worldwide audience. Apple is a case in point. Arguably, other brands that have a strong image, such as Samsung, still lag far behind Apple, despite their repeated efforts.

HTC has recently failed to communicate its value proposition, by neglecting to play up its graphical interface. Its latest commercial involving a parachute jump of an unknown amateur photographer only showcases a single value proposition, the amazing camera. It completely fails to mention its authentic sound, where HTC could have capitalized on its Beats acquisition. Finally, it fails to mention the very ease of social networking thanks to HTC Sense, an experience that is far less clunky that on any other competitor's phone [89]. Whereas Apple has continued to invest in making its product a cultural icon, by inviting John Malkovich and Samuel L. Jackson to showcase the Siri function, HTC's choice of an unknown photographer seems somewhat out of touch. HTC having already collaborated with well-known artists such as Lady Gaga and the Black Eyed Pees to promote their Sensation line, should have continued that approach with the HTC One.

The introduction of the HTC One series is welcome but a bit overdue. Even for the most avid HTC customer, its previous Sensation product platform was somewhat confusing. Even though we will argue that the product introduction of the HTC One Series has omitted a few important customer needs, it has addressed some of the most important ones. First, the One Line focuses on only two main product attributes: "amazing camera and authentic sound"[89]. These two attributes are crucial but lack the punch line, which could have been made through HTC's value proposition, i.e. the ease of sharing with friends. Most smartphones have decent sound (iPhone remains the leader in this category) and decent cameras. As a matter of fact, HTC through its close collaboration with Facebook has managed to make its phones one of the most social in the industry. A corrected slogan might be: "Amazing pictures and authentic sound, to share with the people you love." The HTC One commercial showcases the camera function of the handset, but fails to show either music in use or the HTC user interface in action. It very much feels like a HTC completely neglected the consumer need.

Make it social

Proposition 11: "Become a leader of Social Mobile"

There have been rumors in the press about Facebook having engaged HTC to start work on a new Facebook phone. As the war of platform looms on, many critics point out to the stupidity of such a scheme. In this paper, we would like to differ. On the side of Facebook, this might be a crucial step in monetizing its Mobile business. On the other hand, Mark Zuckerberg is taking no chances, as according to the BBC he has discretely started pinching talent from Apple's iPhone team to develop a phone [53].

An idea that was toyed and ridiculed by the PC Magazine seems nonetheless to have promising potential for HTC. With its market share in Android as well as Windows Mobile taking a beating, it might very well secure a new market by helping Facebook develop its own operating system. Whereas the patent issues might be overwhelming, market potential is still untapped for a more consumer friendly and friendly way to use a smartphone. HTC's proficiency in user interfaces with Sense puts it in a good position to hand Facebook a new way to monetize mobile. The very nature of Facebook could bring into being a Mobile OS that could merge texting, e-mail, and multimedia sharing on Mobile. A recent survey leads to mixed results about the viability of such a model, as many users might be turned off by privacy issues, while others are attracted by the sharing potential of such a solution.

From US surveys, it would seem that customers would be more inclined to purchase an Amazon rather than a Facebook phone, with around 80% stating they would not be interested in a Facebook phone [90]. On the other hand, by leading a small survey on Facebook on an international audience in the breadth of this thesis, the acceptance level was much higher at 41% indicating maybe a more heightened sense of privacy in the United States. Building a Facebook phone is undoubtedly a risky endeavor; furthermore, such a phone is not expected to become a market leader. Due to previous spats between Google and Facebook, a deeper integration on Android is unlikely. However, Facebook seems to be on good terms with both Apple and Microsoft, which could entail a push to make both operating systems more social.

A Facebook phone, however, should not be ruled out. With its current purchase of Instagram, Facebook is well positioned to develop a powerful photo-sharing tool, messaging service, contact storage, more social platform. By using a conservative estimate of an adoption rate of 10%, this

would already constitute a significant figure, which could give HTC a new place to multi-home its product.

Branding Management

Proposition 12: "Rethink the branding strategy"

While HTC's CEO Peter Cho, an engineer by profession, has driven down the slogan 'quietly brilliant', implying that the company does not need any advertising, since its product excellence will do, Samsung, its fiercest rival, has been putting considerable resources in building its brand equity. Whereas Mr. Cho's message appeals in certain cultures where humility is key, it does not resonate the same way in Western cultures where you do not count if you are not on top.

HTC does enjoy strong links with operators and handset dealers. Whereas this is a good channel to distribute products, it implies less control on promotion and advertising efforts, diluting the capacity to communicate a clear value proposition. In the United States, HTC ads are usually communicated directly by operators, which allows HTC to leverage on their resources; however, it also makes it harder to have a unified branding communication strategy. The only place a customer can find a direct brand communication is on the HTC website. It is only with its last HTC One product line that HTC has finally tried to opt for an integrated marketing approach.

Focus on emerging markets

Proposition 13: "Foster growth through expansion in emerging markets. Build from the bottom-up to grow the customer base from the bottom of the pyramid and gain a large loyal customer base."

In recent years, HTC seems to have made the same mistake as powerhouse exporters such as Hitachi, Panasonic, Sony and Toyota, a phenomenon I would like to call snubbing emerging markets. According to Ichii et al., in recent years all these companies have been working hard on maintaining a high-end customer base with high-end products in developed rich economies. In the second half of the 20th century, they entered Western markets moving from the bottom of the pyramid to the top, while continuously improving their product offering and building a name for themselves.

However, between 2005 and 2010, while Western and Korean rivals such as Volkswagen and Hyundai were experiencing double digit growth fuelled by the rise of emerging markets, Honda

and Toyota, who make two thirds of their revenue abroad saw sales stagnate. In January 2012, Japan had its first annual deficit in 31 years. Western and Korean rivals have clearly been faster and more aggressive in their efforts to enter emerging markets, as shown in Brazil, India and Indonesia where South Korea's LG has become leader in TV sales light-years ahead of Japanese firms. Japanese firms have been unable to counter smart local companies and foreign multinationals, which have been much faster to react to market demand. Of course there are exceptions such as Daikin, an air-conditioner manufacturer, and Unicharm.

With the continued recession in Europe and anemic growth in developed economies, as well as the added complication of IP litigation abroad, HTC has likely made the same error of judgment by underestimating the potential and speed in which emerging markets have evolved. The BRIC economies, as well as tech savvy Indonesia and a growing Latin America present high growth opportunities for the Taiwanese firm. In 2010, these territories represented only 4.4% of HTC's total revenues, even though they had grown by 79.3% from 2009. Just as its Japanese peers, HTC has made four crucial mistakes identified as follows [20]: (1) distaste for middle and low-end segment of the market, (2) aversion to mergers and acquisitions, (3) reluctance to commit financially and organizationally and (4) failure to properly allocate talent.

Here is how HTC should correct these mistakes. (1) After signing ECFA with China, Taiwan firms such as HTC who already own a production plant in mainland China, have more favorable terms than their foreign rivals. However, HTC still lags far behind rivals Apple, Nokia and Samsung for the high-end market and behind local but aggressive firms such as Huawei and Lenovo for the middle to low end segment. By concentrating on the middle-end segment, HTC will be able to gain market share while the smartphone category grows in China. While concentrating on the core features of a smartphone, HTC would be well positioned to compete with local mid-segment firms with its superior design and user interface, while offering better quality, prestige and reliability than ShanZhai producers. HTC did not realize the importance of gaining market share, while a product category is growing.

(2) As a temporary solution to patent litigation, HTC has made a few acquisitions of its own. However, it has relied mostly on organic growth to expand abroad, while having a limited capacity to do so. Emerging markets tend to remain protectionist and market access is limited to foreign firms. While this is not the case for HTC in China, it remains so in other emerging

markets. As discussed in the section M&A above, many factors need to be taken into account for a successful merger to take place.

(3) While keeping production capacity exclusively to Taiwan and China, HTC is crippled in emerging markets. As long as it keeps on focusing on high-end customers in emerging markets, it will be unable to harvest economies of scale and become an important player in the global market. As witnessed in Figure 12, it remains extremely reliant on sales in staggering rich world economies.

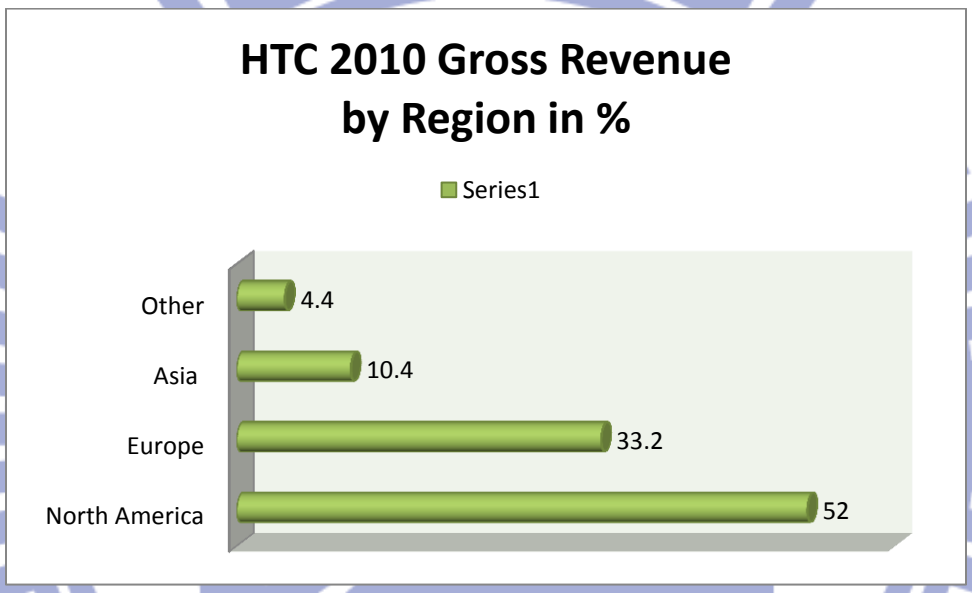


Figure 12: HTC Gross Revenue per Region, Datamonitor

(4) With most strategic decisions being made in Taiwan, and limited responsibility being given to regional business units, HTC fails to get a grip in emerging markets where it still depends on relationships with local dealers and network operators. It is by promoting local talent and delegating responsibilities that HTC will manage to make a dent in emerging markets. At the risk of diluting its corporate structure, HTC needs to acknowledge the risk of hiring top local talent. Any global company in HTC's position has difficulty customizing products to local conditions, responding to fast market changes and breaking into new segments. While HTC excels at customizing high-end products in developed economies through its close relationship with local partners, it seriously lags behind rivals Nokia and Samsung to harness growth in emerging markets.

There are promising signs however, as HTC is planning to expand further into second-tier and third-tier Chinese cities. Even though HTC has had a very warm reception from Chinese customers, it lags behind Apple and Nokia, and as its rivals, it should grow in the mid- to low-end market. By gaining the loyalty of the bulk of local customers, it can build a name for itself by growing a product category. The launch of lower-end HTC One V and One S Models might come just in time for HTC to extend its reach in developing markets.

5.4.3 Building the product platform

HTC had a head start in mobile right after the introduction of the first generation iPhone. Until the 3Q11, it managed to ride the wave of smartphones and had three digit annual growth in both sales and profits. However, as competitors, especially Samsung, closed the gap and managed to provide more attractive design, more advance display technology at a more affordable price, it seems HTC has seen its good fortune tumble.

In early 2012, HTC has tried to reposition itself by a nonetheless risky maneuver. It seems HTC listened to critics and launched its new One product line, composed of the high-end One X, the middle-range One S and the lower range One V. The One line was supposed to become for HTC, what the Galaxy line has become for Samsung, its flagship product line. Whereas it had an initial warm welcome, critics pointed out a few weaknesses that had not been corrected, and that had suddenly appeared. Overall, it seems HTC has not managed to create the necessary hype to re-launch its brand. But how could it reposition itself?

VI. Conclusion

By using the PPDM, we first explored the forces that are shaping the dynamics of the smartphone industry and in a second stage, tried to give an insight onto how a company such as HTC might leverage both internal and external resources to gain competitiveness in a platform dominated ecosystem.

In the limited scope of this study, we introduced the reader in the Appendix to terms specific to the smartphone industry, multi-sided markets and product platforms. In Chapter 2, we went through the previous literature about mutli-sided platforms, product platforms and innovation management, as these are the building blocks to the PPDM Model in Chapter 3. We then shed light on both the Business Model Canvas [33] and the PPDM Model. As for Chapter 4, the

industry review, by referring to the business model canvas, we explored the current state of the smartphone industry and presented the underlying trends in this industry that will continue to be of considerable influence in the foreseeable future. After shedding light on the key trends, we examined the forces shaping supply and demand, and how companies need to balance both of these forces to serve the needs of both groups of stakeholders.

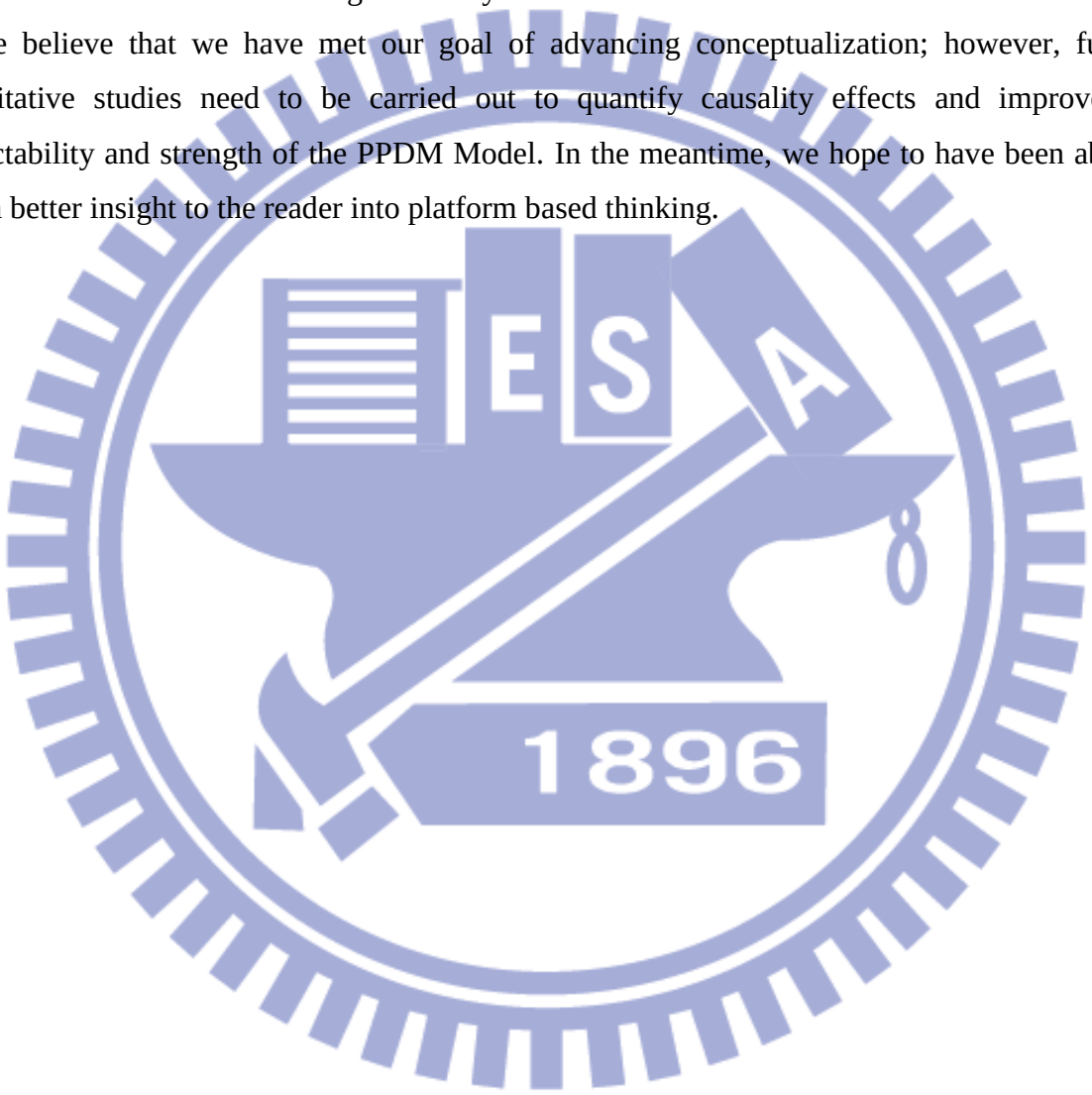
In Chapter 5, we combined both the Business Model Canvas [33] and PPDM models to better understand the particular case of HTC and to develop a tailor-made set of propositions. To start, by drawing on the Business Model Canvas [33] we examined the key trends, market and industry forces that influenced HTC to a greater extent. In a second stage, by drawing on the PPDM Model, we made an extensive analysis of the ecosystem in which HTC is operating. This analysis was meant to determine the degree of vertical integration in this ecosystem, how value was shared between the different levels of the value chain, and to what degree companies would be able to benefit from multi-homing. This exposed the much more open nature of both Google's and Microsoft's platforms in comparison with that of Apple. This analysis also allowed us to better predict conflicts with adjacent industries and to identify the weak points where potential new entrants might strike. So much for factors outside of the company's operational capabilities.

In the following step, we used a resource based approach to better understand which organizational capabilities the firm could draw on, and which capabilities it would need to leverage from its partners to develop its own coherent product platform. By drawing on four major building blocks: consumer insights, product technologies, manufacturing know-how and organizational capabilities, the firm would be able to develop its own Product Platform composed of the most efficient Subsystem-Mix it could develop. Thanks to this efficient distribution of resources and leveraging on partners' capabilities, the firm would be able to better identify market opportunities and develop a matching product offering. This constitutes the last step in the PPDM model.

To conclude, we believe that we have both made some progress in advancing platform management thinking. On the one hand, we developed an alternative approach to industry analysis that could compensate the fallacy trap of Porter's five forces. Thus in technology management, focusing exclusively on core competences will lead to a dangerous path, as witnessed by both Sony's recent demise and Samsung's rise in grace through vertical integration based platform building. The business model canvas is meant to internalize the key trends, which

must be considered in a fast moving industry; thus providing the best way for the target firm to guarantee its survival within an ecosystem by enabling it to identify both its current position as well as its desired position within the value chain. The PPDM Model in turn combined constructs to better understand Ecosystem structure and a framework to identify crucial internal and external resources and formulate concrete action plans drawing on internal and external resources within the context of a given ecosystem.

We believe that we have met our goal of advancing conceptualization; however, further quantitative studies need to be carried out to quantify causality effects and improve the predictability and strength of the PPDM Model. In the meantime, we hope to have been able to give a better insight to the reader into platform based thinking.



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Appendix

1. Concept Definitions

1.1 Business Model

According to Sinfield et al. [38] a business model includes, at a conceptual level: "(…) all aspects of a company's approach to developing a profitable offering and delivering it to its target customers.".

1.2 Capabilities vs. Competencies

According to Ulrich and Smallwood [40], organizational capabilities differ from core competencies in the same way that individuals' personality differs from their professional skills. Thus an individual's functional competence can be compared to an organization's core technical competencies, to the same degree as an individual's social skills can be compared to an organization's capabilities. Both sets of skills are crucial, however in the scope of this thesis we a holistic approach to both of these skills will be adopted, acknowledging that both sets paramount to organizational success.

1.3 Platform

A platform is a subsystem or interface that is used in more than one product, system or service. According to Simon [37] the platform is becoming one of the most important business models of the 21st century. The most vibrant platforms today embrace third party collaboration, and the companies that control them seek to "foster symbiotic and mutually beneficial relationships with users, customers, partners, vendors, developers, and the community at large".

1.4 Ecosystem

The Ecosystem is the result of a self-sustaining and value-generating platform. It aims at generating value by fostering the positive externalities of network effect. It is by seeking the collaboration of multiple partners from upstream (suppliers) and downstream (customers), that multi-sided platforms can reach the stage of an ecosystem.

A rough endeavor made by Gawer and Cusamano [16] explains the main reason for creating an ecosystem resides in the interest of the platform leader and its complementors to foster

innovation in order to add value to its platform by involving users and developers. When striving to build a sustainable ecosystem, the platform needs to consider many strategies including whether it wishes to create an open or close platform, or whether it wishes to finance its business model at the expense of customers or complementors or suppliers. In this study, software ecosystems are the main drivers in the smartphone industry.

1.5 Platform Strategy

Addresses the issue of how companies can use product platforms to extend their reach into new market segments and at different levels of price and performance. Some generic platform strategies are mentioned as follows.

The first strategy [29], is the one not to be followed, namely Niche specific platforms with little sharing of subsystems and manufacturing processes. The result of this strategy is a myriad of product families with few shared subsystems which entail higher costs and lower margins. This also leads to manufacturing specialization which is counterproductive to the creation of economies of scale.

The second strategy [29] is referred to as: horizontal leverage of key platform subsystems and manufacturing processes. This strategy involves leveraging a product platform, or one of its components from a market niche to meet the needs of other customer segments on a given tier of price-performance (horizontal integration).

The third strategy [29] is coined vertical scaling of key platform subsystems and consists of a firm scaling its key subsystems to address a range of price-performance tiers within a market segment. This involves scaling up or scaling down the product offering, by adding functions or streamlining products to fit the price-performance sweet-spot on the market.

The fourth, referred to as the beachhead strategy [29] is in fact a combination of horizontal leverage and vertical scaling. This consists in leveraging company resources to build a strong low-cost platform, addressing the needs of many customer segments, and from that initial market foothold, to scale up the performance characteristics of the platform and add new features to appeal to the needs of specific segments. There are also successful cases of companies that use a high-cost platform and scale down to low-cost segments.

It is important for managers to have a process to define platform strategy. To do so, they it is important to assemble a multidiscipline-team composed of engineering, marketing and

manufacturing talent. The team's effort should be divided in five major steps [29]: (1) segmenting markets, (2) identifying growth areas, (3) defining current platforms, (4) analyzing competing products and finally (5) considering future platform initiatives.

The guiding principle of this generic strategy is to obsolete the company's products with better ones through continuous product platform renewal. There might be stark resistance to this concept, as many managers prefer milking the cow at the expense of reduced customer satisfaction and manufacturing competitively. The objective of this renewal in turn is to give power to the product platform through standardization, modularity, and the economic benefits of higher-volume procurement of common subsystem components and increased manufacturing efficiency.

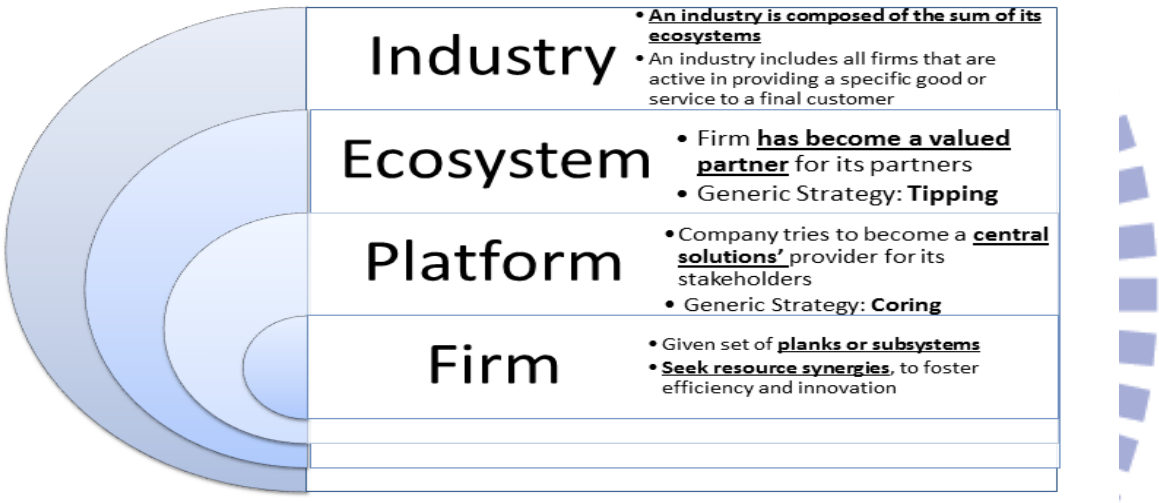

Figure 13: Levels of Platform Development

1.5.1 Coring Strategy

According to Gawer and Cusamano [16], Coring sets out to identify and design an element and make it core to a technology system as well as to a market. The aim is to redefine business and technological relationships to become the central player within a value chain.

1.5.2 Tipping Strategy

Tipping involves pushing the market into the direction of a certain platform. Technology actions might include trying to develop unique and compelling features that are hard to imitate,

or to absorb or bundle features from an adjacent market. The main goal of this strategy is to develop a dominating standard from which competitors can be fenced-out.

1.5.3 Multi-homing

A well-known practice, that refers to a user resorting to more than a single platform to host content. Landsman and Stremersch [quoted in 27] made an insightful study of the phenomenon of Mutli-homing in the video console industry. Whereas previous research had mostly studied the impact of the number of applications on a single platform in correlation with multi-homing, the authors found that the age of the platform as well as its market share are more important drivers to multi-homing. It would be interesting to know if this is also the case in the smart-phone industry.

1.6 Dynamic Stability

According to Boynton and Viktor [37], dynamic stability is the ability to change while remaining concurrently stable and in motion. In the authors words: 'It encompasses adopting a business design that fosters servicing of a wide range of customers with constantly changing needs, while continuously building on internal processes that are general purpose, flexible and reusable across a range of products and product families". The ability to quickly adapt to market needs is more important than the need to change internal processes. In other words, successful platforms keep on being measured by the degree of modularity of their product families.

1.7 Thought architecture

Architecture is the foundation for developing a product line where each member uses common technologies and capabilities [29].

According to Meyers and Leynard [29], though architecture revolves around five principles: (1) product family planning and platforms, (2) simultaneous design for production, (3) global product design and market development, (4) discover latent and unperceived customer needs and finally (5) elegance in design.

1.8 Common Building Blocks

According to Meyer and Leynard [29]: "Common building blocks (CBBs) are the power behind product platforms, and the platforms themselves the power behind specific products brought to market." We can distinguish four types of building blocks, including [29]: (1) insights into the minds and needs of the customer and competitive research confirming those needs, (2) product technology in components, materials, subsystem interfaces, and development tools, (3) manufacturing processes and technologies that allow the product to meet market requirements for cost, volume and quality, (4) organizational capabilities that allow the company to meet the demands of distribution, customer support and information systems for control and market feedback.

1.9 Subsystem Interfaces or Planks

If subsystems [29] are the key to product line architecture, be it for physical products, systems, or services, the interchangeability or modularity of those subsystems is the key to subsequent generations of product improvements.

Simon [37] refers to planks as features that a powerful platform is able to easily scale, morph, and incorporate. These can only be implemented if the ecosystem shows a high degree of modularity. A complementary plank is a product, service or community that integrates with an existing platform, or better yet, platforms (i.e. multi-homing).

1.10 Product Line

Whereas many companies approach product renewal, one product at a time, Meyer and Lehnerd [29] argue that this focus on single products leads companies to a sort of product myopia, and that they are unable to "embrace commonality, compatibility, standardization or modularization among different products and product lines". They argue that successful companies that are able to deliver in the long run usually tend to approach product renewal as an approach to build "an entire family of products that leverage a common market understanding, common product technologies and a common set of highly automated production processes" [29] - automation is a catalyst-.

1.11 Product Family

A product family is defined as a set of products that share common technology and address a related set of market applications [29].

1.12 Product platform

Thus appears the interest to join forces in building a common platform or design from which a host of derivative products could be effectively and efficiently created. The authors emphasize the importance of coupling product renewal with thought architecture. In the case of B&D, this new thought architecture involved having a macro-perspective by identifying power tools as a category instead of drill, leaf blower, lawn mowers, etc. as a single product. The second step was in bridging the traditional divide between engineering and manufacturing, by promoting product and process innovation. Last but not least the long-term commitment of the management team.

1.13 Derivative Products

According to Meyer and Leynard [29] : "Product platforms capable of accommodating new component technologies and variations make it possible for firms to create derivative products at incremental cost relative to initial investments in the platform itself. That is possible because the fundamental subsystems and interfaces of the platform are carried forward across derivative products."

2.Static View - Snapshot as of June 2012

In 2011, the smartphone market expanded at an unprecedented pace. The International Data Corporation (IDC) growth forecast for 4Q11[3] was outstripped by 14.7 percent Y-O-Y, as it reached annualized growth of 54.7 percent. Smartphones have already replaced feature phones as the top selling cell phones in mature markets such as the United States as of July 2011 (2Q11) and in Europe as of September 2011 (3Q11) according to Nielsen [70] and the Guardian [47]. Consequently the smartphone market is becoming more and more competitive these years. As competition becomes fiercer, firms are resorting to new ways to stall the competition. This has resulted in a number of lawsuits between content and component providers.

[3] Note. Quarter 4 2011.

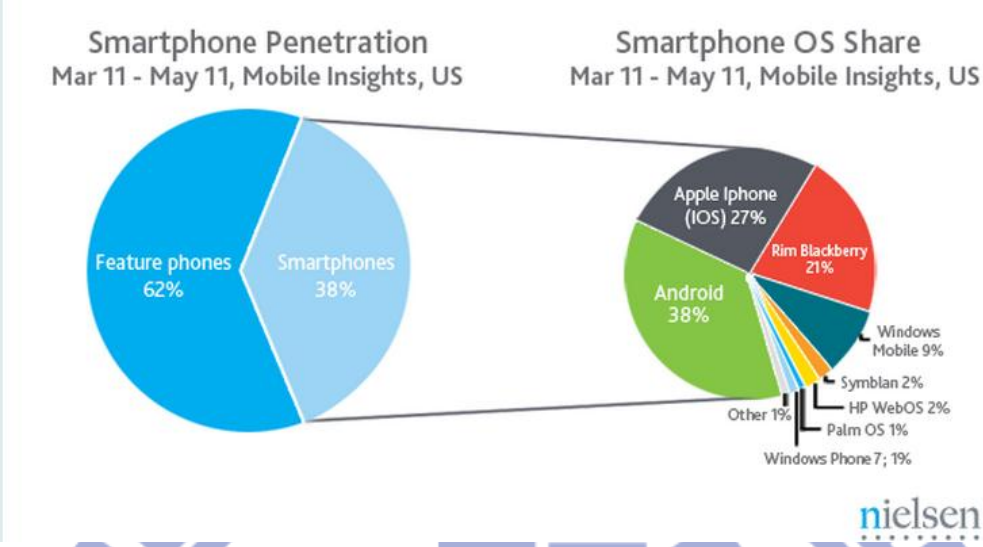

Figure 14: US Smartphone Penetration: Nielson (2011)

For simplification reasons, we shall only take into account the top movers and shakers from 2011 onwards in the scope of this paper. Thus during this period players such as Samsung, Nokia and Microsoft have made some aggressive moves in this market, whereas other rivals have failed in their endeavors. Consequently in the limited scope of this paper, in the software ecosystem we shall analyze in detail the strategies of Apple, Google and Microsoft who seem to be well positioned to dominate the next generation mobile operating system platform of the future. Apple, Samsung and HTC have emerged as the main innovators in the handset market.

Top Five Worldwide Smartphone Vendors, Shipments, and Market Share Calendar Year 2011 (Units in Millions)

Vendor	FY 2011 Shipment Volumes	FY 2011 Market Share	FY 2010 Shipment Volumes	FY 2010 Market Share	Year Over Year Change
Samsung	94.0	19.1%	22.9	7.5%	310.5%
Apple	93.2	19.0%	47.5	15.6%	96.2%
Nokia	77.3	15.7%	100.1	32.9%	-22.8%
Research In Motion	51.1	10.4%	48.8	16.0%	4.7%
HTC	43.5	8.9%	21.7	7.1%	100.5%
Others	132.3	26.9%	63.7	20.9%	107.7%
Total	**491.4**	**100.0%**	**304.7**	**100.0%**	**61.3%**

Source: IDC Worldwide Mobile Phone Tracker, February 6, 2012

Note: Vendor shipments are branded shipments and exclude OEM sales for all vendors.

Figure 15: Top Five Smartphone Vendors Worldwide Shipments Calendar Year 2011

Top Five Worldwide Smartphone Vendors, Shipments, and Market Share, Q4 2011 (Units in Millions)

Vendor	Q4 2011 Shipment Volumes	Q4 2011 Market Share	Q4 2010 Shipment Volumes	Q4 2010 Market Share	Year Over Year Change
Apple	37.0	23.5%	16.2	15.9%	128.4%
Samsung	36.0	22.8%	9.6	9.4%	275.0%
Nokia	19.6	12.4%	28.1	27.6%	-30.6%
Research In Motion	13.0	8.2%	14.6	14.3%	-11.0%
HTC	10.2	6.5%	8.7	8.5%	17.2%
Others	42.0	26.6%	24.8	24.3%	69.4%
Total	**157.8**	**100.0%**	**102.0**	**100.0%**	**54.7%**

Source: IDC Worldwide Mobile Phone Tracker, February 6, 2012

Note: Vendor shipments are branded shipments and exclude OEM sales for all vendors.

Figure 16: Top Five Smartphone Vendors Worldwide Shipments Q4 2011

As discussed in Chapter 4, the smartphone industry is divided into various strata of vertical integration, each of which contributes to the value added inside a given ecosystem. For simplicity's sake, we shall now divide the value chain seen in the IEPF Model into two distinct areas: a software and a hardware ecosystem, where the former is the main driver for innovation and value creation in the eyes of the customer. Software in terms of both operating systems but especially in terms of apps and multimedia content has become the main point of distinction between ecosystems. Furthermore, it is the companies in control of OS development and maintenance that have become the clear platform leaders and integrating forces in the smartphone industry. This is mainly because of their ability to core and tip the market in their direction by becoming central players in the value chain and ring-fencing rival platform developers out of their respective ecosystems.

2.1 Software Ecosystem

In 2007, Apple disrupted the smartphone industry by introducing its first iPhone and its revolutionary business model revolving around its Apple App Store. In doing so, it clearly outshined the existing market leader Nokia by offering a package that better suited consumer needs. After this true disruption, incumbent handset manufacturers found themselves isolated and powerless against this complete ecosystem offered by Apple's platform. It should therefore

come as no surprise that after the 2007 launch of the open source Android mobile operating system, these isolated players flocked on the side of Google. Apple immediately identified this threat, and as a consequence asked Eric Schmidt to kindly leave Apple's board [21]. Later, in order to avoid any direct conflict with Google, Apple resorted to attack device manufacturers such as HTC and Samsung, most probably because of HTC's sparse intellectual property portfolio and minute financial muscle and because Samsung would not want to wage an all-out war against Apple since it remains one of its most important component suppliers for both the Apple iPhone and iPad.

In the early stages of smartphone market, Research in Motion's Blackberry OS, Nokia's Symbian as well as Windows Mobile were the top three Operating Systems on the market. However as iOS and later Android entered the market, their respective market shares soon sored as seen in Figure 14.

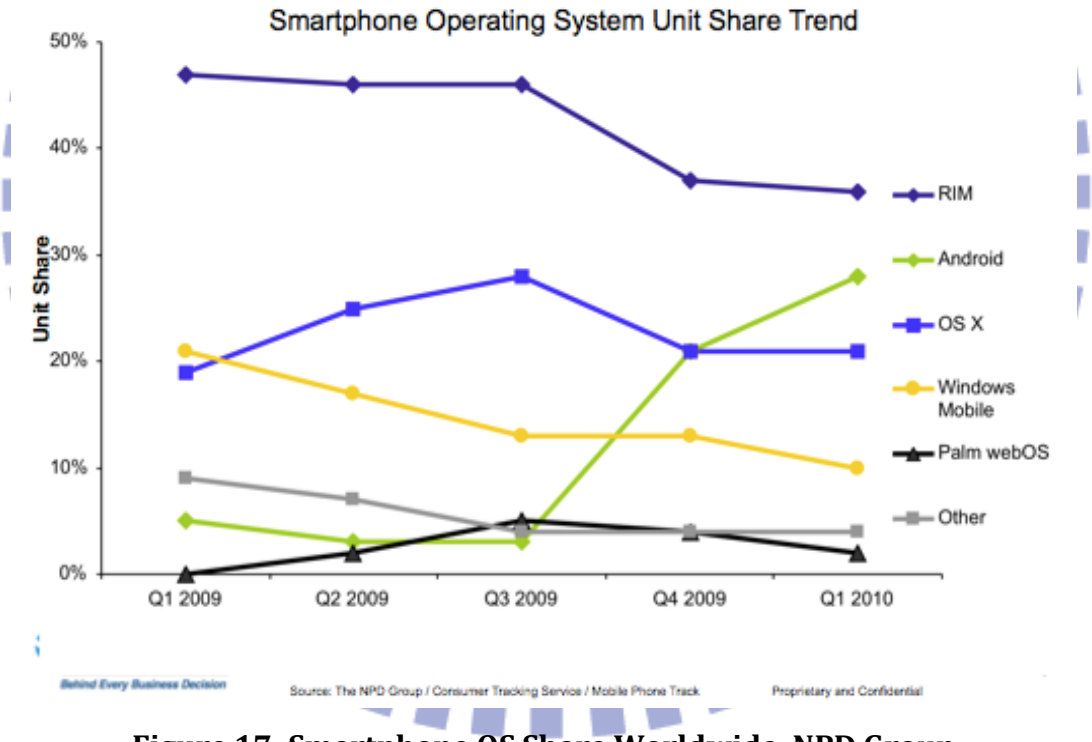

Figure 17: Smartphone OS Share Worldwide, NPD Group

Trying its best to remain relevant RIM, the creator of the Blackberry it distributed prototypes of its new Blackberry 10 in April 2012. Its phone no longer has the trademark Blackberry keyboard and runs on a new Blackberry OS that is not compatible with previous versions. Experts point to the fact that RIM is starting from a clean slate and putting everything on the line.

RIM cannot afford much more failure after data protection issues in both China and India, the counterproductive role of its messenger app in the London riots of 2011, and the failed launch of its tablet during the same year. In 2011, RIM completely failed to gain market momentum and has been losing ground in its core smartphone business ever since. In 2012, RIM issued its first loss warning to investors[4], as it is trying to find a new path for its business. According to the financial times, Microsoft, Nokia and Amazon might be interested in taking over RIM[5].

Apple has remained paranoid due to its history in PC industry, and is trying to avoid at all costs a takeover of the mobile market by Google. It would seem that there are geographic differences in OS adoption, as 2011 US data indicates that Apple was leading smartphone growth in that country.

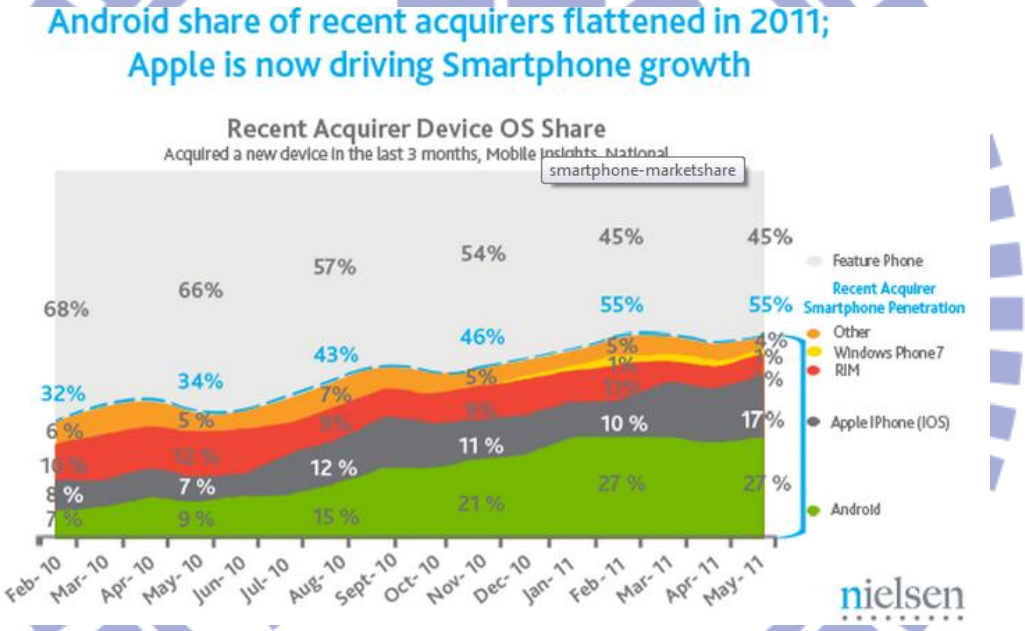

Figure 18: Smartphone OS Share USA, Nielsen Group

But even in the US, Android has managed to keep the upper hand in terms of aggregate Android powered smartphones. By comparing data from the NPD Group and Nielson from 1Q11, it is clear that iOS sales in the US gained momentum in the second half of the year. This was mostly at the expense of other smaller OS such as Blackberry and Symbian, as Android sales remained almost unchanged, going down two percent in the second half of 2011. When compared to 2010 results, these figures become more striking as Android and Apple's market

[4] http://www.ft.com/intl/cms/s/0/12fb9cdc-a9af-11e1-9772-00144feabdc0.html#axzz1xAB4hGxt
[5] http://www.ft.com/intl/cms/s/0/12fb9cdc-a9af-11e1-9772-00144feabdc0.html#axzz1xAB4hGxt

share in the US smartphone market increased by 85% Y-O-Y to 50% MS and 127% Y-O-Y to 25% from March 2010 to March 2011.

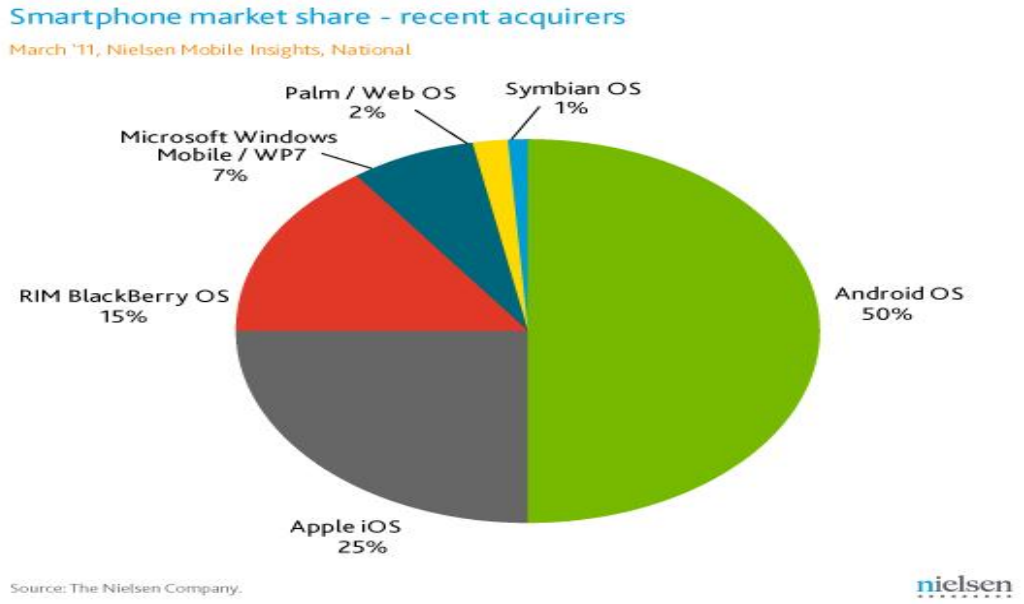

Figure 19: 1Q11Smartphone OS Share USA, Nielsen Group

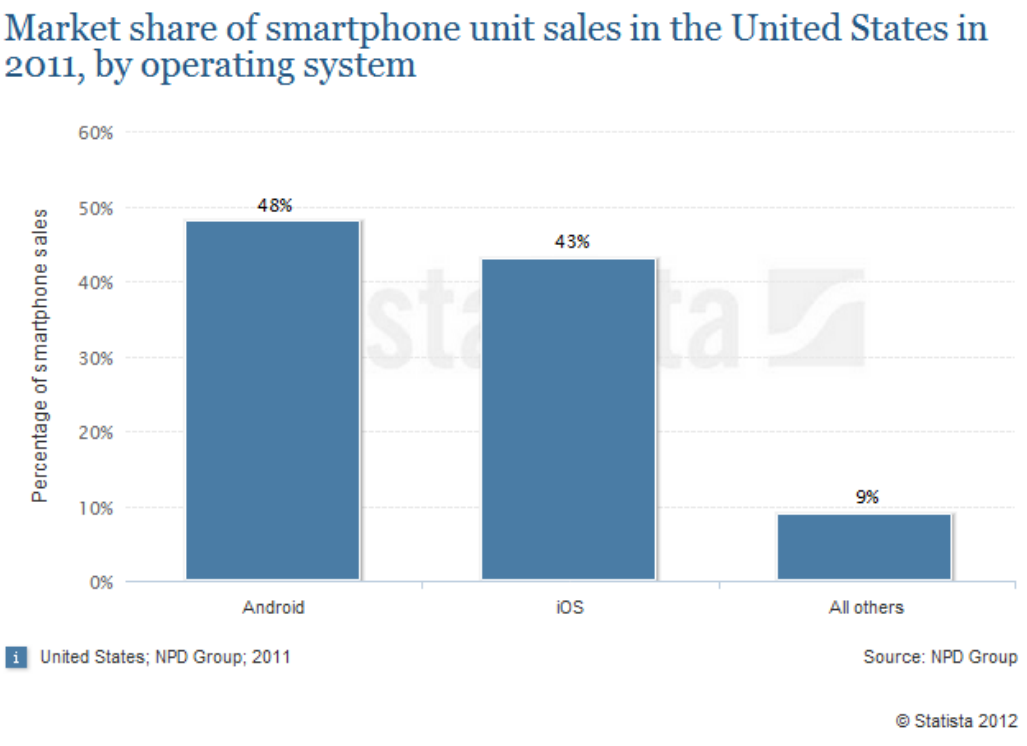

Figure 20: Smartphone OS Share USA 2011, NPD Group

Android's progress was more remarkable worldwide, as its global market share increased by 107.5% to 52.5% MS from 3Q10 to 3Q11. Google has managed to convince many handset manufacturers to adopt its Android OS, while in the other hand eating up other competitors' market share according to Gartner. Apple's in contrast actually suffered a fall of 9.6% to 15% market share on global markets. This would seem to indicate that even though Apple remains attractive to an important customer segment, other handset makers have been able to cumulatively gain market share by serving untapped segments of the population with attractive product offers.

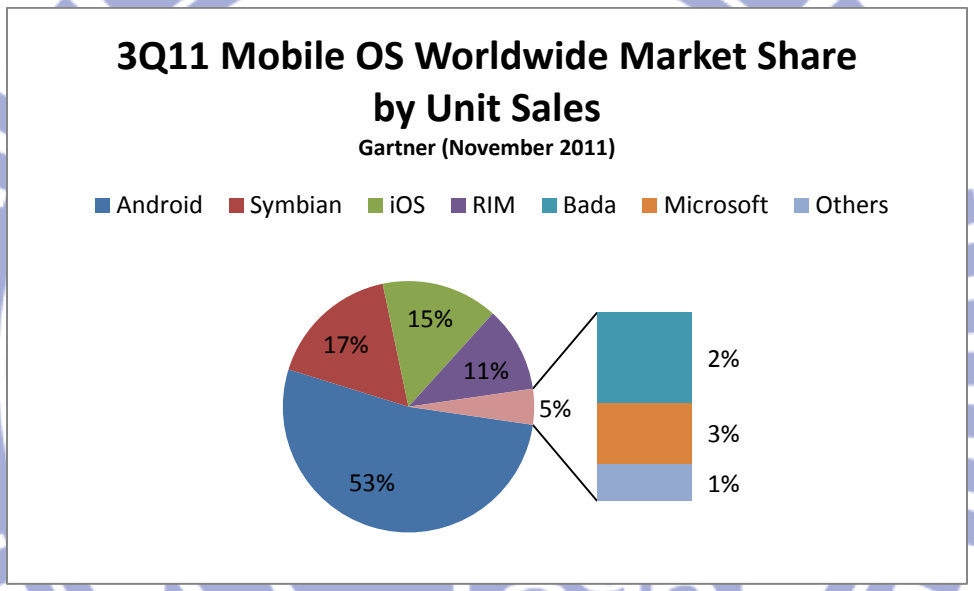

Figure 21: Smartphone OS Worldwide 2011, Gartner

Table 2
Worldwide Smartphone Sales to End Users by Operating System in 3Q11 (Thousands of Units)

Operating System	3Q11 Units	3Q11 Market Share (%)	3Q10 Units	3Q10 Market Share (%)
Android	60,490.4	52.5	20,544.0	25.3
Symbian	19,500.1	16.9	29,480.1	36.3
iOS	17,295.3	15.0	13,484.4	16.6
Research In Motion	12,701.1	11.0	12,508.3	15.4
Bada	2,478.5	2.2	920.6	1.1
Microsoft	1,701.9	1.5	2,203.9	2.7
Others	1,018.1	0.9	1,991.3	2.5
Total	**115,185.4**	**100**	**81,132.6**	**100**

Source: Gartner (November 2011)

Figure 22: 3Q11 Smartphone OS Worldwide USA, Gartner

Apple's main strength is to keep on coming up with proprietary products that fuel its business model, which is based on marketing and R&D around a vertically integrated platform of both hardware and software. Apple's tightly bound software and hardware provides unique differentiation in an otherwise increasingly homogeneous industry. Even with its semi-closed source model, developers remain more loyal to iOS than Android surprisingly, as for 10 mobile apps, 7 are created for iOS [76]. This seems to confirm the theory that semi-open platforms are marginally more effective at fostering innovation while ensuring quality standards. It would seem that by devolving access to developers and keeping its OS closed, Apple has managed to create superior perceived value as opposed to Android, which has since inception insisted on providing an open source approach to both applications and its OS [34]. The two main reasons cited by developers are efficiency and a homogeneous device base. Android's device fragmentation, high level of OS updates on the other hand seems to be playing against it. However when looked at in a new project inception perspective, Android seems to be catching up fast with twice as many new projects are being launched on its platform. The economics of development remain on Apple's side however, as Flurry analytics states: "For every $1.00 a developer earns on iOS, he can expect to earn about $0.24 on Android" [76]. This would seem to

confirm the fact many developers put more resources in developing an Apple version before deciding to multihome on Android, often with a product launch a few months later. This also has huge repercussions on the user base.

As witnessed by its unwavering market share, it would seem that Apple has managed to build up a loyal customer base by identifying and seamlessly integrating subsystems that truly matter to the end user. For example, iOS is widely believed to offer a larger choice of digital content in both multimedia and apps, as well as file sharing far superior to that of Android. Apple has also managed to build a sustainable ecosystem by cross-selling iOS and iMac products to customers. While Android has managed to gain market share by appealing to a different kind of customer segment, it still cannot offer the same unconditional loyalty and appeal as Apple. For example, Google is widely criticized for not putting enough effort into developing a worthy rival tablet to the iPad. The only company that seems to have made an honest inroad is Amazon with its Kindle Fire. However the upcoming launch of Google's Nexus 7 Tablet should make some inroads in this market.

2.2 Hardware Ecosystem

2.2.1 Handset Manufacturers

Since 2007, the cell phone industry has shifted from being an oligopoly into a form more similar to perfect market competition. Nokia had top share in both of smartphone and feature phone market since 1998 however, even though it was recently outstripped by rival Samsung selling 93 million handsets in 1Q12 as opposed to Nokia's 83 million for the same period [52]. This is further testimony to Nokia's waning market share.

In contrast, the greatest winner in the handset market between 2011 and 2012 was not Apple but Samsung, who managed to sell a staggering 27.8 million smartphones between July and September 2011 - a Y-O-Y increase of 275%- as opposed to Apple's 17.1 –a percentage Y-O-Y increase of 128.4%- and Nokia's 16.8 million between July and September 2011. This trend continued towards the end of 2011 with a total of 30 million smartphones sold by Samsung. However, this was still less than Apple's total of 100 million for the whole of 2011 [51]. HTC passed to second place in the Android arena, whereas it had been the best-selling Android powered handset manufacturer in 2010. This was due mostly to its incapacity to excite

consumers with its new product line-up. Even though its Y-O-Y global sales increased by 100% in unit terms, its market share is waning. This was especially clear in the last quarter of 2011, where sales plummeted [80].

Samsung's leaders have made it a case in point to keep control of every production stage of their product cycle. Whereas they were heavily criticized in the past, they have recently gained recognition as they have manage to drive down costs through economies of scale, decrease new product development time, and make a seamless collaboration between product development, manufacturing and marketing functions on a global scale. Today Samsung is pushing hard to drive down costs and cash in on synergistic gains on all fronts: from components (displays, semiconductors, memory, etc.) to finished products (smartphones, tablets, TV sets, laptops, etc.), it is in fact at the forefront of the internet of things, as witnessed by its slogan 'DigitAll'. Competitors are having an increasingly difficult time, as Samsung is able to subsidize losing business units with its star product lines. This has put in doubt the whole relevance of specialization in the high-tech industry preached by Michael Porter. Samsung has become more and more similar to Big Blue in the 1960's, maybe a sign of hardships to come for the company. After analyzing Samsung, it is becoming increasingly unclear how many core competencies a company may have [35].

Another big challenge is the acquisition of Motorola Mobility by Google. As of May 21, 2012, China's antitrust authorities had agreed to allow the merger under the condition that Android should remain open for a period of 5 years. This decision followed that of US and EU authorities. Android handset manufacturers are currently facing great uncertainty whether or not Google is aiming to release its new software exclusively through Motorola which would significantly damage the future development of the Android ecosystem [48]. It is no wonder that Samsung and HTC are both releasing new versions of Windows Powered phones, a sign that they are trying to diversify their risk exposure by multihoming.

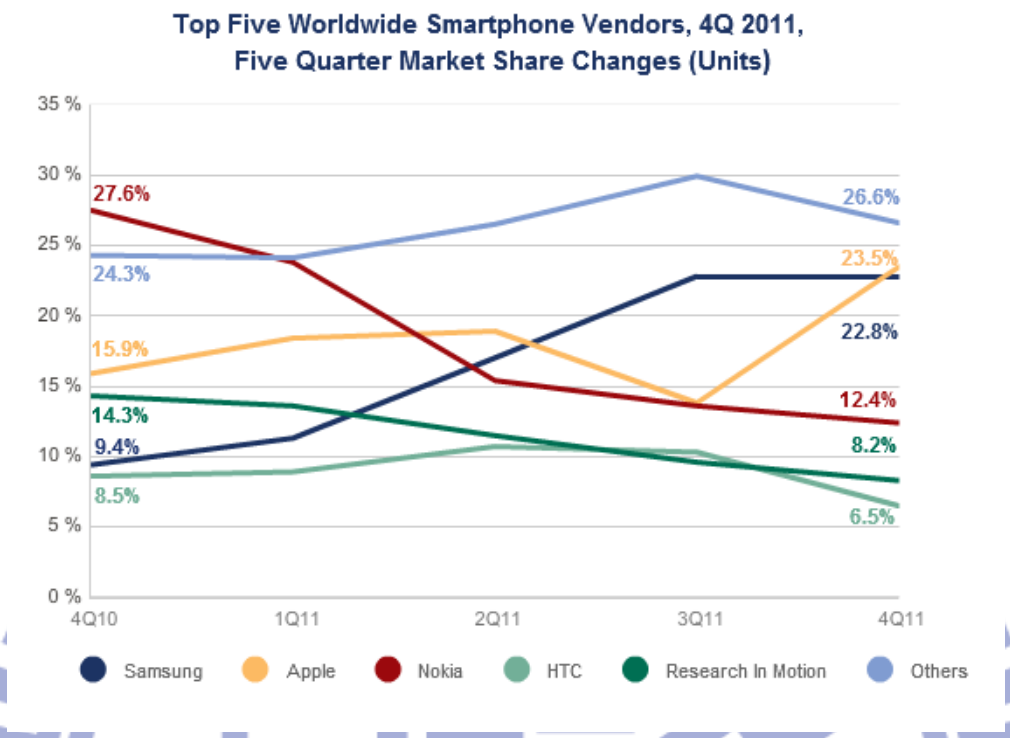

Figure 23: Smartphone Manufacturers Worldwide, IDC (February 2012)

2.2.2 Component manufacturers

As witnessed by seekingalpha.com, investors have already spotted the huge potential growth in the smartphone industry and intend to cash in by investing in companies supplying handset makers.

Semiconductors: IDM vs. Fabless Business Model

The components with most added value remain microprocessors. Whereas the PC industry is still dominated by Intel, the rise of mobile computing has seen the entrance of a new ecosystem of players grouped around a single player the nimble ARM. ARM, whose chip architecture is used in most mobile devices, is a so called fabless semiconductor company, responsible for design but not manufacturing of semiconductors. ARM is based on RISC technology, which has less processing power, but on the other hand is much more energy efficient. ARM has managed to build an ecosystem of foundries and integrated device manufacturers (IDMs), such as Qualcomm – a veteran in the cellphone industry- and Nvidia – a graphics card designer-, as well asTI have all become important suppliers of semiconductors for smartphones all based on ARMs architecture. As for Apple and Samsung, these players have increasingly tried to internalize CPU production with Apple and Exynos line processors for their smartphones and tablets, the architecture used in these processors is also ARM based.

With the convergence of PCs and portable devices, The Economist [84] points to a looming war between two diametrically opposed business models and ecosystems. ARM and Intel have until now coexisted but are facing increased spats of hostility. Intel is seeing a marked decline its PC CPUs due on one hand to a decline in PC demand and a waning partnership with Microsoft. Both Intel and Microsoft seem to have underestimated the rise of mobile and are playing a very unfamiliar role, that of market follower. After years of monopolistic price skimming [3], both firms have become very bloated and left competitors, suppliers, customers as well as legislators increasingly vexed. Whereas many would argue that these firms have gotten their come-uppings, they are both struggling to find a new place of their own. It remains unclear however how they will succeed.

Intel is trying to leverage its Atom chip technology to make less energy-hungry processors to counter ARM in the fast growing mobile market. Intel has one point in its favor, due to its IDM structure, it can hope to drive prices down and offer more affordable prices to handset manufacturers. However it remains unlikely that today's handset manufacturers will willingly put their fate in Intel's hands when they can play prices down between producers of ARM processors. Furthermore, switching to an Intel infrastructure would also entail considerable

switching costs to manufacturers both on the hardware and software side. Thus Intel might find itself having to make resource consuming incentives.

On the other hand, ARM intends to use its low-energy chips to power servers, Intel's domain, and a prosperous market as individuals and corporations migrate to the cloud. ARM and HP have set up a joint venture called Moonshot aimed at servers costing 60% less and consuming a tenth of the power of equivalent Intel servers. According to Ruben Miller of IDC, ARM's servers are designed for less complex computing needs and would work well to power social media websites. However he estimated that ARM would address a market niche of 10 to 12% of users with its 32 bit system, as the use of Intel's 64 bit systems is already wide-spread. ARM says it is currently working on a 64 bit version of its servers.

Even though ARM has many cards in its favor, Intel should not be ruled out; it still has deep pockets and established links with PC manufacturers.

TI, Qualcomm and NVidia's main customers in smartphones remain HTC, Motorola, Nokia and Sony. It is a stroke of luck that they can also count on PC manufacturers spreading into tablet computers to diversify their customer base. In the case of Qualcomm for example, its most important customer of Snapdragon processors by number of smartphones is HTC followed by Samsung and LG. Blackberry and Nokia each has two models Snapdragon powered smartphones. By contrast, NVidia is clearly the leader in power tablets with its Tegra 2 and 3 processors, but is less strong for the smartphone segment. This tendency is probably due to Qualcomm's origins in telecommunications and NVidia's in gaming.

Displays

Another important component is the display market. Apple created a lot of hype by introducing its so called retina display which by combining smaller pixels and forth color per pixel, provides a more lively image. The market leader and pioneer in this market however remains Samsung, with its Super AMOLED displays. Samsung has managed to become a leader in LCD and LED after displacing Sony in the TV market. It later leveraged this same technology inside its Handset unit. Both Retina Display and Super AMOLED technologies have gained great acclaim and customer recognition, as other display producers such as Sony (Super LED) and LG (Nova Display) are struggling to provide competitive alternatives.

Flash memory, already an important component in digital cameras, is also becoming an important component for smartphones. Such firms as SanDisk and Semiconductor Corp are also likely to buck this trend.

An alternative way to do this might be by using Pigneur's Business Model Canvas below.

Figure 24: HTC Business Model Canvas, Pigneur et al.

VII. Autobiography

Roberto Alejandro JOOS

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Born on September 13, 1984, in Montevideo, Uruguay
Swiss and Uruguayan citizen

EXPERIENCE

NCTU, College of Management Science, Taiwan **Teachers Assistant** **09/2011-01/2012**

- Assistant to Marketing Prof. Charles Trappey (Ph.D. Purdue)
- Tutored students in understanding course materials and preparing projects
- Supported professor in course preparation and during lectures
- Composed and graded exams for a 114 student class

UBP Asset Management, New York, N.Y. **Junior Analyst** **07/2011-09/2011**

- Researched and evaluated hedge fund managers and investment opportunities.
- Supported Managing Director in elaborating Macro-HF strategic plan

Civilian Protection Org. Nyon District, Switzerland **Section Leader** **12/2005-08/2009**

- Head of Section responsible for the Protection of Cultural Heritage in the District
- Recruited, trained and organized a team of 18 specialists
- Created district-wide database for inventorying cultural goods
- Implemented district-wide drills and emergency evacuations with military, police and fire departments
- Promoted to Captain in December 2006

International Centre for Trade and Sustainable Development (ICTSD) **06/2009-08/2009**
Geneva, Switzerland **Intern** **01/2006-09/2006**

- Acted as personal assistant to CEO, Dr. Ricardo Meléndez (Ph.D. Harvard)
- Responsible for coordination and logistical support for UNFCC COP15 Climate Change Conference in Copenhagen
- Researched, wrote and updated news briefs and articles

EDUCATION

National Chiao Tung University (NCTU), Taiwan **09/2010-06/2012**
MBA - Global Masters in Business Administration and Technology Management

HEC University of Lausanne, Switzerland **10/2006-06/2009**
Bachelor of Science in Management
Minors: Micro- & Macroeconomics, Finance and Information Systems

HSG University of St. Gallen, Switzerland **10/2003-10/2005**
Assessment-Programme in Law and Economics

ADDITIONAL EDUCATION

National Taiwan University (NTU), Taiwan **08/ 2009-08/2010**
Mandarin Language Enrichment Course - Advanced-intermediate level.

University of Salamanca, Spain **03/2006-06/2006**
Spanish Language - Proficiency Course

LANGUAGES

French	native	
Spanish	mother-tongue	BULATS and DELE Intermedio
English	native	Cambridge Proficiency Exam (CPE) and TOEFL
German	fluent	Goethe Institute German Certificate Level C1
Mandarin Chinese	advanced-intermediate	TOP Exam Advanced-Intermediate

AWARDS

Beta Gamma Sigma Member : in Recognition for Outstanding Scholastic Achievements

National Chiao Tung University Dean's List: in Recognition for Outstanding Scholastic Achievements

National Chiao Tung University: Golden Bamboo Scholarship

Nova Global Network Member for Outstanding International Business Professionals, sponsored by IBM

PROJECTS

Hult Global Case Challenge (2012): co-sponsored by the Global Clinton Initiative, One-Laptop-Per-Child, Habitat for Humanity and Solaid: Project initiator and team leader, regional finalist

Entrepreneurship for Sustainability Business Plan Competition (2011): Project initiator and team leader, semi-finalist.