Analysis of the global smartphone market and the strategies of its major players

Hee-Chan Song
Hanyang University, University of Texas at Dallas[1]
Business Administration, Philosophy
Tel: (214) 635-8148
E-mail: dasein.heechan@gmail.com

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[1] The author is a student at Hanyang University in South Korea, but most of the research for this paper was performed while the author was in an exchange program at the University of Texas at Dallas.

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ABSTRACT

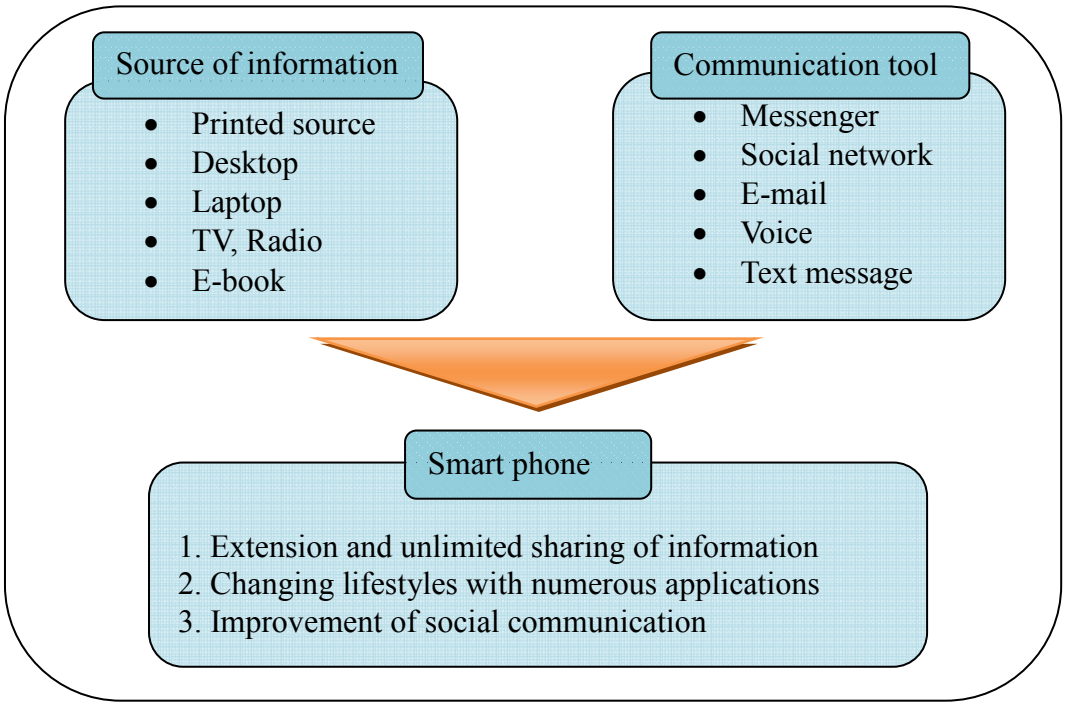
The smartphone has ushered in a new generation of mobile Internet devices. A small smartphone that is only four inches long enables the sharing of real-time information and knowledge, and it can transform lifestyles. People use smartphones to obtain, share and exchange information whenever they desire. The speed of information processing is accelerating, and real-time communication is becoming universal and is no longer constrained by time and space. Through its ripple effects, the smartphone makes it possible for people to realize a genuinely ubiquitous life in a variety of areas, such as business, education, social interaction, and leisure. In this paper, I investigate the global smartphone market by analyzing its growth and the competitive situation. Based on these analyses, I discuss the possible strategy of each player in the market.

INTRODUCTION

1. Definition of the smart phone

A smartphone is a new form of mobile Internet device that combines the traditional features of a phone and a PDA.[2] Another noteworthy definition of a smartphone is that it is a mobile phone that offers more advanced computing ability and connectivity than a basic current mobile phone does.[3] The common aspect of the two definitions is that a smartphone is an integrated device with mobile telephone technology and the ability to access the Internet. The smartphone first achieved both the functionality of a traditional phone and technology of a PC (see Figure 1). Unlike traditional phones, which are produced as finished goods, a smartphone enables users to install, add, and delete hundreds of applications. Through various applications, users can also personalize the interface. Hence, because smartphones allow free access to the Internet regardless of time and location, users of smartphones are entering an era of ubiquitous information.

FIGURE 1
The concept of the smart phone



[2] Ki-Duck Kown, Feb. 8. 2010 "Smart phone shaping the future." Samsung Economic Research Institute. http://www.seriworld.org/01/wldContL.html?mn=B&mncd=0201&pagen=3.

[3] Andrew Nusca, August. 20. 2009. "Smartphone vs. feature phone arms race heats up; which did you buy?" ZDNet. http://www.zdnet.com/blog/gadgetreviews/smartphone-vs-feature-phone-arms-race-heats-up-which-did-you-buy/6836.

2. Effect of smartphone popularization

The continuous progress and expansion of applications allow people to obtain the particular information they want. Users can acquire almost any type of information, such as information on the weather, locations, food, attraction, transportation, medicine, education, games, fashion, sports, and scientific research, without constraints of time and place. Users can also create a new form of social community, influence public opinion, and significantly improve the infrastructure and speed of social communication. Because this mobile generation has strong access to information and networking capabilities, the producer-driven consumption pattern is rapidly being replaced by a consumer-based consumption pattern. Accordingly, the need for customized information is expected to keep pace with change in the IT environment.

3. Radical transformation of the IT industry and the altered competitive situation

The overall structure of the IT industry is being reorganized, and competition in the industry is being expanded and diversified. The introduction of smartphones has spurred the creation of limitless IT-related markets such as the e-book, tablet PC, and net book markets. New entrants that are struggling to penetrate a market are faced with an urgent problem: overcome a lack of functional and technical conversance. At the same time, a new competitive structure has been formed by cell phone manufacturers, operating system providers, telecommunication distributers, and new application developers. Adopting new business models is imperative for existing companies to survive in the reorganized IT industry under its new competitive structure.

1. MARKET GROWTH OF THE SMART PHONE

1.1 History

Since 1996, when Nokia launched its groundbreaking product, the Nokia 9000, which was the first smartphone, the smartphone market has been grown rapidly. The Nokia 9000 Communicator was a combination of an HP-made PDA and a Nokia-made traditional phone. Next, Nokia released the Communicator 9210, which was equipped with the first color screen and open operating system. The 9500 model was the first camera phone by Nokia and was a genuine mobile Internet phone with access to the Internet via WI-FI[4]. Since then, Nokia has led the global mobile phone market by combining its competitive cell phone and Symbian, which is an operating system[5] developed by Nokia.

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[4] Wi-Fi is a trademark of the Wi-Fi Alliance that refers to a range of connectivity technologies including wireless local area network (WLAN).
Wi-Fi Alliance. http://www.wi-fi.org/wp/wifi-alliance-certification. Retrieved 2009-10-22.

[5] An operating system (OS) is software consisting of programs and data that runs on co mputers and manages the computer hardware, and provides common services for efficien t execution of various applications. Wikipedia. http://en.wikipedia.org/wiki/Operating-syste m.

The first catalyst of the expansion of the smart phone market was the release of RIM's Blackberry series in 2001. With its self-developed Blackberry Internet System, the Blackberry series gained sensational popularity in the North American business world by offering business-related services such as a push e-mail system, Internet faxing, web browsing, and navigation. The Blackberry series, which launched in 2002, marked the start of the epoch of the convergent phone. Since then, it has led the market alongside Nokia, attracting 800 million customers by 2007.

The impetus for the expansion of the smartphone market was the release of Apple's innovative iPhone in July. 2008. Apple led an innovative transformation of smartphones with cutting-edge technologies of multitasking, high-resolution screens, wide screens, and customized web browsing, based on its own software technology. The transformation represented enormous progress for mobile Internet devices. Later, Google introduced its Android operating system to companies such as HTC, Motorola, and Samsung Electronics.

1.2 Market growth

While the global traditional phone market faces an ongoing recession due to the global economic downturn, the smartphone market continues its rapid growth. Since 2007, a portion of the smart phone market for the global cell phone industry is expanding in terms of sales volume as well as total sales. According to research conducted by Credit Suisse in December, 2007, while the rate of global cell phone market growth would repeatedly fluctuate up and down during the following four years, the smartphone market would experience tremendous growth. A striking point is that it was predicted that the smartphone market would make up nearly 50% of the entire cell phone market in 2010 in terms of total sales.

The prospects of the global smartphone market
(Unit : Million smartphones, Currency : One hundred million US dollars)

	2007	2008	2009	2010	2007 ~ 2010 CAGR
Sales(unit)*	1178	1274	1203	1308	4%
ASP($)**	133	123	112	102	-9%

*CAGR: Compound Annual Growth Rate
**ASP: American Selling Price
-Source: Credit Suisse

The prospects of the global smartphone market
(Unit: Million smartphones, Currency: One hundred million US dollar)

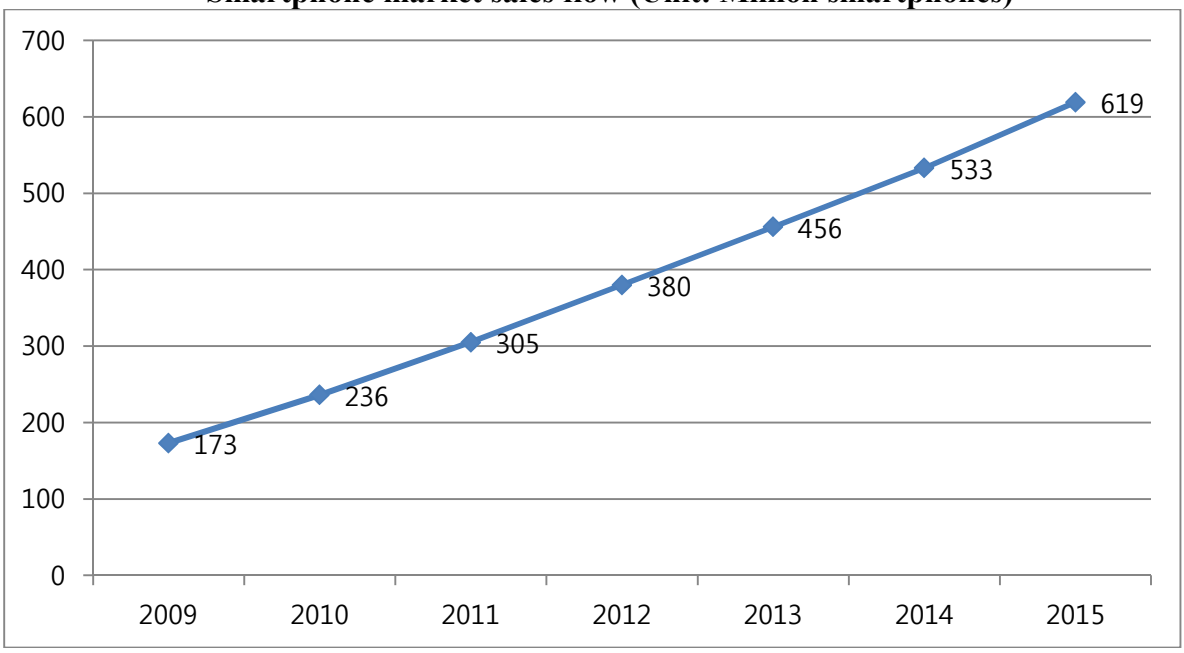
	2007	2008	2009	2010	2007 ~ 2010 CAGR
Sales(unit)	122	105	187	254	20%
Proportion(%)*	10.4	11.9	15.6	19.4	
Sales($)	387	464	550	671	20%
Proportion(%)**	24.6	29.6	40.8	50.3	
ASP($)	317	306	294	264	-6%

* Smartphone sales (unit) as a proportion of total phone market sales
** Smartphone sales (price) as a proportion of total phone market sales
-Source: Credit Suisse

The latest research places smartphone sales volume growth for the first fiscal quarter (Q1) of 2010 between 56% and 67% growth with variance depending on research institutes. An IDC report estimates that 54 million units were sold, and a Canalys report estimated that 55 million units were sold. According to Coda Research Consultancy, total sales volume of the smartphone is expected to be 234 million units in 2010 and 619 million units in 2015 (see Chart 1).

CHART 1

Smartphone market sales flow (Unit: Million smartphones)



-Source: Coda Research Consultancy

The Popular Wi-Fi configuration and 3G telecommunications are considered the largest components behind the optimistic growth forecast for the smartphone market. The previous smartphones were limited by the unstable wireless Internet environment, slow mobile Internet connections, and limited content. However, as Wi-Fi mobile Internet is widely installed, and a variety of operating systems and software are developed, a genuine mobile Internet environment is realized.

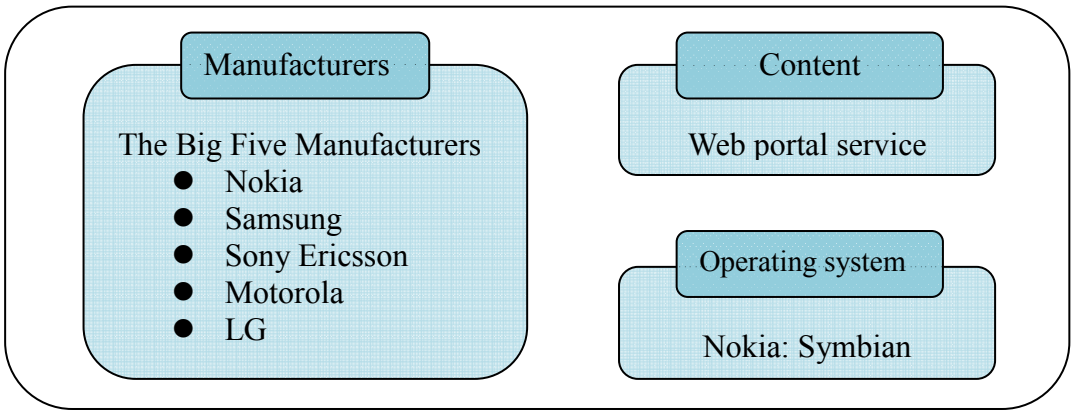
2. MARKET ANALYSIS

2.1 Shift of core value in the IT industry: Hardware to Software

Hardware technology was a major competitive factor in the traditional phone market, and telecommunications companies offered content services through their own portals. However, this was not profitable because there was no stable route to expose contents to consumers. Nokia was the only operating system developer involved in the software market, but it is still not enough to make a sensation (see Figure 2). Thus, the smartphone was unmarketable. Customers' desires placed emphasis on sound quality, camera quality, display quality, and external design, which were determined by the hardware technology itself rather than on content in the traditional phone market. Naturally, Nokia, Motorola, Samsung, LG, and Sony Ericsson, which had attained hardware competitiveness, led the traditional phone market.

Based on IDC research in 2006, before the smartphone was popularized, Nokia sold 347 million units, Motorola sold 217 million units, and Samsung sold 118 million units. However, only 10% of the units sold were smartphones.

FIGURE 2
The traditional cell phone market



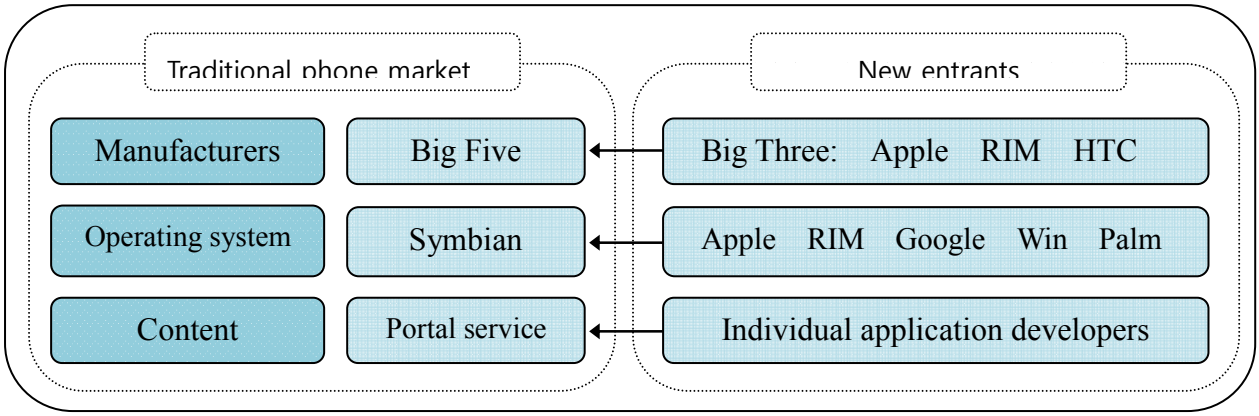
However, as the level of hardware technology becomes standardized and stable wireless Internet configuration is developed, the structure of the cell market is changed dramatically. First, the core value for success in the cell phone industry has shifted from hardware-oriented competitiveness to software-oriented competitiveness. Compared with the existing traditional phones, which are operated through fixed and limited interfaces, smartphones allow their users to make their own interfaces. Customers are now able to obtain customized service based on their individual needs. Hence, the operating system and high-quality content have become vital parts of the smartphone.

2.2 Current market analysis

The newly formed competitive structure of the smartphone market can be divided into three market segments: (1) hardware manufacturing, (2) operating systems, and (3) content (see Figure 3). The first segment is the hardware manufacturing market. This is the fiercest of the three market segments for the big five traditional brands[6] and for the new entrants such as Apple, RIM, HTC. The second segment of the smartphone market is the operating systems market. As the core value of the smartphone market has shifted from hardware to software, Google, Apple, RIM, and Nokia have become the leaders in this market for developing and providing operating systems to cell phone manufacturers. The third segment for newly emerging players is content development. Content developers form another competitive axis because content is provided to application stores. These three market segments comprise the entire smartphone market, and they show vertical integration and strategic cooperation in the long term.

[6] In this paper, 'The Big Five' refers to major hardware manufacturing companies: Nokia, Samsung Electronics, Sony Ericson, Motorola, and LG electronics in the traditional feature phone market.

FIGURE 3
Current smart phone market



2.2.1 Hardware manufacturers

The Big Five have taken a direct hit from the expansion of the smart phone market. Nokia, the leading manufacturer of the Big Five, has experienced a continuous drop in sales volume since Q3 2008, when the iPhone appeared. Recently, Nokia carried out aggressive marketing in a shift from hardware technology to software development. Until now, Nokia has disclosed API[7] to third-party application developers. However, as part of its new marketing strategy, Nokia plans to disclose all of its source code as well. In addition, Nokia is cooperating with Intel and announces its new operating system, MeeGo, in the smartphone market.

However, the four manufacturers other than Nokia still either do not have their own operating systems, or have only started to develop their operating systems in recent years. Samsung, a Korean brand, developed its own operating system, Bada, and used it with Google's open Android operating system. The four manufactures will struggle to survive in the fierce smart phone market because of their unsatisfactory software technology and know-how regarding content services compared with their successful hardware manufacturing.

2.2.2 The Big Three[8]

As the Blue Ocean[9] in the global cell phone market is moving from hardware to software, RIM, Apple, and HTC are gaining the lead in the smartphone race. RIM has already released

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[7] API is an abbreviation of Application Programming Interface, which is implemented by a software program that enables it to interact with other software. It facilitates interaction between different software programs similar to the way the user interface facilitates interaction between humans and computers.
Wikipedia. http://en.wikipedia.org/wiki/API.

[8] In this paper, the "Big Three" refers to the following major new entrants to the smartphone market: Apple, RIM, and HTC.

[9] "Blue Ocean" refers to new demand in an uncontested market space that leads to high growth and profits. The term first appeared in "Blue Ocean Strategy" published in 2005.
Kim, W. C., & Mauborgne. R. 2005. Blue Ocean Strategy. Boston: Harvard Business School Press.

the Blackberry series with its own operating system. RIM is expected to hold high market share supported by its wide distribution channels and its professional image. Computer software giant Apple broke into the emerging market by launching the iPhone, which has its own operating system as well. Apple emerged as the new potential market leader in the North American market, using vertical integration of a closed platform and application services. While the 2G phone has only been released to AT&T in North America, the 3G phone is offered in 21 countries and is continuously expanding its global market share. However, the Taiwanese brand HTC has pursued RIM and Apple; released the Android-based Nexus One that in Q1 2010.

2.2.3 Content developers

Content service businesses have emerged as the most important actors in smartphone competition. In the established traditional phone market, a portal service provided by a telecommunication company was the only source of content. However, as the smartphone allows its users to build their own interfaces, securing high-quality content has appeared as a crucial issue that makes or breaks a competitor. Apple already has developed and managed an application store with the strong content service know-how it gained from developing iTtunes[10]. Apple's current application store contains about 200,000 applications, more than any other application store. Other software developers such as Google, Nokia, and RIM have rushed to enter the smartphone market by opening their own application stores

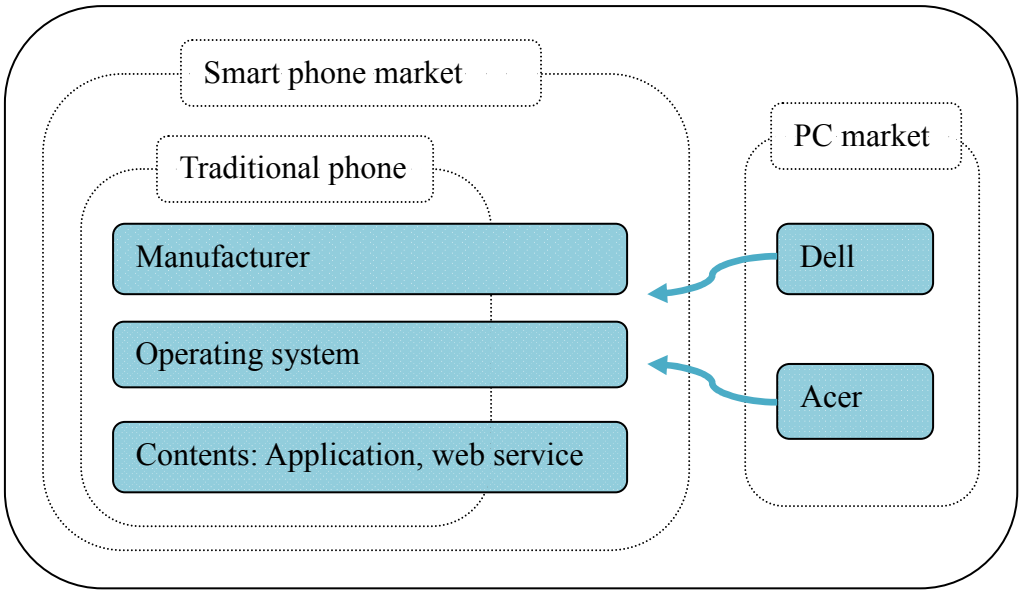
2.2.4 PC makers

The development of the smartphone, which combines the traditional phone and access to the Internet, is also influencing related markets that incorporate Internet technology. The marketability of laptops, net books, smart books, e-books, and tablet PCs is dependent on the level of popularization of the smartphone. In the current market, customers' preferences for the price-value trade-off, portability, and amount of electricity used vary, but the smartphone holds the dominant position in that users can enjoy high-quality voice communication in addition to the mobile Internet connection. Improved Wi-Fi technology and high-quality applications have helped the smartphone overcome major disadvantages such as poor content and infeasibility of real-time wireless networking.

Threatened by the encroachment of the smartphone into the PC market and the stagnation of the PC market, PC makers are gradually joining the competition. As customers' options have changed from a cell phone plus note book, net book, or e-book to the smartphone, PC makers have no choice but to enter the smartphone market. In June 2010, Dell, the second ranked PC maker, released its first smart phone, Android-based Dell Streak . Also in 2010 the third ranked PC maker, Acer, launched Android Liquid A1. In the long run, the continuous growth of the smartphone market will blur the boundary between the smartphone market and the PC market and result in the formation of larger integrated mobile Internet device market (see Figure 4).

[10] I-tunes is Apple's computer application enabling users to download music on online.

FIGURE 4
The formation of the mobile internet device industry



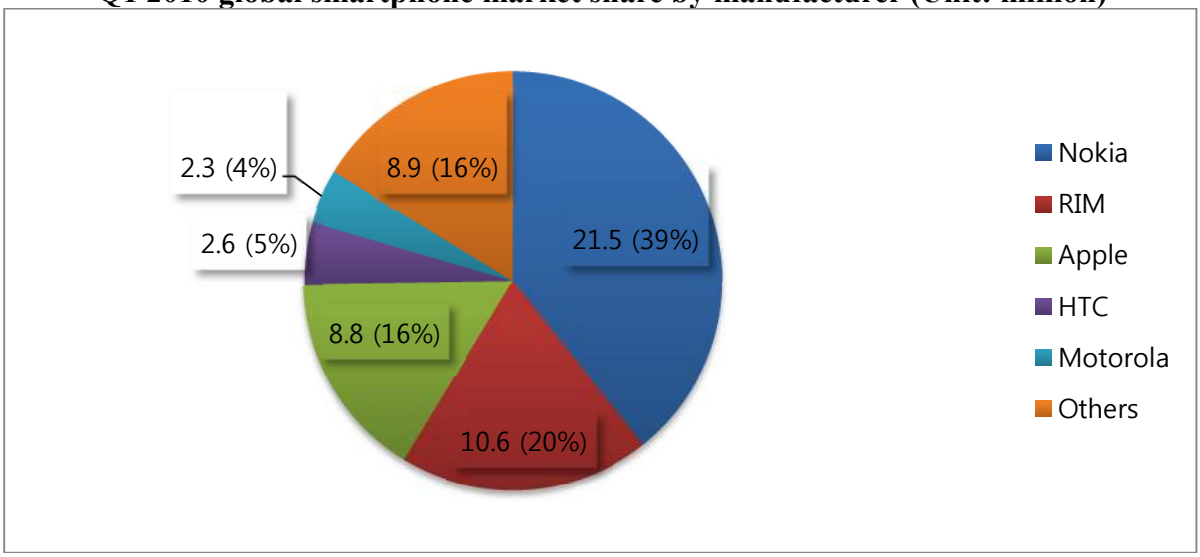
3. COMPETITIVE ANALYSIS

As was discussed, three separate markets are featured in the smartphone market: hardware manufacturing, operating systems, and content. Established cell phone manufacturers and new smartphone makers compete in manufacturing market: operating system developers spar in the operating systems market: and lastly, content developers compete with each other in the application services market. However, those three markets are not mutually exclusive: rather, they are interrelated because the smartphone is a joint effort between cell phone manufacturer, operating system developers, and content developers. Moreover, as more PC makers enter the smartphone market, it will turn into a fierce battlefield where the question of the continued existence of giant IT companies is decided. In the next section, I will discuss the strategy of the players in each of three market segments, and show how each can attain competitive advantage.

3.1 The strategy of players in the first competitive market: Smartphone hardware manufacturing

According to the latest IDC research in Q1 2010, Nokia is currently the leading company in manufacturing. Nokia has developed its own operating system, and it released the first form of the smartphone before popularized. Nokia holds first place in the smartphone market with a share of 39%, and RIM, Apple, and HTC follow (see Chart 2). Aspiring to reach first place, RIM and Apple have made great strides in hardware manufacturing, operating systems and application service.

CHART 2
Q1 2010 global smartphone market share by manufacturer (Unit: million)



-Source: IDC

One noteworthy point is that the Big Five that once led the traditional feature phone market do not appear on the chart, except for Nokia. Why do these manufactures, who made up the leading group by market share in the traditional phone market, struggle in the smartphone market? They were unable to anticipate the shift in market structure from hardware to software in time. In this section, I will discuss the four hardware manufactures that do not have their own competitive operating systems: Samsung, Motorola, LG, and Sony Ericsson. Next, I will cover the strategies of Nokia, Apple, RIM, and HTC in the operating systems market, which is the second market for the smartphone.

The four hardware manufacturing brands: Samsung, Motorola, LG, and Sony Ericsson have two strategies that they can use to survive in the current smartphone market. The first is to focus on continuous hardware development while maintaining their hardware competitiveness. Samsung Electronics produces a world-class LCD and LED panel and an ultra-light/mass-storage memory chip, as well as employing various display technologies. With regard to continuous lightweight, mass-storage, and high definition smartphones, constant hardware-focused competitiveness can be a good strategic card. However, there still seems to be a risk of compatibility between the existing hardware technology and smart phone-only technology.

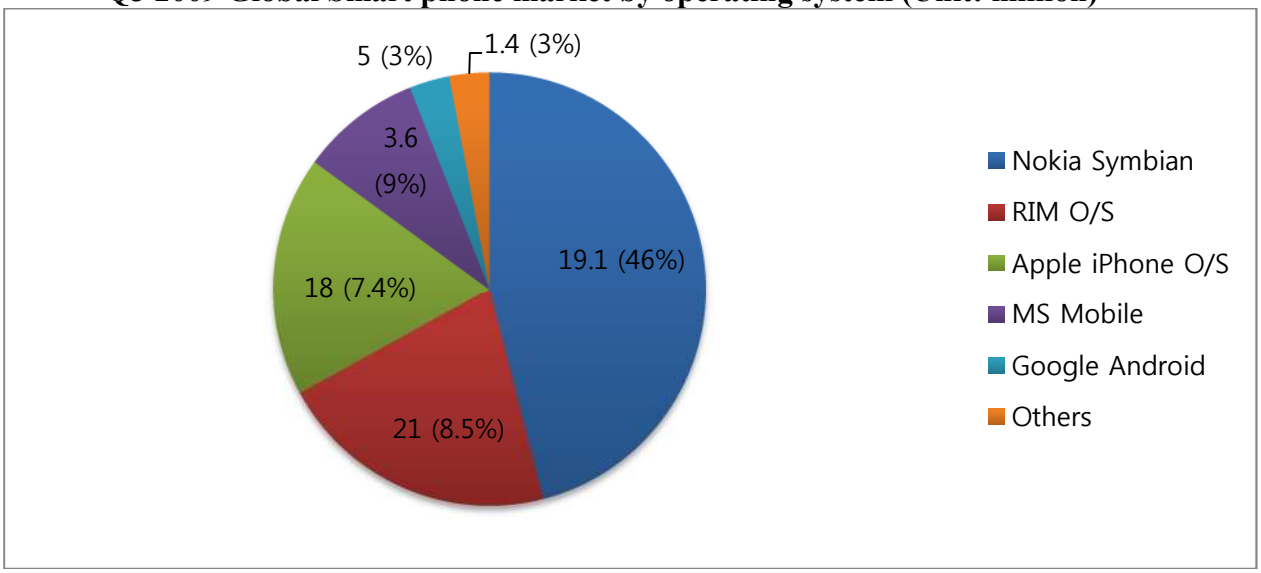
The second card the four hardware manufacturers can play is to begin the development of a new operating system. At present, Samsung, LG, and Sony Ericsson are taking different actions to develop their own operating systems. Samsung is preparing to develop a multi operating system combining the smartphone, smart TV, tablet PC, and other mobile devices. In 2009, Samsung initiated the development of its own operating system, Bada. LG and Sony Ericsson are also gradually turning their strategies away from using Android-based platforms to developing their own operating systems. However, this strategy has an inevitable risk in overcoming the high entry barrier erected by the software giants. In conclusion, hardware manufacturers that do not have competitive operating systems must choose between continuously maintaining a competitive advantage in hardware and developing their own operating systems at tremendous opportunity cost.

3.2 The strategy of the second competitive market: Operating systems

The reason Apple, Google, and MS stand out in the smartphone market is the increasing significance of the operating system. It is a core part of the new market, and it plays a pivotal role in connecting the general function of hardware that controls input, output, and allocating memory, and the availability of various applications. Naturally, software makers who have a competitive advantage in the PC operating market are now jumping into the smartphone market as an extension of the operating systems market.

Research conducted by Canalys in Q3 2009 shows that by the operating systems market share, Nokia's Symbian holds first place, and RIM, Apple, and Google follow (see Chart 3). According to Gartner's research in 2009, while Apple's market share significantly increased from 9.6% in 2007 to 16.6% in 2008, Symbian's market share has decreased from 63.5% in 2007 to 52.4% in 2008. Canalys reported that Symbian's market share decreased from 68% to 47% during those two years.

CHART 3
Q3 2009 Global Smart phone market by operating system (Unit: million)



-Source: Canalys

The continual decrease in Symbian's market share and the remarkable performance of Apple, RIM, and Android imply a crucial possibility in the operating systems market: the question is whether to manage the operating system in a closed platform,[11] as Apple does, or in a completely open platform, as Google does. The Apple iPhone operating system operates in a fully closed system. A closed platform system is strong in regards to security issues, even though it possibly fails to the increase market share. However, Apple overcomes the market share problem through its numerous applications. Thus, the iPhone is the representative

[11] In this paper, I use "platform" as a synonym for "operating system" although these terms have slightly different meanings depending on how they are defined. A general definition of "platform" is a framework on which applications run. Therefore, there should be no confusion from using "platform" and "operating system" interchangeably in this paper.

model of a successful closed operating system. On Apple's stance on possessing competitive applications and manufacturing technology, it is not necessary to stick to an open operating system that is vulnerable to security issues.

It is essential for software makers who operate in a closed operating system to cultivate an echo system with a high-quality application store and appealing hardware competitiveness. This is because the amount of contents and its quality is itself a competitive edge in managing a closed operating system. Customers are naturally attracted to certain operating systems and hardware as they seek to obtain in order to obtain high-quality contents. Apple's strategy of using a closed operating system comes from its strong applications and hardware manufacturing technology.

However, an open operating system has much more potential than a closed system in that it can create more profit. Google's Android creates a synergic effect, integrating its powerful search engine, Google Maps, YouTube, and other web services. For this reason, many global cell phone manufacturers have adopted Android as their operating system. Accordingly, web portal sites prefer Android because they wish to attract as many customers as possible and to enter into the mobile web advertising market. Hence, Google enables a variety of profitable models based on its open operating system. It dominates the content market and the mobile web advertising market by giving content makers more opportunities in service.

Likewise, there are various possibilities and strategic options in the smartphone operating systems market. However, operating system developers should consider one threatening element. The smartphone operating systems market is actually a winner-takes-all market where only one or two players can be victorious in the long run. Although there were many PC operating system makers, ultimately only the Win-Tel system was established. Similarly, only a couple of the four giants (Apple's iPhone, Google Android, RIM's Blackberry, and Nokia Symbian) will command the smartphone operating systems market in the long run.

In conclusion, hardware manufacturers or PC operating systems makers need to decide whether to begin developing their own operation systems or to open and expand the existing operating systems. The alternative is to avoid the operating systems business and focus on different areas of competition, adopting operating systems that are currently available for free.

3.3 The strategy of the third competitive market: Content development and distribution market

Due to the changing customer preference from hardware to high-quality contents, the content development and distribution market has become an important market within the overall smartphone market. Customers gain access to free content services on mobile web sites and application stores due to the stable mobile Internet environment. This accessibility of smartphones to web mobile services and applications also makes it possible for the content-making business to create a variety of profitable models. Mobile search, mobile web advertising, e-commerce, LBS[12], SNS[13], and data traffic management are potential smart

[12] LBS is an abbreviation of Location Based Service. GPS is one of the representative services of LBS. Searching for traffic information, gas stations, restaurants, and friends in particular area is possible services that could be provided to the smartphone users.

phone-related businesses that will generate virtually unlimited profits.

Above all, the popularization of the smart phone and personalized internet devices is an innovative opportunity for mobile search services and web advertising businesses. Google connects its Android operating system to its powerful web services, providing them to smart phone manufacturers. Customers use various forms of web contents by Google at their leisure. Understanding customers' changing preferences, Google expects to profit in numerous areas such as online gaming, advertising, education, LBS, SNS, business and so on. As smartphones become more personalized, customized subscription-based content services are expected to grow. SNS- and LBS-related businesses like social media and social gaming will grow, and traffic control business will appear as a new business model for the smartphone.

3.4 Consolidated analysis on players' strategies in the smartphone market

As was discussed, there are three market segments within the overall smartphone market: hardware, operating systems, and content. Operating systems and content are classified as software as opposed to hardware. The major players can be grouped by their internal competitiveness in these three market segments. In this section, I will discuss the specific strategies of each player and how they work, according to the consolidated analysis presented in table 1.

Insert Table 1 about here

Currently, there is no single player with superior competitiveness in all three market segments. Although Nokia, Apple and RIM seem to succeed in integrating all three segments in a single device, this does not enable them to dominate all three markets. Nokia has its traditional hardware technology and proprietary operating system, but is weak in the content market. Apple and RIM have strong operating systems and content, but they have relatively weak hardware technology.

Likewise, in the smart phone market, the players differ in their strengths and weaknesses. Some players are strong in hardware manufacturing, while others have greater competitiveness in the software market. The major reason is that, in the past, the players could not predict the radical growth in the smartphone market. Hardware manufacturers continuously invested in hardware R & D, and software developers focused only on software development. They might not have needed to launch new businesses in entirely opposite areas, which would have meant experiencing high opportunity costs and risk before the smartphone appeared.

Although software is growing in importance, the smart phone is still thoroughly a composite of cutting-edge hardware technology and software. Now, the combination of hardware and software technology is imperative for competing in the market. The best way to succeed is to strengthen specific competitiveness in all three market segments and integrate

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[13] SNS is an abbreviation of Social Networking Service. It grows with LBS technology and became one of the most profitable services with the introduction of the smart phone.

the three smartphone aspects without technological problems. In the long-term, a company that truly succeeds in both hardware and software will dominate the smart phone market. Currently, however, it takes a lot of time and expense to overcome the financial and technological barriers. Therefore, the long-term strategy should be to strengthen both hardware and software technologies.

Finally, key advantages should be attained by exercising each player's internal competitive edge. All players should enter the market while maintaining their established competitive advantages. High technology know-how will be a strong entry barrier and stable cash cow to support new businesses. Therefore, in order to successfully enter the new market, businesses should not start completely fresh, but should instead begin from established areas of competitiveness. In other words, based on technological advantages and stable financial support from the established competitiveness, entering a new market should start from existing strength.

In particular, from Table 1, we can see that there are two possible starting points to enter the new market. The first is from a hardware strength toward the software market. Manufacturers can choose to move in this direction. Conversely, the second possibility is to move toward the hardware market from a software strength. Software developers would choose this direction. The players who have two cash cows or two core competitive advantages can be flexible in setting a strategy. Otherwise, they can implement a duel-track strategy.

Competitive operating system developers can move in both directions because the operating system developers play a pivotal role in connecting hardware and contents. They have few technological issues in content development and can develop proprietary content more easily than manufactures because smartphone content should be presented on a stable and secure operating system. Operating system developers have their own know-how in developing content that is appealing to customers and using in their operating system.

In this respect, the major operating system developers (Apple, RIM and Google) have more opportunities. They can generate various profitability models by integrating operating systems and contents. Hence, they have two cash cows and two possible courses of action starting from operating system and content power. They can create synergistic effects through mutual technological exchange by managing two software areas.

Hardware manufacturers should make use of their competitive hardware technology and launch software businesses. Their strategic direction is solely toward software. As was discussed, their profits will be limited if they rely on hardware technology alone. Thus, even though they have no competitiveness in the software market, they should launch long-term software development efforts. Nokia has expertise in operating systems development and is able to smoothly move forward into the content market. It is inevitable that the other manufacturers (Samsung, LG, Motorola, and Sony) will incur high risks to enter the software market.

The good news for Samsung, LG, Motorola, and Sony is that they can take advantage of Google's open operating system, Android, and its high-quality contents. The four manufacturers and HTC have created a strategic alliance with Google. Google offers an operating system and contents to manufacturers, and the manufacturers provide Google with

the opportunity to expose its applications and web services to customers. It is a perfect interrelationship between large manufactures and software developers. Both of them would be able to continuously profit if their unbalanced competitiveness between hardware and software continues in the smart phone market.

PC makers entering the smart phone market are noteworthy in that they actually have little or no competitiveness in any of the three market segments. They may have no choice but to enter the market because of serious stagnancy in the PC market. As is the case with the other players, their strategic direction should come from the internal competitiveness that they accumulated in the PC market. In order to increase their market share, they should maintain a low-cost strategy and form strategic alliances with manufacturers or software developers. Successful PC operating systems developer Windows Mobile is worth noting. One critical obstacle is technical compatibility between the smartphone and the PC operating system. If Windows Mobile overcomes the technical problems and succeeds in developing a smart phone operating system, it will be able to compete with Google as a provider of software services.

The final winner will be the company that has a competitive advantage in all three market segments. In other words, the company that succeeds with its hardware production line, operating system, and high-quality contents through vertical integration in the three market segments will take all the winnings of the smartphone market. RIM and Apple have great potential in this respect. Based on their software strength and medium level hardware technology, they can create synergistic effects in all three markets. However, they need to form strategic alliances with telecommunication companies in individual countries to offset weaknesses in the global market. They might invest in global marketing rather than technology at this point.

4. CONCLUSION

The smart phone is no longer the exclusive property of early adopter. Streamlining mobile Internet and 3G mobile communications has opened up boundless possibility for the smart phone, and the innovative idea toward the mobile Internet world leads this generation to the genuine ubiquitous world by the innovativeness of the smartphone. Users are now able to handle almost all of the activities in everyday life with small mobile Internet solutions in their hands. If the development of the Internet made the world into one large community, the popularization of the smartphone will return the world to a multipolar Internet world, which is much more diversified and personalized. Numerous customized Internet worlds will emerge. Regardless of popular opinion, it is evident that smartphones have brought a new era to the IT industry.

IT business should find new ways to keep pace with the changing IT environment. As the core value of the cell phone market is transformed from hardware to software, existing cell phone makers that possess powerful hardware competitiveness in the traditional phone manufacturing market are required to invent new survival strategies. New software makers need to target an operating system and a content market at the same time, developing a unique distinction. Finally, related-IT businesses in the smartphone market will design a win-win strategy by seeking a strategic partnership or merger. In the long-term, one or two players who succeed in consolidating manufacturing, operating systems, and the contents market will

be victorious in the smartphone market.

I have discussed the history and effects of the smartphone, and presented a market analysis and competitive analysis. Based on these analyses, I have also examined the strategies of the major players. The popularization of the smartphone has had a great influence on our lives and the IT environment. If the smartphone is going to remain successfully and be popular in the future, it will be a continuing issue for our society. Although this paper focuses on the field of business and community, because the smartphone has had a great effect on every corner of society, I try to illustrate possible issues related to the popularization of the smart phone other than business issue.

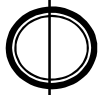
It seems that smartphone-related research can be largely divided into three areas: the technological requirements of smartphones, business viewpoints on the IT industry, and a socio-human approach in a sense of the beginning of mobile Internet society. This paper focused on business rather than on technological and socio-human analysis. In particular, it seems that the social change resulting from the popularization of smartphones is a meaningful research topic. On this topic, macro-social research could be conducted in terms of social transformations due to the advent of the mobile Internet era. The pros and cons of popularization of the smartphone in various areas of society such as administration, education, mass media, crime, and information could be important topics in macro-social research on the effects of the smartphone.

In ubiquitous era, a human approach is also necessary. In the viewpoint of humanity, value change, subordination of human intelligence, and cognizance problem by simplified life styles resulting from the smartphones are thought to be meaningful to research in the future. Personally, as a student majoring in management and philosophy, I am very interested to compare three important dimensions in modern society: technology, management, and humanity. Technology plants the seed for innovative change in life. Exceptional management skills realize technology throughout everyday life. Humanity warns of the negative possibilites resulting from the other two aspects. I think it is the smart phone that makes modern people think of these three perspectives.

The smartphone has overcome the previous limitations on IT technology. While we are still deciding whether the smartphone is of benefit to us, we are living in the IT world and are given no choice but to receive IT benefits. Ultimately, we anticipate how the smartphone will transform our lives even more and predict what IT device awaits us next.

TABLE 1

The illustration of major players in the current global smartphone market and their strategic options

Market Segment	Market Potential	NOKIA	LG Electronics / SAMSUNG / MOTOROLA / SONY	iPhone / RIM BlackBerry	htc smart mobility	Google / android	Windows Mobile	acer / DELL
1. Hardware(H/W) manufacturing	Lightweight, mass-storage, and high definition of smart phone H/W							
2. Operating Systems (O/S)	An important hub connecting hardware and contents							
3. Contents (application, web)	The core of the smartphone, enabling various profitability models							
Strategic Option		Expansion of content businesses through open O/S	Maintaining continuous H/W advantage and entering S/W market	Expansion of market share in the global market	Entering the market with strategic alliance with Google's Android	Making new business models based on its strong O/S infra and contents	Entering O/S market through PC O/S developing experience	Making strategic alliance with others to enter market in the long-term

Core competitive advantage

Medium-level competitive advantage

No competitive advantage

Technology hub and cash cow power

 Direction to move to enter new market or reinforce established competitive

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