ABSTRACT
This paper examines the failure of Japanese mobile phone manufacturers in the mobile phone market after the emergence of smartphones. This paper overviews the smartphone market, then examines the case of Japan. It finds that current theories do not sufficiently explain the difficulty Japanese firms face. It uses a literature review of studies of firms attempting to adapt to technological change in the mobile phone market to pinpoint commonalities and differences between those firms and Japanese firms. This paper concludes that Japanese firms failed to recognize the importance of software and its ability to allow the user to quickly and easily upgrade their phone.

KEYWORDS: mobile phones, smartphones, strategic agility, Japan

1. INTRODUCTION
The mobile phone industry provides a fascinating case study of the effects of technological innovation. The recent explosion of smartphone use has transformed the market for every player in the industry, including manufacturers. Why certain manufacturing firms have failed or succeeded in this market can provide insight into future innovation.

The Japanese mobile phone market is a case study of how firms can waste strategic advantages in a market by failing to adapt to technological change. The global market for mobile phones is huge, but the market of Japan is useful as a case study for several reasons. The market is technologically advanced and less price sensitive, meaning that Japanese consumer tastes move in front of other markets. Furthermore, the Japanese market has a unique mobile phone culture, giving local firms a large advantage, but foreign smartphone manufacturers have made headway into the market when previous attempts have failed.

This paper seeks to assess why Japanese firms have failed in the smartphone market. This paper examines the past and present of the global and Japanese mobile phone markets and attempts to assess why Japanese firms failed in their attempts to expand globally and retain domestic dominance. The paper does this through comparison to successful and unsuccessful mobile manufacturers of both this generation and the last. This paper also aims to use these case studies to predict the future of the mobile phone market in Japan and the world.

2. OVERVIEW OF THE SMARTPHONE INDUSTRY
The mobile market can be broken down into three categories: basic mobile phones, feature phones and smartphones. Basic mobile phones are mobile devices without features beyond talk and text. Smartphones are mobiles with a built in mobile operating system, usually with assorted other features like cameras, Global Positioning System (GPS) capabilities and touchscreens. Feature phones are roughly defined as high to mid ranged phones that are not smartphones.
These mobiles have assorted features like smartphones, hence the moniker “feature”, but typically lack abilities associated with the current generation of smartphones. The most common way to distinguish feature and smartphones is via price, as smartphones are more expensive.

The smartphone industry has seen much change in the past decade. This section will provide a broad overview of the trends shaping the smartphone industry. Most notably, smartphones have seen a greater rate of adoption by consumers in all markets, partially caused by significant price drops. Also, the growing importance of smartphones has also led to a shift in the power dynamic between manufacturers, carriers and software developers.

2.1 SMARTPHONE ADOPTION

Widespread adoption of smartphones began in the late 2000’s. Global sales of smartphones were below 140 million in both 2007 and 2008 [1]. By 2013 first quarter sales were 216 million [2]. While mobile phone sales overall only grew 1.7%, smartphone sales grew 44.1% from 2011 to 2012 to 712.6 million units [2, 3]. In the first quarter of 2013 smartphone sales surpassed feature phone sales for the first time ever, and smartphones are projected to sell 1 billion units in 2013, more than half of all 1.8 billion mobiles sold [2, 3].

The key moment in the development of the smartphone industry is generally regarded as the 2007 launch of Apple’s iPhone. Before the iPhone release, smartphones were mainly notable for email and telephone capabilities; however, the iPhone shifted attention to software in the form of applications and made email and telephone functions a secondary concern [4]. The iPhone release is credited as making smartphones accessible and exciting to mass markets and sparking the growth of the smartphone industry. The years following the iPhone release saw other firms enter the smartphone market, including tech companies Google and Microsoft, as well as increased focus by existing mobile manufacturers like Nokia and Samsung on the smartphone market.

2.2 DECLINE IN PRICE OF SMARTPHONES

The original iPhone initially retailed for $599 for a 8GB phone in 2007, but smartphone prices have continually declined since. From 2012 to 2013, the average selling price of a smartphone dropped from US$387 to US$337, a 12.8% drop [3]. Despite inflation, the projected price of a smartphone in 2017 is US$265 [3]. Declining selling prices for smartphones relative to feature phones not only allow give consumers more incentive to purchase smartphones but also make them feasibly affordable for low income consumers. This has helped spur increased adoption, especially in emerging markets.

2.3 INCREASED POWER OF MANUFACTURERS AND DEVELOPERS

Power in the mobile phone industry has shifted in the last 8 years away from carriers and towards mobile manufacturers and operating systems developers. The deal between Apple and AT&T in 2007 that gave AT&T exclusive rights to the iPhone was a major shift in the balance of power between manufacturers and carriers. Prior to the release of the iPhone, smartphone applications were sold exclusively through carriers and were branded with carrier logos, while the first iPhone sold apps through the Apple “app store” and had only the Apple logo [4]. The debut of the iPhone placed a greater importance on handset design and capabilities, both in
terms of hardware and software, and less of an emphasis on networks, which reduced carrier power (who controlled the networks) and increased manufacturer power [4].

After the 2007 launch of the iPhone and its operating system (OS), iOS, other tech companies announced their own operating systems, notably Google’s Android OS and Microsoft’s Windows Mobile OS. The importance of the operating systems comes partially from applications. Applications are downloaded software for mobile phones from “app stores”, and a commission is sometimes paid to the owner of the app store/operating system. Thus, a quality OS is not only one that runs well, but also has a variety of quality apps available for download. Apple’s “App Store” on iOS was wildly successful partially due to taking a much smaller commission than existing app stores offered by carriers, leading to developers focusing more on the iOS and giving the iPhone a greater variety of apps [4]. iOS is only available on Apple products, while Microsoft demands “Apple-like control of design quality by taking a hands-on interest in the development of OEM devices and by not allowing third-party alterations of the software” [4]. In contrast, the Android OS is open source, which means that any manufacturer can use it free of charge. This has allowed carriers to regain some of their control in the market, using their power to push manufacturers to include “bloatware” that Apple and Microsoft do not allow [5]. Still, developers, despite not being much of a factor a few years ago, now have input and control over product design and development, as well as other aspects of the industry.

3. CASE STUDY: THE JAPANESE SMARTPHONE MARKET

The Japanese market is interesting as a case for several reasons. Japan has often been seen as “ahead of the curve” when it comes to mobile phones, adopting innovation before other countries. Japan is also less price sensitive than other markets, meaning that Japanese consumers are willing to adopt more expensive models – ones that will eventually see a price reduction and be introduced to the rest of the world. Furthermore, the saturation of the Japanese market gives a preview of the market the rest of the world will soon be like, as global saturation increases.

Because of the unique ecosystem mobile phones in Japan inhabit, foreign manufacturing firms have historically found it hard to break into the Japanese market, giving local firms a large advantage. Since the widespread adoption of smartphones, however, Japanese manufacturing firms have seen much of their domestic market share be captured by foreign firms. Japanese firms have made huge strides in technological development but seen their products rejected by their home country and the world. Determining the reason for failure would give great perspective on what kind of innovations are successful.

This section will give an overview of the current state of the Japanese smartphone industry. It will first address the history of the Japanese mobile phone industry and the unique culture of Japanese mobile phones. It will then analyze recent growth and sales trends of subscriptions and handset sales, as well as reasons for these trends. Finally, it will summarize the various reasons why others have proposed Japanese firms have failed in the smartphone era and analyze those reasons.

3.1 THE JAPANESE MOBILE PHONE ECOSYSTEM
Japan has a history of innovation in the mobile phone industry, as well as a unique culture surrounding mobile phones. Japanese mobile devices have been ahead of industry standards for well over a decade, debuting mobile email services in 1999, nearly 6 years before the same service was offered by Research In Motion’s BlackBerry devices for the first time in the US. Japanese phones are able to have advanced functions because they can take advantage of more advanced networks. For example, in 1999, NTT DoCoMo launched i-mode mobile Internet service, which was advanced for its time [6]. The i-mode enabled a huge boom in application development that outstripped the rest of the world [6]. Applications offered 5 or more years ago in Japan are only now being offered in the United States. For example, the United States still lacks any widespread way to pay using a mobile device, but Japanese consumers have had this ability since 2004 [6]. Japan has had music downloads directly to phones since 2002, a feature that Apple and Motorola could not implement on their 2005 collaboration ROKR phones.

Additionally, mobile phones hold an interesting place in Japanese culture, a phenomena known as keitai culture. The phrase “keitai” comes from the Japanese phrase “keitai denwa” (ケイタ電話) which literally means “thing you carry with you” (keitai) and phone (denwa). American English shortens “mobile phone” and “cellular phone” to merely “phone”, but mobile phones are so ubiquitous and necessary in Japan they are more “things you carry with you” than phones.

Mobiles are not merely ubiquitous among younger generations; some view the culture surrounding mobile phones as unique to Japan and augmented by the technology unique to Japan [7]. This technology includes the use of mobile phones as identification and electronic purse; mostly it is technology that more greatly intertwines consumers’ everyday lives with their mobile device. Keitai culture is similar in many ways to American phone culture, especially the proliferation of mobile devices, but keitai culture separates itself with the sheer integration of mobiles into other facets of life. Keitai culture is important enough that research in Japan has been published on the phenomena. Some regard the homegrown culture as a positive, as many aspects of Japanese youth culture come from America, while others criticize it for not conforming to global standards and thus hurting Japan [7].

2.2 CURRENT GROWTH AND SALES

Japan had a mobile penetration rate of over 100% in 2011, meaning that more there were more mobile phones than people in Japan [8]. In 2012 there were 138,362,823 mobile subscribers with 109.43 subscribers per 100 people [8]. Japan saw growth in total mobile subscriptions and in mobile subscriptions per 100 people every year from 2000-2012, as shown in Fig. 1 and Fig. 2. The growth rate of mobile phone subscriptions and mobile phone subscriptions per capita has diminished since 2000, but remains relatively steady, as seen in Fig. 3. The Japanese market is not one with room for explosive growth fueled by an underserved population in the future; rather sales will come from churn and a small number of new subscribers (e.g. young people buying their first mobile).

1 “keitai” is usually spelled with the katakana alphabet, while “denwa” usually uses the kanji alphabet, despite katakana being the alphabet for foreign loan words and “keitai” having a kanji character.
Fig. 1: Mobile Phone Subscriptions in Japan 2000 – 2012:

![Graph showing Mobile Phone Subscriptions in Japan 2000-2012](image)

Note: Adapted from [8].

Fig. 2: Mobile Subscriptions per 100 Residents in Japan, 2000 - 2012

![Graph showing Mobile Subscriptions per 100 Residents](image)

Note: Adapted from [8].
In line with these figures for low growth of subscriptions, Japan saw projections of total sales of mobile phones drop from 2012 to 2013 [9]. Consistent with global trends, feature phones lost market share to smartphones. While overall mobile sales are projected to dip 5.3% to 39.6 million units and mobile phone sales are decreasing in general, smartphone sales are projected to remain constant at 29.9 million units [9]. The lack of new subscribers year to year has led to a prolonged decrease in demand for new mobile handsets.

2.3 RECENT FAILURE OF JAPANESE FIRMS

Despite advanced Japanese ecosystem and unique culture historically providing Japanese firms an advantage in domestic markets, and robust domestic market, Japanese firms have failed to expand overseas and have begun losing market share at home in the smartphone era. Failure to expand overseas is not for lack of effort. As early as 2009, most Japanese handset manufacturers felt pressure to attempt to expand overseas. One analyst was quoted in The New York Times in 2009 as saying, “Japanese cellphone makers need to either look overseas, or exit the business” [10]. However, Japanese firms all failed to do so. The only Japanese firm to command a greater than 5% share of the global mobile phone market since 2003 was Sony (Fig. 4). Sony-Ericsson was briefly a top five player, but began to suffer a decline and eventually fell far behind industry leaders (Fig. 4, Fig. 5). Sony peaked in 2007 with 8.8% of the market, but has since lost enough ground that it is below newcomers Apple, HTC, ZTE and Huawei (Fig. 6).
Fig. 4: Global Market Share of Industry Leaders, 2003-2013 1st Quarter

<table>
<thead>
<tr>
<th>Company</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samsung</td>
<td>10.5</td>
<td>12.6</td>
<td>12.7</td>
<td>11.8</td>
<td>13.4</td>
<td>16.3</td>
<td>19.5</td>
<td>17.6</td>
<td>23.8</td>
<td>22</td>
<td>23.6</td>
</tr>
<tr>
<td>Nokia</td>
<td>34.8</td>
<td>30.7</td>
<td>32.5</td>
<td>34.8</td>
<td>37.8</td>
<td>38.6</td>
<td>36.4</td>
<td>28.9</td>
<td>17.7</td>
<td>19.1</td>
<td>14.8</td>
</tr>
<tr>
<td>Motorola</td>
<td>14.5</td>
<td>15.4</td>
<td>17.7</td>
<td>21.1</td>
<td>14.3</td>
<td>8.7</td>
<td>4.8</td>
<td>2.4</td>
<td>2.3</td>
<td>1.9</td>
<td>*</td>
</tr>
<tr>
<td>Siemens/BenQ Mobile</td>
<td>8.4</td>
<td>7.2</td>
<td>4.9</td>
<td>2.4</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>LG</td>
<td>5</td>
<td>6.3</td>
<td>6.7</td>
<td>6.3</td>
<td>6.8</td>
<td>8.4</td>
<td>10.1</td>
<td>7.1</td>
<td>4.9</td>
<td>3.3</td>
<td>3.7</td>
</tr>
<tr>
<td>Sony Ericsson</td>
<td>5.1</td>
<td>6.2</td>
<td>6.3</td>
<td>7.4</td>
<td>8.8</td>
<td>7.6</td>
<td>4.5</td>
<td>2.6</td>
<td>1.8</td>
<td>1.9</td>
<td>1.9</td>
</tr>
<tr>
<td>Research In Motion</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>2.8</td>
<td>3</td>
<td>2.9</td>
<td>2</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Apple</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>2.1</td>
<td>2.9</td>
<td>5</td>
<td>7.5</td>
<td>9</td>
</tr>
<tr>
<td>ZTE</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>1.3</td>
<td>1.8</td>
<td>3.2</td>
<td>3.9</td>
<td>3.4</td>
</tr>
<tr>
<td>HTC</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>0.9</td>
<td>1.5</td>
<td>2.4</td>
<td>1.8</td>
<td>*</td>
</tr>
<tr>
<td>Huawei</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>1.1</td>
<td>1.5</td>
<td>2.3</td>
<td>2.7</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Note: Adapted from [11, 12, 13, 14, 15, 16, 17, 18, 19, 20].

Fig. 5: Market Share of Manufacturers with Greater Than 5% Market Share

Note: Adapted from [11, 12, 13, 14, 15, 16, 17, 18, 19, 20].
Sony's decline coincides with the rise of smartphones after 2007, when Apple debuted the iPhone. Before 2009, of these firms only Sony was regarded as a major player in the mobile phone market. However, since 2009 all have experienced growth while Sony has continued its decline, such that all of these firms are now above Sony in global market share. In contrast, Apple has grown enough that it now ranks third behind Nokia and Samsung.

Lack of international presence would not be a problem if Japanese firms were successful at home. However, Japanese firms have been losing ground to foreign competition at home as well. In the first half of 2011, domestic firms made up more than 75% of all mobile shipments and only one foreign firm cracked the top 5 firms in terms of market share, which was Apple, in 5th [21]. By the end of the first half of 2013, Apple had become the number one firm in terms of market share and Korea based Samsung had passed Fujitsu and Panasonic, both formerly top 4 firms [9]. Most worryingly, NEC Casio dropped out of manufacturing entirely.

In the smartphone era, Japanese phone manufacturers have struggled. No major smartphone on the global market is Japanese made, and foreign smartphones have snatched up domestic market share for mobile phones. Apple only produces smartphones, but became number one in Japan.

2.4 PREVIOUSLY PROPOSED REASONS FOR THE FAILURE OF JAPANESE FIRMS

This section will outline previously proposed theories as to why Japanese firms fail to successfully market their handsets overseas, and why did they began to lose market share to
foreign firms. In particular, Dujarric and Hagiu [6] do a small case study of the Japanese mobile industry and outline several theories. These theories and others presented by other sources are not necessarily mutually exclusive; indeed, many of them are interconnected. However, these theories do not fully explain the reason for Japanese struggles.

2.4.i CARRIER DOMINANCE

Dujarric and Hagiu [6] argue that the presence of vertical hierarchies within industries in Japan leads to stifled or warped innovation. Vertical hierarchies, where one firm or group of firms commands power over the entire ecosystems, are one of the core reasons for Japan’s manufacturing success, especially automobiles and video games [6]. However, these vertical hierarchies can cause damage for non-leaders within the ecosystem.

In the telecommunications ecosystem in Japan, carriers are the dominant firms [6]. Carriers are clearly at the top of the vertical hierarchy and set standards for the mobile handset manufacturers to meet. This is similar to the United States telecom ecosystem before Apple won some control back from the carriers with their negotiations over the iPhone.

Carriers find it very hard to expand overseas and are thus focused on the domestic market; because carriers are inherently domestically focused, the entire Japanese telecom industry became domestically focused. Carriers are able to dictate to handset makers what features to include on mobile handsets, because of the power they hold as industry leaders. Thus, carriers steer research and development of by mobile manufacturers towards products that are catered to the domestic market, not an international one.

2.4.ii ADVANCED HOME ECOSYSTEM

In the same paper, Dujarric and Hagiu [6] argue that a secondary cause was that the home ecosystem for Japanese firms is so advanced that Japanese handsets are too advanced for other markets. Japanese consumers are used to certain features on their mobile devices and have been for some time. However, many of these features were unable to be marketed overseas, as they were not compatible with current international networks. Japanese handsets were so advanced in their hardware that they were unable to be marketed overseas.

2.4.iii CURSE OF MEDIUM MARKET SIZE

Dujarric and Hagiu [6] argue another secondary cause is that Japan’s large domestic market and modernity caused Japanese firms to not need to expand internationally, but the recent saturation of the market led to problems for firms. Japan has a population of around 125 million people, almost all of which is located in areas that are modernized enough to access mobile services. As such, the mobile phone market grew explosively enough that firms did not need to look internationally. Korean firms, in contrast, have expanded internationally in part due to the relatively smaller size of the Korean market, despite also operating in an ecosystem where a carrier was the ecosystem leader [6].

As growth began to stagnate in Japan in the late 2000’s, due to the market reaching over 100% penetration, firms found focusing on the domestic market alone was no longer a viable strategy. However, these firms did not have products suited to global mobile marketplace and could not penetrate the market.

2.4.iv LATE ENTRY TO THE SMARTPHONE INDUSTRY
NEC, when exiting the smartphone industry in 2013, argued the reason for their failure was their late entry to the smartphone market and an inability to reach economies of scale [22]. When trying to compete overseas, as firms began to do in the late 2000’s, they found they were unable to be as competitive due to late entry to the smartphone industry. As shown, smartphones represented a larger and larger share of the global mobile market, but Japanese firms began production more than 2 years after their main international competition. Japanese firms struggled to reach adequate economies of scale and struggled against established foreign competition. This led them to fail to expand internationally, and then lose domestic market share later, when international firms with economies of scale moved into the domestic market.

2.4 v HARDWARE BIAS

Dujarric and Hagiu [6] also argue that an emphasis on hardware development over software development unique to Japan, known as “monozukuri”. They note that no Japanese firm has created a successful mobile OS. According to Dujarric and Hagiu [6], since mobile hardware varies the most from country to country but software hardly changes, Japanese firms are disadvantaged internationally. No Japanese company has made a mobile OS that has seen widespread adoption.

2.5 THE JAPANESE MARKET IN LIGHT OF PREVIOUS LITERATURE

There are faults with several of the current theories, and the question of why Japanese firms have struggled with smartphones has never been conclusively answered. In particular, Dujarric and Hagiu is the only study produced, and there are several problems with their findings. The theory of carrier dominance in a vertical hierarchy limiting innovation does not explain the ability of Apple to become successful in the same kind of environment in the United States. The mobile ecosystem of the United States, while still somewhat behind Japan, has caught up to Japanese networks, but Japanese phones are still not performing well in the United States (for example, United States carriers now support mobile payments as well as streaming digital TV, 2 examples used in the paper). The theory that Japanese firms do not produce their own software is also questionable due to the open sourced nature of the Android OS. The theory of late entry discounts how other late entrants, like HTC, have found success. The most likely theory is that Japanese firms disregarded software development in favor of hardware, but Dujarric and Hagiu do not explain why software was the deciding factor.

3. LITERATURE REVIEW

To determine the deciding factor to why Japanese firms failed and why it was key, I looked at how and why manufacturers of this current and previous generation of phones succeeded. This literature review aims to summarize the findings of several studies pertaining to securing and maintaining competitive advantages in the mobile manufacturing market. It seeks to summarize and analyze these findings in order to draw conclusions about how firms can seek advantages in the crucial smartphone market.

The body of literature in the field was limited to case studies about success and failures in basic mobile phone manufacturing and about success and failure in the smartphone industry. Because of the relative youth and continued development of the smartphone industry, basic mobile phone studies from the past were included in order to draw more long-term conclusions through comparison. Through JSTOR searches on topics like “mobile phone production” and correspondence with experts in the field, I selected three studies on each topic for their
relevance to the topic and their perceived importance. The studies were limited to three to allow for a more in-depth analysis of each.

3.1 BASIC MOBILE PHONES

The results of the basic mobile phone case studies as seen in Fig. 6 provide excellent theoretical framework for later discussion of the smartphone industry. In general, the studies found success to be based off of one large factor: adaption to technological change, specifically the change in communications standards from first generation networks to second generation. Success, for the purposes of this paper, is defined by market share. Market share was chosen because for many major mobile producers, mobiles are not the main focus; thus profits and losses can be hidden in financial statements more easily. Market share is independently reported and measured, and was deemed a more appropriate metric.

Funk [23] found that manufacturer success came from the manufacturer’s home company quickly adopting the global standard for networks or establishing their own standard that was then adopted. For years, networks were based on analog cellular technology, and the communication standard was the North American standard; however, when digital cellular technology debuted, European/Scandinavian standards prevailed, leading to a dip in performance for North American producers and a rise for European/Scandinavian firms [23]. While this implies that those companies that quickly adapt to technological network changes are at an advantage, the study ignores the role of these firms in setting their country’s standard and the amount of leverage that manufacturers have. It stands to reason that a company producing to the international standard might be able to force local carriers to also adopt these standards quicker.

![Fig 7: Case Studies on Basic Mobile Phones](image)

<table>
<thead>
<tr>
<th>Study</th>
<th>Topic</th>
<th>Main Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funk, 1998 [23]</td>
<td>Mobile communications industry growth from 1993-1997.</td>
<td>• Success in the mobile communications industry is derived from the standards of a firm’s home country being adopted by the rest of the world, or the home country quickly adopting the world standard.</td>
</tr>
<tr>
<td>Doz and Kosonen, 2008 [24]</td>
<td>Nokia</td>
<td>• Success internationally in mobile communications came from “strategic agility” relative to other firms in the industry</td>
</tr>
<tr>
<td>Dittrich, Duysters and Sadowski, 2003 [25]</td>
<td>Nokia</td>
<td>• Success comes from depending on smaller, nimble firms to provide some parts and materials in a quick shifting market and discontinuous change in technology</td>
</tr>
</tbody>
</table>

![Fig 8: Case Studies on Smartphones](image)

<table>
<thead>
<tr>
<th>Study</th>
<th>Topic</th>
<th>Main Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dujarric &amp; Hagiu, 2009 [6]</td>
<td>Japanese smartphone market</td>
<td>• Japanese manufacturers are too focused on hardware and not enough on software development which limits their appeal worldwide</td>
</tr>
</tbody>
</table>
• Second generation networks introduced by Japanese carriers were different from the rest of the world, which caused Japanese phones to be very incompatible with foreign networks
• Japan’s large market for mobile phones (caused by a large population coupled with a high standard of living), meant manufacturers did not have to look outside Japan for profits

MacCormick et al., 2013 [4]
Research In Motion
• The debut of the iPhone placed a greater importance on handset design and capabilities, both in terms of hardware and software, and less of an emphasis on networks
• Operating system (OS) development and adoption is key to smartphone success

Park, Lee, Suh and Kim, 2012 [26]
LGE
• The smartphone market is so complex that no one firm can dominate: it is key that firms collaborate to maximize competitive advantages
• Software and OS development is more important than manufacturing capacity

Doz and Kosonen [24] and Dittrich et al. [25] both focused on Nokia. Nokia has historically dominated the sale of basic mobile phones. Both studies found that Nokia’s advantage in manufacturing came from their ability to quickly react to technological shifts. Doz and Kosonen [24] claimed that Nokia found success through long term strategic planning that was augmented by a willingness to be flexible around technological change. Although the company set long-term goals, the firm was able to adjust these goals on the fly as technological change disrupted their industry, which led them to achieve dominance [24]. The technological change in this case was the change in standards from North American to European, as detailed in Funk [23]. Dittrich et al. [25] also found that Nokia was able to find success due to their outsourcing of much of their manufacturing to smaller firms. By outsourcing, Nokia was able to adapt to technological change much more quickly, because these smaller firms could do so faster than a giant like Nokia [25]. Again, the technical disruption was the shift in networks described in Funk [23]. In the end, both of these studies found that Nokia’s ability to adapt to technological change to be the key to dominance. However, neither of these studies addressed the fact that Nokia, a Finnish firm, saw an advantage due to this technological change, as their home standard was adopted by the world.

3.2 Smartphones

The results of the smartphones studies are summarized in Table 3. For these studies, the one common theme between all three was the importance of software design over hardware manufacturing. Dujarric and Hagiu [6] noted that Japanese firms had fallen behind due to their focus on manufacturing techniques and hardware capabilities. These Japanese firms produced great hardware that had built in capabilities beyond what American or European phones had, but lacked the software to run mobile applications that Apple and other OS offered. MacCormack et al. [4] noted that OS and software development was the key to Apple’s success
in the smartphone market, and the lack of a viable Blackberry OS killed Research in Motion (RIM). Early smartphones by RIM had no real software capabilities, but were dependent on hardware. Similar to Japanese firms, RIM produced great hardware that did not support applications. Applications, almost all produced by third parties, allowed Apple to overtake RIM for smartphone dominance; while RIM’s hardware was more advanced, Apple could continuously draw on new, exciting apps. Finally, Park [25] explicitly states that LG has fallen behind Apple in the smartphone industry because of Apple’s software prowess. Although LG had an edge in the actual manufacturing of smartphones, Apple’s software was much better. In addition, the Apple App Store allowed for third parties to quickly develop and release new technology; consumers would not have to wait to buy a new phone to reap the benefits of technological leaps.

4. CONCLUSIONS AND RECOMMENDATIONS

In comparing both sets of studies, one observation jumps out: in both cases, firms succeeded when they were able to quickly adapt to technological changes. The technological shift from first to second generation networks and the importance of smartphones were both changes that happened very quickly. Nokia and Apple, through outsourcing, were able to obtain “strategic agility”, allowing them to quickly adapt. For Nokia, strategic agility was manufacturing phones that worked with next generation networks. For Apple, it was allowing users to upgrade their software immediately via apps.

In light of the research question “why have Japanese firms failed in the smartphone market?”, the answer would be that the hardware bias of Japanese firms led them to disregard the importance of operating systems and software development, which were the deciding factor in smartphone success.

More generally and usefully, Japanese firms lacked the strategic agility to react to changes in the market. Operating systems and software were key because they gave firms strategic agility. Apple was able to succeed because it developed software and a popular OS, then let third-party developers release apps. Apple obtained strategic agility – even as there were software advances, Apple was able to keep up. These developers are analogous to Nokia’s smaller manufacturers: both quickly adapt to changes and thus benefit the main firm. The use of apps gave Apple strategic agility to react to changing consumer tastes and technological change.

Therefore, when looking forward to the future of the mobile phone industry, it is important for future research to look for 1) what the next innovation will be and 2) who will be positioned to take advantage of it. In both cases of technological change in the literature review, rapid change was a key factor. This indicates that the next potential game shifting innovation will be similar. Recently, the idea of modular mobile phones, or phones whose hardware breaks apart into sections users can customize and update, has become popular. Google and Motorola have reportedly been working on a model. This innovation fits with the ones examined: it will provide the manufacturer a way to quickly adapt to technology upgrades. If modular mobile phones are the way of the future, Japanese firms may make a comeback.

5. REFERENCES


