The Changing Competitive Landscape of the Smartphone Industry

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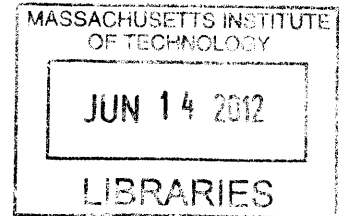
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SUBMITTED TO THE MIT SLOAN SCHOOL OF MANAGEMENT IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE IN MANAGEMENT STUDIES
AT THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

JUNE 2012

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Submitted to the MIT Sloan School of Management on May 11, 2012 in
partial fulfillment of the requirements for the degree of Master of
Science in Management Studies

ABSTRACT

Since the first truly portable phone was released in 1983, mobile phone usage has increased at unprecedented rates around the world. Despite this general industry growth, the smartphone subsector has achieved significantly lower levels of global penetration. As a result, there is a large scope for growth and a significant opportunity for players in the sector to seize in the future. The most widely used and supported smartphone operating systems today are iOS, Android, Windows Phone, Blackberry OS, and Bada. The thesis analysed each of these operating systems and examined ways in which their providers could adapt their current strategies to be better positioned to benefit from this upcoming market expansion. In conclusion, potential future scenarios resulting from changing market dynamics were investigated and compared.

Thesis Supervisor: Henry Weil
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BACKGROUND

Although various forms of mobile phones had been used in vehicles from the 1930s to 1960s, the first fully portable phone called the DynaTAC (Dynamic Adaptive Total Area Coverage) 8000X was tested by Motorola in 1973[1] and publically available for sale in 1983[2]. It weighed about 1.75lbs (785g) and measured 13"×1.75"×3.5" (300mm×44mm×89mm)[3] and though it may be considered quite large today it was considered a revolutionary break-through device at its release[4].
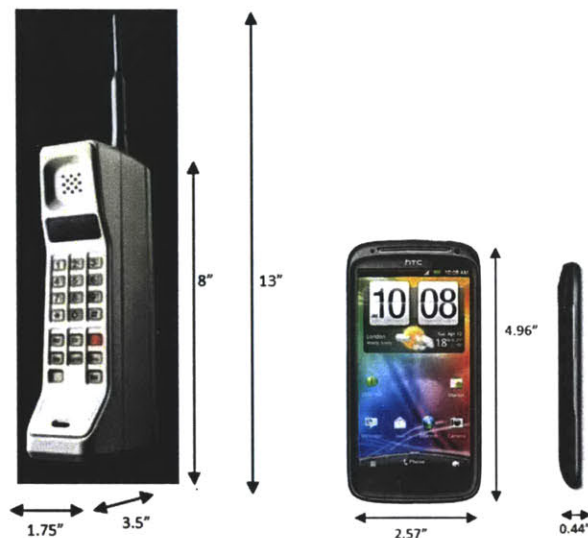
The DynaTAC 8000X is significantly larger and bulkier than today's phones such as the HTC Sensation[5]

As with most forms of early technology, the 8000X was relatively expensive at launch and was priced at $3,995[6] ($9,130[7] in 2012 dollars). Advances in technology led to not only lower priced but also smaller and more reliable mobile phones. As their functionality grew and prices reduced, cell phones became increasingly ubiquitous around the world[8].

The instrument of choice

Mobile-phone and internet users, worldwide
bn

Mobile-phone users

Internet users*

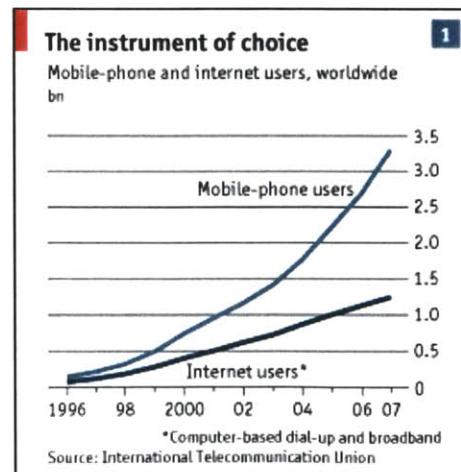1996 98 2000 02 04 06 07

*Computer-based dial-up and broadband
Source: International Telecommunication Union

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[1] Wendy Kaufman, "A Brief History Of The Mobile Phone", *NPR*, April 8 2012, http://www.npr.org/2012/04/08/150230250/a-brief-history-of-the-mobile-phone, accessed April 2012.
[2] *History of Cell Phones*, December 2 2010, http://www.historyofcellphones.net/, accessed April 2012.
[3] Demon Drawer, "DynaTAC 8000X - the World's First Mobile Phone", *h2g2*, July 3 2003, http://h2g2.com/dna/h2g2/A1082521, accessed April 2012.
[4] *jack.eti.br*, http://www.jack.eti.br/www/arquivos/imagens/diversos/dynatac800.jpg, accessed April 2012.
[5] *HTC*, April 11 2011, http://www.htc.com/www/smartphones/htc-sensation/#specs, accessed April 2012.
[6] Retro Brick, "Motorola DynaTAC 8000x", http://www.retrobrick.com/moto8000.html, accessed April 2012.
[7] Bureau of Labor Statistics, "CPI Inflation Calculator", http://data.bls.gov/cgi-bin/cpicalc.pl?cost1=3995&year1=1983&year2=2012, accessed April 2012.
[8] The Economist, "Nomads at last", April 10 2008, http://www.economist.com/node/10950394?story_id=10950394, accessed April 2012.
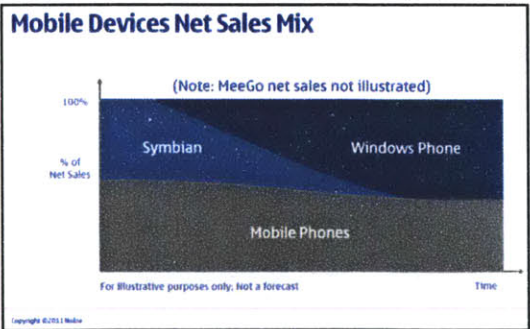
The growth of cell phones accelerated throughout the 1990s/2000s[9] and they slowly began to evolve into personal digital assistants (PDAs) as consumers began to use their phones for activities including internet access, e-mail usage, contact list management, MMS and SMS. These PDAs were used along with pagers and phones before all these devices were merged into the smartphones available today.

Mobile phone subscribers per 100 inhabitants 1997-2007
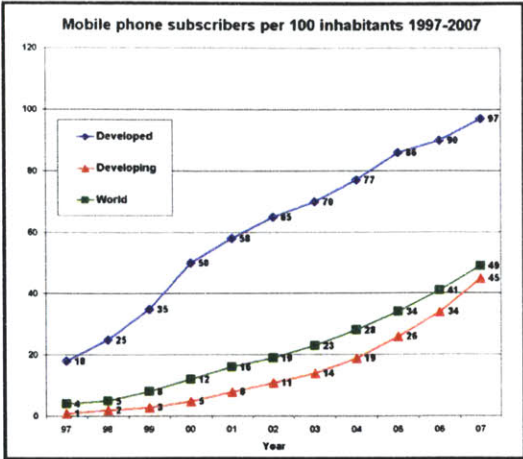
Smartphones are direct descendants of PDAs (Palm 650, 680, 750, Centro, Treo Pro and Pre)

There is currently no formal definition of a smartphones but they may be distinguished from feature phones by the fact that they run an operating system (OS) that allows the development of native applications for functionality enhancement. These OSs offer a wider range of functionality than those typically available on feature phones. Today, the most common examples of smartphone OSs are iOS (Apple), Android (Google), Symbian (Nokia), Windows Phone (Microsoft) and the Blackberry OS (RIM). Initial adoption of smartphones was driven by business users and technophiles but penetration has become increasingly mainstream as a result of several key developments including:

Nokia and Symbian: Nokia's work with Symbian in the early 2000s paved the way for smartphones today. Symbian was a widely used OS that had the largest smartphone market share from 1996-2011 and was licenced by a several hardware manufacturers most notably Sony Ericsson and Motorola. However, its popularity began to wane significantly as Android and iOS took center stage and as a result Nokia announced that they would be no longer be supporting Symbian and transitioning their smartphone

Mobile Devices Net Sales Mix

(Note: MeeGo net sales not illustrated)

Symbian   Windows Phone

Mobile Phones

For illustrative purposes only; Not a forecast   Time

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[9] Wikipedia, "Mobile phone", http://en.wikipedia.org/wiki/Mobile_phone, accessed April 2012.

focus to Windows phone in 2011[10].

Blackberry OS, Palm OS and Windows Mobile: RIM, Microsoft and Palm had a significant role in raising the awareness of smartphones in the mid-2000s with their operating systems that emphasized web browsing, e-mail, contact management and their ability to run a wide variety of applications.

Blackberry 7730[11], HTC Tytn[12] and the Palm Treo 700[13]

The iPhone and Android: The release of the iPhone in 2007 (and its application store in 2008) combined with the emergence in Android have helped expand smartphone usage across a wider range of consumer segments and have contributed to the sustained increase in global smartphone adoption. The iOS app store and Google play (formerly Android Market) have very quickly become the largest global digital distribution platforms with approximately 585,000[14] and 500,000[15] applications available respectively. These platforms have cultivated a developer base that has been instrumental in creating applications that have further extended the smartphones functionality. Smartphones intersect across an increasingly wide spectrum of our lives and impact the way we interact with the world by providing us with new ways of manipulating our surroundings and increasing our efficiency in ways previously unimaginable. Android and iOS have subsequently gone on to become the two dominant platforms eclipsing the popularity of previously ubiquitous competitors.

[10] Charlie Sorrel, "Nokia Kills Symbian, Teams Up With Microsoft For Windows Phone 7", WIRED, February 11 2011, http://www.wired.com/gadgetlab/2011/02/microsoft-and-nokia-team-up-to-build-windows-phones/, accessed March 2012.
[11] 66mobile.com, http://www.66mobile.com/phones/blackberry/BlackBerry-7730.html, accessed March 2012.
[12] 3g.co.uk, http://www.3g.co.uk/PR/June2006/3216.htm, accessed March 2012.
[13] Mobileisgood.com, http://www.mobileisgood.com/phone_big.php?phone_id=703, accessed March 2012.
[14] Andrew Williams, "iOS App Store Hits 585,000 Apps, 200,000 for iPad", Trusted Reviews, March 7 2012, http://www.trustedreviews.com/news/ios-app-store-hits-585-000-apps-200-000-for-ipad, accessed March 2012.
[15] Quentin Fottrell, "Will Nokia's Cheaper Lumia Be Worth It?", Smart Money, April 9 2012, http://blogs.smartmoney.com/advice/2012/04/19/will-nokias-cheaper-lumia-be-worth-it/, accessed March 2012.

Top Smartphone Platforms 3 Month Avg. Ending Jan. 2011 vs. 3 Month Avg. Ending Oct. 2010 Total U.S. Smartphone Subscribers Ages 13+ Source: comScore MobiLens	Share (%) of Smartphone Subscribers		
	Oct-10	Jan-11	Point Change
Total Smartphone Subscribers	*100.0%*	*100.0%*	*N/A*
Google	23.5%	31.2%	7.7
RIM	35.8%	30.4%	-5.4
Apple	24.6%	24.7%	0.1
Microsoft	9.7%	8.0%	-1.7
Palm	3.9%	3.2%	-0.7

Top Smartphone Platforms 3 Month Avg. Ending Feb. 2012 vs. 3 Month Avg. Ending Nov. 2011 Total U.S. Smartphone Subscribers Ages 13+ Source: comScore MobiLens	Share (%) of Smartphone Subscribers		
	Nov-11	Feb-12	Point Change
Total Smartphone Subscribers	*100.0%*	*100.0%*	*N/A*
Google	46.9%	50.1%	3.2
Apple	28.7%	30.2%	1.5
RIM	16.6%	13.4%	-3.2
Microsoft	5.2%	3.9%	-1.3
Symbian	1.5%	1.5%	0.0

Android passed Blackberry OS to become the highest selling mobile OS for the first time in Jan 2011 and the lead between Android and iOS has increased since[16,17] (Based on 3-month average US Sales)

Despite the apparent growth and popularity of smartphones, global penetration is still only approximately 8-12%[18,19] of the total population (or 27% of the total of phones sold[20]). This low global penetration is as result of the significant difference in regional international penetrations with about 50-60% penetration in Europe and North America and only about 10-20% penetration in other markets[21].

Smartphone Ownership is on the Rise

Phase 1 (Jan+Feb 2011)
Phase 2 (Sept+Oct 2011)
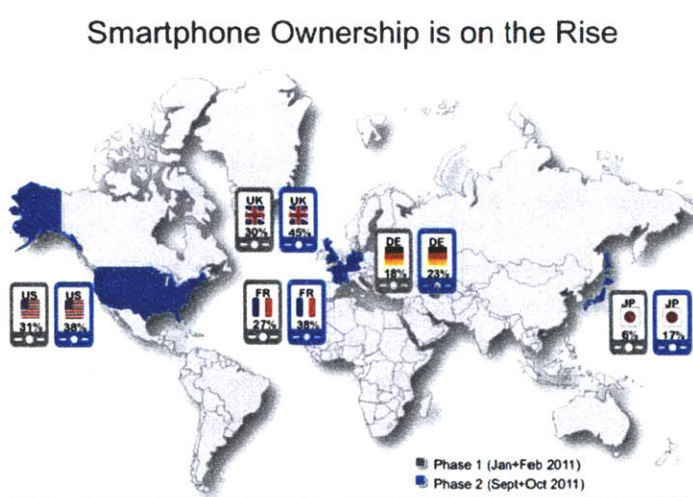
Smartphone usage (as a % of total population) has shown an increase globally but penetration levels vary [22]

[16] Comscore, http://www.comscore.com/Press_Events/Press_Releases/2011/3/comScore_Reports_January_2011_U.S._Mobile_Subscriber_Market_Share accessed April 2012.

[17] Comscore, http://www.comscore.com/Press_Events/Press_Releases/2012/4/comScore_Reports_February_2012_U.S._Mobile_Subscriber_Market_Share, accessed April 2012.

[18] Abhishek Singh, "Only 10 Percent Global Population Owns Smartphone: India And China Are Worse", Daze Info, December 15 2011, http://www.dazeinfo.com/2011/12/15/global-smartphone-penetration-2011/, accessed April 2012.

[19] Horace Dediu, "Global smartphone penetration nearing 10%", Asymco, Dec 13 2011, http://www.asymco.com/2011/12/13/global-smartphone-penetration-below-10/, accessed April 2012.

[20] Sarah Perez, "It's Still A Feature Phone World: Global Smartphone Penetration At 27%", Tech Crunch, November 28 2011, http://techcrunch.com/2011/11/28/its-still-a-feature-phone-world-global-smartphone-penetration-at-27/, accessed April 2012.

[21] Ibid. 22

[22] Nicole Leverich, "Global surge in smartphone usage, UK sees biggest jump with 15% increase", Google Mobile Ads Blog, January 25 2012, http://googlemobileads.blogspot.com/2012/01/new-research-global-surge-in-smartphone.html, accessed April 2012.

In regions where feature phones are still dominant, mobile phones tend to be bought outright at full prices since customers are on pre-paid plans (subscribers pay for phone usage in advance and mobile operators do not subsidize phone plans since subscribers do not sign contracts). This, combined with lower earnings and lower disposable incomes in these regions, means that price is the main driver behind phone purchases. This price sensitivity may therefore be one of the key reasons for the lack of smartphone penetration in these regions.

Smartphones as a Percentage of Population

Country	%	Country	%
Singapore	89.80%	South Korea	33.74%
Hong Kong	61.25%	Canada	30.50%
Sweden	51.61%	Switzerland	30.26%
Australia	47.22%	France	29.94%
Spain	45.71%	Germany	28.05%
Denmark	43.64%	Belgium	28.04%
Israel	44.29%	Poland	18.68%
Finland	42.59%	Malaysia	18.51%
Norway	42.86%	Russia	17.86%
New Zealand	41.86%	South Africa	17.19%
UK	40.26%	Czech Rep	16.35%
Italy	37.87%	Hungary	16.00%
Netherland	37.72%	Thailand	14.64%
Austria	35.71%	Japan	14.26%
Taiwan	35.65%	Brazil	14.16%
Greece	34.82%	Romania	13.74%
Ireland	34.78%	Turkey	10.92%
Portugal	34.58%	Ukraine	10.00%
USA	35.04%	Indonesia	7.90%
		Mexico	7.83%
		Slovakia	7.41%
		China	5.67%
		India	2.72%

There is significance variation in global smartphone penetration levels (penetration defined based on % of total population as of Dec 2011[23])

The penetration rates in the chart above are as a subset of total mobile phone users and thus percentages of the total population which would represent a more comprehensive approximation of the growth potential of smartphones. Increases in smartphone penetration in developing markets are thus likely to be caused by new buyers as opposed to upgrade purchasers. As the prices of low-end smartphones continue to reduce combined with the previous experience of developing countries leapfrogging technology, there is likely to be a future convergence as customers may choose low-end smartphones which have a wider range of functionality and access to the apps through advanced application stores over feature phones with a significantly limited initial feature set and a reduced capacity to improve due to lack of access to developed application stores.

The current state of low global smartphone penetration, the scope for growth based on future movement towards improved penetration in developing regions and the fact that there is not likely to be a clear "winner" but rather several front runners who have majority share combined create a significant and sizeable opportunity for players in the smartphone industry to seize.

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[23] Ibid. 20

OPERATING SYSTEM RIVALRY

The most widely used smartphone operating systems today are Symbian (Nokia), iOS (Apple), Android (Google), Windows Phone (Microsoft), Blackberry OS (RIM), and Bada (Samsung) [24]. Symbian will not be discussed in this thesis as was also once a major OS (and still has a large share of the market) but is not likely to be a significant future player as development has decreased significantly (since it is no longer being actively supported by Nokia which is transitioning to Windows Phone[25]). As outlined above, iOS and Android currently dominate the market while Blackberry OS has suffered from declining fortunes. Windows Phone has seen its visibility increase significantly due to its Nokia alliance but has not yet achieved wide adoption while Bada has been primarily used by Samsung to power their low to mid-end smartphones[26] but has also been unable to achieve the same scale of success as its competitors.

The following sections will analyse each of the five smartphone OS and examine ways in which their providers can adapt their current strategies and better position themselves to potentially benefit from this upcoming market expansion.

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[24] AndroidPhyton.com, http://www.androidphyton.com/2012/04/04/master-the-android-market-48-percent-of-global-smartphone/, accessed April 2012.
[25] Geoff Duncan, "Nokia tries to keep customers with Symbian Belle", Digital Trends, August 24 2011, http://www.digitaltrends.com/mobile/nokia-tries-to-keep-customers-with-symbian-belle/, accessed April 2012.
[26] Anuj Ahooja, "Bada & Tizen, sitting in a (source) tree?", Tech Thirst, January 24 2012, http://techthirst.com/?p=981, accessed April 2012.

ANDROID (GOOGLE)

Android was originally founded in 2003 by Rich Milner[27] (former of Wildfire Communications – a technology telecommunications company later sold to Orange), Nick Sears[28] (former T-Mobile USA Vice President of product marketing) and Andy Rubin (formerly of Danger Inc – famous for their T-Mobile Sidekick line of phones). After a 2005 meeting where Andy explained to Larry Page (Google co-founder) the potential future of Android as a global open platform to capitalize on the increasing importance of cell phones[29], Google acquired Android and moved into the smartphone market in an attempt to capitalize on its growth potential and establish a future leadership position as consumers transitioned from PCs to mobile devices[30]. The first mainstream Android device was the HTC T-Mobile G1 (also known as HTC Dream) in October 2008[31],[32]. The platform progressed from an initial slow start to achieve rapid adoption and overtook RIM and Apple to achieve the highest quarterly smartphone OS sales in the USA for the first time in January 2011[33].

Today, Android is licensed by all major phone manufacturers including Samsung, HTC, Sony, Lenovo, Asus and LG from Google at no charge. Google also does not receive money directly from applications downloaded from Google Play (mobile application store formerly called Android market). Developers keep 70% of the revenue from purchases while the remaining 30% is divided between mobile carriers and payment processors[34]. This revenue sharing agreement is different from that employed by Microsoft (70% developers-30% Microsoft)[35] and Apple (70% developers-30% Apple)[36].

Application Store: Google Play was released in 2008 and grown to host more than 500,000 applications. This quantity of applications compares favourably to the 585,000 available on iOS and consumers generally view both application stores as having around the same level of apps available. Customer perception is, however, different when it comes to the quality with most feeling that iOS has a higher amount of better quality applications. The most likely reason for this is that apps are inherently more difficult to build for the wide variety of Android devices and developers often need to make sure their applications run on base devices with lower hardware requirements and this focus could potentially leading to degradation in quality for all devices.

[27] Scott Kirsner, "Introducing the Google Phone", Boston.com, September 2 2007, http://www.boston.com/business/technology/articles/2007/09/02/introducing_the_google_phone/, accessed April 2012.
[28] T-Mobile Media Relations, "T-Mobile Brings Unlimited Multiplayer Gaming to U.S. Market with First Launch of Nokia N-Gage Game Deck", T-Mobile USA, Sep 23 2003, http://newsroom.t-mobile.com/articles/t-mobile-nokia-N-Gage, accessed April 2012.
[29] Chris Y, "The History of Android, A True Story of Success", http://androidheadlines.com/2010/09/the-history-of-android-a-true-story-of-success.html, accessed April 2012.
[30] Ben Elgin, "Google Buys Android for Its Mobile Arsenal", Business Week, August 17 2005, http://www.businessweek.com/technology/content/aug2005/tc20050817_0949_tc024.htm, aaccessed April 2012.
[31] Sean Cooper, "The T-Mobile G1", Engadget, September 23 2008, http://www.engadget.com/2008/09/23/t-mobiles-g1-gets-release-date-and-pricing/, accessed April 2012.
[32] Andy Simpson, "T-Mobile G1 UK Release Date", Mobile Fun, October 6 2008, http://www.mobilefun.co.uk/blog/2008/10/t-mobile-g1-uk-release-date/, accessed April 2012.
[33] Scott Webster, "Android leaps beyond RIM to take top spot in U.S. market", CNET, March 8 2011, http://reviews.cnet.com/8301-19736_7-20040598-251.html, accessed April 2012.
[34] Eric Chu, "Android Market: Now available for users", Android Developers, October 22 2008, http://android-developers.blogspot.com/2008/10/android-market-now-available-for-users.html, accessed April 2012.
[35] DG, "Windows Phone 7 Revenue Split: 70% to Developer, 30% to Microsoft – Microsoft's Adopts 'Best Apps' Strategy for WP7", Ditii, March 15 2011, http://www.ditii.com/2011/03/15/windows-phone-7-revenue-split-70-to-developer-30-to-microsoft-microsofts-adopts-best-apps-strategy-for-wp7, accessed April 2012.
[36] iOS Developer Program, Apple, https://developer.apple.com/programs/ios/distribute.html, accessed April 2012.

Value Creation & Dynamics: Google receives Android revenue from a variety of sources including:

1. Revenue sharing agreements (from advertising revenue) with carriers and hardware manufacturers for inclusion of Google's software suite (Maps, YouTube, Gmail and so on) on phones[37] they manufacture or distribute.

2. Developer registration fees: Google charges developers a one-time fee of $25 to submit their apps to Google Play.

3. Advertisements displayed (using Google Mobile Ads) in ad-supported applications and when users perform Google searches.

Google does not currently disclose Android financials but some reports indicate that it may have lost over $97M in 2010[38] and despite the fact that Android has achieved a leading position in volume sales, many of its hardware partners have experienced difficulty in sustaining profits due to a combination of competition, lack of differentiation and margins erosion. Apart from Samsung (and HTC to a lesser extent), Android manufacturers have been borderline profitable and struggled to keep up with Apple. Sony (formerly Sony Ericsson), Motorola and LG have barely turned profits since 2008 and do not have strong prospects to do so in the future.

Profit shares of eight mobile phone vendors
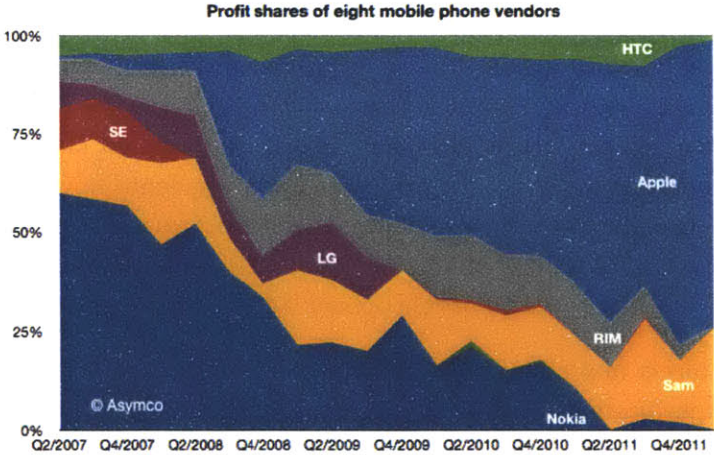
Apple (73%) and Samsung (26%) combined to earn a remarkable 99% of the profits at the end of Q4[39]

Carrier subsidization appears to be the main reason for this profit disparity. Android manufacturers produce phones at a wide variety of price points ranging from $100 and $700 unsubsidized while newer iPhone versions have approximate unsubsidized prices between $400 and $700. However most phones in developed regions are bought subsidized (for example in America, iPhones have historically been

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[37] John Daniel, "How does Google make money on the Android? "Android – The Cash Cow!" ", Hardgeek, June 7 2010, http://hardgeek.org/how-does-google-make-money-on-android-%E2%80%9Candroid-the-cash-cow%E2%80%9D, accessed March 2012.

[38] Tyler Holman, "Google lost over $97.7 million on Android in 2010", May 4 2012, http://www.neowin.net/news/google-lost-over-977-million-on-android-in-2010, accessed May 2012.

[39] Horace Dediu, "The phone market in 2012: a tale of two disruptions", Asymco, May 3 2012, http://www.asymco.com/2012/05/03/the-phone-market-in-2012-a-tale-of-two-disruptions/, accessed May 2012

contract prices of $199/$299 while Android phones have mainly had contract pricing from $0-$199) making the prices difference above less apparent. Thus carrier subsidization has artificially reduced the discrepancy between pricing and allowed Apple to continue to enjoy healthy margins at the expense of carriers. Android manufacturers do not have this luxury as their phones are not subsidized to the same extent by carriers making them less competitive. The situation is further compounded by the fact that most major Android manufacturers pay Microsoft patent license fees to use Android. This situation may be partly responsible for the profit dispersion between Apple and Android manufacturers shown above.

Android hardware partners also have to deal with uncertainty over Google's future plans after it acquired Motorola Mobility in August 2011 as there is a possibility that Google may start to compete directly with them by manufacturing its own phones. Before the acquisition, Google teamed up with hardware partners to manufacture its line of Nexus phones such as the Samsung Nexus S and the HTC Nexus One. Despite these issues facing them, Android manufacturers (other than Samsung) do not appear to be seeking to create their own OS due to the substantial capital outlay required. Many of them have instead decided to hedge their bets and also create phones for Microsoft's Windows Phone. Their ability to wrestle the dominance away from Apple and Samsung will depend on their ability to differentiate their phones and create products that customers are interested in.

Android is currently in a dominating market position and has experienced rapid and continuous success over the past few years. However it still faces several changes such as:

1. **CUSTOMER EXPERIENCE CONTROL**: Some customers have complained from inconsistent experiences across various Android handsets. This quality variability can largely be attributed to phones with modest hardware and older Android versions which are the result of manufacturers' attempt to reach lower price points and target cost-conscious customer segments. However, the end result is that these handsets provide underwhelming experiences that detract from the stellar performance of higher end products. Methods of tackling this problem should take into account the large and increasing consumers who want cheaper devices. Possible options Google can take to solve this issue include:

Encourage manufacturers to produce more advanced devices with higher specifications not cheaper devices with lower specifications: Since Google licenses Android to manufacturers to use as they wish it may be difficult to encourage them to forgo this growing customer segment (who want cheaper phones) might prove difficult especially as doing so would also mean they would have to compete directly entrenched players in the high-end space such as Apple, Samsung, HTC, Motorola and Sony. It is possible that Google may use financial incentives or hardware restrictions to achieve this goal but there may be undesired side effects that reduce the attractiveness of such measures.

Create Cheaper Android Version: Another way of combating this perception is for Google to make an Android specific version that manufacturers who are interested in making lower priced handsets can use and keep the current version of Android for other manufacturers who wish to continue to push the envelope and produce higher end devices.

It will also allow Google to optimize Android to run on devices with lower requirements and focus its development and delivery of updates using a 2-tier approach for both Android versions. This will help to address the main customer experience and quality problems (that were partially caused by use of older Android versions that were no longer being updated) because even cheaper devices will get updates and contain features that will make them run better and more efficiently than they can today. Additional details of development of an alternate Android version are discussed extensively below.

Disadvantages of this approach may be that it diverts Google's attention away from new innovations and may result in more fragmentation as developers may have additional complications in making their applications run on both OS versions.

Continue on current path: And a final option will be for Google to not make any changes and continue on their current path. This may represent the best path if it turns out that most customers are not necessarily concerned about the variability in customer experience and quality across the variety of Android devices.

Based on the current situation, the second option above seems be the most effective despite its potential drawbacks. Some of the effects of the drawbacks could be reduced by clearly communicating the functionality differences between the two versions to customers and developers to ensure that their expectations are clearly met. More specifically application development across the two versions should be setup to ensure that developers have minimal difficulty in creating desirable apps for the both versions without duplicated efforts or extra hassles.

2. LITIGATION CONTROL: There are currently a large number of lawsuits involving Google and a wide range of Android manufacturers. Google has already made proactive steps by its Motorola Mobility acquisition and its purchase of about 2,300 patents from IBM in 2011[40] and will most likely continue to do so as a key part of Android's future success rests on Google's ability to protect itself and its hardware partners from litigation.

The lawsuits are based on patents involving both the basic elements of Android itself and additions made on top of it by manufacturers. The lawsuits have come from a variety of parties including other operating system providers such as Microsoft, other hardware manufacturers such as Apple and even companies like Oracle that are not directly involved in the mobile industry.

Microsoft's lawsuits have achieved high levels of success. The lawsuits are based on Microsoft patents that are allegedly used in Android without permission. Microsoft's strategy has been to sue hardware manufacturers and negotiate royalty payments with them directly without involving Google. To-date

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[40] Patrick Anderson, "Google-IBM Patent Deal: Business As Usual?", Gametime IP, January 5 2012, http://gametimeip.com/2012/01/05/google-ibm-patent-deal-business-as-usual/, accessed March 2012.

Microsoft has been successful with this strategy and has so far gotten about 50%[41,42] of Android manufacturers to pay approximately $10-$15/handset[43].

Apple's lawsuits have achieved varying levels of success. Their strategy has been to obtain legal rulings to ban the sale of handsets that allegedly infringe on Apple's patents. Apple is involved in a number of lawsuits most notably with Samsung which is on-going and previously resulted in stopped sales of the Galaxy tab in 2011[44].

Finally, there is also on-going litigation against Google itself from Oracle. The Oracle lawsuit filed in August 2010[45] alleged that large parts of Android infringed on Java patents. Google may take one of the following approaches to litigation control:

A. Continue to buy relevant patents from companies such as IBM and provide them to hardware manufacturers to use to defend themselves in lawsuits as it did in the HTC/Apple case[46].

B. Take a more proactive stance by filing for more of its own patents (this may be difficult because it has not been part of Google's culture to obtain patents and may only be effective over a long time horizon and will not help the current litigious atmosphere).

C. Try to minimize participation in litigation and not interfere with current cases

Based on the current situation and the future likely continuance of litigation, Google may want to consider both options A and B. It is not recommended that Google provide license agreements that cover manufacturers against litigation when they licence android unless it is less expensive than the first option above. Apart from price, this option is not recommended because manufacturers have already shown that they are willing to pay litigation fees and associated license fees (to Microsoft) so it may not be necessary for Google to shoulder these costs unless it decides to do as a deterrent for future litigation.

3. FRAGMENTATION: Android phones have a very wide range of hardware capabilities (hardware fragmentation) and are sold with several different versions of the platform (OS fragmentation). Hardware fragmentation makes it difficult for developers to create high quality applications as they have to target the lowest "common denominator" to make sure their applications are compatible a wide range of hardware configuration. Situations in which developers do not pay adequate attention to

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[41] Brad Smith & Horacio Gutierre, "Our Licensing Deal with Samsung: How IP Drives Innovation and Collaboration", Microsoft, September 28 2011, http://blogs.technet.com/b/microsoft_on_the_issues/archive/2011/09/28/our-licensing-deal-with-samsung-how-ip-drives-innovation-and-collaboration.aspx, accessed March 2012.
[42] Ibid. 42
[43] Josh Halliday, "Samsung and Microsoft settle Android licensing dispute", The Guardian, Sep 28 2011, http://www.guardian.co.uk/technology/2011/sep/28/samsung-microsoft-android-licensing-dispute, accessed March 2012.
[44] 24-7pressrelease.com , "Apple and Samsung: The Tangled Web of a Complex Business Relationship", March 31 2012, http://www.24-7pressrelease.com/press-release-rss/apple-and-samsung-the-tangled-web-of-a-complex-business-relationship-271750.php, accessed April 2012.
[45] Jonathan Stempel, "Google spurns Oracle $2.2 billion Android damage claim", Reuters, September 21 2011, http://www.reuters.com/article/2011/09/21/us-google-oracle-idUSTRE78K3XL20110921, accessed March 2012.
[46] Phil Milford and Susan Deckee," HTC Sues Apple Using Google Patents Bought Last Week as Battle Escalates", Bloomberg, September 28 2011, http://www.bloomberg.com/news/2011-09-07/htc-sues-apple-alleging-infringement-of-four-u-s-patents.html, accessed March 2012.

hardware fragmentation may lead to their applications not working on specific phones and ultimately reduced customer satisfaction.

A recent example of this Instagram which is a popular photo sharing application (pictured on the right[47]) which could not initially run properly on the HTC One X (a new released phone[48]) because it used a certain processor (Nvidia Tegra 3) not commonly used by other Android manufacturers. OS fragmentation is even more pronounced than hardware fragmentation as 97% of consumers use older (pre 4.0) Android versions even though 4.0 was released in October 2011[49] (as of April 2 2012). The chart and table below show the prevalence of various Android versions currently used by smartphones

Platform	Codename	API Level	Distribution
Android 1.5	Cupcake	3	0.3%
Android 1.6	Donut	4	0.7%
Android 2.1	Eclair	7	6.0%
Android 2.2	Froyo	8	23.1%
Android 2.3 - Android 2.3.2	Gingerbread	9	0.5%
Android 2.3.3 - Android 2.3.7		10	63.2%
Android 3.0	Honeycomb	11	0.1%
Android 3.1		12	1.0%
Android 3.2		13	2.2%
Android 4.0 - Android 4.0.2	Ice Cream Sandwich	14	0.5%
Android 4.0.3		15	2.4%
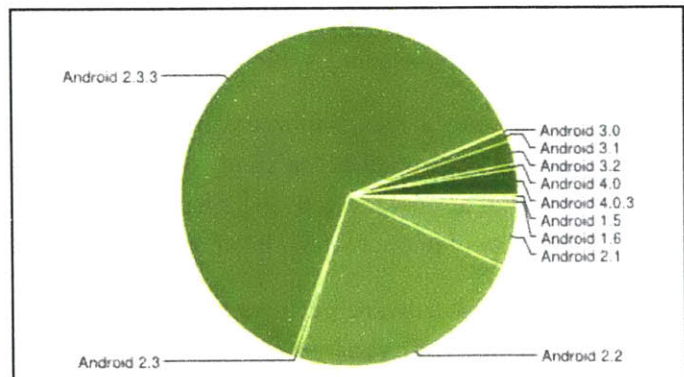
The combination of both types fragmentation is also a major problem and has developed to the extent where there are now about 1,443 unique Android devices with a widely varying set of hardware

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[47] Aloysius Low, "Instagram app for Android shows fragmentation", CNET, April 4 2012, http://asia.cnet.com/crave/instagram-app-for-android-shows-fragmentation-62214178.htm, accessed April 2012.
[48] Ibid. 49
[49] Android Developers, "Platform Versions", http://developer.android.com/resources/dashboard/platform-versions.html, accessed April 2012.

functionality running different OS versions[50]. This made it increasingly difficult and expensive for developers to create applications that work throughout the Android ecosystem. An example of the effects on developers is the twitter conversation below where a developer who claimed that 99.9% of support messages received from customers were complaints that their devices were unsupported but she was surprised by this as she supported over 707 devices. Another developer replied that based on his statistics that she only supported about half of all variations of Android handsets[51].

Fragmentation is a complex issue that has been prevalent throughout most of Android's existence and there are several methods that Google may use to tackle the problem:

A. **Continue on current path:** If Google feels that the negative aspects of fragmentation do not outweigh some of the positive aspects (such as increased variety and choice) and that it is not beneficial to attempt to "rock the boat", then it may continue on its current path and not take any drastic steps to address the fragmentation situation.

B. **Coordinate a recurring mass update for Android phones:** In order to reduce the number of OS versions currently being used, Google may decide to coordinate periodic upgrades with all the manufacturers (and carriers). This would mean that for every time period (6 months or yearly); the majority of phones would be updated to the most recent version.

C. **Pressure hardware partners to manufacture phones running with latest hardware features and running newer versions of Android:** This would theoretically reduce fragmentation but may cause friction between the Google and handset manufacturers because it would require Google to not only pressure them to ensure they initially produce handsets with new features and capabilities but also to persuade them to upgrade the phones much later on when they have already been released.

This would be difficult to implement as Google does not have a strong bargaining position with manufacturers when the phones need an update (and may have already been released for months), rather Google's leverage position with manufacturers is much higher before the phone is released as

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[50] Adrian Kingsley-Hughes, "The sorry state of Android hardware fragmentation", ZDNET, April 2 2012, http://www.zdnet.com/blog/hardware/the-sorry-state-of-android-hardware-fragmentation/19427, accessed April 2012.
[51] Ibid. 51

it is able to negotiate using its application suite (Market (Google Play), Market, YouTube, Maps) and early access to the source code new Android versions under developments as leverage points.

Based on the options outlined above, Google's best option may be to continue with the current situation of pressuring manufacturers by using/restricting access to its Google app suite and newer Android versions[52]. In addition, Google should expand its work with developers (especially those with popular applications) to ensure to assist them with quality assurance (QA) as some developers have reported that increased attention to QA may still led to high levels of compatibility across handsets despite the effects of fragmentation[53].

In order to combat this problem and spur future growth, Google may undertake the following strategic

1. Acquisition of mobile security firm to tackle Android's malware/virus problem: As Android's popularity has increased so too as the number of malicious applications (internally in Google Play and externally on the internet) targeting users and their information. This security concern has the potential to create a bad image for Android if it continues. Hence, it would be beneficial for Google to nip it in the bud by acquiring a company that provides antivirus protection to Android users and rebranding the application as an official free download for all users and pre-installing it on all handsets sold as part of the Google app suite.

2. Creation of specific Android edition for developing markets: Consumers in developing countries are extremely price sensitive so Google needs to continue to undertake measures to keep the prices of phones low. Google does not have a direct influence on price as hardware manufacturers bear the costs of production and may price phones as they see fit. Therefore manufacturers will already be looking to create lower priced alternatives to sell in these markets. One of the methods that they will likely use to achieve lower costs will be to sell phones only capable of running older versions of Android such as 1.5 (Cupcake), 2.2 (Froyo) or 2.3 (Gingerbread) which have lower hardware requirements and therefore cheaper components. This situation may not necessarily represent a problem as customers in these regions may not be as sensitive to the issue as those in developed markets (even a large portion of customers seem to be concerned).

To guard against competitive products (such as Nokia Belle and Windows Phone 7) that may be using their newer versions with enhanced capabilities and to ensure to enhance their customer experience Google may choose to release a native version Android. This version would be developed simultaneously as the mainstream Android version and would enable Google to compete more aggressively and introduce features and functionalities while minimizing costs which manufacturers can pass along to customers. Additionally this Android version should contain applications (such as Nokia adding cricket scores and crop prices to attract Indian users). Google should initially develop the applications itself to

[52] Dan Frommer, "Google Tightens Its Grip On Android, Infuriating Partners", Business Insider, March 31 2011, http://www.businessinsider.com/google-android-2011-3, accessed April 2012.
[53] Todd Hopper, "Zipline CEO: Stop whining about Android fragmentation and do some damn QA!", The Next Web, April 2 2012, http://thenextweb.com/google/2012/04/02/zipline-ceo-stop-whining-about-android-fragmentation-and-do-some-damn-qa/, accessed April 2012.

ensure quality and also encourage local developers to also create applications to augment and increase the variety of options available.

3. Partners: Similar to the process outlined for Apple above, Google could also find partners who are willing to subsidize some of the costs of the phone. In addition to the potential options that Apple may have, Google may have a wider range of partnership opportunities available because it can leverage its search business to offer remuneration or create joint search-phone agreements. Google's existing partnerships therefore present it with an initial set of partners that it can potentially leverage to develop. There may be a significant overlap of interests because partners who pay for search placements are trying to reach a wide range of tech-savvy users who are using the internet and these partners may also be interested in smartphones users in these regions who tend to be tech-savvy and will likely eventually perform search and other internet related activities on their phones.

iOS (APPLE)

After achieving success with the iPod and revolutionizing the music genre by selling record amounts of hardware and popularizing the digital distribution of music with iTunes, Apple made the move into the phone industry with the release of the original iPhone on June 29, 2007[54]. It was first released in the USA, subsequently in the UK, France, and Germany in November 2007 and then eventually across a wide number of countries across the world.

Although there some level of scepticism pre-launch and during some months after launch, the iPhone has gone on to achieve great success (that has led to Apple's current commanding position in the smartphone market) with each yearly release cycle for a variety of factors including:

Design: The iPhone looked significantly different from other phones released at the time and was applauded by many for its attractive and minimalist design.

Functionality and features: The original iPhone was one of the first mainstream phones with a touch screen, an intuitive and elegant operating system that was easy to use, a web browser that rendered complete pages like regular computer browsers and had an in-built iPod (which served as an advanced mp3 player).

Marketing: The iPhone benefited from initial wide-spread hype through word-of-mouth after the Steve Jobs announcement in January 2007 and subsequent Apple marketing that helped create an aura around the product. Apple has been largely successful in continuing its marketing effort by concentrating their advertising on particular items that are iPhone-specific (such as Siri in 2011) even though other smartphone vendors caught up and are now able to out-match the hardware capabilities of the iPhone.

Price Differentiation: Apple adjusted the iPhone's pricing strategy over the years to expand from its original premium market segment (with $499/$599[55] for 2 variations of the original iPhone in 2007 to Free/$99/$199/$299/$399[56] for 10 variations of thee iPhone 4S, 4 and 3GS in 2012 with a year contract). This price differentiation has helped increase the potential addressable market for the iPhone across both developing countries where lower average incomes but also in developed regions where the majority of customers are used to lower smartphone prices (due to carrier subsidization)

Application Store: The application platform store ("App Store") was released on iOS in 2008 and grown to host more than 585,000 applications. Apple was able to leverage this to introduce the iPod Touch in 2008 and iPad in 2010.

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[54] Stephane Dion, "Official iPhone Release Date: June 29, 2007", iPhone Freak, June 3 2007, http://www.iphonefreak.com/2007/06/official_iphone.html, accessed April 2012.
[55] John Gruber, "The iPhone's Funny Price", Daring Fireball, May 1, 2007, http://daringfireball.net/2007/05/iphones_funny_price, accessed April 2012.
[56] AT&T, "AT&T iPhone Pricing Page", April 2012, http://www.wireless.att.com/cell-phone-service/packages/iphone-packages.jsp?priceDropDown=-totalPrice%2C%2Bskultem.marketingSequence%2C%2Bskultem.parentProduct.displayName, accessed April 2012.

iPhone and iPad running iOS[57]

As seen above, Apple has a dominant position in terms of profits as it accounts for 73% of profits in the smartphone industry. It was also until recently the largest global smartphone seller when it overtaken by Samsung as seen in the chart below[58] and iOS is the second largest share of the US smartphone market after Android[59].
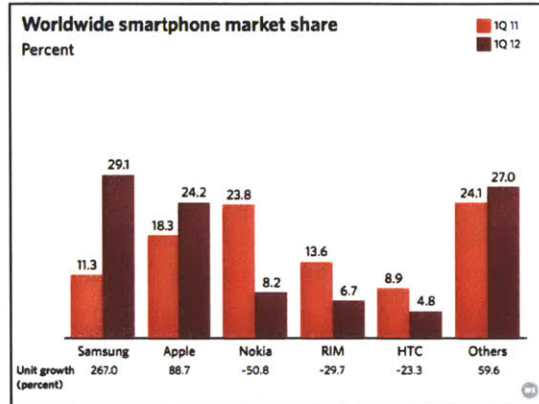
Apple is the second largest global smartphone seller

Top Smartphone Platforms
3 Month Avg. Ending Mar. 2012 vs. 3 Month Avg. Ending Dec. 2011
Total U.S. Smartphone Subscribers Ages 13+
Source: comScore MobiLens

	Share (%) of Smartphone Subscribers		
	Dec-11	**Mar-12**	**Point Change**
Total Smartphone Subscribers	100.0%	100.0%	N/A
Google	47.3%	51.0%	3.7
Apple	29.6%	30.7%	1.1
RIM	16.0%	12.3%	-3.7
Microsoft	4.7%	3.9%	-0.8
Symbian	1.4%	1.4%	0.0

iOS has the second largest share of the US smartphone market

[57] William Appleyard, "What's The Difference Between an iPad and an iPhone?", Gizmos for geeks, May 28 2011, http://www.gizmosforgeeks.com/ipad-iphone-differences, accessed April 2012.
[58] Chris Foresman, "Samsung, Apple continue smartphone market share tug-of-war", Ars Technica, May 2 2012, http://arstechnica.com/gadgets/news/2012/05/samsung-apple-continue-smartphone-marketshare-tug-of-war.ars, accessed May 2012.
[59] Jon Fingas, "ComScore: Android tips the 51% mark in US share, iPhone nips its heels with 31%" Engadget, May 1 2012, http://www.engadget.com/2012/05/01/comscore-us-smartphone-share-march-2012/, accessed May 2012.

Similar to Google, Apple is in a strong market position but still has some challenges that may be impairing its ability to have an even larger market impact:

PROBLEM 1: LITIGATION SCOPE

Apple is currently embroiled in number of litigation battles with competing phone manufacturers (such as Samsung, Nokia, Motorola and HTC) and other corporations such as Kodak and Elan. In the case of competitor lawsuits, Apple's strategy has been to file claims against its rivals to get competing products taken off the market and it has achieved mixed success so far (for example the Samsung Galaxy Tab was redesigned after it was banned in Germany for copying the iPad 2's design[60]). As litigation in the mobile industry expands and Apple continues to play a key role in the process, it may be beneficial to explore whether a modification of their current strategy is warranted. Apple' sections to modify its scope of litigation include:

A. Continue and expand litigation against other hardware manufacturers: Even though the results of the current litigation strategy has been mixed, it can be argued that Apple's strategy has served as a major deterrent to competitors that would otherwise have infringed on its patents. Apple may even decide to expand its efforts to reach an even wider range of competitors as it may be only one breakthrough ruling away from starting to achieve an increase in favourable rulings.

Disadvantages of this approach are the time, financial and employee distraction costs associated with increased litigation.

B. Reduce litigation against other hardware manufacturers: Since litigation against other manufacturers has not been entirely successful, it is also possible to also consider reducing litigation attempts to reduce costs and distractions associated with lawsuits. This option would reduce the media spotlight accompanying cases and allow Apple to concentrate on creating quality products and services.

The main disadvantage of this approach is that it has the potential to cause an increase in infringement of Apple's patents.

Based on the benefits and costs of both suggestions, it is preferable for Apple to adopt the first choice and increase its current litigation strategy to a wider set of competitors to act as a deterrent for future infringement. Additionally, Apple's strong financial position reduces the importance of some of the financial costs associated with this choice.

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[60] Don Reisinger, "Samsung Galaxy Tab 10.1 banned from sale in Germany", CNET, September 9 2011, http://news.cnet.com/8301-13506_3-20103827-17/samsung-galaxy-tab-10.1-banned-from-sale-in-germany/, accessed May 2012

PROBLEM 2: LITIGATION APPROACH

Apple has the following options as it decides whether to modify its current litigation approach:

A. Maintain litigation strategy to ban sales of infringing devices

Apple's first choice is to continue with its current approach and focus on getting specific devices banned from markets. The advantage of this approach is that Apple can target specific high-profile products as the focus of its lawsuits and create a negative aura around the products.

The main disadvantage of this approach is that Apple does not receive any revenue even if cases are successful and lead to the sales bans.

B. Modify litigation strategy to obtain license fee rather than banning device sales

A switch to a licensing strategy (similar to what Microsoft has done) from its current strategy might be a more effective strategic route to take in the future. The primary reason for this recommendation is that Apple has been thus far largely unsuccessful in getting rival phones banned due to the lengthened and uncertain nature of the court process while a licensing strategy on the other hand would enable Apple to economically benefit directly from Android's growth. In addition to this benefit, licensing would serve as a strong disincentive to Android developments as manufacturers would now have to pay fees to both Microsoft and Apple.

Disadvantages of this approach are that it could push manufacturers to support Windows Phone and that it could cause Android manufacturers to feel infringe on the visual aspects of iOS because that they have licence protection from Apple and lead to reduction in its iOS' distinctiveness and competitive advantage.

Based on the comparison of both options outlined above, it would seem that Apple would benefit more from switching to a litigation strategy to obtain license fees from infringements. However considering that Apple continues to opt for the earlier option may mean that it considers the financial benefits of the latter option less important than the financial benefits that a licensing strategy would bring.

PROBLEM 3: MOBILE OPERATORS RELATIONSHIP

Apple was the first hardware manufacturer to wrestle significant power away from mobile operators. It was not only able to keep the iPhone free of carrier branding but also able to negotiate a data revenue sharing agreement with AT&T[61] (though this was subsequently dropped during the release of the iPhone 3G in 2008[62]) and the ability to deliver updates directly to customer (before the iPhones, carriers usually

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[61] Aidan Malley, "iPhone, AT&T revenue to highlight Apple's fiscal fourth quarter", Apple Insider, October 17 2007, http://www.appleinsider.com/articles/07/10/17/iphone_att_revenue_to_highlight_apples_fiscal_fourth_quarter.html, accessed May 2012
[62] Dan Moren, "Apple and AT&T drop revenue sharing, boost data plan costs", MacWorld, June 9 2008, http://www.macworld.com/article/1133841/att_dataplan.html, accessed May 2012

authorized updates). As Apple has expanded iPhone availability to a wide range of mobile operators it has been able to maintain this level of influence with reports claiming that Sprint currently pays Apple subsidies of $200, 40% higher than other smartphones, for each iPhone sold[63] and made a massive commitment of $15.5B[64] over four years to offer the iPhone to its subscribers.

Apple's growing influence has caused operators to take actions to redistribute power to other hardware manufacturers and operating systems. This was most clearly seen in Verizon Droid's campaign which was orchestrated because Verizon was losing customers to AT&T due to its exclusive Apple contract and wanted to create a viable alternative[65]. This campaign ended up being successful and is widely attributed as being one of the main reasons for Android's success today. There have been recent rumblings from operators that they are dissatisfied with the amount of power held by Android and are willing to take steps to dilute their power. Key examples of this are with AT&T push during the Nokia Lumia 900 launch and Verizon's media comments stating that they are willing to work with Microsoft to build a "third ecosystem"[66].

As a result, it is critical that Apple consider defensive strategies to maintain the balance of power as mobile operators take steps to reduce its influence. Possible alternatives to consider include:

A. Maintain status quo and make no changes to operator relationship

Apple's first choice is to continue with its current operator relationship style and continue to find ways to get the best deal for itself and extract maximum value from their joint agreements. The main disadvantage of this approach is that it does not address the problem and leaves operators free to execute plans that may be detrimental to the future success of iOS.

B. Form closer ties with operators:

Apple may begin to make a more concerted effort to develop its relationship with carriers to reduce the likelihood that these carriers will partner with rival manufacturers. The primary disadvantage of this alternative is that operators may still go ahead with their plans regardless of the relationship level. Furthermore, Apple may already have a very strong relationship with operators and the incremental benefit from working to improve this may be very small.

Although the first scenario seems destined to have longer term repercussions, it may still be in Apple's best interest to follow that option as the second alternative may still lead to a situation where operators still take measures to reduce Apple's dominance.

[63] Siddharth Cavale, "Sprint CEO to take pay cut as iPhone costs pinch", Reuters, May 4 2012, http://www.reuters.com/article/2012/05/04/sprintnextel-brief-idUSL4E8G460I20120504, accessed May 2012
[64] Zach Epstein, "Sprint says iPhone deal is worth $15.5 billion", BGR, October 27 2011, http://www.bgr.com/2011/10/27/sprint-says-iphone-deal-is-worth-15-5-billion/, accessed May 2012
[65] Seth Weintraub, "Verizon's Droid Campaign Attacks iPhone", PC World, October 19 2009, http://www.pcworld.com/article/173896/verizons_droid_campaign_attacks_iphone.html, accessed May 2012
[66] Kevin Parrish, "Verizon: We'll Push Windows Phone Like We Push Android", Tom's Guide, April 20 2012, http://www.tomsguide.com/us/Verizon-Windows-Phone-Fran-Shammo-DROID-Android,news-14900.html, accessed May 2012.

In addition to the corrective actions listed above, Apple may also employ the following general strategies:

Innovation and Ecosystem Protection: First and most foremost, Apple should continue to focus on release of new innovative products and services. In particular, it should strive to create or acquire specific software (or hardware) features that are unlikely to be immediately copied by competitors and can be used as marketing tools to drive sales. An example is this is the Siri on the iPhone 4S.

Supplier Employee Welfare: Apple should take steps to increase the conditions of their suppliers' employees to avoid potential media backlash and a Nike-scale scenario. There have already been some close brushes that have created negative publicity for Apple and has the potential to become a larger problem if Apple does not take early proactive steps to tackle the problem.

Price reduction but margin maintenance: Since consumers in developing countries are particularly price sensitive, Apple's strategy could be to find ways to maintain their margins while increasing the volume of phones sold. Since lowering prices will lower margins and may have an adverse impact on Apple's image as a luxury brand, other steps to reduce cost inputs and maintain margins should be taken. Cost taking measures could include logistics network development and supply chain optimization are two areas that Apple can consider.

Specific iPhone model: Apple to-date has not made any version of its iPhone to specifically fit the needs of developing nations and has instead sold the same versions of its phones sold in developed markets. Therefore it may be worth investigating whether a specifically created iPhone version will contribute to a net benefit or have a detrimental impact on profitability. Apple already has some experience in this as it currently sells the iPod Touch for about $400-$500 less than the equivalent iPhone version (iPod Touches currently sell for $199/$299 while unsubsidized iPhones sell for about $599/$699).

Developer support: Apple should team up with local developers to help create specific apps that will match the needs of local citizens in. Since Apple has shown its willingness to acquire smaller companies in the past, it may be possible to go through this route if it proves difficult to find common agreements with local developers. Alternatively Apple may look to cultivate an ecosystem where developers find it favourable to create iOS applications that solve local needs rather. This may be achieved by help sponsor competitions or through other similar financial incentives.

Partner for subsidies: Apple may also find a partner that is willing to pay a portion of the price of the phone enabling customers to be offered a lower price and Apple to keep their margins. This model will be similar to the cost subsidy model that is widely used in America allowing customers to pay very low prices (usually from free to $199) for phones that cost anywhere from $599 to $699 unsubsidized. In the USA, the most common partners used for these subsidies are telecom providers but it may be difficult to use a similar model in regions where it is not the accepted norm. As a result, finding the appropriate partner may represent the most difficult aspect of this recommendation. Examples of potential partners may be large multinational firms who wish to develop their presence in developing regions. In return for

subsidizing the phones, these companies may receive direct product placement/advertising on the iPhones interface or be part of promotions and marketing campaigns,

The biggest potential problem may be that Apple has not typically been involved in similar partnerships in the past. In particular, Apple has not yet compromised on its iOS interface to include direct third party elements that may be classified as advertisements and their inclusion may be perceived as going against iOS "clean" image.

To mitigate this and other issues, a thorough market analysis should be performed to ensure the arrangement to make sure it is beneficial to both parties and will not have an adverse effect on iOS brand. Additionally, smaller limited scale pilots could be undertaken before a full roll-out is completed to ensure that any potential problems can be solved and handled more efficiently without causing any larger scale problems. These pilots can be carried out in markets where lower income levels may be one the primary reasons that Apple does not yet have a major foothold, have relatively high populations and already have a large basic cell phone user base. These markets therefore have potential to become large Apple userbases in the future. Since market analysis may not be able to confidently consumer behaviour and attitudes, this recommendation should be approached carefully.

WINDOWS PHONE (MICROSOFT)

Although Windows phone was officially publically unveiled in Feb 2010 and released later in October of that year, Microsoft has had extensive experience creating mobile operating systems with Windows Mobile. Windows Mobile was originally released in 2001 and licensed to hardware manufacturers for a license fee of about $8-$15[67]. It experienced a fair degree of success as its sales grew and functionality increased in the mid-2000s. However the introduction of the iPhone OS and Android, Widows Mobile sales suffered and began to lose traction in the market due to a number of factors including:

1. The core operating system was originally developed for use with a stylus and as a result many parts of the interface contained legacy components that were difficult to navigate with the use of a finger which caused frustration among many users.

Navigation in Windows Mobile was designed for a stylus[68]

2. The navigation issues highlighted above were compounded by the fact that almost all Windows Mobile phones had resistive screens (screens that function through applied pressure) which worked relatively well with a stylus but were more difficult to navigate with fingers than capacitive screens (screen that react to the electrical conductivity in the user's fingers) that were used by iPhones and the majority of Android handsets.

3. Negative perception with many users due to a poor experience with older Windows Mobile versions, lack of a polished user interface, perceived steep learning curve, not as user-friendly as competitors and poor media reception to the release of new handsets running Windows Mobile[69].

4. Difficulty in finding applications and perceived lack of applications: While iOS and Android had application stores that allowed users to easily find programs they needed, Windows Mobile did not originally have this functionality built-in meaning that users needed to find the applications they needed and install them by themselves.

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[67] Ewan MacLeod, "Would you pay $15 for a Windows Mobile license?", Mobile Industry Review, October 1 2008, http://www.mobileindustryreview.com/2008/10/would_you_pay_15_for_a_windows_mobile_license.html, accessed April 2012.
[68] Jonathan Nalder, "Windows Mobile menu", flickr, August 11 2006, http://www.flickr.com/photos/jnxyz/212388727/, accessed April 2012.
[69] John Herrman, "HTC Touch HD2 Review: A Tragedy", Gizmodo, November 9 2009, http://gizmodo.com/5400593/htc-touch-hd2-review-a-tragedy, accessed April 2012.

The store named, Windows Marketplace for Mobile, was eventually introduced in October 2009 but did not gain traction and only had about 2,000 applications compared to hundreds of thousands of iOS and Android. As a result, many users assumed that Windows Mobile had few applications compared to its competitors even though there were thousands available on the internet that were not in the application store.

5. Technological advancements in the early and mid-2000s made it difficult to handsets with the required level of functionality needed to run Windows Mobile efficiently. Windows Mobile gained a reputation for crashing and freezing which was hard to shake off later in its life cycle.

6. Finally and as stated above, Microsoft charged handset manufacturers a fee of about $8-$15 to use Windows Mobile on their handsets while Google gave away Android for free (and in fact had revenue sharing agreements with hardware partners and carriers for user searches made using Google services[70]) .

Year	Marketshare
2004	11 3%[70]
2005	17%[70]
2006	37%[71]
2007	42%[71]
2008	27%[71]
2009	15%[71]
2010	7%[71]
2011	3%[71]

As a result, Windows Mobile saw its market share decline[71] and Microsoft announced that they would be re-starting their mobile strategy with the release of Windows Phone in the fall of 2010[72]. Windows Phone represented a change in strategy from Microsoft as it was built with an increased focus on the customer experience[73] and a completely revamped user interface focused on simplicity named Metro. Windows Phone 7 is incompatible with its Windows Mobile and there were no official upgrade path for devices running the last version.

Microsoft initial launch partners included HTC, Samsung, Dell and LG; this was later extended to include Nokia, ZTE, Fujitsu and ZTE. The Nokia partnership, announced in February 2011, was of particular importance because Nokia was losing its relevance in the smartphone market as a result of the underperformance of its Symbian OS and needed to form an allegiance with either Microsoft or Google as the development on its Symbian successor (Meego) was too far behind schedule to have a significant market impact.

Despite this partnership and general early positive reviews and awards[74], Windows phone has been unable to gain significant traction in the market and its market share has hovered between 1-2%[75] in the US and around 1%[76] globally.

[70] Tricia Duryee, "Android's Secret Sauce? Google's Advertising Rev-Share Deals With Carriers", Paid Content, March 26 2010, http://paidcontent.org/2010/03/26/419-androids-secret-sauce-googles-little-known-advertising-rev-share-deals/, accessed April 2012.
[71] Wikipedia, "Windows Mobile", http://en.wikipedia.org/wiki/Windows_Mobile#Market_share, accessed April 2012.
[72] Sean Hollister, "Microsoft prepping Windows Phone 7 for an October 21st launch", Engadget, September 26 2010, http://www.engadget.com/2010/09/26/microsoft-prepping-windows-phone-7-for-an-october-21st-launch/, accessed April 2012.
[73] Joe Belfiore, "Get Ready for 60% More Potential Customers", The Windows Phone Developer Blog, February 27 2012, http://windowsteamblog.com/windows_phone/b/wpdev/archive/2012/02/27/get-ready-for-60-more-potential-customers.aspx, accessed April 2012.
[74] Tom Warren, "Windows Phone wins IDEA 2011 – people's choice design award", Winrumors, September 18 2011, http://www.winrumors.com/windows-phone-wins-idea-2011-peoples-choice-design-award/, April 20,2012
[75] Nielsen Wire, "More US Consumers Choosing Smartphones as Apple Closes the Gap on Android", January 18 2012, http://blog.nielsen.com/nielsenwire/consumer/more-us-consumers-choosing-smartphones-as-apple-closes-the-gap-on-android/, accessed April 2012.
[76] China Tech News, "Nokia trying to take advantage of Lumia challenge Apple's hand operators develop", March 29 2012, http://www.cntechnews.info/nokia-trying-to-take-advantage-of-lumia-challenge-apples-hand-operators-developer/, accessed April 2012.

Global smartphone penetration at 27%
Mobile Handset Manufacturer vs. Platform Market Share (H1 2011)
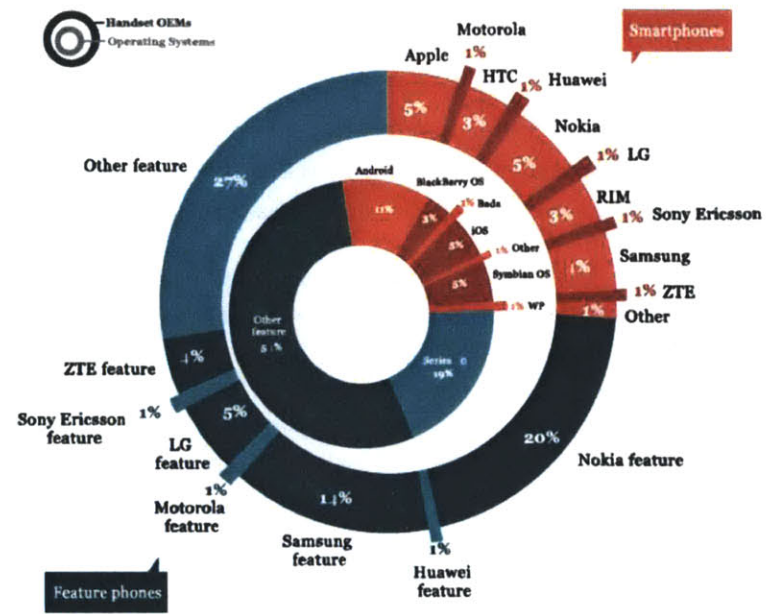
Windows Phone has been unable to achieve significant adoption since its release[77]

As a result, Microsoft is currently in a relatively weak position in the smartphone industry but may be able to take certain steps that Microsoft can take to improve its situation as the smartphone market expands:

PROBLEM 1: LACK OF CUSTOMER EXPOSURE

One of the main issues facing Windows Phone is that many customers are very familiar and readily recognize the iPhone and to an extent an Android Phone (generally called "Google Phones" or "Droids"), however these customers are less aware of Windows phones and how it differentiates itself from its competitors. This may be partly as a result of a combination of factors including (i) Windows Phone being the latest OS released (2010 vs. 2007 for iPhone and 2008 for Android), (ii) has a much smaller install base than either iOS and Android, (iii) Windows Phone marketing is not as widespread and impactful as IOS and android marketing and (iv) is not actively "pushed" by the influential carriers (such as AT&T and Verizon) in pre-paid regions (where most customers buy their handsets from their mobile carriers) and as a result sales representatives are recommend iOS and Android handsets instead as the representatives are not aware of the merits of Windows Phone.

Some of the strategic alternatives Microsoft can take to solve this major problem include:

(A) **Continue as is**: This option would involve continue its current substantial efforts to market the Windows phone brand and increase customer exposure. Current marketing involves a steady stream

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[77] Ibid. 22

of advertising (as opposed to a concerted focused large scale campaign) and a recent push with Nokia during the release of the Lumia 900.
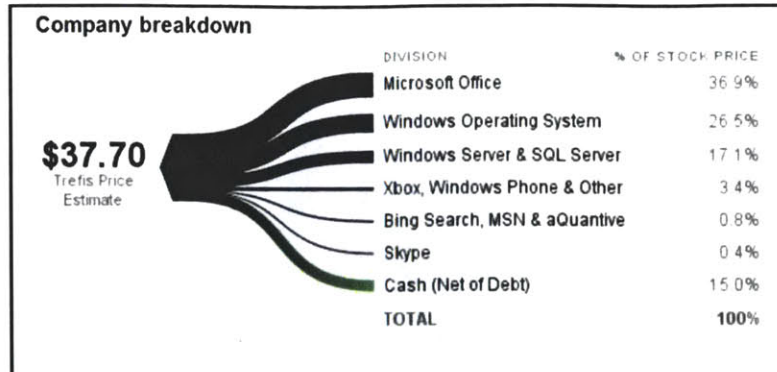

Recent marketing efforts have been substantial and have included a strong campaign for Nokia phones such as the Lumia 900 above[78]

(B) **Increase current marketing efforts and gradually build momentum till Windows 8 launch**: This option is likely to be more expensive than the first and could be potentially more successful. However since it involves "doing more of the same" and that Microsoft is already making a signifying marketing effort, it is uncertain whether there will be a substantial increase in customer awareness and whether this increase will translate to an increase in sales large enough to justify the implementation costs. This alternative is riskier than the first but has a higher potential pay-off if successful.

(C) **Launch a campaign that ties is in with Windows 8 launch and with other Microsoft products with mobile operators and hardware partners**: This option is the most expensive, the riskiest and the most difficult to implement because it not only involves bringing in other Microsoft products but also includes partnership which is likely to have its own set of alignment issues. One of the advantages of this approach is that there may some operational costs (due to overlap) saved by merging the two marketing initiatives. However, lumping Windows Phone with Windows 8 market may have a detrimental effect on the launch of Windows 8 (which could be a potentially uncertain launch because it is a significant departure from previous Windows versions and contains to be a hybrid UI (user interface) offering options both for tablets and traditional desktop use).

Microsoft is currently in a poor position in the smartphone race with the potential to deteriorate further and get even worse. It may not have another chance to make the necessary dent in this expanding market that is poised to take off and there is a significant risk as phones may eventually overtake the PC market (Microsoft's "home turf").

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[78] TechnoMarket, http://technomarket.org/wp-content/uploads/2011/12/Nokia-Lumia-900.jpg, accessed April 2012.

Company breakdown		
DIVISION		% OF STOCK PRICE
Microsoft Office		36.9%
Windows Operating System		26.5%
Windows Server & SQL Server		17.1%
Xbox, Windows Phone & Other		3.4%
Bing Search, MSN & aQuantive		0.8%
Skype		0.4%
Cash (Net of Debt)		15.0%
TOTAL		100%

$37.70 Trefis Price Estimate

The Windows division is estimated to contribute to as much as 26.5% of Microsoft's stock Price[79]

Moreover, it appears that customers, investors and the media are beginning to beginning to doubt whether Microsoft can pull off a winning mobile strategy after the poor performances of Windows Mobile, Microsoft KIN and Windows Phone 7. The mobile world is also a fast-changing sector where it is possible that today's heavyweight champions are tomorrow's failures and vice versa.

Consequently, it is recommended that Microsoft adopt the third strategy despite the inherent risk and embark one of the largest campaigns in its history because it needs to take such a drastic step to remain relevant in the industry. The proposed implementation of this option is outlined in detail below:

EXTENSIVE MARKETING CAMPAIGN AND FULL ECOSYSTEM TIE-IN WITH RELATED MICROSOFT PRODUCTS: Microsoft is already taking steps to use the Metro interface used in Windows Phone across its other products such as Xbox, Office 15 and Windows 8[80]. However as Windows is already a successful product with an established customer base, Microsoft may be able to leverage the launch of Windows 8 in the fall to roll-in a combined Windows Phone 8 (WP8) comprehensive marketing campaign. Microsoft should approach this campaign with the same focus and tenacity (company alignment and heightened sense of necessity) as they did during the Windows 7 launch after Vista failed to have the desired market impact.

The campaign should be focused on addressing the most common issues that customers face with Windows Phone namely quantity and quality of applications, handset availability across carriers, technical functionality and range of handset choice (suggested approaches to combat these deficiencies are outlined in the sections below). Another key component of the campaign that should be emphasized is Windows 8's ability to run Windows Phone 8 applications (this functionality is rumored but not yet officially confirmed by Microsoft and has the potential to be a key marketing tool if it is implemented). Considering the success of the Xbox, the campaign should also continue to not only emphasize the Xbox functionality of the phones as it has done but also the similarity with the interface as a way of increasing broad customer familiarity with Windows Phone 8.

[79] Trefis, https://www.trefis.com/company#/MSFT, accessed April 2012.
[80] David Goldman, "Microsoft's master plan to beat Apple and Google", CNN Money, April 17 2012, http://www.money.cnn.com/2012/04/17/technology/microsoft-windows-8/index.htm, accessed April 2012.

The leaked (and unconfirmed) features of Windows Phone 8 include[81,82,83]

A. Internet Explorer 10 (IE10) mobile
B. Increased shared components with Windows 8
C. Multi Core Processor and multiple screen resolution support
D. NFC support and USB Hub feature
E. MicroSD expansion support and New Camera API
F. Native code support for third party developers and App-to-App communication support
G. BitLoker encryption
H. DataSmart data usage monitoring and Wi-Fi hotspot detection in Local Scout

This alleged new set of functionality means that Windows Phone 8 will now match and in some places, surpass iOS and Android in functionality but previous experience with supposedly superior technology losing out (Nintendo DS vs. Sony PSP) shows that these improvements alone may be insufficient to bring success to the platform. Nevertheless, specific updates relevant to customers (IE10, screen resolution, Processors, MicroSD) and developers (native code, app-to-app communication) should be marketed towards both groups.

Microsoft should strive to position one or two specific customer-centric feature to be used for marketing purposes (similar to Apple's strategy with the retina screen on the iPhone 4 or Siri on the iPhone 4S).

As most of the growth potential is overseas, the marketing push should be on a global scale and not confined to developed regions. The specific components of the campaign in these regions should match the local tastes of the communities.

Finally, it may be beneficial for Microsoft to combine its marketing efforts with its partners to supplement and magnify the impacts its campaign and reach a wider audience. Partners who have the most likelihood to influence customer choice should be selected in various markets. For example in regions where most customers use post-paid phone plans, it is more likely that carriers have greater influence on customers choice of handsets and Microsoft should look to team up with the carriers to form joint marketing campaigns that could potentially reach wider audiences. Verizon/AT&T in America and China Mobile/China Unicom in China are prime examples that fall in this category. As iOS and Android establish themselves further and begin to gain a dominant foothold, telecoms are increasingly eager for there to be a third major player to give them more negotiating leverage[84] and Microsoft might be able to use this to convince them to join forces in the marketing campaign (including store shelf space and employee incentives to push Windows Phone).

[81] Paul Thurrott, "Windows Phone 8 Preview", Paul Thurrott's Supersite for Windows, February 2 2012, http://www.winsupersite.com/article/windows8/windows-phone-8-preview-142154, accessed May 2012.
[82] Evan Blass, "Exclusive: Windows Phone 8 Detailed", Pocketnow, February 2 2012, http://pocketnow.com/windows-phone/exclusive-windows-phone-8-detailed, accessed May 2012.
[83] Ibid. 73
[84] Brian X. Chen," Why AT&T and Verizon Are Rooting for Windows Phones", The New York Times, April 24 2012, http://bits.blogs.nytimes.com/2012/04/24/carriers-windows-phone/?hpw, accessed May 2012.

In the USA which is a critical market for Nokia, AT&T were partners in the marketing initiative behind the Nokia Lumia 900 (which was described as the biggest launch that AT&T had ever done[85]), thus it is possible that Microsoft may be able to expand their relationship with AT&T as a partner in this proposed wider campaign.

As mentioned above Verizon, who were responsible for the hugely successful Droid campaign, have also made media comments implying that they are willing to work with Microsoft to build a "third ecosystem"[86] and should definitely be considered as partners in the campaign (and may in reality already be working with Microsoft behind the scenes with Verizon to do this).

Although there may be some potential complications with working with both Verizon and AT&T simultaneously on the marketing campaign, it is possible to do so by segmenting advertising (for example for specific handsets) and Microsoft may be successful in accomplishing this by leveraging carriers' ever increasing fear of iOS and Android's dual dominance.[87]

Alternatively, in regions where customers mostly used pre-paid plans, it may be that hardware manufacturers have a significant influence on customer choice so Microsoft should team up with them to boost its campaign. A potential partner could be Nokia who has done notable work in India and several African markets.

PROBLEM 2: QUANTITY AND QUALITY OF APPLICATIONS

Another key recurring issue commonly associated with Windows Phone the supposed quantity and quality of apps available. As of April 3 2012, Windows Marketplace is the third largest smartphone application store has approximately 82,234 apps[88] compared to 585,000 and 500,000[89] on iOS and Android respectively. However this is expected as both app stores were opened years before and if a time-normalized comparison of the app stores is made by a considering the same time window after launch, then Windows Marketplace actually has more applications than Android but less than iOS (it took Windows Phone 14 months, Android 19 months and iOS 12 months to reach 50,000 apps respectively)[90].

Windows Phone has built a substantial amount of applications and is on track to surpass the 100,000 milestone by the end of May at the current growth rate of 10,000 apps per month. The store reached 40,000 apps after the first year, 50,000 apps 40 days after that, 60,000 apps 27 days after that and about

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[85] Roger Cheng, "AT&T promises biggest launch ever for Lumia 900", CNET, March 28 2012, http://news.cnet.com/8301-1035_3-57405796-94/at-t-promises-biggest-launch-ever-for-lumia-900, accessed May 2012.
[86] Kevin Parrish, "Verizon: We'll Push Windows Phone Like We Push Android", Tom's Guide, April 20 2012, http://www.tomsguide.com/us/Verizon-Windows-Phone-Fran-Shammo-DROID-Android,news-14900.html, accessed May 2012.
[87] Ibid. 75
[88] Rafe Blandford, "Windows Phone Marketplace passes 80,000 apps", All About Window Phone, April 3 2012, http://allaboutwindowsphone.com/news/item/14554_Windows_Phone_Marketplace_pass.php, accessed May 2012.
[89] Ibid. 16
[90] Rafe Blandford, "Windows Phone Marketplace passes 50,000 apps", All About Window Phone, December 27 2011, http://allaboutwindowsphone.com/news/item/13913_Windows_Phone_Marketplace_pass.php, accessed May 2012.

30 days to get to 70,000 and 80,000 apps which shows that there has a significant increase in recent months in app submissions implying increasing interest from developers.
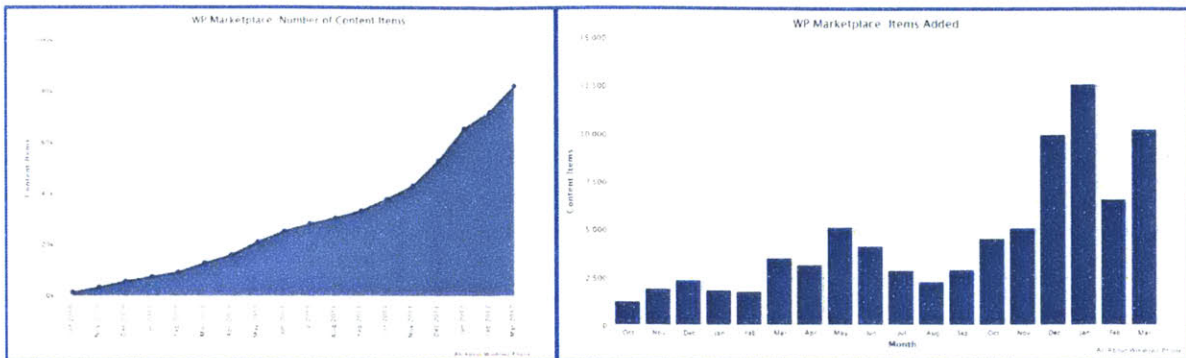
The number of marketplace applications has grown recently[91]

Another way to analyse Windows Marketplace is to check whether it contains popular applications that are available on other stores. The table below shows the results of a recent study to testing this by checking if the 20 most popular apps on Google Play and iOS were present in Windows Phone.[92]

App	On iOS?	On Android?	On Windows Phone?
Facebook	YES	YES	YES
Twitter	YES	YES	YES
Google+	YES	YES	-
Foursquare	YES	YES	YES
Instagram	YES	YES	-
Draw Something	YES	YES	-
Angry Birds Space	YES	YES	-
Infinity Blade II	YES	-	-
Modern Conflict 3	YES	-	-
Pandora	YES	YES	-
Spotify	YES	YES	YES
Kindle	YES	YES	YES
Dropbox	YES	YES	-
Skype	YES	YES	YES
YouTube	YES	YES	YES
Netflix	YES	YES	YES
Hulu Plus	YES	YES	-
Yelp	YES	YES	YES
Google Maps	YES*	YES	-
Gmail	YES	YES	-
*Google Maps powers the built-in Maps app on iOS devices, but is not available as a download from the iTunes App Store.			

Windows Phone does not have enough of apps popular present on rival app stores

Although this comparison is only limited to the top 20 applications and popularity is not necessarily a proxy for quality, this unscientific comparison shows that there is still some work to be done to bring more popular applications to Windows Phone to reach parity with its competitors.

In order to improve this problem, there are some strategy adjustments that Microsoft may consider including:

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[91] Ibid. 79
[92] Jaymar Cabebe, "Windows Phone Marketplace: Does it have the apps I need?", CNET, April 5 2012, http://www.cnet.com/8301-17918_1-57409565-85/windows-phone-marketplace-does-it-have-the-apps-i-need, accessed May 2012.

Developer support: Microsoft should continue its current strategy of encouraging developers to create Windows Phone apps by providing them with financial support, marketing assistance and premium spot placement in Widows Marketplace[93]. This should not only continue but be intensified that the most popular applications are present at the release of Windows 8 and to coincide with the campaign described above.

Furthermore, some game developers have complained that they are not currently able to access native code and have to use XNA Game Creator tools leading to a complete re-write of the application. This problem will be remedied with the release of Windows Phone 8 which will support native code[94,95].

In addition to this Microsoft should continue to expand and develop its application porting tools for Android, iOS and Symbian that were released last year[96]. It may be possible to use this expansion and added functionality as part of the campaign (and coincide with the Windows Phone 8 launch) to attract a more developers.

Nintendo Partnership: A potential avenue that Microsoft may investigate is to approach Nintendo for an exclusive licensing arrangement. The agreement would entail Nintendo making its huge portfolio of handheld game titles exclusive to Windows Phone. Nintendo has had a very successful history of handheld consoles Game boy (GB), Game boy advance (GBA) and DS which have sold a total of 118M, 82M, 151M[97] models respectively. These consoles have spawned an enormous range of popular titles including Super Mario world, Mario Kart, Pokémon, Nintendogs, Brain Age and The Legend of Zelda. Thus, if Microsoft is able to secure an exclusive agreement to bring these titles to Windows Phone then it would represent a major coup that would go a long way to bring consumer attention to the platform. Furthermore, it may also be useful to investigate whether Nintendo's non-handheld consoles such as the NES, SNES, Nintendo 64 and GameCube could be included as part of the agreement (Sony's handheld console, the PlayStation PSP, was able to emulate PlayStation 1 games so it may be possible to technically achieve a similar feat on Windows Phones).

Nintendo announced its first ever annual loss[98] and has been faced with increasing pressure as customers have begun a large transition[99] to playing shorter span easily consumable games on their phones and away from more comprehensive and longer games on dedicated handheld consoles such as Nintendo's recently released 3DS[100].

[93] Jenna Wortham and Nick Wingfield, "Microsoft Is Writing Checks to Fill Out Its App Store", The New York Times, April 5 2012, http://www.nytimes.com/2012/04/06/technology/to-fill-out-its-app-store-microsoft-wields-its-checkbook.html?_r=1, accessed May 2012.
[94] Jon Jordan, "Windows Phone will support native code, but only when Windows Phone 8 is released", Pocketgamer, Nov 7 2011, http://www.pocketgamer.biz/r/PG.Biz/Windows+Phone/news.asp?c=35015, accessed May 2012.
[95] Suror, "Blackberry Playbook gets Angry Birds Space before Windows Phone", WMPoweruser, April 24 2012, http://wmpoweruser.com/blackberry-playbook-gets-angry-birds-space-before-windows-phone, accessed May 2012.
[96] MSDN, "Porting Your Application to Windows Phone", March 22 2012, http://msdn.microsoft.com/en-us/library/hh394031(v=VS.92).aspx, accessed May 2012.
[97] Nintendo's Consolidated Sales Transition by Region, March 2012, http://www.nintendo.co.jp/ir/library/historical_data/pdf/consolidated_sales_e1203.pdf, accessed May 2012.
[98] CBS News, "Nintendo reports first ever annual loss", April 26 2012, http://www.cbsnews.com/8301-501465_162-57421806-501465/nintendo-reports-first-ever-annual-loss, accessed May 2012.
[99] Vlad Savov, "By the numbers: in portable gaming, Nintendo's loss is Apple's gain", The Verge, April 26 2012, http://www.theverge.com/2012/4/26/2976735/nintendo-sales-stats-handheld-gaming-report, accessed May 2012.
[100] Kyle Orland, "Nintendo plays catch-up, will offer downloadable versions of 3DS, Wii U retail games", Arstechnica, April 27 2012, http://arstechnica.com/gaming/news/2012/04/playing-catch-up-nintendo-to-offer-downloadable-versions-of-3ds-wii-u-retail-games.ars, accessed May 2012.

Despite this market shift, Nintendo do not have any plans to manufacture a smartphone and may instead be exploring future opportunities of releasing their games on the available platforms. Since Windows Phone is currently far behind iOS and Android both in market share and number of apps, it is likely that the platform would receive little to no consideration if Nintendo were to go down this route. This eventuality could cripple Microsoft's chance of resurgence in the mobile market and further widen the gap between it and its competitors. Therefore a move by Microsoft to secure this agreement would not only benefit it by securing exclusive content and increasing awareness for Windows Phone but also eliminate the possibility of its competitors getting the content and enable Nintendo to profit from the growing smartphone sector.

Finally, as the Windows platform has the largest number of developers and available to it, it may be possible to investigate methods by which Windows Phone can benefit from its older sibling's success. As seen from the rumors above, Microsoft may already be planning to do this by sharing many components between the two platforms but the ultimate way to achieve this would be to enable applications made for either platform fully supported by the other (accounting for differences in hardware and other such provisions). By doing this, Windows Phone would be able to hugely capitalize on the potentially huge amount of developers making applications for Windows 8 (which has a complete touch Metro interface that is very similar to Windows Phone and is designed for tablet use). Additionally, since current Windows Phone applications would be able to work on Windows 8, current (and future) Windows Phone developers would immediately be exposed to a much larger customer base that would increase their revenues, their likelihood of further development and therefore increase general interest in the platform as the potential to realize huge returns due to this larger customer pool would be increased for all developers. Although there may be some significant technical barriers that prevent this from occurring in the form described above, it is imperative that Microsoft should make a concerted effort to take the necessary steps to bring this to fruition as this strategic move is a specific competitive advantage not available to its rivals - Apple's Max OS X as significantly less desktop OS market share (90% vs. 6%) than Windows and cannot run iOS apps while Google's Chrome OS has minimal desktop OS market share (less that 0.1%) and is unable to run android apps.

Acquisition of Development studios: One of the crucial components of Microsoft's Xbox strategy in the game console market was the acquisition of high potential development teams that enabled Microsoft to gain in-house talent that produced games exclusive to the Xbox. Two notable examples are Rare (creators of *GoldenEye 007* and *Banjo-Kazooie* on the Nintendo 64 and Bungie (creators of the Halo Series). These along with other acquisitions helped the Xbox differentiate itself and have exclusivity on titles that would otherwise have been made for only the PlayStation or available on all other platforms and helped tip the scale to help Xbox 360 match PlayStation 3 as the console of choice for many gamers across the world. Microsoft should consider extending this strategy to the smartphone sector by acquiring development teams that have either have a history of making popular games on phones or have the potential to make hit games. If acquisitions prove to be difficult, then partnership agreements such as exclusivity could also be explored to achieve similar results.

PROBLEM 3: CARRIERS HAVE A LIMITED SELECTION OF WINDOWS PHONE AVAILABLE

This is another reason for the low penetration of Windows phone in developed markets where pre-paid plans are prevalent (particularly the USA which is currently Windows Phones primary market). This problem is most likely to be best reduced by working closer with carriers which is an extension of the approach described in the marketing campaign above[101]. In addition to the points already mentioned above, specific agreements to boost availability and sales in stores such as store shelf visibility, promotions and personnel training should be adopted to boost visibility and better enable customers to be aware of Windows phones.

PROBLEM 4: UPGRADEABILITY CONCERNS

Another common Windows Phone complaint is the lack of transparency around the software update processes. Currently, OS updates are performed and delivered by Microsoft but wireless carriers have the ability to block updates (for a single cycle)[102] and this has led to situations where many customers are dissatisfied because they are not able (or have to wait for a long time) to get the latest updates with new features that would enhance their phone experience.

Additionally, several news sites have carried articles about the upcoming Windows Phone 8 creating some excitement among current Windows Phone users and future potential users. However Microsoft has not yet made any statements clarifying the upgrade process and whether current Windows Phone users will be eligible to upgrade to the new version of the OS when it is released. This has led to a situation where customers (and the media) are apprehensive about buying new phones[103] as they are apprehensive about purchasing new handsets that may become significantly less attractive in some months' time when Windows Phone 8 is released.

In order to solve the first problem of late updates, it may be beneficial for Microsoft to adopt a strategy similar to the one employed by Apple and deliver updates directly to the customers itself. This would improve customer satisfaction, drastically reduce the amount of time needed for customers to get updates and create a noteworthy advantage over Android which has suffered from substantial delays in updates from Google getting to the end-users. Interestingly, Microsoft originally announced their intention follow this update route but changed its approach closer as the release date of Windows Phone approached[104].

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[101] Mike Feibus, "Windows Phone will gain serious market share this year", Betanews, April 24 2012, http://betanews.com/2012/04/21/windows-phone-will-gain-serious-market-share-this-year/, accessed May 2012.

[102] Paul Thurrott, "The truth about Windows Phone 7, software updates, and carriers' ability to block those updates", Windows Phone Secrets, November 11 2010, http://windowsphonesecrets.com/2010/11/11/the-truth-about-windows-phone-7-software-updates-and-carriers-ability-to-block-those-updates/, accessed May 2012.

[103] Andy Ihnatko, "Microsoft: Take care of Windows Phone owners!", Chicago Sun Times, April 24 2012, http://www.suntimes.com/technology/12105262-478/microsoft-dont-let-down-current-windows-phone-owners.html, accessed May 2012.

[104] Arnoud Wokke, "Microsoft talks Windows Phone 7 features, native code, multi-tasking and update process", Mobile Tech World, sApril 11 2010, http://www.mobiletechworld.com/2010/04/11/microsoft-talks-windows-phone-7-features-native-code-multi-tasking-and-update-process/, accessed May 2012.

To solve the second problem about negative perception due to ambiguity of future OS upgrades, Microsoft should consider adopting a more transparent communication channels with its customers and the press. For example, it may currently be Microsoft's best interest to let current users or potential buyers of the Nokia Lumia 900 (which was recently released as described above) whether or not their phones will be upgradeable to Windows Phone 8 which is likely to be released in some months over the fall. In the future, it may be beneficial for Microsoft to adopt a strategy whereby it gives guarantees on the upgrade schedule of phones. For example, phones will be able to receive upgrades to the latest version of the OS for 18-24 months after they are released. This may be quite difficult to achieve on a global basis but should be investigated on at least on a regional or specific phone model basis. It would act as a great marketing tool, create a notable advantage over its competitors (iPhones are usually upgraded to newer versions of iOS for up to 2-3 years but do not have a clear upgrade schedule and Android phones have a bad reputation and have derided in the press about their poor upgradeability and give the platform heightened credibility among its current customer and the media.

In addition to the strategic changes to solve perceived problems with the platform above, Microsoft may also consider implementing the following to boost the global adoption of Windows Phone:

EXPAND PATENT LITIGATION

Microsoft has been very successful in its patent litigation and currently collects licensing fees from hardware manufacturers who account for over 53% of the total Android sales in the USA.
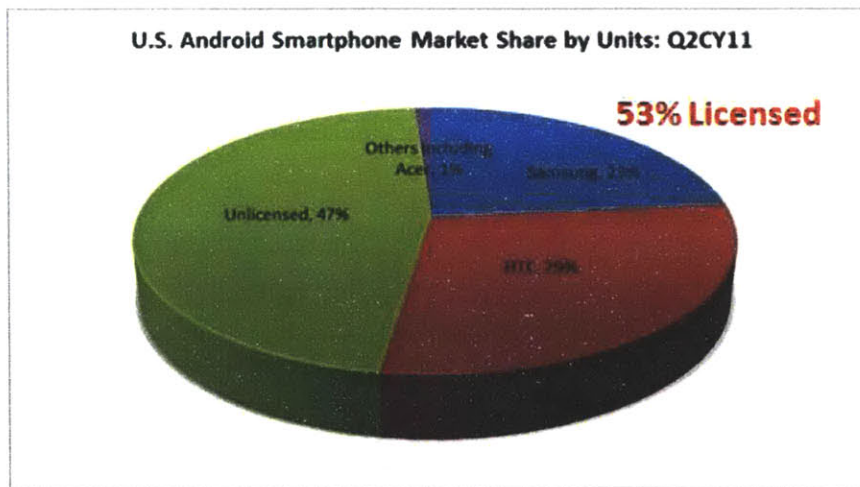
Microsoft obtains licensing fees from a significant proportion of Android manufacturers[105]

[105] Brad Smith and Horacio Gutierrez, "Microsoft's New Patent Agreement with Compal: A New Milestone for Our Android Licensing Program", Technet, October 23 2011, http://blogs.technet.com/b/microsoft_on_the_issues/archive/2011/10/23/microsoft-s-new-patent-agreement-with-compal-a-new-milestone-for-our-android-licensing-program.aspx, accessed May 2012
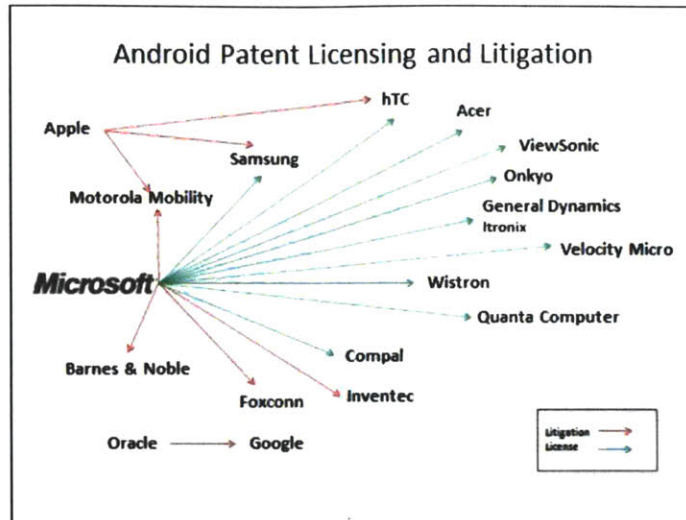
Microsoft has successfully turned many of its litigation efforts into licensing agreements[106]

As a result, it is recommended that Microsoft continue and expand its litigation efforts to obtain fees from an even larger segment of manufacturers. Licensing revenue may then be redirected to be used on various Windows Phone initiatives.

INCREASED FOCUS ON ENTERPRISE SEGMENT IN DEVELOPED MARKET

As most of the proposed initiatives above are directed towards the consumer segment it might also be useful for Microsoft to continue to take measures that target the enterprise customer segment. Windows Mobile was widely used by corporations so it may be possible for Microsoft to find effective ways to leverage these extensive client relationships to encourage them to adopt Windows Phone as their next platform. This is a particularly salient point as businesses today are beginning to move away from the previously dominant Blackberry platform and towards iPhones and Android devices. It is therefore a key period to find ways to capture these corporations who are more likely to remain loyal to the platform of their choice over the long-term (corporations tend to stick with the "tried and trusted" than everyday consumers may be more likely to follow trends).

Some ways in which Microsoft may achieve this are by including more enterprises specific functionality (this seems to be already be considered as enterprise functionality are some the prominent features of Windows Phone 8), encouraging creation of enterprise application in its application store (this follows the same route as detailed above particularly the section about the acquisition of key developer talent

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[106] Ibid. 107

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in these areas where specific external talent is needed) and finding ways to offer pricing discounts or bundle packages for purchases of Windows 8 and Office 15 (assuming the absence of antitrust issues).

INCREASED DEVELOPING MARKET (PARTICULARLY CHINA) FOCUS

It is also critical that Microsoft continue to focus on developing markets as it executes its mobile plan particularly as the attractiveness of the sector is based on the upcoming growth from these regions. China, with over 1 billion mobile subscribers[107], is set to overtake the USA and become the home of number of smartphone users in the world[108]. Apple and Android are already taking advantage of this growth and it is therefore a market that Microsoft should pay particular attention to in the near future. Furthermore, Microsoft should leverage its previous experience and work with its partners to focus on the creation of specific features to match developing markets needs and concerns. An example of a potential partner which has experienced success in developing regions is Nokia. Among many other notable innovations, Nokia provides Indian farmers with instant pricing information[109] that reduced the influence of middlemen who were benefitting from informational asymmetry (this example is particularly interesting as it highlights a social benefit as well as a feature that was made specifically to cater to a local need).

Since price is the major driving force behind purchases in developing markets, it is imperative that Microsoft adopt measures to reduce the cost of ownership to users (Android handsets can be priced as cheaply as $150-$250 in some markets while Windows Phones are still $300-$400 range). Microsoft has already taken the first step by the release of Tango update Windows Phone which supports lower hardware specifications 256MB (formerly 512MB) RAM and 4GB (formerly 8GB) internal storage[110]. In addition to this Microsoft should investigate additional methods to lower the hardware price in these regions. Some potential avenues to achieve this include leveraging Nokia (or other hardware partners) and its supply chain optimization proficiency to reduce costs and accelerate price depression for customers while maintaining manufacturers' margins. Microsoft may also subsidize handsets directly by offering credits to manufacturers who are able to sell phones at certain price points while maintaining adequate performance levels. Finally, it is also important to explore approaches to lower prices of smartphone data plans as this may have an even greater impact on purchases as it is a recurring fee that the customer has to manage (rather than the up-front handset cost). Potential avenues that Microsoft may take include direct subsidization of data plan, joint subsidization of plans with operators (or other corporate partners) and bundling plan discounts/credits with phones.

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[107] Eric Savitz, "China's Mobile Market Tops 1 Billion Subs; Bullish For Apple", Forbes, April 27 2012, http://www.forbes.com/sites/ericsavitz/2012/04/27/chinas-mobile-market-tops-1-billion-subs-bullish-for-apple/, accessed May 2012.
[108] Abhishek Singh, "China To Leapfrog USA To Become World's Biggest Smartphone Market", Daze Info, March 19 2012, http://www.dazeinfo.com/2012/03/19/china-to-leapfrog-usa-to-become-worlds-biggest-smartphone-market-report/, accessed May 2012.
[109] Press Trust of India, "Nokia launches phones for farmers", Business Standard, June 12 2009, http://www.business-standard.com/india/news/nokia-launches-phones-for-farmers/64545/on, accessed May 2012.
[110] Thomas Newton, "Windows Phone Tango: Shifting minimum requirements down to 256M ", Recombu, January 23 2012, http://recombu.com/news/windows-phone-tango-shifting-minimum-requirements-down-to-256mb_M16544.html, accessed May 2012.

LICENSING FEE MODIFICATION

A final and drastic measure that Microsoft should evaluate to drive adoption of Windows Phone is to consider dropping or eliminating the licensing fee it currently charges hardware partners to use the platform on their phones. Microsoft has repeatedly mentioned that they have minimal interest in doing this and are already losing a substantial amount of money in their mobile department so their current strategy of gaining revenue directly from sales seems appropriate. However, it may also be useful for Microsoft to re-visit this issue if it continues to suffer as one of the key drivers behind Android's success. As alternative revenue sources grow then it may be possible for Microsoft to earn equal or higher levels of income from these areas despite the reduction of fees. This may be implemented after a period in which Microsoft's mobile strategy (or the other recommended modifications to this strategy above) does not have the desired effect on Windows Phone or alternatively, as a tool to drive higher interest from hardware partners before the launch of a major version of Windows Phone.

BLACKBERRY OS (RIM)

Research In Motion (RIM) was one of the early pioneers of the smartphone era and enjoyed such popularity that it BlackBerrys became synonymous with smartphones among many users in the mid-2000s. Despite this early success, RIM began to experience significant challenges on the customer and its traditionally dominant enterprise segment from 2009 for a variety of reasons including:

(1) BlackBerry failed to innovate quickly enough to match changing consumer interests. The most prominent example of which is the move toward touchscreen phones (fueled by the popularity of the iPhone). RIM continued with its frontfacing keyboard and screen layout despite accelerating sales of phones with touchscreens and was slow to release the BlackBerry Storm to compete in this field at the end of 2008[111]. The Storm was ultimately unable to make the desired impact and the product line was discontinued after the release of the BlackBerry Storm 2 in October 2009[112]. Additionally, the BlackBerry browser was slow, unable to render pages appropriately and consistently described as the worst part of the OS by users but RIM was unable to modify for years until 2009 when it purchased Torch Mobile in August 2009.[113]

(2) Competitors (Apple and Google) capitalized on developer support with their application store while RIM was slow to catch up and offer a comparable solution. As a result, many of the most popular games and apps present on iOS and Android are not available (or have vastly inferior versions) on the BlackBerry App World. RIM therefore missed the opportunity to be at the forefront of this boom. As a result of the slow adoption by developers, the BlackBerry App World currently has only 70,000 applications compared with approximately 585,000[114] and 500,000[115] on iOS and Android respectively.

(3) Due to the lack of foresight and innovation above, more recent versions of the BlackBerry OS continued to be layered upon the original legacy base leaving the platform uncompetitive compared to its competitors. BlackBerry 10 (formerly BBX), RIM's updated OS, is supposed to tackle this problem and introduce a fresh platform that is better equipped to match iOS and Android but has not yet been released despite being in development for over two years.
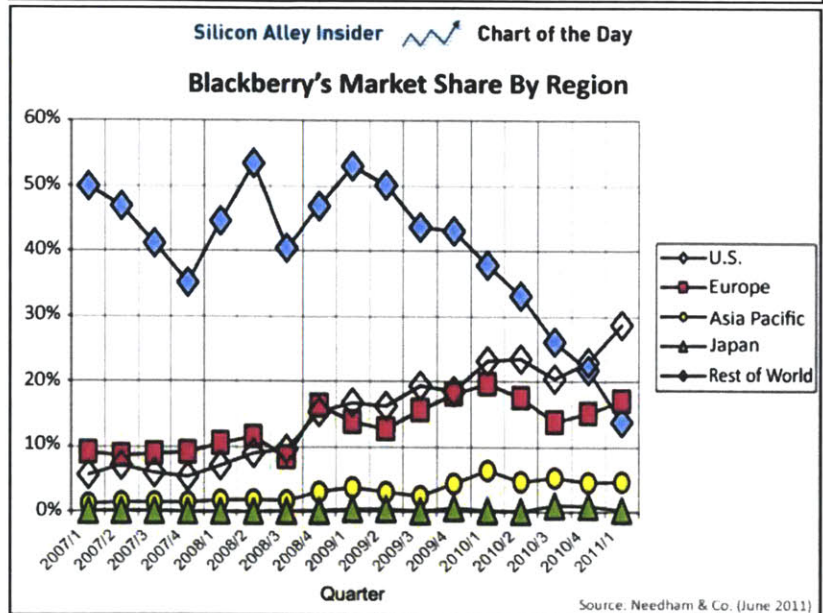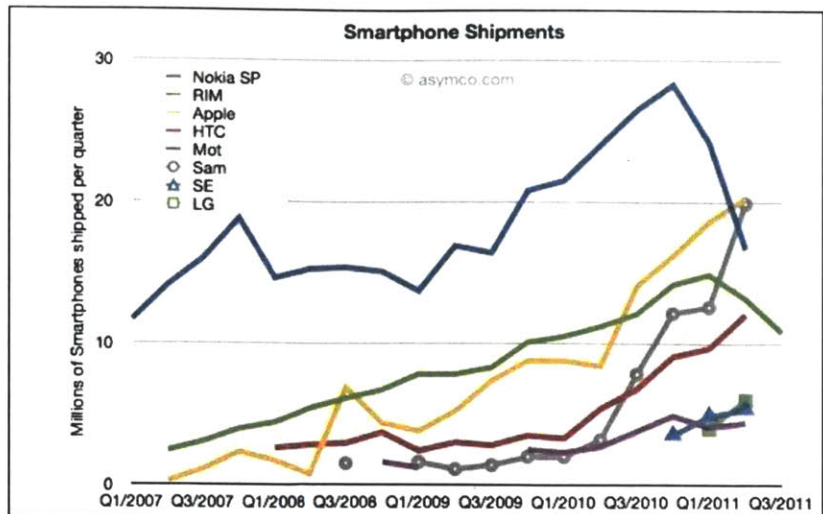
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[111] Johan, "Verizon To Release Storm On November 21, 2008", TechFresh Network, November 13 2008, http://www.techfresh.net/verizon-to-release-storm-on-november-21-2008/, accessed May 2012.

[112] BlackBerry Empire, http://www.blackberryempire.com/2009/10/26/verizon-officially-blackberry-storm-2-9550-smartphone/, accessed May 2012.

[113] Al Sacco, "What RIM's Torch Mobile Deal Means for the BlackBerry Browser--and You", CIO, August 25 2009, http://www.cio.com/article/500493/What_RIM_s_Torch_Mobile_Deal_Means_for_the_BlackBerry_Browser_and_You, accessed May 2012.

[114] Ibid. 16

[115] Quentin Fottrell, "Will Nokia's Cheaper Lumia Be Worth It?", Smart Money, April 19 2012, http://blogs.smartmoney.com/advice/2012/04/19/will-nokias-cheaper-lumia-be-worth-it/, accessed May 2012.

41

Smartphone Shipments

Silicon Alley Insider **Chart of the Day**

Blackberry's Market Share By Region

Source. Needham & Co. (June 2011)

These problems along with others have led to an erosion of BlackBerry's market share and smartphone sales[116]

On May 1, 2012 International Data Corporation (IDC), a market research and analysis firm, mentioned that RIM's global smartphone market share reduced by 30% to 6.7% from 13.6% a year earlier[117]. RIM announced fourth-quarter losses of $125M in March 2012 which showed a significant erosion of its position compared to profits of $935M over the same period in the previous year; RIM's share price is currently at an eight-year low (as of May 3, 2012)[118] and fell by over 72% from $48.10 to $13.48 from May 1, 2011 to May 1, 2012. RIM is thus stuck in a vicious cycle as it continuing to lose market share at

[116] Zach Epstein, "BlackBerry market share in Q2 may have hit single digits", BGR, September 16 2011, http://www.bgr.com/2011/09/16/blackberry-market-share-in-q2-may-have-hit-single-digits/, accessed May 2012.
[117] IDC Press Release, "Worldwide Smartphone Market Continues to Soar, Carrying Samsung Into the Top Position in Total Mobile Phone and Smartphone Shipments", IDC, May 1 2012, http://www.idc.com/getdoc.jsp?containerId=prUS23455612, accessed May 2012.
[118] Reuters, "RIM shares hit 8-year low as BlackBerry 10 underwhelms", Chicago Tribune, May 3 2012 , http://articles.chicagotribune.com/2012-05-03/business/chi-rim-shares-hit-8year-low-as-blackberry-10-underwhelms-20120503_1_blackberry-world-toronto-listed-shares-rim-shares, accessed May 2012.

an alarming rate leading to less interest from developer which in turn results in less applications which leads to even less customer interest and worsening market share. These problems are further compounded as business users have increasingly pressured their IT departments to adopt iPhones and Android phones there has been a noticeable uptake by those platforms in the enterprise segment makes it increasingly difficult for RIM to focus on a specific customer segment.

RIM has attempted to stage a comeback by replacing its co-CEOS Mike Lazaridis and Jim Balsillie with Thorsten Heins, releasing the BlackBerry Playbook in April 2011 and unveiling plans for a new BlackBerry OS scheduled to be released by the end of 2012. The new BlackBerry OS, formerly called BBX but now referred to as BlackBerry 10 would be a fusion of the operating system used on the tablet (BlackBerry Tablet OS) and the old Blackberry OS.

RIM showed off large portions of BlackBerry 10 in BlackBerry World on May 1, 2012, it was also announced that BlackBerry 10 would represent a fresh start and not be compatible with applications developed for previous versions of BlackBerry OS (but would work with the much 15,000[119] applications designed for the Playbook). This would create a significant handicap at launch considering that iOS, Android and Windows Phone would have over 650,000, 600,000 and 150,000 apps at that time and therefore RIM made a concerted effort to woo developers to create compelling applications for the device that would be ready by launch. This effort included[120]:

1. As is usually the case in these situations, RIM has partnered with developers to create applications that would be available to customers when the OS is launched. An example of which is Gameloft which will create 11 games (ranging from basic puzzle to more intricate experiences).

2. RIM handed out thousands of test prototypes to developers at the conference to enable them test their applications and gauge their performance on a physical device.

3. The BlackBerry 10 developer kit was released to developers providing more familiar and flexible options for application production[121] while the App Generator was introduced to simplify the process of creating applications for the platform.

4. Finally and a sign of the reliance on developers for success, RIM offered a $10,000 revenue guarantee to developers. The guarantee specified that RIM would pay the difference to ensure that developers made at least $10,000 by the end of the first year of availability[122]. In order to qualify for the promotion, developers need to have their application submissions approved into the store and make a minimum of $1,000 download revenue.

[119] Alastair Sharp, "RIM offers BlackBerry 10 tools to lure developers", MSN Money, May 1 2012, http://money.msn.com/business-news/article.aspx?feed=OBR&date=20120501&id=15053708, accessed May 2012.
[120] Ibid. 108
[121] Joseph Volpe, "BlackBerry 10 developer toolkit released in beta, adds Native and WebWorks SDKs for app-building flexibility", Engadget, May 1 2012, http://www.engadget.com/2012/05/01/blackberry-10-developer-toolkit-released-in-beta-adds-native-an/, accessed May 2012.
[122] Roger Cheng, "RIM guarantees $10,000 to BlackBerry 10 devs in first year", CNET, May 1 2012, http://news.cnet.com/8301-1035_3-57425481-94/rim-guarantees-$10000-to-blackberry-10-devs-in-first-year/, accessed May 2012.

Despite the announcement and strong push for developers, RIM's share price dropped by over 5.7% on the day of the announcement underscoring analysts' doubt of the successfully execution of the proposed plans. Based on market dynamics, it is highly unlikely that RIM will be able to return to its previous position of prominence and as a result will be better served to focus on strategies to help position it as an attractive acquisition option. The two fundamental aspects of this approach will be to continue to push forward with the launch of BlackBerry 10 (survival) and investigate acquisition or partnership options that would be most appropriate for the company.

PART 1: SURVIVAL

The first part of RIM's survival strategy will be to find methods to stem the tide and reverse its fortunes. Although it is currently in a tough situation and may be involved in a partnership or acquisition scenario in the future, it must still look to improve its situation to both serve its shareholders now and make itself an attractive partner so that the shareholders may benefit in the future.

BLACKBERRY 10 LAUNCH: This launch likely represents one of the most important events in RIM's history so it is crucial that all the parts of launch be effectively managed.

Speed – One of the main determinants of success will be the speed of the launch. Although it would seem that the BlackBerry 10 (BB10) should be launched as quickly as possible, the initial quality of the OS at launch is also very important as many observers may completely write the company off if it is released early but contains omissions or does not function at the standards of its competitors. Therefore RIM's goal should be to release the product at the earliest practical time before Microsoft's WP8 launch at a competitive quality standard.

Timing – Current reports and internet leaks indicate that BB10 seems to be scheduled to launch around the end of the year and possibly around October[123]. Considering that rumors indicate that Microsoft launched WP7 in October 2010, WP7 Mango update in October 2011 and rumors indicate that it is planning to launch Windows 8 and WP8 in October 2012, it may be in RIM's best interest to consider launching BlackBerry at a time that does not clash with this due to the inevitable gigantic media focus around this event.

Launch Strategy – As an underdog in the smartphone race, RIM's approach to BB10 should have several similarities to Microsoft's WP8 strategy. However since RIM has significantly less cash ($1.77B[124] vs. $36.79B[125]) some of the capital intensive suggestions may not be directly applicable. The specific campaign components (fully detailed in the Microsoft section above) that RIM should adopt are:

Developer support
Nintendo Partnership

[123] Joey Mullette, "BlackBerry 10 Release Date: BlackBerry 10 Phone to Launch in October", BostInno, April 27 2012, http://bostinno.com/2012/04/27/blackberry-10-release-date-blackberry-10-phone-to-launch-in-october-report/, accessed May 2012.
[124] MSN Finance, RIMM's Balance Sheet, May 2012, http://www.bing.com/finance/search?q=RIMM&scenario=BalanceSheet&FORM=DTPFIO, accessed May 2012.
[125] Ibid. 113

Form Closer relationships with carriers

The suggested approach and reasoning behind these suggestions are located in the Microsoft section above. In addition, it would be particularly optimum if these features were the most innovative and attention grabbing and if RIM introduced these features closer to the BB10 launch date to avoid being copied and nullified by competitors (a relatively common occurrence in such situations).

RIM should also try to build up support from its extensive base of present and former users by focusing its launch marketing message to appeal to both new users and BlackBerry fans. It may be important to also create BlackBerry devices that run on BB10 to appeal to these customers and a RIM spokesperson has already announced that there will be BB10 devices with keyboards.

Blackberry Playbook – The current BlackBerry Playbook has fared poorly in the marketplace but it may still be in RIMs best interest to launch a new version alongside BB10 for several reasons:

1. There will be increased media hype and exposure around the new OS if it launches on a tablet alongside phones.

2. If RIM were to survive as a stand-alone company, it would be more strongly placed if it were also in the tablet space as this product category is growing at a very attractive rate.

3. RIM would have increased leverage while bargaining with a potential acquirer or partner if it were developing tablets in addition to its phones.

Despite these potential benefits, RIM should analyze whether they have the finances available to undertake the R&D needed to put out a good product to ensure the solvency of the company.

DEVELOPING MARKET FOCUS: Considering that BlackBerry's relevance in developed markets is falling rapidly, it may be in RIM's best interest to focus their strengths on these regions. Targeting these regions would mean an emphasis on lower cost devices which may not have the physical requirements to run BB10. Therefore, it is up to RIM to decide whether there is a need to launch the BB10 globally or to use older OS versions to give them more financial flexibility to compete with Android and Windows Phones who are also exploring options to reduce their device prices.

Based on the benefits of both options, it may be more beneficial for RIM to follow the second option and not launch BB10 globally so that it can focus on reducing price and maximizing its potential to reach more customers in developing regions. This option may work because customers in these regions are likely to be less worried about getting the latest version of the OS than getting a product that they can afford. Additionally, the recently released BlackBerry OS 7 (BB7) and older BB5 are relatively capable operating systems that contain functionality that far exceeds that in handsets that are currently used in these regions.

The BlackBerry 9900 runs BB7 and is an example of potential phone that could be used in developing markets

PATENTS AND LITIGATION: RIM needs to consider all options available to it to survive until BB10's release and areas of exploration include either selling/licensing patents or filing for patent infringement by competitors. Patent infringement filing might be the less attractive option because it may involve significant legal expenses and the RIM may not have enough time to reach a potential settlement. Selling or licensing patents is a potentially better option that RIM could explore. This could be a potentially lucrative as recent patent sales have fetched high prices (for example Nortel selling its patents to the Microsoft-Apple led group for $4.5B[126] and Google purchasing Motorola primarily for its patent portfolio for $12.5B[127]).

Some industry observers have mentioned that, although RIM's current patent portfolio may be worth between $1-3B[128], it may be easier for RIM to license its patents due to uncertainty about buyer demand since most of its patents are not essential to LTE (3GPP Long Term Evolution is the upcoming global standard for mobile high-speed data).
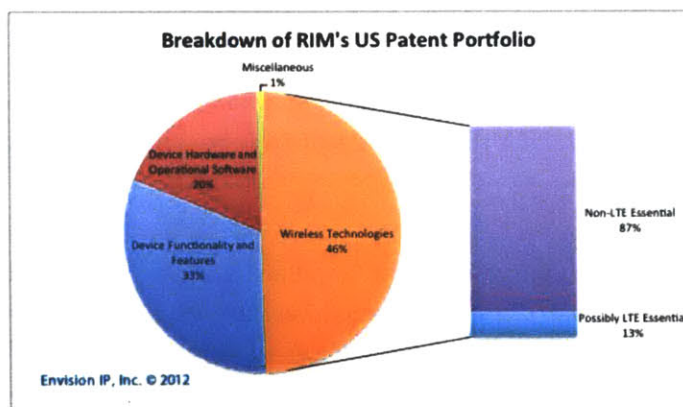
RIM's patent portfolio contains a limited proportion of attractive LTE essential patents[129]

An additional reason for licensing patents rather than selling them is because a sale may result in significant undervaluation by buyers who perceive that RIM is facing financial difficulty and is desperate to offload the patents.

[126] Chris V Nicholson, "Apple and Microsoft Beat Google for Nortel Pat ", The New York Times, July 1 2011, http://dealbook.nytimes.com/2011/07/01/apple-and-microsoft-beat-google-for-nortel-patents/, accessed May 2012.
[127] Google Investor Relations, "Google to Acquire Motorola Mobility", August 15 2011, http://investor.google.com/releases/2011/0815.html, accessed May 2012.
[128] Maulin V. Shah, "RIM May Fare Better in Licensing its Technologies Rather Than Attempting to Sell its Patent Portfolio", Envision IP, January 26 2012, http://envisionip.wordpress.com/2012/01/26/rim-may-fare-better-in-licensing-its-technologies-rather-than-selling-its-patent-portfolio/, accessed May 2012.
[129] Maulin V. Shah, "Breakdown of RIM's Patent Portfolio", Envision IP, April 22 2012, http://envisionip.wordpress.com/2012/04/22/589/, accessed May 2012.

PART 2: SALE

RIM's situation has deteriorated over the years and is set to worsen in the near-term as customers continue to choose Android and iPhones over BlackBerrys and even those who would otherwise have bought BlackBerrys wait for BB10. As a result, it may be beneficial for RIM to locate appropriate strategic investors, partners or acquirers to ensure its survival. Reports suggest that RIM may already be considering such alternatives as they may be close to hiring JPMorgan Chase to serve as an advisor on strategic decision[130].

The search for strategic investors would involve convincing interested investors to back the company now in hopes of receiving a healthy return in the future. The likelihood of finding such investors will depend on their risk tolerances and the level of concessions RIM is willing to make in exchange for financing.

In terms of a sale, RIM can either decide to sell the entire company or break down the company into smaller divisions to be sold separately. Selling the whole company would be faster and simpler while dividing the company could be potentially more difficult but could create more value. The presence and level of value creation in this instance will depend on whether the acquirers can extract more synergies from specific parts of the company than they would otherwise would if they had the burden of buying the whole company. RIM's current market capitalization is about $6.3B (As of May 4, 2012) and based on expected premiums ranging from 40-60%, so a potential acquirer would need to pay approximately $8.8B-$10B. This substantial outlay and combined with the fact that the Canadian government may be reluctant to allow the acquisition due to national concerns means complicates a RIM acquisition.[131] Nevertheless, numerous suitors who may be interested in purchasing RIM include:

Dell: As with HP, Dell is a major player in the PC industry and is currently in the extremely tiny margins in the PC industry and as a result has begun a shift (similar to HP and IBM) to offer more services. This shift has begun to become more noticeable in its profit mix where only a third of its profits now come from its PC business. As the margins in the PC industry continue to reduce and tablets continue to gain increased prominence, Dell may be looking for ways to get into the expanding smartphone market. The best and most effective for Dell to do this would be to acquire a current player such as RIM.

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[130] Don Resinger, "RIM looking to JPMorgan for life support, report says", CNET, April 19 2012, http://news.cnet.com/8301-1001_3-57416318-92/rim-looking-to-jpmorgan-for-life-support-report-says/, accessed May 2012.

[131] Eric Savitz, "Research In Motion: What's The Company Really Worth?" Forbes, April 9 2012, http://www.forbes.com/sites/ericsavitz/2012/04/09/research-in-motion-whats-the-company-really-worth/, accessed May 2012.

The likelihood of a dell acquisition is low due to Michael Dell's wary attitude towards the smartphone sector[132] (due to the razor slim profits made by hardware producers other than Apple and Samsung) and HP's disastrous acquisition of Palm. Furthermore, Dell may not need to manufacture handset to benefit from the smartphone sector boom and as it attempting to do so by expanding its range of services for Android and iOS[133].

Nokia: Nokia might be looking to bolster its position in the sector by acquiring RIM. However, it is likely that only the hardware and services divisions would be attractive to Nokia as it has already pledged its future to Windows Phone (after shunning Symbian) thereby would presumably not be interested in adopting BB10.

Nokia's future is already tied to the success of Windows Phone 8 and its financial situation is precarious so the added risk involved in this acquisition might be one that it is unwilling and unable to bear.

Sony: Similar to Nokia, Sony has seen its position in the smartphone industry deteriorate over the past few years. However, the new CEO, Kazuo Hirai, has pledge to re-focus mobile one of the core areas to revitalize the company.[134] As a result, Sony bought out Ericsson's share of their joint venture (Sony Ericsson) to give it increased flexibility and may be looking to acquire an OS developer such as RIM to reduce its current reliance on Android.

Sony's level of interest in RIM will be primarily dependent on how competitive it thinks BB10 is with Windows Phone, iOS and Android. Additionally the degree of overlap between the manufacturing operations may reduce Sony's ability to realize synergies and diminish their interest in the hardware portions within RIM.

Samsung: Samsung has enjoyed success in the smartphone sector and the general mobile industry. It recently overtook Nokia to become the largest global phone manufacturer[135] and may have surpassed Apple to sell the highest number of smartphones in Q1 2012[136]. However its smartphone strategy is heavily dependent on Android (and to some extent Windows Phone) and Samsung has been looking to lower this dependence by its development of Bada. An acquisition of RIM would give Samsung its own OS and give it extra leverage over Google and the ability to offer more software innovation (than is otherwise possible from just skinning Android).

Samsung is already involved with three smartphone OSs (Android, Windows Phone and Bada) and may be reluctant to add another one. If it does decide to adopt BB10, then it may prefer to license the OS

[132] Rob Enderle, "Michael Dell Interview: How Dell Is Being Reborn", IT Business Edge, April 17 2012, http://www.itbusinessedge.com/cm/blogs/enderle/michael-dell-interview-how-dell-is-being-reborn/?cs=50238, accessed May 2012.
[133] Ibid. 121
[134] Reuters, "Sony Will Change, Grow in Mobile, Medical: CEO", CNBC, April 12 2012, http://www.cnbc.com/id/47022898/Sony_Will_Change_Grow_in_Mobile_Medical_CEO, accessed May 2012.
[135] Charles Arthur, "Samsung overtakes Nokia – and possibly outsells Apple's iPhone", The Guardian, April 27 2012, http://www.guardian.co.uk/technology/2012/apr/27/samsung-overtakes-nokia-apple, accessed May 2012.
[136] Zach Epstein, "Samsung tops Apple in smartphones, blows past Nokia to end 14-year run at No.1 in mobile", BGR, April 27 2012, http://www.bgr.com/2012/04/27/samsung-tops-apple-in-smartphones-blows-past-nokia-to-end-14-year-run-at-no-1-in-mobile/, accessed May 2012.

rather than acquire RIM. Finally, the possibility of a Samsung acquisition is reduced by Samsung's repeated denial of interest in acquiring RIM[137,138].

HTC: Despite early success, HTC has recently experienced a change in fortunes over the past year and saw its net profit and smartphone sales reduce by 70% and 35% respectively in Q1 of 2012. HTC currently makes phones using Android and Windows Phone but with Google and Samsung's increased partnership (based on their recent Nexus collaborations), Google's Motorola acquisition and the Microsoft-Nokia alliance, HTC may be considering using its own OS on its phones to avoid being marginalized. HTC already has some software expertise as it heavily skins the Android interface with its "Sense" skin and a full operating system would serve as an evolution of this. A RIM acquisition could also give HTC access to a larger share of the corporate market and make it less susceptible to changing consumer demand.

Similar to Samsung, HTC already makes phones for two platforms and is a small company with limited resources and may therefore be hesitant to adopt a third. HTC does not have the financial resources necessary to purchase RIM and would need to worry about the overlap in the hardware divisions of both companies thereby reducing the likelihood of an acquisition.

Amazon: Amazon has achieved remarkable success with its Kindle Fire Tablet based on Android so would be naturally attracted to the adjacent smartphone market. The key factor would be whether it would be better for Amazon to enter the market with Android or with BB7/BB10. Considering that Android is already an established platform with a healthy developer following and BB10 has not yet launched (so has no applications) and BB7 is not considered competitive to Android 2.3/4.0, it seems unlikely that Amazon would purchase RIM for the BlackBerry OS however there may be other parts of the company that are attractive (such as BlackBerry Messenger (BBM) which could be used as a differentiator on its Kindle Fire and future Android phones)

Google: With the current litigious trend in the smartphone industry, Google could be interested in purchasing RIM for its patents. However, as discussed above, the attractiveness of RIM's portfolio may not be very high due to the lack of LTE-essential patents. Additionally, Google acquisition of Motorola Mobility at the end of 2011 frightened some of its hardware partners and Google is still in the process of finalizing this integration process and may not wish to assume the burden of another large scale acquisition.

Microsoft: The potential of a Microsoft acquisition is relatively low because as it has already bet its chips on Windows Phone. A RIM acquisition would also take Microsoft into the hardware business which they do not have any experience in. With the WP8 launch coming up, an acquisition would led to a significant operational undertaking that would detract from the launch and lead to months (and possibly years) of trying to consolidate the two completely different operating systems.

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[137] Raven Lovecraft, "Samsung strongly denies RIM buyout rumors", TG Daily, January 18 2012, http://www.tgdaily.com/business-and-law-brief/60863-samsung-strongly-denies-rim-buyout-rumors, accessed May 2012.
[138] Chris Davies, "Samsung: Mobile acquisition imminent, but it's not RIM", Slashgear, May 4 2012, http://www.slashgear.com/samsung-mobile-acquisition-imminent-but-its-not-rim-04226252/, accessed May 2012.

BADA (SAMSUNG) ⬤

Bada is Samsung's smartphone OS and was announced released in 2010, it was originally developed as an independent project but Samsung announced in January 2012 that it would be merging development with Tizen (an Intel-backed Linux based open source OS).[139] Samsung's vision is for Bada to power lower cost smartphones thereby increasing their penetration in regions where consumers would otherwise be unable to afford them.[140] Other than giving Samsung increased price flexibility in developing markets, Samsung's aim is to use Bada to give it full control over the user experience and reduce its dependence on Android give Samsung leverage with Google.

The Samsung S8500 Wave was the first phone released with Bada[141]

As mentioned previously, Samsung is the only major hardware manufacturer supporting three smartphone OSs (WP, Android and Bada) and has been doing relatively well with this multi-platform approach thus far. Samsung Apps is the applications store for Bada and currently has approximately 40,000 apps[142] and has not succeeded in attracting a broad base of developers. As a result of this and competition in the smartphone sector, Bada has been unable to gain a foothold in the market and currently has a 3% global market share compared to about 50% for Android in 2011.[143] Consequently, Samsung's attempt to tie in Bada and Tizen might be an attempt to appeal to the developers who are currently creating apps for Tizen (and previously for Meego which was the precursor to Tizen).

Thus, the options available to Samsung are to either continue with Bada or take steps to try to improve its penetration or to drop the platform and concentrate their efforts on Android and Windows Phone development.

Samsung's primary reasons for adopting Bada are for increased leverage, control over user experience and improved price flexibility. Therefore if Samsung can achieve these three outcomes without incurring the financial burden of developing its own OS then it may be more inclined to follow the second

[139] Elizabeth Woyke, "Samsung Merging Its Bada OS With Intel-Backed Tizen Project" Forbes, January 13 2012, http://www.forbes.com/sites/elizabethwoyke/2012/01/13/samsung-merging-its-bada-os-with-intel-backed-tizen-project/, accessed May 2012.
[140] Samsung Electronics, "What is bada", http://www.bada.com/whatisbada/index.html, accessed May 2012.
[141] Tera, "Samsung Wave S8500 in Germany", http://www.hdmobiles.net/samsung-wave-s8500-in-germany/, accessed May 2012.
[142] Reuters, "Samsung: World's largest smartphone manufacturer still dependent on Google's Android", The Economic Times, may 3 2012, http://articles.economictimes.indiatimes.com/2012-05-03/news/31558903_1_galaxy-s3-google-s-android-smartphone, accessed May 2012.
[143] Ibid. 131

alternative above and drop support for Bada. Since Samsung already manufactures phones for WP and Android, it already has degree of leverage that may increase substantially if the WP8 launch is successful. Thus, Samsung does not necessarily need to continue Bada development to achieve this goal.

In terms of user experience control, Samsung's Android phones have a UI layer called Touch wiz that gives them a completely different look than a typical non-skinned Android phone. This is not the case with Windows Phone however, as Microsoft does not allow skinning and Samsung is unable to create a distinctive interface on its phones (but may still use hardware to differentiate). Therefore Samsung already has a form of user experience control in some market segments but would increase its ability to do so with Bada.

Thirdly, as the prices of Android phones continue to reduce (and low-cost manufacturers such as ZTE use Android to target developing areas) and Microsoft continues to take steps to drive down the price of Windows phones (such as the introduction of Tango outlined above) it becomes increasingly unnecessary for Samsung to focus on using Bada in lower priced smartphones. This is compounded by the fact that Bada is uncompetitive with WP and Android at the same price points due to less functionality, less familiarity and significantly less applications.

Based on this analysis and future market projections, it is recommended that Samsung strongly consider dropping support for Bada and focus its resources on Windows Phone and Android unless situations occur:

(1) WP8 turns out to be unsuccessful and Microsoft loses a foothold in the market.

(2) Bada begins to see a substantial increase in sales and market share.

(3) There is a strong uptick in developer interest and number of applications submitted to the market place (this may be due to release of a new phone, new OS version, the Tizen partnership or similar high profile incident).

INDUSTRY DYNAMICS, FUTURE SCENARIOS AND CONCLUSION

As the smartphone market continues to expand, there are several future possible scenarios in which the current operating system landscape might change. The scenarios discussed below will be based on sales market share as opposed to revenue (or profit) market share; however both forms of market share may converge as hardware margins converge as competition increases and the market reaches saturation. Possible future scenarios include:

1. ANDROID-DOMINATION SCENARIO: In this case, the Android platform is dominant followed by a large margin by iOS and Windows Phone. The most likely industry dynamics that would cause this outcome would be

A. The inability of Apple to reduce its prices appropriately to attract customers from developing markets led to an increased rate of Android adoption and a perpetuating cycle that led to even cheaper Android devices and higher sales

B. Google was able to utilize a technology innovation that was hard for its competitors to imitate that led to a spike in adoption of Android that it competitors could not recover from.

C. Windows Phone severely underperformed and hardware manufacturers doubled down on their Android efforts and combined to overcome Apple and iOS.

The ramifications of this outcome would mean that Google would gain even more power and access to user information and help them achieve their ultimate plan to be able to learn more about users so that it can sell more personalized advertisements that match users' interests[144]. Google would be able to leverage its mobile market position to both tablets/PCs industries and this could potentially lead to even more distrust in its privacy controls and the use of personal information for monetary purposes. This scenario would be very damaging to Facebook as Google would use its position to drive adoption for its competing Google+ social networking site. Finally, this scenario would also mean that the free and open operating system model had triumphed over other models and would thus be most likely to be replicated in future adjacent platform rivalries.

2. iOS-DOMINATION SCENARIO: In this scenario, Apple's closed-system strategy has triumphed and given them a wide lead over Android and Windows phone. Possible industry changes that could have led to this scenario include

A. Apple was able to find a way (new model or subsidy from partner) to reduce the prices of phones and this allowed to overtake Android.

B. Apple's litigation efforts against Android manufacturers proved very successful and support for Android diminished extensively thereby reducing competition for Apple.

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[144] Joe Levi, "How Does Google Make Money with Android?", Pocketnow, October 3 2010, http://pocketnow.com/android/how-does-google-make-money-with-android, accessed March 2012.

C. Due to an unsuccessful Windows 8 launch, Apple was able to extend its dominance in the tablet space with the iPad and extended this dominance back to the mobile sector.

The effects of this scenario would be that Apple would obtain even more industry power at the expense of not just Google and Microsoft but mobile operators as well and could even leverage this position to become an operator itself. Additionally, the Windows PC business would be significantly affected by this as the iPad would emerge as a major computing device. Finally, this scenario would mean that the closed-system platform prevailed and thus be more likely to be used as a template in future emerging platform rivalries.

3. STALEMATE SCENARIO: This is an interesting situation where the market shares of iOS, Windows Phone and Android are very similar. This equitable distribution could be caused by some of the following

A. Windows Phone 8 launch is a massive success and drives wide scale adoption and development for the platform

B. The Microsoft-Nokia partnership blossoms and Nokia is able use its previous experience in Europe and developing markets to gain market share.

C. Litigation issues drive hardware manufacturers to produce more phones for Windows Phone at the expense of Android thereby tipping the balance in Microsoft's favor.

This scenario is potentially the best for consumers as it has the highest amount of competition (which leads to lower prices and better products). It would also mean that both Google and Apple would be relatively worse off at the expense of Microsoft who would have pulled off a great comeback to catch up based on its late start with WP7.

In analysing these scenarios above, it is possible to hypothesize how the value chain and subsequent revenue derived will change

Current mobile revenue state: As stated above Google may have lost over $97M[145] in 2010 and it is unclear whether Microsoft makes money from its Windows Phone division as it reports figures under its Entertainment & Services division but it would seem that the division is contributing to the sustained losses of the business unit. Conversely, iOS (through the iPad and iPhone) contribute significantly to Apple's revenues and are money making machines for the firm.

Future mobile revenue projections: Revenue is expected to increase for Microsoft and Google and reduce for Apple under most of the scenarios above. However this is dependent on the overall health of the industry, relationship with hardware partners and the ability to find ways to monetize their growing customer bases through services. A key service will be search; Microsoft signed an agreement with Verizon Wireless to make Bing the default search engine on all its phones which has led to Android and

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[145] Tyler Holman, "Google lost over $97.7 million on Android in 2010", May 4 2012, http://www.neowin.net/news/google-lost-over-977-million-on-android-in-2010, accessed May 2012.

Blackberry phones using Bing and their default search engine. The third scenario above would give Microsoft the flexibility to sign more of such deals and increase its revenue at the expense of Google.

Scenario drivers: Applications are expected to make less of an impact on the outcomes described above as the quantity and quality of application on Windows Phone is expected to catch up to that on Android and iOS. Furthermore, most major apps are expected to be on the three major platforms in the future leading to a convergence in quantity across the store. This convergence is projected because Microsoft is making a concerted push to lure developers to create applications for Windows Phone (which currently has about 82,234 apps) both financial incentives and the impending launch of Windows 8. The move towards HTML and apps embedded in web pages is also likely to reduce the importance of the absolute number of apps and application stores in general.

Litigation is expected to make a significant impact on the outcomes described but due to the extent of litigation the specific impact is difficult to predict.

LAWSUITS IN THE MOBILE BUSINESS
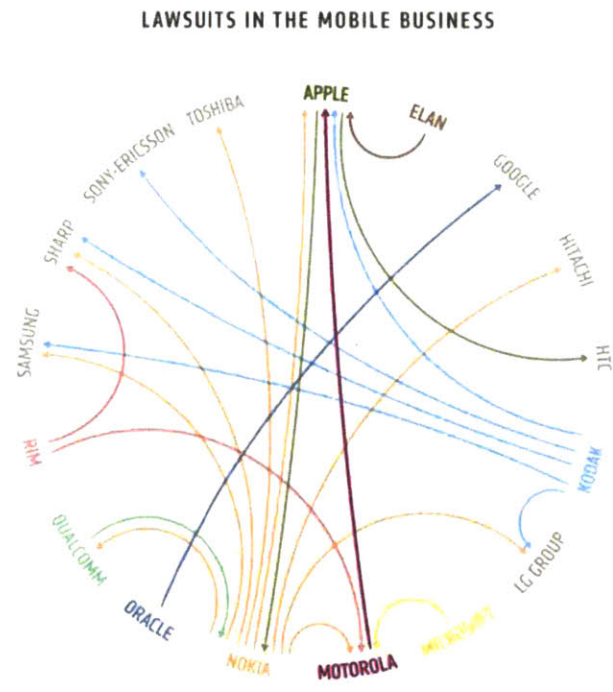
Litigation is widespread in the mobile industry[146]

All the scenarios above point to a future in which tablets, smartphones and hybrids are more common leading to a more complex form factor mix than the current laptop plus smartphone norm. The emergence of Windows 8 and the subsequent ability to run full operating systems (not just smartphone OSs) will further push desktops towards the point of irrelevance and significantly reduce the need for

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[146] Chris Foresman, "Motorola asks ITC, two federal courts to throw book at Apple", Ars Technica, Ocotber 6 2011, http://arstechnica.com/apple/2010/10/motorola-asks-itc-two-federal-courts-to-throw-book-at-apple/, accessed May 2012

full laptop computers. However the need for physical keyboards in certain scenarios (such as developing or other areas that require accurate and repetitive typing) may mean that hybrid systems (such as the Asus Transformer pictured below) with the ability to be used as both laptops and tablets become more common place. Advancements in touchscreen typing technology could, however, offset the need for such systems. The decreasing relevance of RIM (and the Blackberry OS) combined with the need for and tactile connection points may lead to a decrease in phones with physical keyboards and a continued increase in screen sizes leading to large phones or "phablets" (such as the Samsung Galaxy Note 5.3" device pictured below). The ultimate result could be that customers can do most of their most common daily tasks with just their tablets and phones with the occasional need for a full laptop (or just attachable keyboard to their tablets) for certain types of projects.
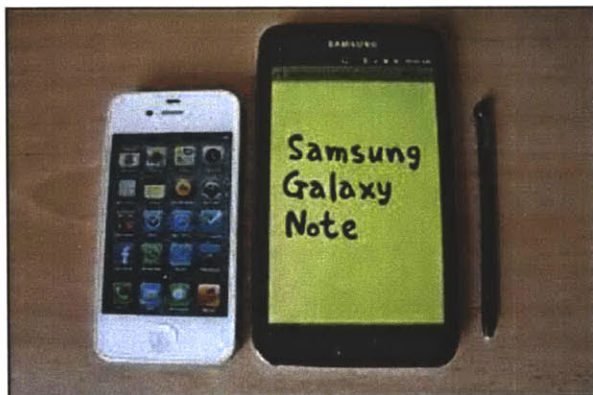
The Samsung Galaxy Note[147] (alongside an iPhone) and the Asus Transformer[148] may become two of the more prevalent future form factors

In conclusion, this thesis analysed the current state of smartphone operating systems and examined strategic changes that each of the competitors could make to improve their current market positions and be better positioned to take advantage of the increasing growth and popularity of smartphones. Further areas of interest that may be examined to get a more comprehensive picture include an analysis of the strategic options available to other major parts of the phone industry such as hardware manufacturers and mobile operators. Additionally, as the Chinese market has a significant impact on the future of the smartphone sector, analyses that are more focused on the dynamics of the region would be an interesting potential area of exploration.

[147] IDG.com, http://www.pcworld.idg.com.au/review/mobile_phones/samsung/galaxy_note/401248, accessed May 2012
[148] Amazon.com, http://www.amazon.com/Transformer-TF101-A1-10-1-Inch-Tablet-Separately/dp/B004U78J1G, accessed May 2012