Impact of the Apple iPhone on the Mobile Phone Industry

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Abstract

Although the press coverage of the iPhone's impact has focused on its immediate effects on sales of competing products, the most important effect of the iPhone is its fundamental challenge to mobile phone industry power structures and product strategies. The iPhone calls into question how the mobile industry segments users and designs products, and as such its impact on industry practices may be far greater than its effect on phone sales.

1. Introduction

On January 9, 2007, Apple CEO Steve Jobs took the stage at the Macworld Expo in San Francisco to pre-announce a new mobile phone, the Apple iPhone. He was characteristically enthusiastic about its prospects.

"We're going to make some history together," he said. "Today Apple is going to reinvent the phone." (Jobs, 2007)

Even though it had not yet been released, the iPhone quickly became one of the most discussed new technology products, outstripping the coverage of other very prominent mobile phone products that have been shipping for years. A search for the term "iPhone" on Google returns about 53 million hits. For comparison, "Razr" (Motorola's iconic slim phone) returns 23 million hits, and "Treo" (Palm's smartphone) returns about 30 million.[i]

The mainstream media also gave the announcement extensive coverage. Newsweek and Time Magazine both ran detailed commentaries, and the announcement was covered prominently by major daily newspapers including the New York Times, Washington Post, and Los Angeles Times.

Most of the early coverage was positive. "Apple's relentless focus on simplicity, efficiency, utility and fun makes the iPhone seem a different species than its competitor, something more personal, more approachable and, ultimately, more desirable than anything else out there," wrote Newsweek (Levy, 2007). Apple's stock rose 8.3% on the day of the announcement, while the stock of e-mail phone maker Research in Motion dropped 7.8% (Los Angeles Times, 2007).

But a negative reaction quickly set in online, especially among some technology analysts noting features available in other "smartphones" but not included in the iPhone. "I actually expect a backlash of sorts as people figure out how much this thing doesn't do," said Avi Greengart of the research firm Current Analysis. He cited the iPhone's lack of enterprise features such as secure enterprise e-mail and Microsoft Office compatibility. (Haslam, 2007).

As the market awaits release of the iPhone, many observers are polarized between those who predict that it will be a broad success -- the "reinvention of the phone" that Jobs promised -- and those who believe that Apple will have deep trouble even meeting its initial sales goals. We believe that both camps are wrong. In the short run, iPhone sales are likely to impact only other entertainment devices. In the long run, it may have a more substantial impact by providing an example of how to deliver an integrated device including hardware, software, and services -- as well as an example of a smartphone designed as an appliance rather than a general-purpose computer.

Note that we focus our analysis on Apple's impact in the US, its initial market. By the time Apple launches in Europe, its next market (availability predicted for fall 2007), it will have new products and its competitors will have revised their strategies. In addition, the European launch will depend heavily on its choice of operator partner(s) and the success of the US strategy.

2. Key features of the iPhone

Before discussing the impact of the iPhone, it's important to understand what is and is not distinctive about it.

Hardware features

The iPhone is a "candybar" style device (ie, without flip cover or slider). The front of the device is dominated by a touch-sensitive 320x480 screen, and it does not have a physical keypad. It weighs 135 grams: heavy for a simple “feature” phone (which tend to range from 80g to 120g), but light for a “smart” phone (which range from 110g to more than 200g). Hardware features include a quad-band GSM/Edge cellular radio (without 3G), WiFi (802.11 b and g), Bluetooth 2.0, and a two megapixel camera.

The iPhone's hardware features and configuration are comparable to those of other "smartphones" already on the market. For example, the HTC 3600 has a form factor and weight similar to the iPhone. The HTC device lacks 802.11g and has a lower-resolution screen, but has a UMTS (3G) radio, a memory card slot, and two built-in cameras.

User interface

Apple made a distinctive departure from the industry norm in this area. Unlike other touchscreen smartphones, the device has no stylus, and is designed to be entirely finger-driven. The interface can sense multiple simultaneous finger presses, enabling the user to manipulate the interface via gestures (something that Apple says it is patenting). For example, pinching the fingers together is used to reduce the magnification on a web page. This sort of "multi-touch" interface has been discussed in the past, but Apple is one of the first companies to implement it in a commercial product. It won't be possible to judge the success of Apple's approach until the iPhone ships.

As is typical of many Apple products, the iPhone's interface also includes some minor features uncommon in most competing products and designed to spotlight the company's attention to detail. One is a proximity sensor that turns off the touchscreen when the device is close to the user's face (so incidental contact with the user's ear won't activate functions of the phone). Another is the use of position sensors to rotate the screen's image appropriately when the device is turned sideways.

Built-in software

The iPhone incorporates a version of Apple's MacOS X with its Safari web browser. Depending on how the browser is implemented, this is potentially a differentiator for Apple as most mobile browsers can display only a subset of the web content available on PCs. However, the iPhone is not planned to include Java or Flash support, limiting its ability to display some websites. The iPhone also includes Yahoo e-mail support, Google Maps and associated location-based services, iPod music and video playback, a suite of phone apps (address book, threaded SMS, calendar, dialer, visual voicemail [pick messages from a printed list on screen]), photo management software, and some widgets provided by Apple. The visual voicemail product appears to be unique, and of course iTunes is not offered for other companies' devices (other than a few Motorola mobile phones). Yahoo e-mail and Google Maps are available for other mobile devices.

What's missing

Some notable features available in many other smartphones are missing from the iPhone, including:

- *A physical QWERTY keyboard* such as that found in the Palm Treo and RIM Blackberry devices. Instead, there is a virtual keyboard on the touchscreen.

Apple claims this is an advantage because mobile device keyboards have such small keys that they are hard to use.

- *The ability to install third party applications.* At release Apple said the iPhone will be a closed device -- only Apple will be able to offer new applications for it.
- *The ability to read and edit Microsoft office documents,* which is important to business users who often receive them as e-mail attachments.
- *A user-replaceable battery.* Like the iPod family but unlike most mobile phones, the iPhone's battery cannot be replaced by the user. While this allows Apple to make the device thinner because the battery does not require a separate housing, the user can't carry a backup battery, and when the battery wears out the device must be returned for service. Palm Computing tried a similar approach with its early smartphones, but gave up due to customer complaints.

3. Who will want an iPhone?

Many of the commentators discussing the iPhone portrayed it as a competitor to all "smartphones" on the market today, including the Palm Treo and Research in Motion's Blackberry. Steve Jobs encouraged this comparison in interviews (Grossman, 2007) and at the iPhone announcement by making direct comparisons to the Treo, Blackberry, and other smartphones (Shaw, 2007). The drop in RIM's stock price on the day of the announcement showed that some investors were persuaded by this argument.

But the idea of a "smartphone" is a mobile industry term that doesn't have much resonance with most users, who buy devices to solve problems rather than get technology. Different smartphone designs solve different problems, and so are bought by different groups of people.

RIM's Blackberry, for example, is bought primarily by businesspeople with heavy communication needs, especially in government and the financial services market. The Blackberry has extensive corporate e-mail features, and is directly tied to an e-mail delivery system that integrates with Microsoft Exchange. The Palm Treo has a somewhat broader range of features, with a huge base of third-party applications. But its core customers are middle-aged "mobile professionals" who need to manage information on between meetings (Kairer, 2006), and like the Blackberry it is offered with a corporate e-mail service (provided by Good Technology).

The iPhone, by contrast, will be connected primarily to iTunes. It doesn't have the corporate e-mail infrastructure of RIM; it has a consumer-oriented e-mail client from Yahoo. Although Apple brags that the screen-only interface of the iPhone is superior, BlackBery users are generally very enthusiastic about using their “thumb keyboards” (Shaw, 2007). Unlike the Treo, the iPhone can't read Office documents, and it won't have access to the vertical market applications written for Palm.

The wide screen and relatively large flash storage of the iPhone will make it better than either Blackberry or Treo for viewing videos and playing music, while the presence of the Safari browser may make the iPhone better for recreational browsing. Those features are most attractive to younger users who want to use a mobile device to enhance their lifestyles . Those features are not as high a priority to Blackberry and Treo users, who care most about e-mail and business software.

Rather than competing with Treo and Blackberry, the iPhone opens up a new segment of potential smartphone users. This segment has been estimated to account for about 12% of mobile phone users in the US and Europe. (Mace, 2007)

4. iPhone impact on the industry

The iPhone has already changed the terms of the debate for all handset vendors creating smartphones. Every new mobile data device is being evaluated against the iPhone's specs, with some recent announcements by companies like LG being positioned as either responses to the iPhone, or products that Apple copied (Gizmodo, 2007). Considering that it typically takes at least 12 to 18 months to develop a new mobile phone, it's physically impossible for any of these products to be reactions to the others, but the assertions show how much the iPhone is affecting industry debates.

Impact on the mobile operators

The most obvious and immediate impact was a publicity boost for Cingular/AT&T, which has exclusive rights to provide wireless service for the iPhone in the US. Purchase of an iPhone will require a two year service agreement with Cingular, and the product will be offered in both Apple and Cingular stores. Mobile operators are anxious to attract young customers, who are believed to be more likely to use mobile entertainment services (Connell, 2006). So the demographics of iTunes users and the youth-friendly image of Apple were probably strong inducements to Cingular.

It's not clear how much Cingular had to give up in order to get the iPhone. For example, both companies say Cingular has exclusive rights to the iPhone in the US, but we don't know if that applies to this product only, to a line of products, or to any telephony-equipped device that Apple makes.

For handset vendors, one of the most difficult aspects of working with an operator is complying with the long list of hardware and software features that the operator requires in the device. Those customizations add development time and cost, and the work must often be re-done for each operator, creating extra expenses every time the manufacturer adds a new operator. Thus far, it appears Cingular required fewer customizations than usual for the iPhone: there will be no Cingular logo on the bezel of the iPhone, and Apple says Cingular is modifying its voice mail system to support the visual voice mail feature of the iPhone. "They broke all their typical process rules to make it happen," said Tony Fadell, senior vice president of the iPod Division at Apple. (Grossman, 2007).

We also don't know the business terms of the relationship between Apple and Cingular. After the announcement, Verizon said it had declined the opportunity to carry the iPhone because Apple's business terms were too restrictive: it would not have been allowed to sell the iPhone in third-party retail channels that carry other Verizon phones, such as WalMart. Apple also supposedly insisted on control over customer support decisions (such as whether to replace or repair a device), and a share of the monthly service revenue from iPhone customers (Cauley, 2007)

Cingular officials, for their part, claim that Apple actually "bent a lot" to Cingular's requirements, agreeing to require a Cingular contract for purchase of the device, and cooperating with Cingular to make it difficult to break the software lock tying the phone to the Cingular network (Segan, 2007). But the terms reported by Verizon, in particular the monthly revenue sharing, would be a substantial departure from the normal behavior of US operators. So the iPhone provides a precedent that other mobile handset vendors may try to duplicate, if they can produce sufficiently innovative products. The power of the handset vendors was already rising because of the success of the Motorola Razr, which was credited with helping Verizon and other operators gain subscribers from Sprint, which did not carry the Razr when it was first released (Foster, 2006).

It's likely that Apple will attempt to secure similar terms from operators in Europe and other parts of the world. Apple officials say that they would prefer to sell through only a single operator in Europe, which may well be true, but could also be a negotiating tactic to extract the maximum possible number of concessions from operators.

Whatever happens with the business terms today, the iPhone's long term impact on the operators will depend entirely on how well it sells. If it's heavily in demand, and in particular if it attracts customers away from other operators, all of the operators will be more willing to make special deals for innovative phones that look likely to attract users. On the other hand, if the iPhone is a sales disappointment, operators will take fewer risks (and make no concessions) for an unusual device in the future.

Impact on the major handset manufacturers

In the short term, the iPhone could create new opportunities for the major handset manufacturers such as Nokia, Motorola, and Samsung. Although the publicity for Apple may be embarrassing to the handset companies, the operators who aren't allowed to sell the iPhone may be extremely anxious to find a substitute. This should create an opportunity for the handset companies to sell iPhone-like media phones to the operators, and to get substantial marketing support for them. The recently-announced Samsung F700 and LG Prada already appear to be benefiting from this attention.

Impact on SonyEricsson

The #4 handset maker is probably the major handset player most directly affected by the iPhone because it has made a substantial investment in music phones, with a line of well-received Walkman phones that are widely available in Europe. SonyEricsson also has a music store that ties to its phones. So it's in a better position than other mobile phone companies to potentially compete head to head with the iPhone. If Apple signs a single operator in Europe, Sony Ericsson may be able to partner closely with several of the rejected firms.

In the United States, though, the iPhone announcement is more a barrier than an opportunity. Cingular is the only US operator currently carrying SonyEricsson mobile phones in the US, and it's hard to picture Cingular promoting the Walkman phones against the iPhone. Because SonyEricsson exited the CDMA market in 2003 and does not have a strong relationship with the remaining GSM operator, T-Mobile, the prospects for its music phones in the US market look poor.

Impact on Microsoft

Microsoft appears to be the company most directly hurt by the iPhone announcement. For several years, Microsoft attempted to compete with the iPod using its traditional PC business model -- license a software solution and enable a group of clone hardware vendors. When this was a market failure, in 2006 Microsoft shifted to a vertically integrated approach with Zune, a music player sold by Microsoft and tied to a Microsoft-run music store. Zune had been on the market for less than two months when Apple announced the iPhone. Microsoft's main differentiator for Zune has been the inclusion of WiFi networking. The iPhone includes WiFi, Bluetooth, and a cellular radio. This substantially undercuts Microsoft's claim to technological leadership, although the iPhone apparently doesn't include the wireless song sharing features included in Zune.

Microsoft's management was clearly caught off guard by the details of Apple's announcement. One day before the announcement, Robbie Bach, the president of Microsoft's entertainment and devices division, was quoted by Reuters as speculating that Apple would form an MVNO rather than working with an operator, and was dismissive of Apple's ability to build an integrated phone and music player. "You have to find out what it's great at. Is it great as a phone or is it great as music player?" he said. "If it's great as a music player, then it's just another iPod trying to be a phone." (Wakabayashi, 2007)

Three weeks after the iPhone announcement, Microsoft announced that Bryan Lee, the executive who oversaw the announcement of Zune, was leaving the company.

Ironically, Microsoft might have been better positioned to confront the iPhone if it had never bothered with Zune in the first place. If Microsoft still had a credible independent music store, it could have offered that store to the operators rejected by Apple, along with iPhone clones made by its licensees. By mimicing Apple's strategy of proprietary systems, Microsoft has put itself in the worst of all possible worlds: its systems product is not as good as Apple's, and it has alienated many of the hardware vendors who could have cloned Apple's hardware.

Impact on RIM and Palm

The iPhone is not likely to have a major immediate impact on Blackberry and Treo sales, for the reasons listed above: It doesn't appeal to the same customers.

But Palm's corporate image may be vulnerable. The iPhone does not challenge the BlackBerry’s image as a workhorse -- something not necessarily sexy, but reliable and productive. But in the US, Palm's core market, the Treo has often been viewed as the coolest smartphone, and it has been a status symbol in Silicon Valley. The visceral attraction to the iPhone among technophiles undercuts the Treo's position.

Impact on the entertainment industry

Almost completely overlooked in the iPhone announcement was the fact that the device is also the first widescreen iPod, with a screen that's 40% bigger than the next largest iPod. That makes it much more attractive for watching video than any other iPod. Apple already has a video downloading business on iTunes, and claims to have sold 1.3 million copies of Disney movies between October 2006 and January 2007. That figure is more than the sales of all other video downloading services combined during that period, although it's still only a miniscule fraction of DVD sales. With a widescreen device, Apple may be in a position to sign up more movie studios and sell more movies and TV shows.

It's not clear what impact the iPhone will have on the downloadable music market, but it is a potential threat to the ringtone business. iTunes songs typically sell for 99 cents, while the operators usually charge about $2.99 for a ringtone (NPD Group, 2005). If the iPhone can use its songs as ringtones (something that is not yet clear), that would undercut the ringtone business model, at least among people using Apple phones. And it could create pressure for other ringtone services to lower their prices.

Impact on the phone design process

This is potentially the most important effect of the iPhone. Apple's design process is fundamentally different from most of the companies in the mobile phone business. Apple operates as a systems company, creating integrated hardware and software "solutions" that are tightly linked together. The iPod and iPhone are an exemplar of this approach; they deeply integrate the device with the iTunes music and video store. The only other mobile phone companies that normally operate this way are Palm and RIM, and Apple has vastly more money, engineering resource, and marketing muscle than both of them combined. They're niche players; Apple is a major consumer electronics firm with the strength to attack the major handset vendors head-on.

While the big handset vendors have decades of phone design expertise, they lack Apple’s depth of systems design experience. To the extent that Apple is successful with the iPhone, the majors will be under pressure to either develop systems expertise, acquire a company that knows how to do systems design, or work with a partner who can do it. This could increase the value of RIM and Palm to potential acquirers.

The iPhone also reinforces a trend among the phone manufacturers toward proprietary operating systems for smartphones. Several years ago, the smartphone market was widely expected to coalesce to a single operating system for all devices, just as the PC market converged for the most part on Windows. But since then, Nokia has settled on S60, a mostly proprietary software layer running on Symbian OS. SonyEricsson purchased UIQ, another layer running on Symbian. Motorola is working on its own version of Linux. Palm has bought back the rights to Palm OS, and RIM uses its own operating software on its phones. Samsung and LG are the last major worldwide handset manufacturers without their own OS software. Microsoft is still licensing Windows Mobile, but many of its major licensees have dropped out, with Dell being the most recent. Probably the most successful Windows Mobile licensee today is HTC, a Taiwanese contract manufacturer, although other companies selling some Windows Mobile devices include Samsung, LG, Palm, and Motorola. None of them are exclusively on Microsoft. Rather than converging to a single OS standard, the mobile phone market appears to be diverging into proprietary software citadels.

The iPhone's other impact on mobile phone design may be its conception of a segmented smartphone market. Most smartphone product designs in the past have aspired to serve all possible segments, mixing entertainment, communication, and other features. Bach of Microsoft is very explicit about this direction:

"Our strategy focuses on helping you bridge the things you do in your work-style and the things you do in your lifestyle. If you think about Windows Mobile and the work we do integrating with mail and Exchange, while at the same time providing people with multimedia capabilities, text messaging, our Windows Live services, search, etc., we kind of span that view....We think the bulk of the market is people who want a phone that does things both for their work-style and for their lifestyle." (Fried, 2007) That philosophy is reflected in the design of Windows Mobile products like the Samsung Blackjack, whose marketing promotes work and personal entertainment features all in one device.

Apple is taking a more segmented approach, betting that a device optimized for entertainment and personal use will be more successful than one designed to be a jack of all trades.

5. Unresolved issues

The first question is whether the iPhone will actually perform as claimed. If it does, there are several important market dynamics to watch:

What will the operators rejected by Apple do?

Apple already signed one operator in the US, and wants to do the same in Europe. That will create intense demand for an alternative product among the other operators. In the US, Verizon, Sprint, and TMobile are all working urgently on answers to Apple's product, creating an opportunity for manufacturers that can produce media phones, and software developers creating apps that can duplicate some of the iPhone's functions. This distribution pull also creates opportunities for music stores that compete with iTunes: although Microsoft is now closed to competing vendors, Real Networks is still very active in this area. Mobile operators want handset companies to support the operators' own music stores, but it is difficult for the manufacturers to integrate seamlessly with a different music store for every operator, and thus Apple is likely to retain an ease of use advantage. Two key questions: Will some handset vendors emerge as the leading iPhone competitors, and will the rejected operators come together to support a single alternate music store?

What's next from Apple?

As with the iPod, the 2007, iPhone is just the first in a family of products, and thus it is difficult to anticipate the impact of the follow-on products. Will they target other segments? Will they be offered (in the US) through Cingular, or through other operators? In future products, will Apple emphasize WiFi or WiMax connectivity rather than cellular networks?

Is the smartphone a computer or an appliance?

The iPhone raises a fundamental question over whether the mobile market will be more like personal computing (general-purpose, hardware loosely coupled with software) or like appliances (most devices dedicated to a single market segment, hardware and software tightly integrated). If the market is like PCs, Windows Mobile may be reinvigorated, and companies like Samsung and LG, which are skilled at turning out commodity hardware, will have an advantage. If hardware continues to become commoditized, this will also increase the power and control of operators.

If the market is more like appliances, then the market will favor companies that can design systems such as Apple, Palm and RIM. If Nokia, Motorola, and SonyEricsson can take advantage of their proprietary operating software and increase their system design capabilities, they could also benefit; while Microsoft may find it difficult to find a powerful hardware partner. A differentiated world of appliances makes hardware brands more powerful, so it would weaken the market power of operators.

What role will browsing play?

The mobile phone industry has long hoped to get large numbers of mobile users to browse the Web on their phones, to drive more data charges and enable adoption of web-based services. But to date those efforts have not lived up to the industry's hopes. There are two popular explanations for this low adoption. One is that most people simply aren't interested in browsing the Web in a mobile setting. Another is that the small screens and underfeatured browsers of mobile devices can't duplicate enough of the Internet to attract users. The iPhone will help to test the second proposition. With a half-VGA screen and a browser derived from a PC product, it should be able to give a browsing experience that's much more like browsing on a PC. Thus, the iPhone could prove a bellwether for the future evolution of the mobile Internet.

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Notes

[i] Google searches conducted on February 24, 2006. Google searches are an unreliable measure of a term's popularity when it has the same spelling as a commonly used word. However, "iPhone," "Razr," and "Treo" are all distinctively-spelled brands unlikely to be confused with anything else.