

The Revolution in Software:

The Disruptive Nature of Open Architecture

June 2011

Over the last several months, the world has witnessed how the use of social media has facilitated political revolutions in North Africa and the Middle East. Protestors have utilized social networking websites to challenge the decades-long authority maintained by various political regimes. As one activist in Cairo put it, “We use Facebook to schedule the protests, Twitter to coordinate, and YouTube to tell the world.”¹

Investors should also take careful note of another revolution now underway—one occurring not in the political world but in the technology industry itself. The rapid proliferation of open architecture, specifically through the development of various application (“app”) stores, is having a profound impact on cellular phone companies, computer manufacturers, video game developers and a host of other businesses.² Historically, the only viable option for computer programmers was to work with major corporations in developing new programs. Today, because smartphone manufacturers, computer tablet manufacturers and social networking websites all maintain retail app stores that sell games, utilities, and other products, programmers can essentially bypass software companies and sell products directly to consumers.

The general business model for new apps is that the software developer earns 70% of the sales revenue, while a commission of 30% is retained by the so-called hosting service or app store. Let us presume that the average app sells for, say, five dollars (although some are far more expensive and many are free). Therefore, developing an app and selling one million copies of it would result in remuneration of \$3.5 million to the developer. If 10 million apps were sold instead of 1 million, the remuneration would be \$35 million. To date, for example, Apple claims it has paid over \$2.5 billion to developers for programs sold through its app store.³ Clearly, the financial incentive for talented programmers is to work on their own rather than for a major software corporation involved in developing programs. The freedom of expression for independent developers, combined with the financial incentives available to them, is literally revolutionizing the software industry and has made open architecture the standard.

	Apps for Sale Per Operating System	Implied Market Share Forecast
Android-based	380,000	43.2%
Blackberry/RIM	34,500	3.9%
Nokia	40,000	4.5%
Apple	<u>425,000</u>	<u>48.3%</u>
Total	879,500	100.0%

Source: Multiple publications available online

It is difficult to overstate the impact of app stores on the cellular phone industry. In essence, the number of apps per operating system, when viewed as a percentage of the total number of apps available, is the implied market share forecast. The programmers who write the apps are, presumably, the best informed about that market. They understand what can be done with the various operating systems and

¹ Source: <http://www.miller-mccune.com/politics/the-cascading-effects-of-the-arab-spring-28575/>

² For the uninitiated, apps refer to programs available on smartphones, tablet computers and social networking websites, designed to perform any number of functions for the user.

³ Source: <http://www.appleinsider.com/>

which ones are likely to be popular with consumers. The programmers certainly have incentive to devote maximum effort to understanding consumer preferences, since that is the major factor in determining their potential earnings on the apps they write. Therefore, the number of apps per operating system is effectively a vote among the most informed people in the industry.

The Google app store, known as the Android Market, was launched in October 2008 and has an estimated 380,000 apps available for sale, according to multiple sources on the Internet. BlackBerry App World, launched in April 2009, has roughly 34,500 apps. The Nokia Ovi Store, launched in May 2009, probably has over 40,000 apps. The Apple App Store was the first to launch, in July 2008, and has an estimated 425,000 apps. The proportion of the 879,000 apps for each platform can be translated into an implied informed market share forecast. At any point in time, the number of apps written per operating system represents the implied forecast. That forecast reflects where the programmers choose to devote their efforts, so it is probably a better predictor of consumer preferences than actual market shares as they exist now.

Now, let us compare these implied forecasts to the actual market share figures. In 2010, Symbian, which has been the operating system used on Nokia phones, had a 37.6% market share. Yet, based on the

<u>Market Share of Smartphone Operating Systems</u>	
Symbian	37.6%
Research in Motion	16.0%
iPhone	15.7%
Microsoft	4.2%
Other	3.8%
Android	<u>22.7%</u>
	100.0%

Source: Gartner Group

implied market share forecast, Nokia has only a 4.5% market share, so its competitive position, if the implied forecasts are in fact accurate indicators, should be in decline. We are perhaps seeing the early stages of that decline, as Symbian had a substantially higher market share in 2009, at 46.9%. On the other hand, Android has an implied market share forecast of 43.2%, whereas its actual current market share is just 22.7%. Therefore,

Android should experience significant gains in market share, and this clearly occurring. In 2009, Android’s actual market share was just 3.9%. Clearly, the fate of the various smartphone manufacturers will depend on consumer preferences for these operating systems and on the profit incentives for programmers to write for those systems.

The growth of app stores has contributed to the ongoing trend in the cellular phone industry, which is the increased importance of software over hardware. When the use of cell phones was first gaining popularity, consumer preferences were based on the physical attributes of the phone. The overriding trend was toward smaller and smaller phones that could easily fit into a pocket. With the introduction of smartphones and the endless number of apps available for use on them, consumer preferences have clearly shifted towards the software capabilities of the phones, with the physical attributes of the phones becoming less of a concern.

Whereas the original smartphones sold for \$100 or more, one can now buy a smartphone from Samsung or LG Electronics for \$49.99. The emphasis on the software, rather than the hardware, has led to pricing pressure that has substantial implications for phone manufacturers such as Research in Motion, the maker of Blackberry. Research in Motion had \$19.9 billion of total revenue in fiscal 2011. According to the company's own statistics, 80% of revenue, or \$16.0 billion, was from the sale of smartphones.⁴ The company sold a total of 52.3 million smartphones, which equates to an average price per unit of roughly \$305. However, if the average price of its smartphones eventually declined to say, \$100, then the company would need to sell 160 million units to match their revenue of the past year. If prices fall, and the company's market share also falls, as its implied forecast seems to suggest, Research in Motion and many other companies operating in this space are likely to be challenged in one respect or another.

It should also be noted that the price per phone that Research in Motion receives is the amount that the cellular telephone company (e.g., Verizon, AT&T, etc.) pays for the phones. The retail price paid by consumers is less than that amount because the telephone company, in effect, subsidizes the sales. At a \$50 smartphone price point, however, it seems reasonable to expect that the telephone companies will not continue the practice of subsidizing, since there are so many available choices. The reason they originally subsidized the market was that they charge data fees. Early smartphone users were expected to use the network more intensively than standard cellular phone users so it originally made sense to subsidize the sale of the phones to entice premium users and collect higher data fees. Now that a large, established base of phones exists, the need to subsidize phone sales declines with each passing month. Therefore, the practice of subsidies will likely cease and telephone companies will effectively become intermediaries selling smartphones to the public at cost. At that point, we will see what the actual earnings of the manufacturers are without the telephone company subsidies.

While the development of app stores creates new competitive pressures in the market for smartphones, different forms of app stores are displacing other products as well. Consider the app stores available on the aforementioned online social networking sites, such as Facebook. The so-called Facebook Platform, launched in 2007, enables third party programmers to develop games and other applications for use by Facebook members. According to Facebook's website, its platform has attracted over a million developers from more than 180 countries who have created over 550,000 active applications. The platform even spawned a class at Stanford University in the fall of 2007 entitled Computer Science 377W: "Create Engaging Web Applications Using Metrics and Learning on Facebook," which ultimately resulted in the creation of several successful apps and significant financial rewards for students.⁵ Zynga, a company founded in 2007 for the sole purpose of developing apps for social networking sites, has developed a number of games that reportedly have over 250 million monthly active users. As is the case with smartphone app stores, independent programmers have the opportunity to bypass the major software corporations and reach consumers through social networking sites—only on a far larger scale.

⁴ Source: Research in Motion FY2011 annual report.

⁵ <http://www.nytimes.com/2011/05/08/technology/08class.html>

Facebook is estimated to have over 600 million members worldwide, including almost half the U.S. population.⁶ Of course, the potential expansion in social networking apps is obviously not limited to Facebook, as Twitter, LinkedIn and other sites have captive audiences of hundreds of millions of users as well.

What are the ultimate implications of this for software companies, or video game developers such as Electronic Arts or Take-Two Interactive, or console makers such as Sony and Microsoft? When considering these questions, it should be kept in mind that the development of apps is only in its very early stages. The app stores, whether on smartphones or social networking sites, have only existed for a handful of years. Time will tell which companies incur profit destruction at the hands of app stores. What is clear now is that the continued development of the open architecture model will result in a further shortening of the product lifecycle for numerous companies in various industries. As this technological disruption changes the competitiveness and profitability of a number of large capitalization technology companies, the earnings models and valuation multiples which have been used to describe them will be disrupted as well.

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⁶ <http://www.businessinsider.com/facebook-has-more-than-600-million-users-goldman-tells-clients-2011-1>