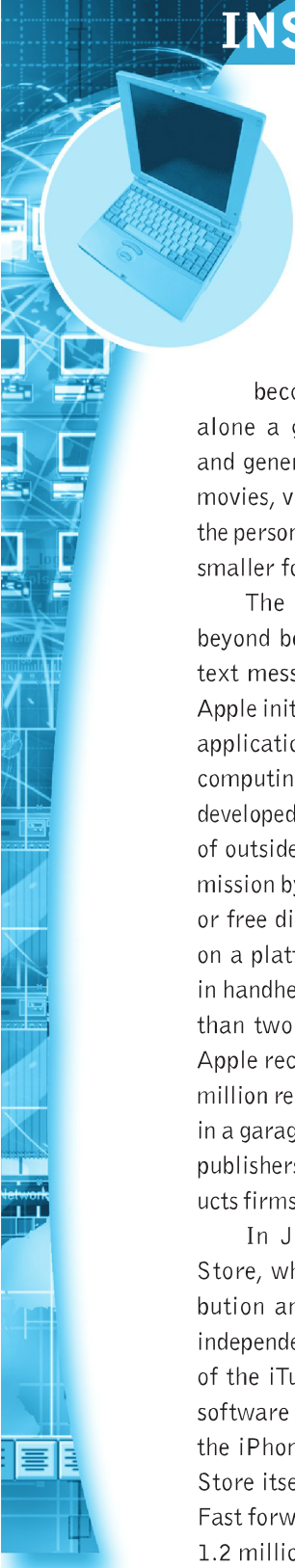


INSIGHT ON BUSINESS

APPS FOR EVERYTHING: THE APP ECOSYSTEM



When Steve Jobs introduced the iPhone in January 2007, no one—including himself—envisioned that the device would launch a revolution in consumer and business software, or become a major e-commerce platform, let alone a game platform, advertising platform, and general media platform for television shows, movies, videos, and e-books. In short, it's become the personal computer all over again, just in a much smaller form factor.

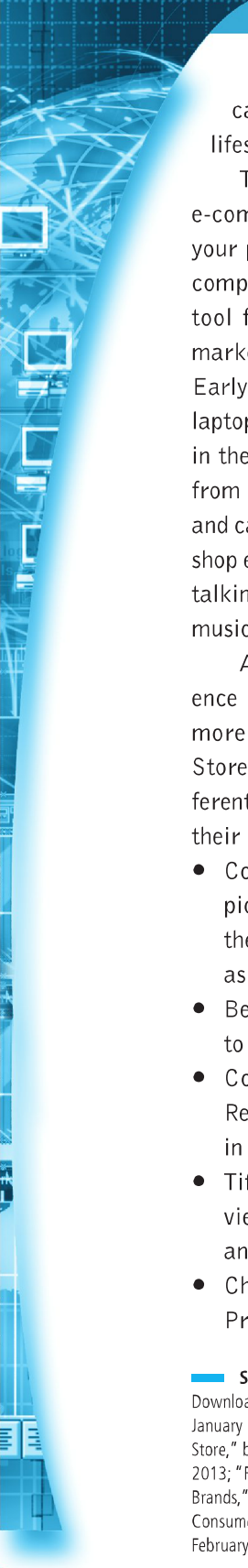
The iPhone's original primary functions, beyond being a cell phone, were to be a camera, text messaging device, and Web browser. What Apple initially lacked for the iPhone were software applications that would take full advantage of its computing capabilities. The solution was software developed by outside developers—tens of thousands of outside developers—who were attracted to the mission by potential profits and fame from the sale or free distribution of their software applications on a platform approved by the leading innovator in handheld computing and cellular devices. More than two-thirds of apps are free. Every month, Apple receives thousands of new apps from over 9 million registered developers who may be teenagers in a garage, major video game developers, or major publishers, as well as Fortune 500 consumer products firms using apps for marketing and promotion.

In July 2008, Apple introduced the App Store, which provides a platform for the distribution and sale of apps by Apple as well as by independent developers. Following in the footsteps of the iTunes music store, Apple hoped that the software apps—most free—would drive sales of the iPhone device. It was not expecting the App Store itself to become a major source of revenue. Fast forward to 2014: there are now an estimated 1.2 million approved apps available for download from the App Store. Other smartphone developers

also followed suit: there are also thousands of apps available for Android phones, BlackBerrys, and Windows phones. As of June 2014, more than 75 billion apps had been downloaded from the App Store, and somewhere between 2 and 3 billion apps are downloaded each month. Apple has reported that customers spent over \$10 billion in the App Store in 2013, generating an estimated profit for Apple of about \$3 billion. Even so, Apple's primary goal in offering apps is not to make money from them, but instead to drive sales of devices—the iPhones, iPads, and iPods that need software to become useful. It's the reverse of printer companies who make cheap printers in order to sell expensive ink. At the same time, apps tie the customer to a hardware platform: as you add more and more apps to your phone, the cost of switching to, say, an Android, rises with each new app installed.

The app phenomenon, equally virulent on Android and BlackBerry operating system platforms, has spawned a new digital ecosystem: tens of thousands of developers, a wildly popular hardware platform, and millions of consumers looking for a computer in their pocket that can replace their now clunky desktop-laptop Microsoft Windows computers, do a pretty good job as a digital media center while on the road, and, by the way, serve as a cell phone.

The range of applications among the 1.2 million or so apps on the Apple platform is staggering and defies brief description. Currently, there are 24 different categories. You can use the Genius feature to recommend new apps based on ones you already have. There are so many apps that searching for a particular app can be a problem unless you know the name of the app or the developer. Google is probably the best search engine for apps. Enter a search term like "Kraft app" and you'll find that Kraft has an app called iFood Assistant that provides recipes



using Kraft products. The most popular app categories are games, education, business, lifestyle, and entertainment.

The implications of the app ecosystem for e-commerce are significant. The smartphone in your pocket becomes not only a general-purpose computer, but also an always-present shopping tool for consumers, as well as an entirely new marketing and advertising platform for vendors. Early e-commerce applications using desktops and laptops were celebrated as allowing people to shop in their pajamas. Smartphones extend this range from pajamas to office desktops to trains, planes, and cars, all fully clothed. You can shop anywhere, shop everywhere, and shop all the time, in between talking, texting, watching video, and listening to music.

Almost all of the top 100 brands have a presence in at least one of the major app stores, and more than 90% have an app in the Apple App Store. Here are a few examples of how some different firms are using apps to advance and support their brands:

- Converse's Sampler: Allows users to take a picture and "try on" a pair of shoes to see how they look in the clothes they're wearing, as well as to immediately purchase the shoes
- Benjamin Moore's Color Capture: Enables users to match colors and paints
- Colgate-Palmolive's Max White Photo Recharger: Enables users to whiten their teeth in photos
- Tiffany's Engagement Ring Finder: Lets users view diamonds by size, shape, setting, metal, and design
- Charmin's SitOrSquat: Restroom Finder: Provides users with locations of nearest public

bathrooms, including cleanliness reviews, availability of changing tables, and handicapped access.

There are, of course, dangers in any ecosystem dominated by a single company. The Apple iOS platform is closed and proprietary, a walled garden, a limiting sandbox. The apps you buy there can play nowhere else. Many apps are incredibly single-purposed and limited in applicability. The apps don't come with any warranty. Because Apple controls who can play in the sandbox, there is the possibility, even the likelihood, that Apple acts as a censor of content, or as a monopolist that prevents certain applications from entering the marketplace, or more likely, as an arbitrary, inscrutable bureaucratic machine that decides which apps will play and which will not. For instance, Apple has removed applications because of sexually themed content. Such programs often appear on the store's list of most-downloaded apps. Clearly Apple is concerned the App Store might become an adult digital theme park that would turn off parents and families who are the target audience for iPhone and iPad sales. In 2012, for the first time, Apple was forced to remove malware from its App Store. A Russian app entitled "Find and Call" purported to simplify users' contacts lists, but instead stole those contacts and uploaded the address book to a remote server, spamming those addresses. In 2013, researchers at Georgia Tech created an app that was able to elude all of Apple iOS's most current security tools, including sandboxing, code signing, and various anti-exploit technologies. Thus far, most Apple app malware has been targeted toward jailbroken iPhones. However, clearly, the app ecosystem is not immune to many of the same issues that apply to the Internet and e-commerce at large.

SOURCES: "App Store Metrics," Pocketgamer.biz, accessed September 3, 2014; "iTunes App Store Now Has 1.2 Million Apps, Has Seen 75 Billion Downloads to Date," by Sara Perez, Techcrunch.com, June 2, 2014; "Apple's 2013 App Sales Top \$10 Billion," by Daisuke Wakabayashi, *Wall Street Journal*, January 7, 2014; "Global Brands in the Mobile Landscape," by Anne Hezemans, *Distimo*, October 2013; "Researchers Outwit Apple, Plant Malware in App Store," by Gregg Keizer, *Computerworld*, August 20, 2013; "Apple: App Store Now Makes Over \$1 Billion in Profits Per Year," SeekingAlpha.com, May 30, 2013; "First Instance of iOS App Store Malware Detected, Removed," by Christina Bonnington, *Wired.com*, July 5, 2012; "The Apps Strategies of the Top 100 Brands," by Haydn Shaughnessy, *Forbes.com*, October 27, 2011; "The State of Mobile Apps," by The Nielsen Company, June 1, 2010; "Mobile Apps and Consumer Product Brands," by Tobi Elkin, *eMarketer*, March 2010; "Apple Bans Some Apps for Sex-Tinged Content," by Jenna Wortham, *New York Times*, February 22, 2010; "Inside the App Economy," by Douglas MacMillan,