The Mobile Business Printing Landscape: Assessing the Opportunity

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IN THIS EXCERPT

The content for this excerpt was taken directly from the IDC Industry Developments and Models report titled, "The Mobile Business Printing Landscape: Assessing the Opportunity" by Holly Muscolino (Doc #228220). All or parts of the following sections are included in this excerpt: IDC Opinion, Situation Overview, Overview of Mobile Printing Solutions and Future Outlook. Also included are Figures 1 and 2.

IDC OPINION

Several factors have come together to drive forward the mobile printing paradigm. Primary, of course, are the requirements of an increasingly mobile and distributed workforce and the continued blurring of work and personal time. IDC predicts that by 2013, the mobile worker population will account for 35% of the worldwide workforce and three-quarters of the workforce in the United States. The second factor is the proliferation of affordable, highly featured smartphones and tablets. IDC also reports that smartphone vendors shipped 303 million smartphones in 2010, up 75% from 2009. Total smartphone shipments worldwide will reach 926 million units by 2015. Worldwide media tablet shipments will grow from 17.9 million units in 2010 to more than 120 million units in 2015. Finally, we are seeing what IDC analysts call the "appification" of almost everything, driven by the explosive growth of mobile apps that turn existing digital and physical world experiences into apps. Additionally:

- IDC defines *mobile apps* as software applications that run on mobile implementations of high-level operating systems (HLOSs). For the purposes of this document, we define mobile printing as a print job *initiated* by a mobile app. (Note that the print job itself may or may not reside on the mobile device.) While the mobile apps market has been largely driven by the consumer market, enterprise apps are expected to play a bigger role in the future. This analysis focuses on the mobile printing of business documents.
- The market for solutions that enable printing and related functions from mobile devices such as smartphones and tablets is in its infancy, with multiple vendors providing diverse solutions deployed in a variety of ways and meeting different user requirements. The result is confusion, a lack of understanding, and a degree of skepticism.
- We propose a taxonomy for categorizing mobile printing solutions for business documents, exploring various modes of deploying these solutions, and highlighting some of the options available on the market today. It is likely that multiple solutions will be required to meet the needs of multiple constituents. We expect to see the development of standards for mobile printing. In addition,

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vendors will need to remain nimble to leverage the capabilities of new and evolving handheld devices as well as new opportunities and business models as more and more applications migrate to the cloud.

SITUATION OVERVIEW

Introduction

Business is no longer bound by the four walls of the brick-and-mortar office and neither is business printing. Several factors have come together to drive forward the mobile printing paradigm. Primary, of course, are the requirements of an increasingly mobile and distributed workforce and the continued blurring of work and personal time. *Worldwide Mobile Worker Population 2009–2013 Forecast* (IDC #221309, December 2009) predicts that by 2013, the mobile worker population will account for 35% of the worldwide workforce. In the United States, three-quarters of the workforce will be mobile by 2013. This includes workers who travel outside of the office or work out of remote locations as well as those who are mobile within the office or campus environment.

The second factor is the proliferation of affordable, highly featured smartphones and tablets. Recent IDC research indicates that 23% of business workers said they use a smartphone at work. *Worldwide Mobile OS 2010–2014 Forecast and Analysis* (IDC #226273, December 2010) reported that smartphone vendors shipped a total of 303 million smartphones worldwide in 2010, up 75% from 2009. Total smartphone shipments worldwide will reach 926 million units by 2015, resulting in a compound annual growth rate (CAGR) of 25%. In North America, 74 million smartphones were shipped in 2010, with over 150 million projected for 2015, at a CAGR of 15.4%. Worldwide media tablet shipments will grow from 17.9 million units in 2010 to more than 120 million units in 2015, a CAGR of 46.6%. Shipments of media tablets in the United States will grow from 8.4 million in 2010 to over 32 million in 2015, a 32.1% CAGR.

Finally, we are seeing what IDC analysts call the "appification" of almost everything, driven by the explosive growth of mobile apps that turn existing digital and physical world experiences into apps. *Worldwide and U.S. Mobile Applications, Storefronts, and Developer 2010–2014 Forecast and Year-End 2010 Vendor Shares: The "Appification" of Everything* (IDC #225668, December 2010) predicts that the number of downloaded apps will increase from 11 billion in 2010 to 77 billion in 2014, representing a CAGR of 63%. This growth is facilitated by tablets and other devices in addition to smartphones. IDC researchers believe that the mobile apps market is still in its infancy and that it will evolve dramatically over the coming decade.

IDC defines *mobile apps* as software applications that run on mobile implementations of high-level operating systems — for example, Android, BlackBerry, iOS, Symbian, webOS, Windows Mobile, and Windows Phone 7. For the purposes of this document, we define *mobile printing* as a print job *initiated* by a mobile app. The app may be an email client, Web browser, or some other document-centric application. The app may

be created specifically for the purpose of managing mobile printing. (Note that the print job itself may or may not reside on the mobile device.) The print job is transmitted to the printer or MFP directly, or indirectly, via a WiFi, Internet, or Bluetooth connection.

While the mobile apps market has been largely driven by the consumer market, enterprise apps are expected to play a bigger role in the future. This analysis focuses on the mobile printing of business documents (e.g., PDF and Microsoft Office Suite) rather than consumer documents, which are typically photos and other images. It is important to note, however, that (today at least) the boundary between consumer and business applications is vague and much of our discussion would be applicable to both markets. We are focusing on business printing for the purpose of clarity and reduced scope.

The Mobile Printing Value Proposition

For the end user, the mobile printing value proposition primarily centers on convenience. Users can print anytime, anywhere from their handheld device without installing print drivers or having other specific knowledge about a printer, such as its IP address. Mobile workers can begin to leave their computers behind when traveling outside of the "home office," with the knowledge that they can still print documents if necessary. The convenience advantage extends to both the professional traveling outside of his or her own organization's locations as well as to the worker who needs to print at different locations within an organization's own campus or facilities.

Some specific use cases that demonstrate convenience are:

- Print a boarding pass at a hotel or other printing "hot spot"
- Print out a contract at a customer's location
- Receive an email on a handheld at home and print it out without turning on a PC
- Print documents at a remote corporate location without IT assistance
- Receive last-minute updates to a presentation and print the presentation before attending a meeting
- Print from the phone on the way to the office and have documents waiting when you arrive

Hand in hand with convenience is increased productivity. Mobile printing means that document printing does not need to be delayed. Activities that individuals find easier (or more comfortable) using paper versus the screen (such as especially long or complex documents), or tasks that require print, can be accomplished as needed.

Perhaps counterintuitively, mobile printing may provide an added level of security since, in some cases, it offers users the option to print documents only when they are

standing next to a device, ensuring that only the intended recipient has access to the printed document.

Mobile printing provides a new revenue stream for hotels, airport lounges, coffee shops, libraries, and other locations that serve mobile workers. It allows these establishments to meet customer needs and increase customer satisfaction while driving additional business and providing competitive differentiation.

For traditional print service providers and printing equipment manufacturers, the value is in driving print volume. Whether this print volume is largely incremental or composed of jobs that would have been printed anyway at a later time is still being debated. One can argue a negative impact on print volume, since greater access to printing means that documents can be printed just in time rather than just in case. However, IDC research shows that smartphone users are more likely to report year-over-year increases in their print volume, whereas nonusers are more likely to report flat or decreased print volume.

IDC's Mobile Printing Taxonomy

Mobile printing is a new and emerging market with a number of different implementations and no clear standards. As a result, there are a number of ways to categorize the various mobile printing solutions available today. In all cases, the print job is initiated on a handheld device and is sent to the printer or MFP via a wireless connection. Some possible ways to segment the market are:

- Method used to send a document to print:
  - Directly from document-related mobile applications via a "Print" menu option
  - From a mobile app that is specialized for mobile printing
  - From an email client, either as an attachment or the printing of the body of an email
- Where the end user is initiating a print job:
  - Within an organization's infrastructure
  - External to an organization's infrastructure
- Vendor-specific solution versus vendor-agnostic solution (based on either the handheld device or the output device)
- Type of document that can be printed (e.g., PDF, images, and Microsoft Office Suite)

We have chosen to categorize mobile printing solutions by where the document is rendered for printing and the path used to communicate between the handheld device and the printer or MFP. There are two basic models, each of which can be broken into two subcategories, as depicted in Figure 1: peer-to-peer printing and cloud printing.

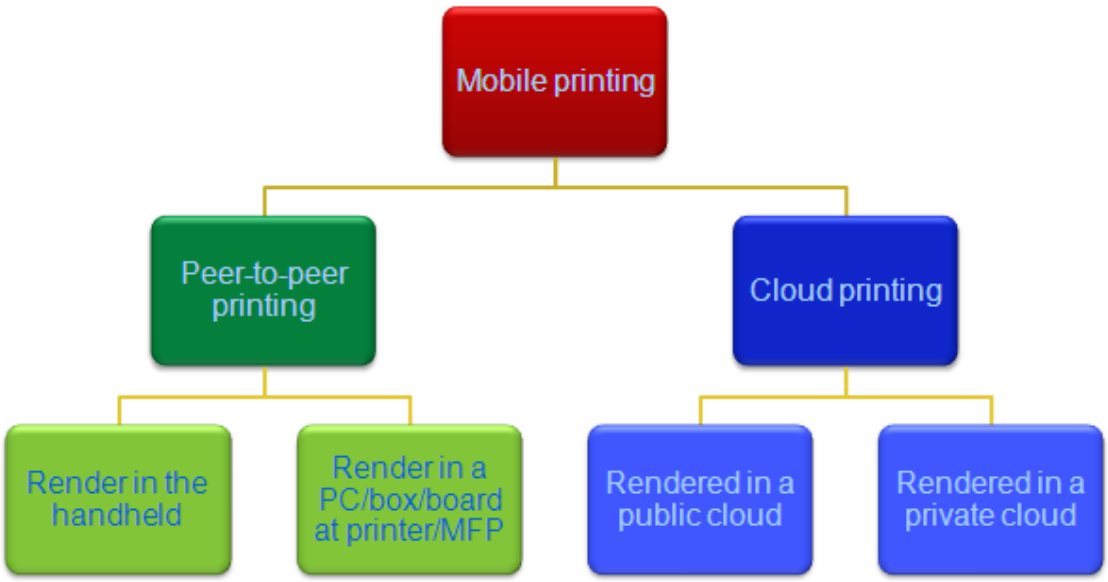
In the peer-to-peer model, the handheld communicates directly with the printer/MFP (or via a computer directly connected to the printer/MFP). In this model, rendering can occur in the handheld device, in a computer associated with the printer/MFP, or potentially on the printer controller board itself.

In the cloud model, the document is processed by a cloud-enabled application. Within this model, there can be a public cloud implementation or a private cloud implementation.

Note that the terms "mobile printing" and "cloud printing" are frequently used interchangeably in day-to-day jargon. By our definition, cloud printing is a subset of mobile printing. *While all cloud printing is mobile printing, not all mobile printing involves a cloud implementation.*

FIGURE 1

Mobile Printing Taxonomy



Source: IDC and Global Graphics Software Ltd., 2011

In both the peer-to-peer model and the cloud model, there are two primary requirements for the solution:

- It must have information about the specific output device to prepare the document for printing. This may be accomplished via use of "universal" print drivers loaded onto the handheld device, or via universal or specific drivers hosted in the cloud.

- It must be able to locate the output device. Location may depend on standard print services that enable users to discover devices on a network, or devices may be identified via an email address or other unique identification.

An example of the peer-to-peer model in which the document is rendered in the handheld device is Apple AirPrint. In this model, the user may print directly from a creative application, such as Apple's iWork applications running on an iPad. This model is simple to use since no additional infrastructure is required. However, output quality may suffer, due to limitations in processing power and memory on the handheld device. Also, the handheld must have some knowledge of the printer and its location. (In the AirPrint example, the handheld and the printer must be connected to the same network, and the printer must be an AirPrint-enabled device.

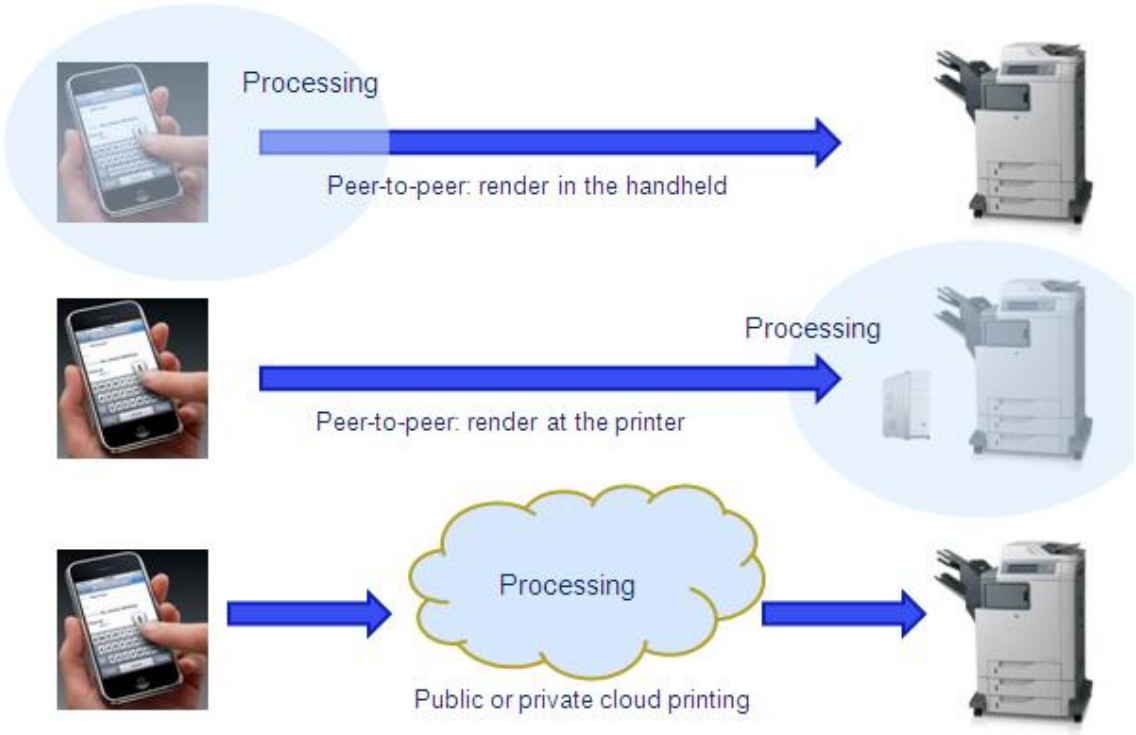
At ITEX 2011, Global Graphics demonstrated a proof-of-concept peer-to-peer solution in which rendering occurs at the printer or MFP. In the ITEX demonstration, processing occurred in a box that was connected to an MFP, though Global Graphics plans to work with its OEMs to produce an embedded solution in the future (refer to Figure 2). This model also requires no additional infrastructure (except the box at the device) and it offloads the rendering task from the handheld device, producing more reliable quality and minimizing the load on the device battery. In addition, the handheld device itself does not need to have printer/MFP-specific information, though it still needs to locate the device on the network.

An example of a public cloud printing implementation is Google Cloud Print, which enables users to print from a mobile device to any printer that is "cloud ready" or connected to a PC running the Google Chrome OS. Since in this model the rendering task is also offloaded from the handheld, quality may be more reliable.

Figure 2 depicts the differences between the two types of peer-to-peer printing and cloud printing.

FIGURE 2

Peer-to-Peer Versus Cloud Printing



Source: IDC and Global Graphics Software Ltd., 2011

Overview of Mobile Printing Solutions

The sections that follow highlight selected mobile printing solutions.

EFI

EFI was the first to enable printing for mobile workers with the launch of its PrintMe product about 10 years ago. Today, EFI offers two mobile print solutions:

- **PrintMe.** A cloud-enabled solution that allows driverless printing from a PC or handheld device to any PrintMe-enabled printer, available in many hotel business centers
- **PrintMe Connect.** A free peer-to-peer AirPrint-based application that enables direct printing from Apple devices to EFI Fiery–driven printers or MFPs

PrintMe

The PrintMe solution enables mobile workers to print to a PrintMe-enabled output device in one of four ways (the first two are less relevant to our definition of mobile printing than the second two since they are designed to support printing from PCs):

- Upload the file to **www.printme.com**
- Print from a desktop application after installing the PrintMe print driver
- Email the file to **print@printme.com** from any Internet-connected device
- Initiate via a PrintMe iPhone app

A PrintMe-enabled device is any PCL or PostScript printer with a USB, parallel port, or network connection that is connected to a PrintMe Station. The PrintMe Station is a network appliance that connects a printer securely to the Internet. Each PrintMe Station has a unique PrintMe ID that identifies the appliance.

Once a job is submitted, the user receives a unique DocID that must be entered at the PrintMe station to retrieve the printed document securely.

Supported file types include Microsoft Word, Microsoft Excel, Microsoft PowerPoint, HTML, PDF, PostScript, and .txt image files (bmp, gif, jpg, pic, pct, png, tiff, and tif).

An auto-discovery feature at **www.printme.com** enables users to locate nearby PrintMe-enabled printers.

The solution is free to end users who may pay for the printed output. For service providers, the solution is available directly from EFI as well as its partners. PrintMe is sold as a subscription service for a single printer or MFP, with the cost of the equipment, activation, service, and maintenance for one, three, or five years included in the original purchase price. Pricing for additional years of service, remote installation, or multiple MFPs is available. Pricing is *not* dependent on usage (number of documents, etc.).

Future models of Fiery controllers will have the PrintMe technology built in to allow direct mobile printing.

PrintMe Connect

PrintMe Connect is a free solution that enables direct printing from Apple iOS 4.2–enabled devices with AirPrint (iPad, iPhone, and iPod touch). The software runs as a proxy on a Windows system on the wireless network to enable AirPrint printing to EFI Fiery–driven devices on an enterprise network. When the user selects the "Print" button, he/she is presented with a list of available Fiery-driven devices to select from and submits the job.

Xerox has recently announced a partnership with EFI and the PrintMe solution.

Xerox

Xerox offers three mobile printing solutions targeted at different categories of mobile workers:

- **In-office solution.** The Xerox Mobile Print Solution provides mobile printing services from anywhere to devices that exist within an organization's infrastructure. That infrastructure may be deployed across multiple locations.

- **Managed services solution.** The managed services solution is similar to the in-office solution but deployed in a managed services environment.

- **Out-of-office solution.** The out-of-office solution is based on EFI's PrintMe technology that enables end users to print outside of their organization's infrastructure.

Xerox Mobile Print Solution

The Xerox Mobile Print Solution is a private cloud solution that enables users to print from any Internet-connected smartphone or tablet to any EIP-enabled Xerox MFP on an organization's network. The solution is based on three Xerox technologies: the Xerox Global Print driver, a universal print driver that can print to any PS or PCL printer; pull printing features; and some additional mobile print technology.

The solution integrates with an organization's existing email and authentication systems, enabling it to utilize an organization's business rules for security, confidentiality, and accountability. Supported file types include Microsoft Word, Microsoft Excel, Microsoft PowerPoint, PDF, text files (.txt) and rich text files (.rtf), JPEG images, and HTML email. Xerox indicates that though output quality can vary among vendor's implementations, Xerox offers "no excuses" document output, with accurate conversion of Microsoft Office documents to EIP-enabled devices.

Xerox Mobile Print functions as follows:

- The user emails a document to a mobile printing email address set up for his/her organization (e.g., mobileprint@[insert your company name here].com). The user does not have to decide where to print until he/she is ready to pick up the document.

- In response, the user receives a confirmation email with a secure confirmation code.

- To print, the user selects Mobile Print on a Xerox EIP-enabled MFP, enters the confirmation code, selects the documents to print (a thumbnail appears on the device panel), selects finishing options (duplex, collate, staple, etc.), and prints.

Xerox Mobile Print does not require an app to be downloaded, and there is no need to select a specific device until the document is printed. Only EIP-enabled Xerox devices are supported. Since all printing occurs within an organization's firewall, the solution is extremely secure.

The solution is available through all Xerox channels worldwide. Though there is some geographic variation on pricing, the basic pricing model is a software license fee and a per-device license fee. Xerox is intentionally keeping these fees low and believes it has the lowest price on the market for a fleet of devices.

Xerox Managed Mobile Solution

Xerox's Managed Mobile Solution is similar to the Mobile Print Solution described previously; however, it is deployed in a managed services environment and leverages

the customer's existing email architecture and user security strategies to deliver mobile printing.

The Managed Mobile Solution does support non-Xerox devices as long as they are registered for the solution; however, all features may not be available and the experience may not be as rich. For competitive devices and non-EIP Xerox devices, Xerox supports a push printing model in which the user adds the confirmation code to the title of the email along with an identifier for the printer to send the job to that printer.

The Managed Mobile Solution integrates into the MPS Office Tools that are already managing the environment. This integration allows Xerox to manage the health of those devices that are being administered by its device management tools and provides a single point of device configuration for general settings as well as for the mobile print enablement of each device. Xerox also provides integration of Mobile Print into its standard MPS Enterprise Print Governance and user-level job accounting to ensure that Mobile Print is fully incorporated into the customer's managed environment.

There is a fee to set up the servers, with the number of servers dictated by the number of users, and a fee per month per user.

Out-of-Office EFI PrintMe Solution

A new addition to the Xerox portfolio is an out-of-office solution introduced in partnership with EFI. The EFI PrintMe Server provides the same mobile printing workflow described previously for EFI PrintMe; however, the EFI PrintMe Server provides direct connection to up to 20 Xerox EIP-enabled MFP devices, eliminating the requirement for the EFI PrintMe Station. Print jobs can be located and released directly from the MFP touchscreen. For non-EIP-enabled devices, a PrintMe Terminal can be connected to any Windows XP printer. (The PrintMe Terminal is equivalent to the PrintMe Station.)

All PrintMe jobs can be printed in any PrintMe-enabled printers, whether or not they are connected via the PrintMe Station, PrintMe Terminal, or PrintMe Server. At this time, there is no further integration with the other Xerox mobile printing solutions.

FUTURE OUTLOOK

Though printing solutions for mobile workers, such as the EFI PrintMe product, have been available for a number of years, the market for solutions that enable printing and related functions from mobile devices such as smartphones and tablets is in its infancy. In some ways, it is akin to the early days of Web to print, with multiple vendors providing diverse solutions deployed in a variety of ways and meeting different user requirements. The result is confusion, a lack of understanding, and a degree of skepticism.

One might jump to the conclusion that the industry should rally around a single standard and/or method of deployment, converge on a uniform user interface, and agree on an open approach that enables printing from any mobile device to any output device anytime, anywhere. But the reality is that there are different types of customers, with different priorities, for mobile printing solutions. Those customers may include not only the end user or the print service provider but also the enterprise IT department and others. Requirements may vary even among end users. For example, the needs of the road warrior are likely different from those of the individual who travels between corporate facilities. Though the market may not require the abundance of options available today, it is likely that multiple solutions will be required to meet the needs of multiple constituents.

That said, we expect to see the development of de jure or de facto standards that will simplify the morass of products available today and that will enable users to more freely access multiple solutions. Those standards should also address the need for consistent drivers, security features (both inside and outside the firewall), and pricing models for both users (consumer and business) and providers (equipment manufacturers and print service providers) — while still providing support for multiple handheld operating systems and output devices. A suitable analogy might be when PostScript became the common language for PCs, Macs, and Unix-based computers.

In addition, as more applications take to the cloud, mobile printing may become just one component of a larger cloud-enabled workflow. Simply printing may become arcane as we develop the capabilities to orchestrate entire business processes on the go — with our thumbs!