# Expanding the MFP Ecosystem with Xerox's Extensible Interface Platform (EIP)

## Contents

# Expanding the MFP Ecosystem with Xerox's EIP
## Introduction

This white paper has been prepared on behalf of Xerox Corporation by Bissett Communications, publisher of The MFP Report newsletter. It updates a previous white paper (*From Peripheral to Platform:  MFP Software Development Tools and Xerox's Extensible Interface Platform™*) released in October 2006, when Xerox announced its Extensible Interface Platform. EIP is a Web services application development environment that enables software developers to create server-based applications that seamlessly interact with Xerox multifunction printers (MFPs) in the office via the device control panel.

Significant changes have occurred since EIP debuted, thus warranting an updated assessment. The market for MFP software tools has expanded dramatically with regard to the number of participating MFP manufacturers, the scope and level of interest among independent software vendors (ISVs), the evolution of the software tools and partnering programs, and the receptivity of businesses and sales channels to MFP-related software. At the same time, Xerox has gained substantial experience with EIP and has implemented many aspects of its partnering program that were planned but not yet implemented in 2006.

This updated and expanded white paper is divided into six sections:

- **The first section** describes the relevance of MFP software platforms such as EIP from the perspective of MFP customers, software developers, MFP sales channels, and MFP vendors.

- **The second section** provides a historical overview of the MFP solutions market, highlighting the convergence between document management and MFP-based document capture as a backdrop for the development of today's MFP software platforms.

- **The third section** considers MFP software development platforms in greater depth, including the relative merits of the two main technical approaches. Also assessed are key business considerations regarding the way vendors bring their tools to market.

- **The fourth section** provides a more detailed assessment of Xerox's EIP, including its origins, development, components, capabilities and device dependency. Also included is a comparison of EIP to competing MFP software application platforms.

- **The fifth section** focuses on Xerox's EIP business strategy, including its partner program and go-to-market activities, and compares Xerox approach to that of key competitors.

- **The sixth section** concludes with an overall assessment of EIP, pointing to the continuing opportunities and challenges Xerox faces in the MFP solutions marketplace.

# Expanding the MFP Ecosystem with Xerox's EIP
## The Relevance of Xerox EIP
## and MFP Software Platforms

As is often the case with new technologies, there is a tendency to presume that the uses and benefits of those technologies are self-evident and conferred uniformly. In reality, this is seldom the case. It is particularly important when discussing EIP and other MFP software tools to distinguish among the different groups that are affected and how they are affected.

There are four key constituencies most affected by EIP; each group is intended to find value in this white paper. These audiences consist, respectively, of customers who purchase MFPs and related software applications developed on top of EIP; software development partners who create new kinds of MFP-linked solutions using EIP; the multifaceted MFP sales channel that is charged with selling this combination of hardware and software; and Xerox itself as an MFP vendor and the creator of EIP.

### If You Are an MFP Customer
Nearly every business knows what a copier or printer is and has made the transition to using some form of shared MFP. An increasing number of organizations scan with MFPs, but a much smaller number is likely to have experience with MFPs that are tightly integrated with document applications. This situation is changing rapidly. One widely-quoted forecast holds that half of all office MFPs will soon be sold with some kind of complementary document software "solution." For this reason, those who buy, use and manage MFPs need to understand the role of Xerox EIP.

For those who will interact "hands-on" with MFP-linked applications, it is important to understand how MFP software tools can enable new and useful document solutions that provide tight integration, flexible personalization, and functional simplicity. For executives making purchase decisions on imaging equipment and software, such solutions can leverage an investment in MFP hardware while enabling wider deployment of new document applications that provide a tangible return on investment. And for IT managers who are charged with installing and supporting these new solutions, it is critical to understand which MFP software environments are best able to foster applications that are easy to deploy, straightforward to manage, and secure in use.

### If You Are an Independent Software Developer or Systems Integrator
For application developers, MFP software tools enable new office imaging capabilities that provide added value for current customers and help attract new prospects. This can help software developers increase sales and gain new revenue streams. In addition, certain attributes of a vendor's MFP software platform and the vendor's software partnering program may together make it possible for such tools to appeal to a broader range of companies beyond just ISVs, including systems integrators, IT resellers and in-house software developers.

> "…half of all office MFPs will soon be sold with some kind of complementary document software "solution." For this reason, those who buy, use and manage MFPs need to understand the role of Xerox EIP."

# Expanding the MFP Ecosystem with Xerox's EIP
## The Relevance of Xerox EIP
## and MFP Software Platforms (cont.)

### If You Are in the MFP Sales Channel

Those who sell MFPs — whether they work for dealers, direct sales branches, agents or IT resellers — now find that software is an essential component of their daily sales operations. Vendors are aggressively promoting software as the lynchpin in their solutions strategies, and customers are increasingly demanding more value than can be provided by networked MFPs alone. Salespeople will seldom promote a toolset such as EIP in the course of their normal activities. In fact, EIP per se does not necessarily need to be discussed in many sales situations. Far more critical to the sales channel will be the number and scope of software partners that a manufacturer engages, and the quality and effectiveness of the partner program the manufacturer has implemented.

Successfully selling MFP software, such as EIP-enabled applications, will require more initiative on the part of a sales organization and the individual salesperson. Traditional MFP sales organizations may also find new competition emerging from IT resellers and high-end solutions providers in selling some applications. However, those in the MFP sales channel who are up to the challenge, and who are best supported by their manufacturer, will find new rewards enabled by platforms such as EIP. In addition, there may be more opportunity for selling partnerships between MFP sales channels and system integrators or consultants.

### If You Are Part of Xerox

Lastly, from a corporate perspective, MFP manufacturers have their own particular set of interests as regards their software platforms. Xerox has been clearer and more encompassing than the competition in outlining this dynamic. Xerox states that EIP enables it to:

1. Respond to customers' growing demand for document solutions that leverage Xerox MFP hardware

2. Create added differentiation in a mature market for its WorkCentre devices

3. Boost customer loyalty to Xerox and its products, with the expectation of gaining a larger share of customers' office imaging budgets

4. Increase overall sales of WorkCentre hardware

5. Ultimately drive a greater volume of output on its MFPs, thereby boosting annuity revenue and profitability.

# Expanding the MFP Ecosystem with Xerox's EIP
## The MFP Industry
## and a Solutions Market Context

Multifunction printers, or MFPs, in the office are hardcopy devices that connect to a network and provide two or more functions among printing, scanning, copying and fax. The vast majority of networked MFPs in offices are toner-based machines, originally monochrome and increasingly color. Many MFPs with B&W output now feature color scanning. Also, solid ink and liquid inkjet office MFPs have recently emerged and may become increasingly important.

The transition from the old analog copier days to digital multifunctionality is essentially complete. New analog copiers have not been manufactured for several years. Two-thirds of new monochrome digital copiers and virtually all color copiers are used today as MFPs. In fact, it is becoming the norm for some type of network printing and network scanning to be standard in the base configuration of MFPs, especially in the case of color devices. Consistent with this trend, the volume of prints continues to grow in both absolute and relative terms, versus a declining volume of copies. And with the rapid shift toward color MFPs, the volume of output is skewing even more toward printing and away from copying.

This does not mean the office imaging market has reached a steady state. In fact, the MFP market is today in the midst of a transition that is more striking, dynamic, complex and challenging than was the arrival of multifunctionality. This is the transition from an MFP being a network peripheral that is used foremost for printing, to the rise of the MFP as a software platform or portal on or through which a wide variety of document applications are accessed by office workers. While most of these emerging applications relate to document capture, specific MFP applications are also relevant to a number of vertical markets, such as education, legal, government and finance. In addition, there is growing interest in software and systems that collect, track, report and charge for usage of MFPs; control access to MFP functions and features; and personalize the MFP experience for individual users, teams, groups, departments, clients or applications.

Whereas the first wave of multifunctionality was driven by printing, this new era is driven primarily by the scan function on these devices. Simple but powerful scanning to e-mail first gave credibility to networked MFPs as document capture devices. In recent years, MFP-based scanning has benefited from mutually reinforcing trends that include:  rising interest in document management; regulatory and disaster recovery concerns; increased availability of document and content applications; the spread of distributed capture as imaging installations grow; acceptance of text search as a result of companies like Google; and growing interest in content management from leading IT vendors, including Microsoft, Oracle, EMC and IBM.

Concurrently, the quality and capabilities of the scanning function on office MFPs have continued to improve. For a long list of reasons, customers find today that MFPs can be excellent document scanners. The shift toward color MFPs is further increasing the demand for scanning, even as the role of copying and fax decreases. What vendors, software companies and end users now seek is a powerful but flexible array of scanning choices that integrate MFPs into office workflows and provide a personalized user experience at the device, while still maintaining the historic "green button" simplicity of copiers.

> "… the MFP market is today in the midst of a transition that is more striking, dynamic, complex and challenging than was the arrival of multifunctionality. This is the transition from an MFP being a network peripheral that is used foremost for printing, to the rise of the MFP as a software platform or portal on or though which a wide variety of document applications are accessed by office workers"

### The Evolution of MFP Applications

The functionality required for printing, whether in a small office or across an enterprise, has been amply defined for many years. Print drivers are part of PC operating systems. Printer hardware companies, print technology suppliers and standards bodies have specified the requirements for printing any document in any environment, for managing print devices, and for administering and controlling the printing process.

This is far from true with regard to scanning, particularly on a network. The key difference is important to grasp. Printing entails receiving from a computer a stream of existing data and instructions on how to portray the data on paper. In contrast, scanning engenders creating new data in the form of images. It is therefore necessary when scanning that users designate where the images are to be sent, how they are to be described, and what is to be done with them.

When scanning on MFPs arose in the 1990s, the only scanning protocols (initially TWAIN or ISIS and later WIA) presumed that a scanner was always attached to a PC. Users would "pull" images from the scanner to the PC and immediately determine what to do with them. The driver was usually supplied by the scanner vendor, and there could be subtle incompatibilities between scanner features and imaging applications.

The challenge presented when scanning on a network-attached MFP is that there is no direct connection between the MFP and a computer. Vendors first attempted to meet this challenge by mimicking the PC scanning model. Users could scan a document on an MFP and store the images inside the device or place them in a folder on the network. There was no simple way to associate data with the images, which meant that users needed manually to locate, retrieve and redirect the images to the intended application or destination. Equally importantly, early MFP scanning solutions offered little in the way of security when it came to authenticating, identifying, tracking or controlling access to the scan function.

Gradually, vendors improved the user experience for sending scanned images directly from MFPs as attachments to standard e-mail messages. Scanning to e-mail addressed a need that customers previously had not articulated but which delivered tremendous value. More than any other single factor, scanning to e-mail fueled the adoption of MFPs as distributed document capture devices and paved the way for more sophisticated MFP scan solutions. At the same time, e-mail had important advantages that were not shared in other application areas. For example, e-mail is nearly ubiquitous in business; it is highly standardized; it has its own addressing and security infrastructure; and a few e-mail applications dominate the corporate market. In order to enable equally simple and effective scanning from networked MFPs to a much more diverse group of applications, some vendors and their partners began to develop server-based solutions.

These solutions took several forms. One approach was a server-based utility for creating scan templates that could be selected from the MFP control panel to specify scan settings and image destinations. This approach is exemplified by Xerox's former CentreWare Scanning Services. Another approach was to provide tight integration between a third-party server with its own user interface and links to other applications.

This approach is epitomized by ShareScan from eCopy and AutoStore from Notable Solutions (NSi). Initially, these solutions worked exclusively with a particular vendor's MFPs (i.e., Canon for eCopy and HP for NSi). An alternative approach was a vendor-developed server application that supported limited user interaction from the MFP control panel (e.g., Ricoh GlobalScan) or via a paper coversheet (e.g., Xerox SMARTsend). And yet another approach relied on scanned paper coversheets generated at the desktop (e.g., Omtool AccuRoute).

Each of these approaches had shortcomings, including: a relatively high price, particularly for a dedicated server and separate display; poor ease-of-use and limited flexibility associated with weak control panel integration; minimal ability to control access to the scan function or to track scanning use; and the lack of robust developer tools to enable seamless integration with third-party applications.

These shortcomings led to the launch in 2003 of the industry's first integrated MFP software development platform, which was Canon's Multifunction Embedded Application Platform. "MEAP" is a Java-based software environment used to create applications that reside inside Canon MFPs. The first MEAP application became available in 2004. However, due to a combination of business decisions and technical constraints, MEAP has fostered a fairly small number of MFP applications and partnerships over the years.

Other MFP vendors followed with their own development platforms for their specific MFPs. Sharp announced its Web services based Open Systems Architecture (OSA) in the fall of 2004. Ricoh, which had provided a few ISVs with a very basic 'C' software toolkit in 2003, launched its Java-based Embedded Software Architecture (ESA) in late 2004. Fuji Xerox followed at the end of 2004 with a Web services based platform called Apeos iiX.

After a lull in 2005, three more vendors entered the MFP software development arena in 2006. Lexmark announced its Java-based Embedded Solutions Framework (eSF) early in the year. In the fall, Xerox announced EIP, and HP previewed a Web services platform called Simple Document Capture (SDC). In the summer of 2007, HP replaced SDC with a broader Web services offering called the Open Extensibility Platform (OXP), and Konica Minolta began to engage developers with its OpenAPI, which is also based on Web services. In 2008, Toshiba announced its Web services based e-Bridge Open Platform, and Samsung announced a JavaScript platform called JScribe that is sourced from a German company called CCP.

Meanwhile, a handful of software companies have continued to carve out a solid position amidst this plethora of vendor-specific platforms by developing cross-platform "middleware" for network scanning from MFPs. These companies — primarily eCopy but also NSi and EFI — have established partnerships with multiple MFP vendors and a growing list of ISVs.

If all these choices were not enough, several scanner vendors — including HP, Kodak, Fujitsu and Canon — have launched new network-attached, single-function scanners over the past two years. More recently, some of these vendors have staked out software tool strategies to enable integration with MFP middleware vendors or other application developers.

### MFP Software beyond Scanning

While network scanning is by far the largest and most important application area to benefit from the emergence of MFP-based software, two other areas warrant mentioning: document accounting and security.

Document accounting refers to software and systems that collect, track, report and/or charge for usage of MFPs, as well as printers, copiers and fax machines. Historically, document accounting was focused on tracking copier usage and allocating the cost of copies, typically to external parties. Document accounting has a long history in the legal market and in certain other vertical markets, such as education. Equitrac has for many years been the leader in this segment. With the shift from copying to printing and now to scanning, with greater IT awareness of the costs associated with output, with the spread of color devices that are more costly to operate, and with growing concern over environmental impacts, there has been increasing interest in document accounting in a broader range of companies and industries.

On analog copiers, document accounting required that special hardware be developed and attached to each copier. The advent of networked MFPs made it possible to replace these add-on hardware "boxes" with server-based software. With today's MFP applications platforms, document accounting vendors are able to develop even more powerful software, improve the walk-up user experience, provide greater customization, and offer better integration with other applications and MFP functions, particularly scanning.

Comprehensive security in the context of networked MFPs is poorly understood and often difficult to achieve. The security features provided by MFP application platforms can be interesting in the context of printing and very complementary to the scan function. MFP platforms provide new capabilities for printing that improve the walk-up user experience at the control panel, enable greater personalization, and maintain an audit trail of print jobs. Most of the added security benefits for scanning are quite similar, including a superior user experience at the MFP control panel, determining who has access to the MFP scan function, and providing an audit trail of scanning usage.

### MFP Application Development Alternatives

There are two main technical "camps" in the market for MFP software development tools: an embedded Java approach and a Web services approach. Each has certain strengths and limitations from the perspective of software developers and customers.

The Java approach in MFP software development arose first. It is exemplified by Canon's MEAP and Ricoh's ESA, as well as by Lexmark's eSF. Java is a widely accessible and powerful programming language. With these platforms, one or more Java applications can reside inside an MFP, although there may also be a server component. The application may perform a specific task (e.g., convert images to searchable PDF files), or it may link images and associated data to an external application.

Java is easier to use than traditional programming languages, but it still requires well-trained programmers with a reasonable level of skill and experience. Java applications can be resource intensive in terms of the processing power and memory they require from the MFP. Because the same processor is used to operate the MFP and host the MFP application, performance may slow down and limit the number of applications that can be accessed. The Java approach has also proven somewhat cumbersome when it comes to designing a user interface for the MFP

control panel. Lastly, because the Java application must be installed inside each MFP where it is used, this approach creates significant administrative overhead in terms of disseminating, managing and updating MFP applications. These challenges are magnified in large enterprise environments.

The alternative Web services approach to MFP software development is used by a longer and growing list of MFP vendors, including Xerox, Fuji Xerox, Sharp, HP, Konica Minolta and Toshiba. This approach leverages international Web standards such as HTML, XML, WSDL, AJAX and SOAP to create applications, to link applications with each other, to develop MFP user interface screens, and to manage all of this software. It is worth noting that when development began several years ago on Java-based MFP application tools, a mature and robust embedded Web server with a small footprint — a prerequisite for a successful Web services platform — was not readily available. That is no longer the case.

Web services development is typically much less demanding and less complex than Java programming. A Web-oriented MFP platform is thus accessible to a wider range of developers, including corporate in-house developers and technology resellers. The time needed to develop a Web-oriented MFP application is less than the time needed to create a similar Java application. At the same time, if a particular task is best achieved through Java programming, a Web page displayed on the MFP control panel can invoke JavaScript applications for particular tasks or processes.

There are other advantages to using Web services for MFP application development and using Web browser technology to display information on an MFP control panel. It can be easier to develop highly customized and intuitive user screens on the control panel. Because the applications do not run inside the MFP, the embedded browser needs only to display the Web pages. This reduces the need for processing power and memory inside the MFP. Likewise, it enables applications to be used in conjunction with lower-end or less expensive MFPs that lack the resources to run embedded Java applications. This is increasingly important as less expensive, letter-size MFPs grow in popularity.

It is also more practical to have multiple applications running on a server than to have them all running inside an MFP. And because the software is on a server, it is easier to deploy, manage and update in an enterprise environment. Because the application does not reside inside the MFP, the MFP vendor does not need to undertake lengthy and complex testing of the application before launching the new hardware.

Finally, there is no concern about removing software when an MFP is retired, returned or sold. About the only possible downside to a Web based approach is that a large number of MFPs interacting with an application on a server might conceivably create a bottleneck. However, servers can generally be sized for such demands. In addition, advanced image compression inside most MFPs greatly reduces the magnitude of image traffic on a network.

In summary, a Web services approach to developing server-based MFP applications has many compelling advantages and no real disadvantages as compared to creating Java applications that reside inside an MFP.

**"There are other advantages to using Web services for MFP application development and using Web browser technology to display information on an MFP control panel. It can be easier to develop highly customized and intuitive user screens on the control panel. Because the applications do not run inside the MFP, the embedded browser needs only to display the Web pages. This reduces the need for processing power and memory inside the MFP."**

### MFP Hardware Considerations

Two aspects of MFP hardware design are important to consider. These are the MFP controller, which is the "brains" of the MFP device, and the MFP control panel.

In terms of the controller, the key concerns relate to performance, architecture and readiness to support applications. As mentioned, the power available from the processor in the MFP controller can be an issue for the Java approach in that the same processor is used to operate the MFP and to host MFP applications. In addition, some applications — such as those entailing optical character recognition ("OCR") or image processing — can be very demanding in terms of the processing resources they require.

The issue of controller architecture is more subtle. It is advantageous that the controller integrate all MFP imaging functions and that those functions share the same processor, memory, hard drive, interfaces and image processing. Such architectures are the norm in most MFPs today. However, this means that an MFP configured with a third-party print controller (e.g., a Fiery from EFI) will likely still require the vendor's own embedded MFP controller in order to be compatible with applications. This can add complexity and cost. It is also worth noting that most emerging MFP software platforms generally have not been backwards compatible with a vendor's previous models.

Lastly, it is important to understand whether the MFP controller supports the vendor's application platform "out of the box" or whether additional firmware is required. Some vendors require that customers wishing to use applications with an MFP procure a software upgrade for each machine. Such kits can add $100 to $750 to the list price of each MFP.

In terms of the MFP control panel, the main requirement is that the liquid crystal display (LCD) be of a sufficient size to portray application-oriented screens. It must also support touchscreen operation. A large, high resolution, backlit, color LCD is the optimal choice. In the MFP industry, the major Java-based application platforms have been designed to support one specific size of LCD. Conversely, many Web-based software platforms support a wider array of control panel LCDs. While the LCD control panel can also be used to display a touchscreen keyboard for entering text, some vendors are beginning to offer a separate keyboard for use in conjunction with the control panel. This seems to improve ease of use.

### Go-to-Market Strategies

One of the major challenges for individual MFP vendors and for the MFP industry as a whole is to appreciate that good technology — while necessary for transforming MFPs into application platforms — is not alone sufficient to assure success. Just as important are a vendor's business strategy, its partnering programs, and its go-to-market plans.

The first issue to consider is how open the MFP vendor is when it comes to working with multiple ISVs. Some vendors require a prospective partner to provide a detailed description of the application, justify why the company wishes to work with that vendor, and undergo a rigorous selection process. Also important are the price the ISV must pay in order to gain access to the MFP software tools, and the nature and cost of development support for the ISV.

One critical issue is whether the MFP vendor charges a royalty on the software that the ISV develops. Given that leading platform companies like Microsoft and IBM do not charge such royalties, it is doubtful that an MFP vendor can do so successfully. A

related issue is whether the vendor requires the ISV application be certified before it can be sold for use with the vendor's MFPs. If certification is mandatory, the fee for certification and the time required to obtain certification become important considerations.

Casting a shadow over these other concerns is the fundamental issue of whether an MFP vendor is developing and selling its own applications, and whether such software competes — or is perceived by the ISV as competing — with its own applications. Hardware vendors are strongly advised to limit their own development efforts to "infrastructure" applications, leaving ISVs to develop software with greater added value.

Even if an MFP vendor does an exemplary job in recruiting numerous credible ISVs to participate in a software development program, challenges remain with regard to how effectively the vendor partners with these ISVs to market, sell and support the resultant applications. The approach to sales is especially critical. Historically, the most successful software in the MFP market has been resold by an MFP vendor or even relabeled by the vendor. Examples include Canon's relationship with eCopy; Xerox's relationships with Captaris, Equitrac, Nuance and X-Solutions; and HP's relationship with NSi. The success of these partnerships reflects the early stage in the MFP solutions business when such arrangements were undertaken. Clearly, it is not tenable on an ongoing basis for MFP vendors to sell and support all of the applications being developed by all of their partners.

The other critical sales issue is the dissimilitude in channels and business methods between the MFP industry and the document software market. MFPs are sold primarily through independent office equipment dealers and direct sales branches. The equipment and software are typically leased, often in conjunction with a per-page charge that covers supplies and service. Conversely, document-oriented software is sold by a combination of value-added resellers (VARs), system integrators and direct sales. Typically, such software is bundled with higher-value services relating to customization, integration, support and upgrades.

To the extent that an MFP vendor and an ISV both have direct sales channels, joint selling should be feasible. When MFP hardware and ISV software are sold through different channels, creating workable programs is more complex. Nonetheless, in both instances certain joint marketing activities are obvious. These include publishing a partner solutions catalog or Web site; creating a partner Web site or portal; bilateral exhibiting opportunities at trade shows; direct mail campaigns; and joint or cooperative advertising.

Notwithstanding such efforts, the biggest challenge for MFP hardware vendors, ISVs and their respective channel partners is how effectively they develop the necessary infrastructure to facilitate mutual sales. MFP vendors who achieve programmatic strength in sales, marketing and partnering will have a distinct advantage over their competitors, even if the competition enjoys certain technological or pricing advantages.

Last, but certainly not least, is whether the MFP vendor has a clear vision of the interplay between hardware and software in its fundamental business model. Some vendors see software and partnerships purely as costs of doing business in order to sell more MFPs and increase output volume. Other vendors look at software to generate a new source of profit that can offset declining hardware and aftermarket revenue, and redefine the MFP business model. And some vendors appear confused as to which approach they are pursuing. Having clarity on this is a prerequisite to effective MFP software development partnering.

### The Genesis of EIP

Although Xerox announced EIP in October 2006, the technical underpinnings go back several years. To a large extent, EIP brought to technical fruition and provided wider availability for earlier MFP software tools that Xerox had created over a period of several years. In 1999, Xerox began creating separate MFP programming interfaces for scanning, printing, embedded fax, and job accounting. Companies such as, Equitrac, Nuance, X-Solutions and NSi developed or integrated applications using these tools. Xerox also used these programming interfaces to develop its own SMARTsend network scanning application.

Over time, Xerox significantly modified some of its early ideas on how to transform these individual tools into a more encompassing MFP software platform. The fact that Xerox was not the first vendor to launch an MFP software platform enabled the company to learn from the experiences of others and to benefit from ongoing progress in the IT industry.

As a result, Xerox became the first MFP vendor to aggressively apply the vision and terminology of so-called "Web 2.0" technologies and a related Service-Oriented Architecture (SOA) approach to the multifunction device market. Web 2.0 refers to an evolving collection of second-generation, Internet-based services that help people collaborate and share information online. Similarly, SOA provides a means for making IT systems easier to share, reconfigure and integrate. Xerox speaks of EIP as relying on the network as the fundamental platform for MFP services; delivering a rich, interactive, browser-based user experience on the MFP device; and fostering a participative community of developers that encompasses ISVs, channel participants and even customers.

It is important to note that, after deciding in late 2005 on the precise software direction for EIP, Xerox proceeded quickly in developing the new platform. The ensuing work encompassed two main endeavors. First, Xerox added a standardized Web services layer on top of its existing MFP programming interfaces. Second, Xerox created new Web services to handle presentation and communication of information on the MFP control panel and to enable user authentication.

### The Structure of EIP

EIP includes three categories of modular application programming interfaces (APIs). The Multifunction Services APIs encompass tools for programming and controlling the scan, print and embedded fax features of the MFP. Xerox also includes in this group the interfaces to its MFP job accounting and network/user authentication capabilities.

The scanning APIs, in conjunction with accounting and authentication, are the most significant of these interfaces in that they provide the widest range of partnering opportunities. Conversely, the printing APIs are primarily intended to expose features relating to print data stream conversion. EIP does not provide a Web services API for the copy function. As a result, EIP cannot be used to customize the standard copier interface on the control panel.

The Management Services APIs provide control over MFP device management, while the Presentation Services APIs handle the bidirectional display of Web pages on the MFP control panel and the transfer of data from the MFP back to the server. Inside EIP-compatible MFPs, Xerox utilizes a commercially available web-browser that uses standard HTML protocols.

These services within EIP are all connected internally via what Xerox calls an Inter-Process Communication (IPC) layer. The key benefit of the IPC layer is that data available to one application or service can be directly accessed by another application or service. This avoids redundant data entry, thereby enhancing accuracy, productivity and security. Beneath the IPC layer are the fundamental device services and capabilities inherent in Xerox MFP controller and provide the core capabilities exposed to developers.

Xerox provides EIP partners with a comprehensive development environment that includes APIs, documentation, widgets, style sheets for creating MFP user screens, programming examples, and other tools. Xerox includes display profiles that enable an EIP application to determine the size and attributes of the LCD on the MFP control panel and modify Web pages so they are optimally displayed on that device. Similarly, Xerox leverages existing Web standards for serving multilingual Web pages to the MFP. In addition, Xerox has developed an MFP device emulator that makes it easier for an ISV to develop an EIP application without having multiple Xerox MFP devices on hand.

To develop an EIP application, an ISV utilizes EIP Web services and APIs in conjunction with standard Web development tools to create Web pages and applications that reside on a server. The software on the server hosts the Web pages that are then presented to the user via the MFP control panel. Data that users enter from the control panel are communicated back to the server, which in turn can communicate with other applications. Nothing in the EIP architecture requires a dedicated application server, and EIP can scale to support the requirements of the application or environment. A single server can be expected to support multiple EIP applications, a large number of MFPs, and hundreds or even thousands of users.

Xerox has done an exemplary job in supporting EIP across its MFP product line. When EIP was announced, it was supported only on Xerox's 32-75 ppm monochrome WorkCentres. Xerox has since refreshed almost every one of its ledger-size MFPs to include EIP support. As a result, EIP is supported on all of Xerox's ledger-size color MFPs for the office market, and on its current and previous range of 32-87 ppm ledger-size monochrome MFPs. More recently, Xerox extended the range of devices that support EIP down to 25 ppm and up to a light production machine that prints at 125 ppm and scans at 100 ppm. Xerox has also been open about plans to support EIP on selected letter-size Phaser MFPs starting in 2008.

### EIP versus the Competition
Xerox's EIP provides ISVs with an advanced, easy-to-use MFP software development environment. EIP has all of the inherent advantages of Web technologies that were enumerated in the previous section of this document. These include:

- Fast and easy application creation that is accessible to a broad range of developers;
- A rich and highly customizable user experience at the MFP control panel;
- The ability to leverage existing Web standards and IT infrastructure;
- Compatibility with a broad range of MFPs without burdening the processors and memory in those devices;
- Inherent support for secure and comprehensive application deployment, user access and device management; and
- Scalability as regards the number of servers, applications, MFPs and users.

**"Xerox provides EIP partners with a comprehensive development environment that includes APIs, documentation, widgets, style sheets for creating MFP user screens, programming examples, and other tools. Xerox includes display profiles that enable an EIP application to determine the size and attributes of the LCD on the MFP control panel and modify Web pages so they are optimally displayed on that device."**

Currently, the only MFP vendor promoting a Web services approach nearly as strongly as Xerox is Sharp. Some of the capabilities presently in EIP are not yet available from Sharp, but Sharp in the second half of 2008 will release a new version of OSA that promises to close the gap. However, the new features in OSA are not compatible with existing Sharp MFPs. HP in the spring of 2008 also stepped up its efforts to explain and promote its OXP Web services platform. While OXP initially lacks full support for control panel customization, it is backward compatible on several HP devices and is tightly linked to HP's Web JetAdmin software. Meanwhile, the respective Web services platforms from Konica Minolta and Toshiba are still immature. These vendors have gaps in what they offer and are proceeding cautiously when it comes to engaging ISVs.

In contrast, Canon's MEAP and Ricoh's ESA are mature platforms that utilize a Java-based approach. As a result, they share the inherent technical limitations of the Java approach discussed previously. For example, ESA and MEAP lack easy-to-use Web tools that EIP provides for developing control panel screens. In addition, Ricoh has not yet made available the kind of MFP application deployment and management tools that Canon provides and IT managers expect. One unique advantage that MEAP does have is an API for the copy function that can be used to personalize the walk-up copier control panel.

Since EIP was announced in late 2006, Xerox has focused on adding EIP support to most of its WorkCentre models and getting EIP into the hands of as many developers as possible. As a result, there have been no significant changes or extensions to the functionality of EIP. Xerox is planning to release its next version of EIP in late 2008.

Xerox gives evidence of having continued to evolve its approach to software partnering since launching EIP. Xerox emphasizes that it is guided by an "EIP-enabled software strategy" rather than "an EIP strategy." The difference is more than verbiage. It reflects the fact that EIP is itself not a solution, but rather an enabling platform for connecting third-party solutions to Xerox MFPs. As such, EIP is a catalyst for an evolving MFP business model and, in the longer term, for creating a Xerox MFP software ecosystem.

Xerox has expressed in unambiguous terms an EIP business model that encompasses the distinctly different needs of customers, software partners, the MFP sales channel, and its own business. Xerox says that existing and potential customers are insisting that new MFPs deliver greater value in the office. EIP-enabled applications are intended to fill that need. For software partners, EIP can unleash new capabilities that are valuable to customers, thereby helping ISVs sell more software. Availability of a wide array of solutions should increase interest on the part of VARs, integrators and other IT resellers to sell Xerox MFPs or to install solutions that leverage Xerox MFPs. Finally, from a Xerox corporate perspective, the intention for EIP is to create added differentiation for the company's MFP hardware, boost customer loyalty to Xerox and its products, increase overall MFP hardware sales, and drive more pages from the company's installed base of MFPs.

From the outset, Xerox intended that access to EIP would be extremely open in order to foster a community of EIP software partners. The company has lived up to that promise. Initially, Xerox tapped ten developers to create what it called the EIP Development Consortium. These companies were AND Technologies, Captaris, Equitrac, Kofax, Notable Solutions, Nuance, Omtool, Pharos, Streem Communications, X-Solutions and Xerox's own XGS consulting business unit. Xerox worked with this small, informal group to solicit early developer feedback, facilitate rapid development of an initial set of EIP applications, and provide a proof point in the market demonstrating its commitment to EIP.

Xerox first met with members of the Consortium in mid-2006, months before EIP was announced. An EIP Development Consortium Forum was held in November 2006, and version 1.0 of the EIP software development kit (SDK) was released to these companies in December 2006. Starting in early 2007, Xerox gradually made the SDK available to additional ISVs. The first EIP-enabled application became available in May 2007.

In July 2007, a revamped Xerox Alliance Partner program was launched worldwide. This was followed in January by the launch of an EIP Partner Portal Web site (http://www.xerox-solutions.com/Partners/). Among other things, the Partner Portal has a page containing EIP widgets and applications. Partners and developers can post their own code or free trials of their software on the site. In addition, Xerox has created an online EIP Collaboration Corner where developers can share their knowledge, communicate best practices and solve problems.

Xerox hosted its first US Partner Conference for EIP developers in October 2007. The event was attended by nearly 100 people representing 37 software companies, along with approximately 100 leaders from Xerox direct and indirect sales organizations. This was followed by the first European Partner Conference in January 2008, which was attended by 27 people representing 16 software partners.

"Xerox has expressed in unambiguous terms an EIP business model that encompasses the distinctly different needs of customers, software partners, the MFP sales channel, and its own business. Xerox says that existing and potential customers are insisting that new MFPs deliver greater value in the office. EIP-enabled applications are intended to fill that need."

Xerox has made it very simple for companies to gain access to the EIP SDK. Not only is the SDK free of charge, Xerox does not charge royalties on the resulting EIP-compatible applications that partners develop and sell. As of March 2008, more than 1,000 companies had filled out a simple application on the Partner Portal to gain access to the SDK. Of these companies, 420 had received the SDK and joined the Xerox Alliance Program.

The Xerox Alliance Program has four membership levels that are applied consistently around the world. All companies who apply for and receive the EIP SDK enter at the Developer level. Companies at this level pay for technical support on a per-incident basis and receive no marketing or sales support from Xerox. The Silver level represents a selling relationship with Xerox, but the applications are not validated by Xerox. The Gold and Platinum levels have tiered revenue requirements with Xerox based on annual software sales and MFP hardware pull-through. Xerox also validates solutions from Platinum and Gold partners in order to improve the customer experience by ensuring that the solutions work well with Xerox MFPs.

Generally speaking, applications from Gold partners are sold and supported directly by Xerox in one major geography (e.g., North America, Western Europe, Developing Markets), and the partner sells its applications independently in the other geographies. Applications from Platinum partners are sold and supported by Xerox on a direct basis worldwide. As of March 2008, there were more than 400 Developer partners, 42 Silver partners, seven Gold partners, and four Platinum partners in the Xerox Alliance Program.

Xerox intends gradually to exit the business of selling re-branded office software from third parties in favor of working with software developers under the Xerox Alliance Program. Xerox is not doing away with current re-branded software, but it will avoid re-branding new software in the future so as not to compete with its partners.

From the perspective of marketing and sales support for EIP partners, Xerox continues to make headway. EIP applications from multiple partners were prominently featured at the AIIM/On Demand Show in April 2007 and March 2008. In mid-2007, Xerox equipped every sales office demo room with the necessary infrastructure needed to show EIP applications. And in February 2008, Xerox distributed its first Solutions Catalog.

# Expanding the MFP Ecosystem with Xerox's EIP
## Conclusion

When we first examined Xerox's EIP in the fall of 2006, we concluded that it was an important technical development in the multifunction market. As we concluded:

> "EIP is a solid new offering for an office MFP market that is increasingly warming to the idea that well-integrated applications can drive competitive differentiation and boost revenues and profits. The launch of EIP takes Xerox from being a laggard in MFP software tools to being on the technical forefront. The server-oriented, Web services approach at the core of EIP is aligned with what software partners and IT customers seek today, and the first iteration of EIP is well-developed for the task."

We stand by our initial assessment regarding the technical strength and fundamental usefulness of EIP as an MFP application integration platform. Xerox's rigorous pursuit of Web services was prescient. While Xerox was not the first vendor to head in this direction, the company has done much to build credibility and momentum for this approach in the MFP market. What appeared to be a solid software platform has now been tried by hundreds of application developers, with positive results, and the first of what will soon be dozens of EIP-enabled MFP applications have begun to reach the market since mid-2007.

There has been historically a widespread impression in the document software community that Xerox customers are at a higher echelon than those of competitors. Consequently, many ISVs believe that Xerox can offer them better access to such customers via its sizable direct sales force. In both perception and reality, Xerox is advantaged relative to other vendors in gaining attention and support from software developers. Combining this with the relative simplicity and sophistication of the EIP toolset puts Xerox in a strong position to engage a very large number of good quality software developers. This community includes not only ISVs, but also systems integrators and in-house corporate software developers.

Software developers, including many which have had experience with MFP software platforms from other vendors, have reacted very positively to EIP. Even as the benchmark for MFP software tools rises, Xerox remains at the forefront in offering a robust, powerful and easily accessible set of tools. The large and growing numbers of EIP developers, along with a growing list of EIP-enabled applications reaching the market, are positive testimony to the technical strengths of EIP. While Xerox has not fundamentally extended the EIP platform since it was launched, the company has fulfilled its commitment to rapidly refresh its MFPs so that nearly every model can leverage EIP applications. With this accomplished, Xerox is now working on adding new functionality to EIP.

Xerox's initial business plans and partnering intentions with regard to EIP were at the leading edge of what was going on the MFP market back in 2006. At the time, we reserved our verdict on the effectiveness of these plans until they were fully implemented and reaction from the market could be gauged. We were cautiously optimistic in 2006, concluding:

"The true challenges for Xerox's EIP initiative ongoing are on the business side rather than the technology side. Partners, customers and competitors alike will be keenly watching to see if Xerox follows through with the requisite internal sales incentives and external marketing and partnering activities. Vision and determination are big pluses when it comes to EIP, but the ultimate success of this new MFP software push will depend far more on mundane perseverance and tactical excellence."

**In both perception and reality, Xerox is advantaged relative to other vendors in gaining attention and support from software developers. Combining this with the relative simplicity and sophistication of the EIP toolset puts Xerox in a strong position to engage a very large number of good quality software developers. This community includes not only ISVs, but also systems integrators and in-house corporate software developers.**

Xerox's fundamental business decisions with regard to EIP — no royalties, no equipment enablement fees, nominal costs for developer support, an aggressive commitment to partner recruitment, early customer engagement, and fostering a community of developers — have remained hallmarks of the EIP go-to-market strategy. In all of these regards, Xerox has been a leader in the MFP industry. Some of these directions have required that Xerox move beyond its traditional "comfort zone." Partnering on software development and collaborative marketing with a long list of mostly small firms is not "in the DNA" of Xerox, but the company has proven itself to be up to the challenge.

In addition, Xerox continues to move at a brisk pace in evolving and expanding its software partnering program. The fact that Xerox is taking a global perspective on EIP partnering is itself a unique differentiator in the MFP business. Future collaboration with Fuji Xerox will address a remaining challenge in delivering solutions that are truly global. Program elements such as the Partner Portal, the Solutions Catalog, and major partner events have each marked important milestones.

Xerox has also been effective in making a case for EIP to end users. Xerox has gone further than competitors in creating and delivering targeted messages that appeal to the specific interests of IT, line management, "C" level executives and office workers. From a channel perspective, much work remains. The decision to move quickly and offer multiple EIP software applications to Global Imaging was an important step. We expect that Xerox will soon refocus some of its go-to-market efforts on the IT reseller channel, where the company has been an early proponent of MFP solutions. Additionally, Xerox has made progress promoting EIP solutions inside its XGS services-led business for enterprise customers, and we believe XGS can become a significant channel for EIP solutions in the future. Meanwhile, Xerox continues to experiment with programs and incentives to motivate its direct sales force to sell EIP-enabled applications.

Summing up our technical and business perspective on EIP, we conclude that Xerox has taken a lead over its office MFP competitors when it comes to enabling the development, marketing, sales and support of well-integrated third-party software solutions. Having said this, MFP software platforms and solutions marketing are witnessing tremendous change, and ultimate leadership in this market has yet to be determined. Xerox is aligned to benefit as much as — and likely more than — some of its major competitors in the office MFP market as a rising tide of channel and end-user interest in MFP solutions "lifts all boats." As long as Xerox continues to build on the momentum it has created for EIP, the company has the opportunity to leverage a growing range of MFP-savvy applications to bolster its hardware market share, its MFP-related revenue, and its overall profitability.

To learn more, call 1- 800-835-6100
or visit us at **www.xerox.com/eipinfo**

**"Xerox's fundamental business decisions with regard to EIP — no royalties, no equipment enablement fees, nominal costs for developer support, an aggressive commitment to partner recruitment, early customer engagement, and fostering a community of developers — have remained hallmarks of the EIP go-to-market strategy. In all of these regards, Xerox has been a leader in the MFP industry."**

**"Xerox has also been effective in making a case for EIP to end users. Xerox has gone further than competitors in creating and delivering targeted messages that appeal to the specific interests of IT, line management, "C" level executives and office workers."**