



Internet-Enabled Printing: The Future of Printing

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The New Future of Printing: Internet-Enabled Printing

Executive Summary

Computers, software and the Internet are revolutionizing the area of document management. They will impact printing technology, processes and strategies. The issue is not when but how this will occur. Print vendors and users need to know so that they can make the appropriate strategy changes.

Despite predictions that computers would result in less printing, this has not happened. It appears that the use of paper and printing technologies fulfill some basic business objectives and that it is unlikely that printing and paper will go away in the short- or medium-term.

But this does not mean that printing will not be dramatically affected by these changes. This white paper describes how the new software technologies of digital archiving and workflow will combine to extend the value of the printer rather than reduce it. Conventional printing and new archiving and Internet capabilities will extend the horizons and potential of conventional printing resulting in new printing strategies and processes. This new printing model -- the hybrid model of printing -- results from the synergistic blending of these two sets of printing approaches where the whole is greater than the sum of the parts.

We call this model the Digitally-Extended Printing Solution (DEPS). The DEPS will form the basis for new approaches to printing over the next few years. The DEPS leverages the Internet, archiving and new paper printing technologies to create new competitive models for business and new ways of working for end-users.

The new DEPS is integrally dependent on the Internet for new forms of access to and distribution of printed documents. As such, the DEPS will become an integral part of the electronic commerce strategy of corporations. Rather than printing going away, the DEPS elevates its role as a mission-critical factor in new competitive strategies utilizing the Internet.

This white paper also provides recommendations for action for corporations and print managers and shows how INSCI's Sterling architecture and suite of products can help them build a DEPS which will respond to the challenges now facing printing and print strategies.

I. Introduction

This is White Paper Number 4 in a series of white papers produced by INSCI on digital document management. In this paper INSCI sets out what it sees as being momentous changes and trends in the area of high volume printing. These trends are quickly revolutionizing how organizations deal with high volume printing, otherwise known as the printing of transaction documents.

INSCI is one of the seven Global Sponsors of the Docuworld program created by Xerox Corporation. The other six corporations sponsoring Docuworld are Sun Microsystems, MooreCorporation, Adobe, Electronics for Imaging, Splash Technology and Colorbus. The Docuworld program is a worldwide series of conferences that show Xerox's vision of the future of printing and document management. INSCI is an integral partner with Xerox in creating this new vision.

This white paper describes INSCI's vision of the future of printing. It is aimed particularly at printing industry professionals in user corporations, service bureaus and printer manufacturers so that they too can see how their own printing and digital copier products are likely to evolve. It is also aimed at information technology professionals involved in the production of high volume transaction documents and at planning how they will be integrated into enterprise information and document management systems.

We in INSCI believe that after reading this white paper readers will understand that printing, electronic commerce and the Internet are going to become integrally linked. This will occur in such a manner that will extend the value of conventional printers and open up new business and competitive horizons to corporations that avail themselves of the emerging power of new software technology: the Internet and digital printing.

II. Background on INSCI: The Company and The Mission

INSCI is a developer of software for the digital archiving of production print documents. This software allows print documents to be viewed online instead of being printed. Once viewed, documents can then be selected to be printed (as a source of reprints) instead of having to be kept as physical inventory.

INSCI's software was originally used to replace microfiche. Digital archiving enables documents that were formerly put on microfiche to be archived on a storage medium and then to be viewed online and printed as necessary.

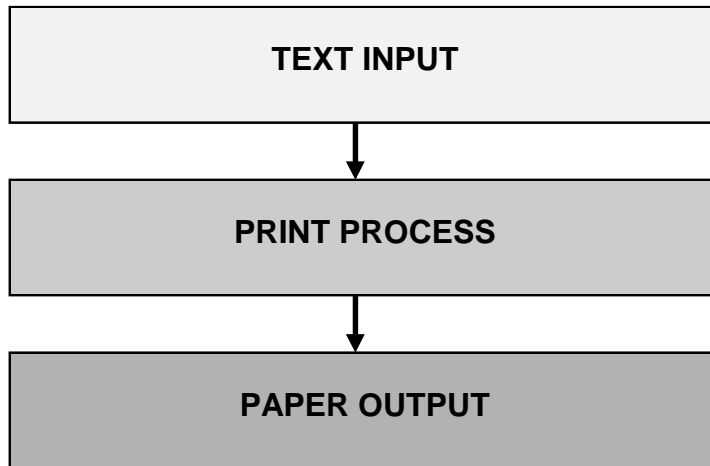
Microfiche replacement was originally used mainly by accounting departments to replace the printing and distribution of "greenbar" financial reports such as general ledger and back office transactions. However it was later taken up by customer service departments to enable customer service representatives to view customer documents such as statements and invoices so that they could see the same document that was printed for the customers.

INSCI sees its mission as being one to exploit a synergy between the power of printing and the power of digital archiving and online viewing. Printing is a powerful medium that, despite the predictions to the contrary, has not gone away and is unlikely to any time soon. As new methods of printing become available -- together with such innovations as digital networking of printers and highlight color -- the need increasingly is to meld these innovations with innovations in document management so as to leverage the power of each for business improvement

Today it is clear that with the emergence of the Internet, printed documents are increasingly being viewed through Web browsers. INSCI increasingly also defines its mission as being the integration of printing with the Internet and with electronic commerce. As corporations worldwide become increasingly dependent on the Internet this need will become ever more apparent. INSCI is a leader in this field.

Figure 1 shows the Evolution of Digital Printing. We see that traditional printing, geared solely toward paper output, evolves to a comprehensive printing solution that involves an extension of the document, through a digital storage process, into digital document output. Distribution can occur online, through CD's, through e-mail, or another digital distribution mechanism.

Traditional Print Solution:



Evolves to COMPREHENSIVE PRINTING SOLUTION:

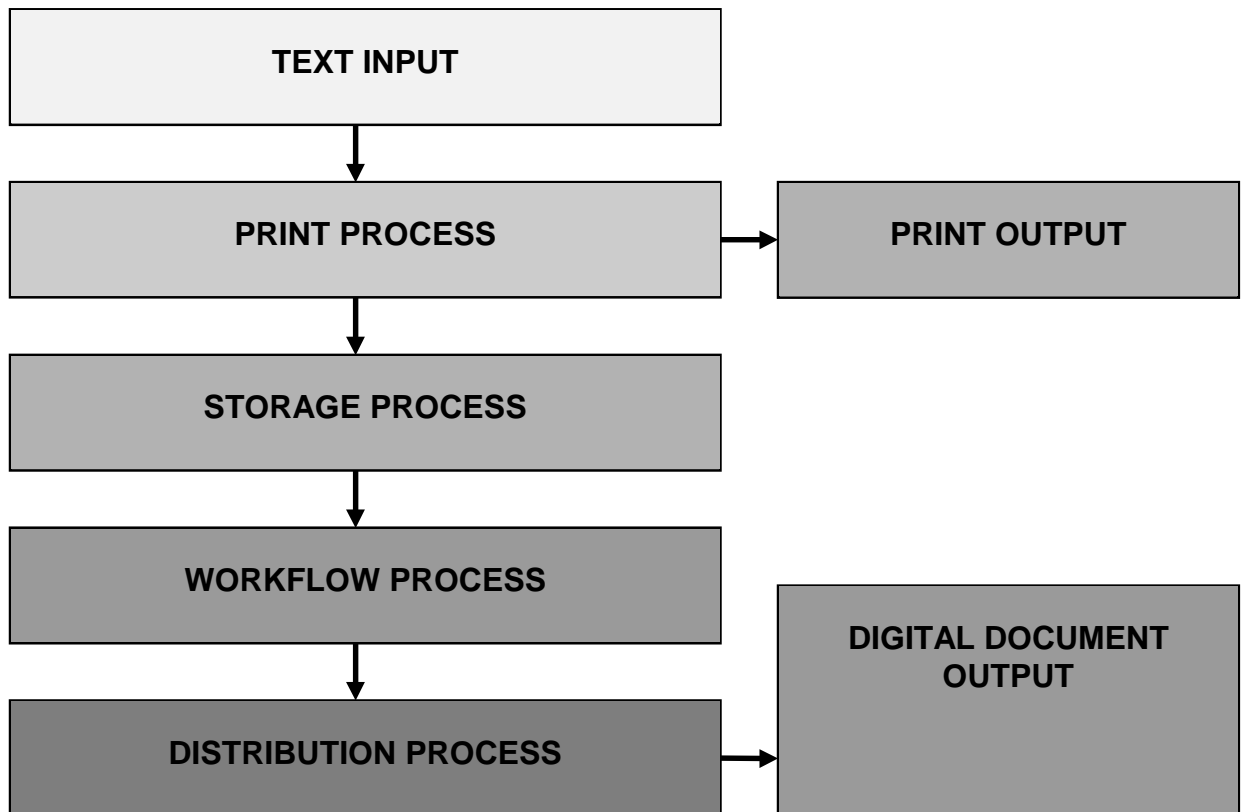


Figure 1: The Evolution of Digital Printing.

III. Market Trends

Each year the Electronic Document Systems Association (the organizing body behind the annual Xplor Conference, devoted to printing industry trends) carries out a survey of its members. This is the most comprehensive global survey of electronic printing trends conducted by any organization. The latest results are from the 1998 survey. We are reproducing some of the conclusions of the survey to provide a context through which to view the major trends in the printing industry as they exist today.

Trends: on-line commerce

On-line commerce is the third major investment focus for corporations; it is the top future investment for 58% of corporations.

Trends: printing and on-line viewing

Over 60% of companies are migrating to the use of on-line viewing instead of printing; over 50% of all corporations are moving to a situation where they process and distribute digital print documents with no printing whatsoever.

Trends: document management

Almost 50% of corporations are integrating high volume printing with their document management systems; almost 80% of corporations are moving to integrate document storage and retrieval strategies with their document management policy.

Trends: e-mail

24% of corporations are now using e-mail as an alternative to printing high volume transaction documents; a further 25% of corporations are investigating e-mail as an alternative to high volume printing.

Clearly corporations are undergoing a revolution in the way they think about document storage and retrieval and high volume printing. The two technologies are starting to merge in many ways. E-mail is starting to become a significant extension to conventional printing strategies. On-line viewing as an extension to and in some cases a replacement for printing is becoming widespread. Corporations are seeing the Internet as a way to extend the power and the value of conventional printing operations.

Within these trends there are some other important directions. First, the form of on-line viewing is changing. Remote Web viewing is replacing local on-line

viewing via workgroup systems. Secondly, and most importantly, high volume printing is becoming a vital part of any electronic commerce strategy.

The Internet is redefining products, processes, markets and competition. It is therefore redefining printing products, the processes that precede and follow the printing event, the printed documents, and finally how competitive positioning can be improved using new ways of printing. The Internet is therefore redefining the whole world of print.

IV. The Conventional Printing Solution

Printing has undergone numerous momentous changes over the last 20 years. Non-impact printing via both laser and inkjet has transformed the economics of the industry. The move to digital technology inside printers has made new types of printing applications possible. Color is transforming the printing industry currently. Short-run printing and publishing technologies are resolution in different business models and economics.

These changes were driven by customer objectives that stressed the achievement of a very focused goals and objectives. These were:

- Higher print speeds
- Higher quality output
- Lower cost per page
- Higher functionality print applications

The new technologies were harnessed to achieve and continually improve on these goals. The technologies we see today are a result of customer objectives that were based on a business model that focused on the use of printed paper to achieve certain business and marketing goals.

These customer objectives have had certain implications. The first is that it was hardware-based, the center of its universe being a very fast and capable high volume printer. It had proprietary data streams such as AFP, MetaCode, and DJDE. And other than paper, there was no other means of delivery. Given the technology of this era, these customer objectives led to a proprietary set of technologies that drove the industry to a high level of refinement.

V. The New Printing Model

Changes in the business and technology environments, however, have led to significant changes in the goals and requirements of business and in the resulting printing requirements. The overwhelming competitive necessity to reduce costs is affecting printing objectives. Increasing consolidation and competition has led to a search for new competitive models. The Internet has provided a major channel for new forms of competition and alternative means of delivery. The Internet is also redefining the nature of the document and this in turn has impacted the objectives of corporate print strategies.

The new customer objectives can be summarized as follows:

- Fewer pages/less paper/less growth in the use of paper
- Lower inventories/digital reprints
- Open print applications such as Postscript, PDF, HTML and XML
- Internet access and distribution

Paralleling the rise of these operational objectives has been the rise of new business objectives. These are:

- Saving paper and consumables cost
- Saving people, warehousing and transportation costs of output
- New types of print product
- New ways to compete using new printing and computer technologies

There are some new and important implications of these new customer objectives. These are:

- The new printing will be software enabled, as well as incorporating some very capable printers.
- There will be open print formats such as Postscript, PDF, HTML and XML
- The print model will be Web-enabled
- It will run on open platforms such as UNIX and Windows NT.

The new world of printing is solution-oriented. The new digital hybrid print product serves new hybridized business strategies. And these in turn are an integral part of a corporation's electronic commerce strategies.

VI. The Digitally-Extended Printing Solution (DEPS)

Despite predictions that computers would do away with paper, this has not happened. The printer and the print format has enduring value and it is very likely that it we will continue to add to that value using a traditional printing approach as new technologies develop.

But, nonetheless, the power and importance of the Internet and its potential to transform business and printing is dramatically affecting printing. Surveys of print customers show that they are increasingly turning to the Internet to supplement conventional printing. What is happening is that these new Internet and computer-based technologies are forming an increasingly important overlay on the printing function. The result is that digital means of dealing with print are being used to extend the power and value of the conventional printer and of conventional printing technologies and processes.

The new print model is a hybrid model. In this model the new Web-based technologies do not compete with conventional technologies but rather complement them. The two approaches to printing co-exist and reinforce each other, each meeting different business objectives and each able to be used through different channels to reach different market segments in different ways. The new digital technologies extend the power and reach of conventional printing allowing it to achieve objectives it could not achieve on its own. The new hybrid print strategies open up new competitive horizons for business and meet new sets of needs for consumers and print customers.

The new DEPS prints to multiple channels, not just paper. These channels include the Web, CDs, DVDs, email, and broadcast. Whatever the digital medium of storage and distribution, the new DEPS prints to it.

The new DEPS stores all printed documents digitally for as long as they are needed and for whomsoever needs them to be stored. It becomes the new warehouse for these documents. It is capable of providing reprints from the warehouse for whoever needs them and is so authorized.

The new DEPS provides on-line viewing and access to single and multiple print documents over however long a period is required by the operator. The access can be local or remote and through proprietary access method such as Windows or through open Web browsers.

The new DEPS provides ubiquitous access to employees, both local and remote. It also provides ubiquitous access, where required, to customers for their own purposes including viewing, analysis, reprints and expiration. It can serve as virtual private filing cabinet for employees and customers

The new DEPS also incorporates other software capabilities that are essential for the efficient and effective use of these document repositories. In particular, it incorporates workflow and work management capabilities that allow these documents, either singly or collectively, to be routed via the Web and the processing of these documents to be monitored, analyzed and reviewed.

The new DEPS also allows for the storage of heterogeneous documents. This means that scanned documents can be retrieved along with the transaction documents they refer to so that customer service is effective and not limited by technology constraints and applications peculiar to a particular type of document.

The DEPS is the new solution for printing that incorporates the new computer and Web technologies that are redefining all other industries. Far from being the antithesis of printing on paper, it is the means by which printing is becoming relevant to the new world of digital documents.

VII. The Sterling Suite of Products

The DEPS is not a single software capability but a set of capabilities. A DEPS based on just an archive capability will meet some but not all of the important objectives of a true DEPS solution. For a DEPS solution to be truly useful it must be based on a broad-based architecture that comprehends the various objectives of a DEPS.

INSCI's vision of the DEPS is comprehended in its Sterling Architecture. This defines the various software capabilities that make up a DEPS solution. The functional areas addressed by the Sterling Architecture are showed in Figure One.

As seen in Figure One, for each of the levels of the Sterling architecture there are a set of discrete capabilities. For each of these capabilities there must be a specific software package. INSCI's set of products make up a suite which cover most of these capabilities and all of the essential ones such as workflow, imaging and intelligent data streams. Figure Three is a product matrix that describes what INSCI products address what functional areas.

INSCI's Sterling suite of products collectively comprise the DEPS. INSCI has developed its products to an architecture which means that a customer wishing to develop a DEPS has the necessary software capabilities to do this. Its COINSERV products allow for digital archive and retrieval via its WebCOINS product which provides Internet access and distribution capabilities. Advanced COINScan allows scanned documents such as customer applications and check images to be stored and retrieved with the transaction documents that they relate to. Its COINSFlow product allows for sophisticated work management capabilities. It provides CD output for yet another alternative form of distribution. It provides for integrated faxing. The Sterling Suite is the Digitally-Extended Printing Solution.



Sterling Architecture: Functional Areas

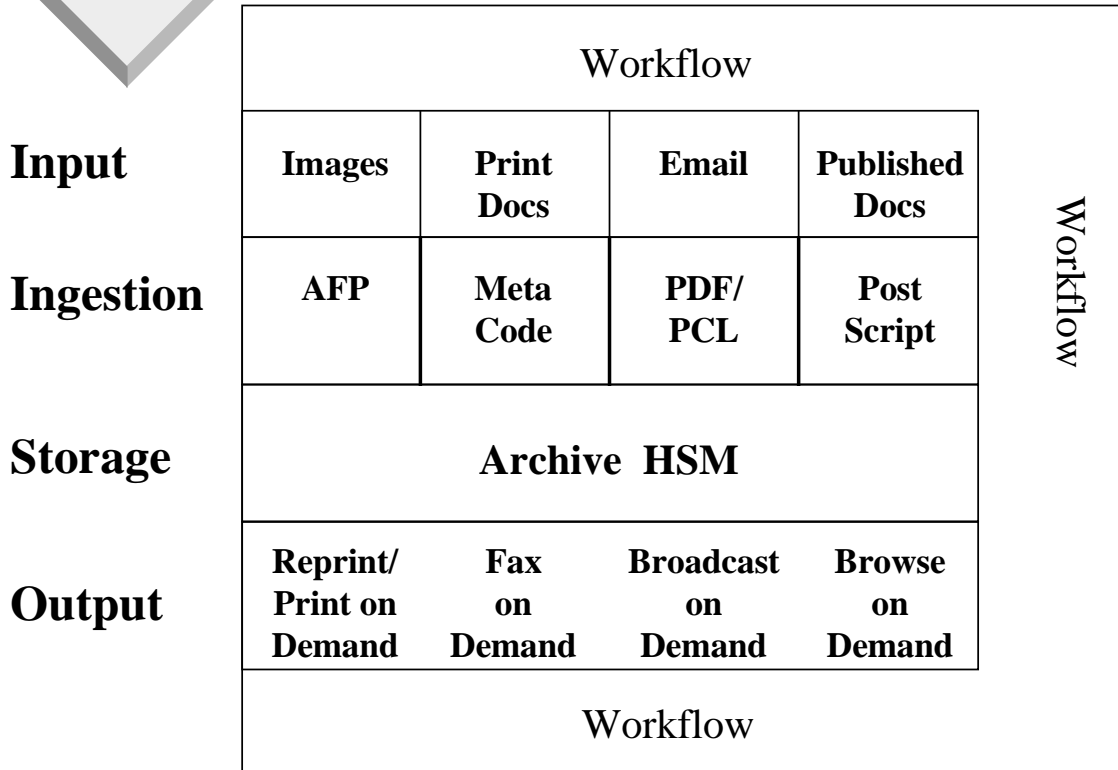


Figure 2. *The Sterling Architecture: Functional Areas*

Sterling: Product Matrix

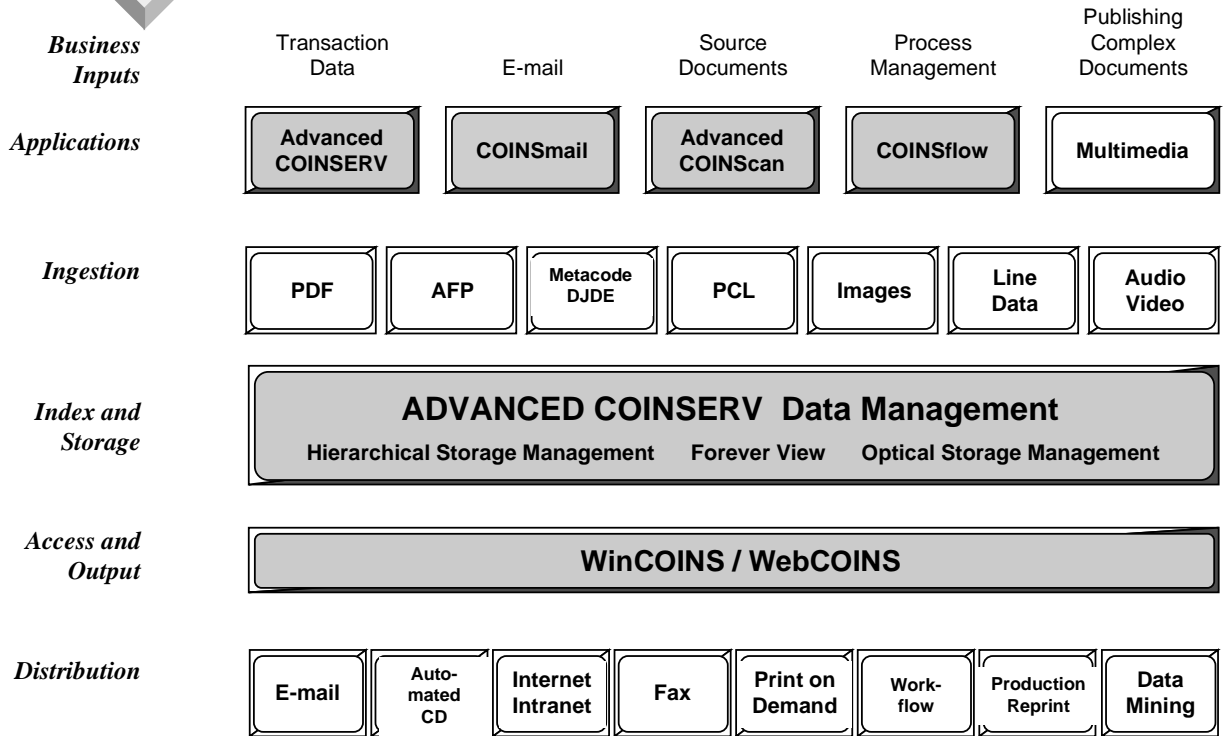


Figure 3. The Sterling Architecture: Product Matrix

VIII. Printing and Electronic Commerce

In the new world of Internet-extended printing, corporations simultaneously print to both paper and the Web, they create new printing strategies which combine both paper and Web-based print documents and they penetrate new markets and compete in new ways using new and imaginative hybrid digital print products.

In this new world, high volume printing and electronic commerce combine such that the digital printed document becomes an integral part of electronic commerce. Statements and invoices become directly accessible to customers on corporate Web sites. Transaction documents with one purpose become marketing documents with multiple purposes and such documents become integrated with personal financial management and PFM packages such as Quicken and Money.

The new hybrid print strategies give us new types of benefits. These include:

- Reprints from local archive
- Reprints from the Web
- Hybrid distribution -- paper, Web and other
- Customer-access to their own transaction documents on the Web

This promises and delivers faster service, lower costs, and particularly more convenience. And for corporations there are equally compelling benefits. These include dramatic cost savings, enhanced customer service, new ways to compete, and a way to migrate to electronic commerce. Corporations can create new products based on the DEPS and forge new revenue opportunities.

IX. Conclusions

- High volume printing and the Internet are converging.
- Digital archiving extends the value of printers.
- New hybrid print products and strategies are emerging.
- Hybrid printing is integral to electronic commerce.

X. Recommendations

- Get your printing operations people to get into the new world of digitally-extended printing solutions.
- Install a digital document repository/archive as the hub for this solution.
- Make sure it is integrally Web-enabled.
- Make sure you integrate this solution into your electronic commerce strategies.