



Next-Gen Print Infrastructure Services: Leveraging Cloud and IoT to Accelerate Your Digital Transformation Strategy

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IDC OPINION

The Role of Print in the Digital Office

Print remains a valuable and integral business function, but organizations struggle to understand how print infrastructure fits within the context of broader strategic IT initiatives, such as IT outsourcing, cloud migration, and digital transformation (DX). Most enterprise organizations today are engaged in a headlong battle to modernize IT infrastructure fueled by a digital-first mantra. However, the desire to move quickly often results in a myriad of disconnected digital and historical legacy processes, leaving businesses stuck in a hybrid environment where new digital processes are less effective and legacy processes are no longer supported. This White Paper leverages data from a recent IDC study that examines how businesses are prioritizing strategic IT investments to drive digital transformation and look more specifically at how those investments could be mapped to long-term requirements around the usage of paper and print.

The Future of Business Is Digital First

Over the past few years, two trends have dominated the office technology landscape: the integration of mobile technology as a business computing platform and the ongoing progression toward a digital-first strategy. Digital transformation is now foundational for organizations of all types, and significant IT spend is allocated to these broader DX programs. According to IDC's 2019 *Digital Transformation Executive Sentiment Survey*, an average of 3.7% of an enterprise's revenue is spent on digital transformation initiatives.

These efforts are fueled by many different variables; however, the targeted goals remained unchanged. Operationally, businesses need to become more agile, innovative, responsive, and customer centric to stay competitive.

Highlights

3.7%

of an enterprise's revenue is spent on digital transformation initiatives.

49%

of business operations already rely on digital infrastructure.

46%

of organizations are still in the beginning stages of digital transformation.

Only 4%

of organizations are fully transformed.

70%

of organizations prefer as-a-service or consumption-based models over traditional financing methods to reduce upfront costs.

Meanwhile, organizations are striding quickly into a new digital economy, where consumption-based billing and software-as-a-service (SaaS)-based models are preferred over conventional financing methods.

At the same time, IT is focused on requirements to drive better performance, improve security, ensure system availability, and create a path for continued innovation. Key stakeholders are often identified to lead specific DX programs within the enterprise, and significant resources have been allocated to manage and monitor these programs along the way.

Operational goals are critically important — the simple fact is that the future of business is digital first. As a result, a high level of IT/business transformation is required to support the business over the next five years. Although it varies by organization and vertical, approximately 49% of business operations already rely on digital infrastructure (as opposed to physical), moving to 57% over the next five years.¹

Even so, it has become clear that digital transformation does not occur with the flip of a switch. The desire to become 100% digital at the onset has led to numerous failed attempts as companies try to accomplish more than they are able to achieve. According to *IDC MaturityScape Benchmark: Future Enterprise Worldwide, 2020* (IDC #US45863318, January 2020), 46% of organizations are still in the beginning stages of digital transformation, and only 4% of organizations are fully transformed. The defining characteristic of the digitally determined organization is a single enterprisewide strategy, not multiple digital strategies rooted in the various lines of business (LOBs).

Meanwhile, organizations are striding quickly into a new digital economy, where consumption-based billing and software-as-a-service (SaaS)-based models are preferred over conventional financing methods. A recent study from IDC shows that organizations overwhelmingly prefer subscription-based billing when it comes to financing their strategic DX initiatives. In fact, 70% of organizations prefer as-a-service or consumption-based models over traditional financing methods to reduce up-front costs, realize benefits of moving from capex to opex, and facilitate more predictable monthly billing structure.

Prioritizing Strategic IT Investments

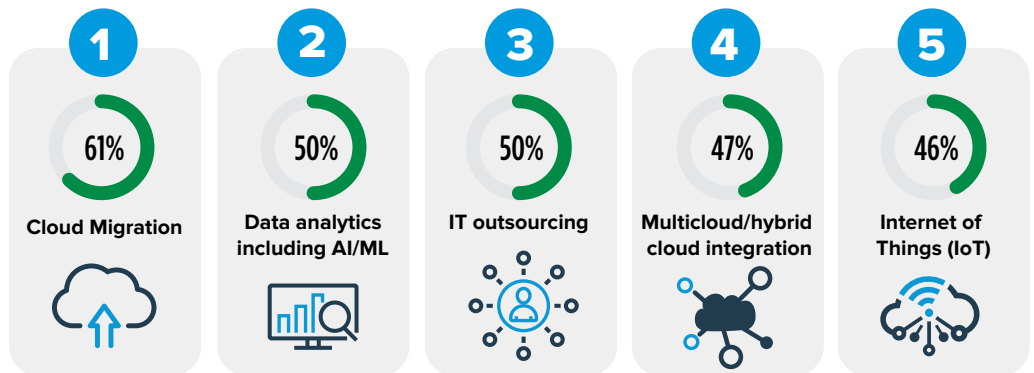
Demands for operational efficiency, increased productivity, and better business performance continue to drive changes in how organizations view IT infrastructure. The focus is less on what is needed to support current business requirements and more on what is required to remain competitive as business evolves. As enterprises continue shifting to a cloud-native architecture, IT automation becomes more imperative. The agility and flexibility to effectively respond to changing market dynamics require modernization of applications and infrastructure. As a result, digital first should be embedded in the enterprise DNA to “future proof” the business.

Without question, organizations are making sweeping investments in IT infrastructure in support of their digital transformation initiatives. While there are multiple components within the technology stack to consider, the desire to move IT infrastructure to the cloud is *the* number 1 business priority (see Figure 1).

FIGURE 1

Top 5 IT Initiatives Supporting Strategic DX Investments

Q. What are the main IT initiatives supporting the strategic DX investments being made by your organization?



Note: Multiple responses were allowed.
Source: IDC's Next-Gen Print Survey, May 2020

Methodology

To help organizations update and optimize their print infrastructure to better support digital transformation efforts, Lexmark partnered with IDC on a variety of customer research focused on the role print plays in an organization's digital transformation efforts, associated challenges, and preferred solutions. Primary research included customer focus groups, interviews, and a global web survey (n = 1,511) with organizations actively involved in digital transformation.

Situation Overview

When it comes to IT outsourcing, enterprises are swayed not just by the productivity issues already described but also by the ability to deploy resources more effectively. Most IT departments are stretched thin supporting companywide issues while also dedicating resources to strategic projects. To address these resource

Worldwide, 61% of enterprises have deployed IoT projects, while an additional 27% plan to deploy in the next 12 months. Just as important, 85% of IoT decision makers say organizations have a budget allocated for IoT projects.

shortfalls, IT organizations are minimizing on-premises infrastructure and moving to cloud-based services with increasing momentum. Indeed, 79% of organizations say they are investing in cloud infrastructure to drive their DX strategy, and half say they are looking to outsource some or all of the IT infrastructure.

For any cloud strategy to be successful, organizations must take a comprehensive approach to adoption. Enterprise customers demand the option to have multiple clouds — public and private — that offer a unified architecture and consistent experience. Platform as a service (PaaS), infrastructure as a service (IaaS), and software as a service are major components of any enterprise cloud adoption strategy. Over 74% of organizations are currently using SaaS and over 50% are using PaaS and IaaS.²

Integration of new and legacy systems/infrastructure is also critical. The adoption of hybrid, multicloud environments is accelerating, and selecting what workloads to host in a public or private cloud (and the right vendor for each workload) is a major decision. IT must enable a seamless flow of data across the organization to ensure disparate silos of information are not a hinderance to achieving specific business goals.

For these reasons, further technology investments are being made to support the cloud-first strategy. Data analytics fostered by ubiquitous deployment of IoT technology is garnering significant attention and traction. Worldwide, 61% of enterprises have deployed IoT projects, while an additional 27% plan to deploy in the next 12 months. Just as important, 85% of IoT decision makers say organizations have a budget allocated for IoT projects.

The ability to mine and analyze data captured from a myriad of devices is key to helping enterprise organizations unlock efficiencies and drive additional cost savings in business operations. Investments in core IoT infrastructure as well as edge technologies will play a foundational role in enabling organizations to maximize the return on investment (ROI) of IT investment. With more analytics applied to the IoT data, organizations are increasingly looking to put analytics capabilities closer to the point of data creation. In response to this demand, vendors will offer more products with compute and storage capabilities designed to be installed at the edge, which means organizations will need to emphasize ongoing IoT management and optimization.

Finally, enterprises must consider the extraordinary circumstances surrounding the COVID-19 pandemic and its impact on business operations. Organizations are already moving to enable their employees to work from home more effectively with tools such as video calling, cloud-based collaboration software, and online document authoring. The work-from-home phenomenon was initially viewed as a stopgap response until things return to normal. The future has become much less certain.

For most organizations, digital transformation is a journey fraught with numerous obstacles. Technology portfolio modernization and rationalization is the No. 1 DX challenge for CIOs today.

What is clear, however, is that a distributed workforce is likely to be in place for quite a while, maybe forever. This is forcing organizations to look for new ways to ensure business continuity by investing in collaboration technologies, digitization, and workflow automation to drive productivity in the new work environment, further increasing adoption of cloud/IoT and accelerating transition to digital infrastructure. The COVID-19 pandemic is underscoring the importance of being an organization that is resilient, agile, and fully connected — or digital.

Despite Ongoing Efforts, Digital Transformation Remains an Elusive Target

For most organizations, digital transformation is a journey fraught with numerous obstacles. Technology portfolio modernization and rationalization is the No. 1 DX challenge for CIOs today. In fact, 83% of enterprises indicate current programs are in place to rationalize their technology infrastructure; however, only 35% report that their approach is effective.³ For many organizations, creating an IT modernization and rationalization plan that aligns with their overall DX strategy remains problematic.

Not surprisingly, integrating new technology investments with existing IT infrastructure is identified as a major obstacle. Indeed, lingering IT infrastructure is one of the biggest hurdles organizations face with digital transformation. On average, nearly 50% of organizations view integrating existing IT into the new IT infrastructure investments as challenging. While this varies by region and type of business, the problem is much more prevalent in developed regions where organizations have a higher maturity level and are further along the DX adoption curve: 63% of organizations in developed markets such as the United States, the United Kingdom, and Germany cite integrating existing IT into new IT infrastructure as particularly challenging.

Integrating with and supporting legacy processes also impede progress. Worldwide, 51% of organizations cite updating or replacing legacy business processes as having a negative impact on the ability to execute strategic DX initiatives. Again, developed regions are much more likely to experience this pain point. Of course, the impact on business outcomes can be devastating: Most organizations state that challenges associated with updating or replacing legacy processes result in exceeding project budgets and longer implementation times.

Worldwide, 49% of organizations say managing their print infrastructure is challenging, while the problem is even worse (61%) in developed regions.

The Unaddressed Problems with Print

Lingering IT infrastructure, which refers to the legacy hardware, software, network resources, and services required for the ongoing operation and management of the enterprise IT environment, is typically scattered throughout the organization. What most enterprises fail to recognize, however, is that the existing print ecosystem most likely represents a significant portion of the organizations' lingering IT infrastructure. For most organizations, the existing print fleet is complex and has grown organically over time to include multiple brands and a mix of devices, often not well suited for organizational needs. This collection of devices of varied ages and from multiple manufacturers lacks consistent user experience, which creates confusion for employees and can impede the use of advanced features such as scanning and document routing that simplify document processes.

Meanwhile, lingering print infrastructure is often cited as a source of frustration for IT managers, who are constantly looking for ways to simplify and reduce unwanted burden on IT staff. Worldwide, 49% of organizations say managing their print infrastructure is challenging, while the problem is even worse (61%) in developed regions. To alleviate these concerns, IT managers cited the need for features such as consistency across the print fleet, the ability to simplify device and print management through a single platform, automated firmware updates across the fleet, better supplies management and fulfillment, and simplified reporting and auditing.

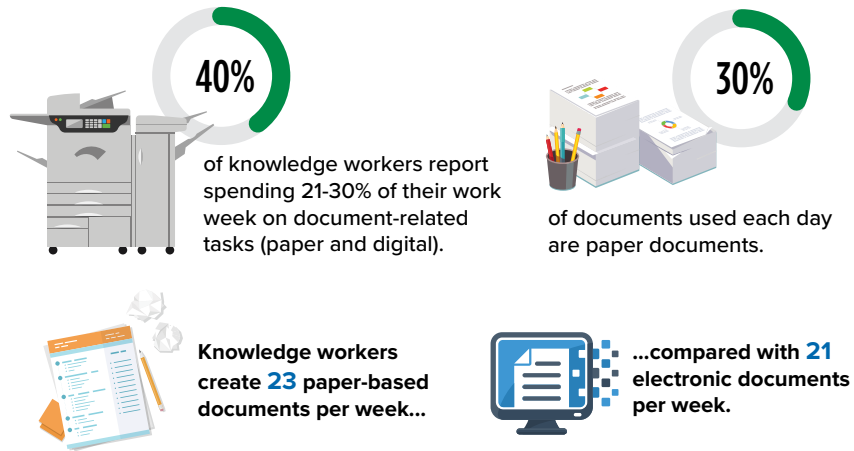
Most importantly, lingering print infrastructure can undermine an organization's ability to execute on strategic DX initiatives. In fact, 57% of organizations say lingering print infrastructure is negatively impacting their cloud migration strategy ... and as previously mentioned, cloud migration is the top priority.

Why Print Matters in Today's Business Environment

For most enterprise organizations, print is not a priority. Nevertheless, print is viewed as a requirement for the foreseeable future and remains an essential service that IT departments must continue to support. While print is not always considered strategic, 43% of organizations are investing in print infrastructure as part of their broader DX initiatives, and for good reason. Print remains an integral and important business function, and paper remains entrenched in most businesses' processes today. IDC's 2019 *Document Processes Survey* shows that knowledge workers still need paper to complete their daily activities (see Figure 2).

FIGURE 2

Paper Remains Highly Entrenched in Today's Office



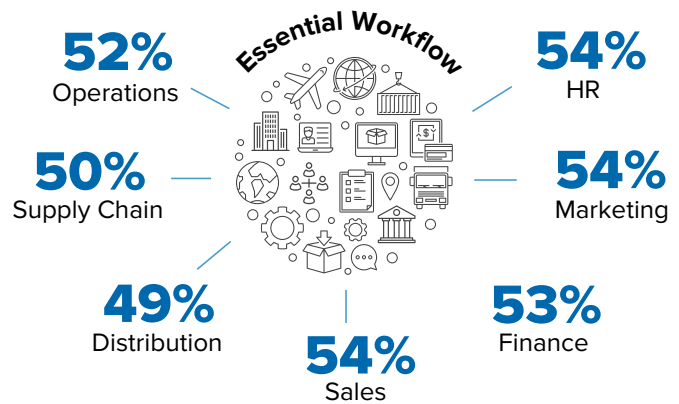
n = 300
Source: IDC's Document Processes Survey, May 2019

It is important to distinguish between what is considered essential and nonessential printing in today's business environment. There are several horizontal (back-office) use cases spanning across industry sectors that continue to rely heavily on paper, such as customer and employee onboarding, expense reporting, sales operations, applications processes, and purchasing. According to IDC's research, half of all back-office workflow processes still have significant printing requirements (see Figure 3). At the same time, paper also persists in many front-office applications in vertical markets such as healthcare, insurance, banking, manufacturing, distribution, and the public sector.

FIGURE 3

Print Requirements Within Essential Back-Office Workflow Processes

Q. What proportion of the essential workflow processes in the following areas have significant printing requirements?

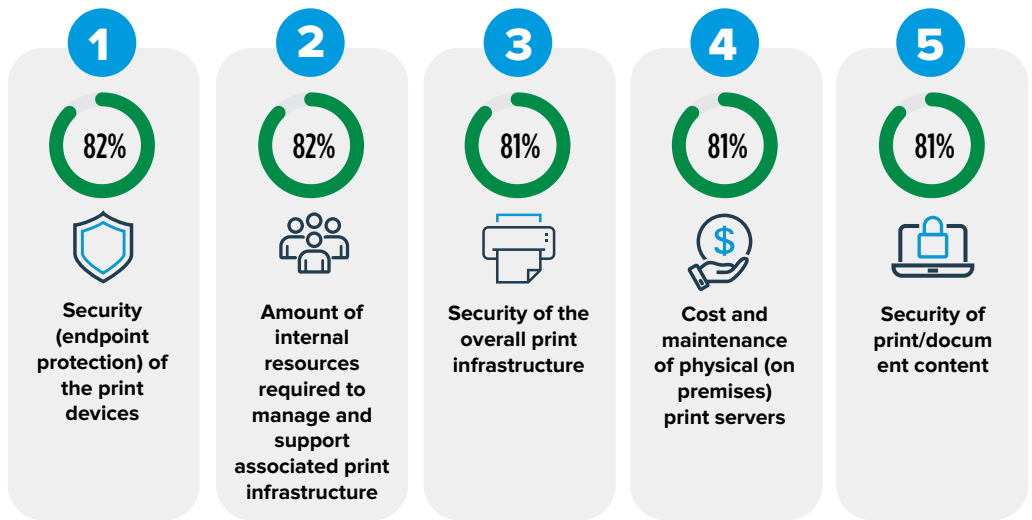


Source: IDC's Next-Gen Print Survey, May 2020

Despite its importance to business operations, print remains troublesome for many organizations and is often viewed as a drain on existing IT resources. Businesses continue to identify challenges associated with their existing print environment. Not surprisingly, security is the top concern and number 1 priority for organizations that want to modernize the print infrastructure. Even so, costs and challenges associated with the ongoing management and support of on-premises print infrastructure, including print servers, is ranked almost equal in importance (see Figure 4).

FIGURE 4

Top IT Concerns Related to Managing Print



Source: IDC's Next-Gen Print Survey, May 2020

Security encompasses many attributes within the print and document environment. Interestingly, an organization's print and document infrastructure is uniquely positioned at the intersection of digital transformation and IT security. Even so, most businesses fail to recognize the security vulnerabilities associated with their existing print and document environment. At the heart of this issue is the role of the smart multifunction peripheral (MFP), which has become an intelligent business processing hub that serves as an on-ramp and off-ramp to business information, whether it is stored in the device, on the corporate network, on paper, or in the cloud.

Historically, security and IT managers have assumed that systems put in place to protect the network would extend to other connected peripherals. But security around the network perimeter is crumbling, and every device connected to the network is now a standalone security threat — printers and MFPs included. More than 80% of organizations cite security concerns within the print and document infrastructure (refer back to Figure 4).

The notion of a paperless office has been discussed for years, but for many reasons, it has yet to fully materialize.

IT burden and internal resources associated with managing print and print servers are also problematic. The physical infrastructure required to enable printing is often massive and hard to deploy, manage, and support. Print is also viewed as costly: 81% of IT decision makers cite the costs of managing physical, on-premises print servers as an IT concern, while 80% cite the lack of visibility into overall print spend and print usage requirements as an IT concern.

Technology obsolescence is also identified as particularly challenging, especially for those enterprises that are pushing aggressively toward digital transformation. In fact, most organizations (79%) cite difficulties in updating or replacing existing print hardware and applications as an IT concern. As described previously, many businesses currently operate with an aging print fleet made up of multiple brands and various configurations. Some of these devices were acquired outright, and others were installed as part of a long-term service contract. Many organizations remain hopelessly tethered to outdated equipment even though print technology has evolved to provide for advanced functionality in areas such as security, analytics, and document processing.

Despite the challenges described, most enterprise organizations (57%) do not plan to update the print environment in support of their DX initiatives. Instead, these companies are looking to integrate the existing print ecosystem within the overall DX program. This is a risky strategy that will likely result in less than desirable results and diminished return on investment. As described previously, legacy IT infrastructure is a huge barrier toward advancing DX programs. If left unaddressed, the existing print environment could potentially drag down the overall program because of incompatibility issues and the lack of interoperability between the old systems and new IT infrastructure.

Bridging the Gap Between Paper and Digital

Migrating from paper to digital is a fundamental element for any digital transformation strategy. The transition to digital, cloud, and mobile technology has fundamentally altered the way businesses work with information. At the same time, removing paper whenever and wherever possible has been earmarked as a means for improving efficiency and driving cost reduction. The notion of a paperless office has been discussed for years, but for many reasons, it has yet to fully materialize.

Of course, recent events have altered the office technology landscape, and there is some speculation that work-from-home policies enacted as a result of the COVID-19 pandemic might signal the beginning of a more precipitous decline in paper use in the office environment. While the need for ad hoc printing might be going away, any desire to go 100% paperless is less prevalent today. For most enterprises, complete elimination of print and paper usage is difficult to justify based on the level of disruption to existing workflow and business operations. Those back-office printing

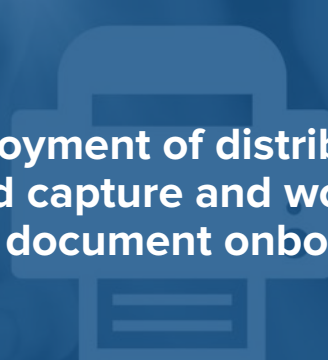
In many instances, print continues to be the most efficient and cost-effective method of communication and often a preferred medium for collaboration.

applications already identified will not simply disappear unless they are replaced by some form of digital alternative, and in many cases, that is cost prohibitive. Indeed, IDC's research shows that organizations expect very few changes in print requirements over the next two years.

At the same time, the use of paper is critically important for communication and collaboration. Internal and external communications for most organizations are typically handled through several channels. Internal or across-company communications efforts are mostly controlled and digitally born, while external communications are more likely to be paper based. Use of paper is also highly influenced by the habits and preferences of knowledge workers. In many instances, print continues to be the most efficient and cost-effective method of communication and often a preferred medium for collaboration.

Meanwhile, numerous barriers continue to hinder the ongoing adoption and deployment of digital workflow and process optimization. While user behavior and corporate policies represent significant hurdles, limitations in technology and infrastructure likely play the most prominent role in hindering DX initiatives. The fact is that most organizations continue to operate in a hybrid office environment, with some combination of paper and digital content intermixed within the same workflows. The lack of interoperability between new digital systems and the legacy business is when DX often begins to break down.

Once again, limitations with the existing print and document infrastructure can severely limit opportunities around digitization and workflow automation. Indeed, 60% of organizations say lingering print infrastructure is negatively impacting the company's ability to support digital workflows. Some of this could be caused by device limitations and a poorly designed fleet deployment strategy. In many cases, companies simply do not have adequate scanning capabilities across the organization. A proper deployment of distributed MFPs equipped with advanced capture and workflow software can help facilitate document onboarding at the point of need while enabling line of business to take advantage of process optimization and workflow automation tools. Meanwhile, most enterprises are not taking full advantage of smart MFPs and the ability to drive efficiencies and productivity through better process analytics.



A proper deployment of distributed MFPs equipped with advanced capture and workflow software can help facilitate document onboarding.

By leveraging a true SaaS architecture, IT departments would no longer need to worry about print server management, device driver management, installing various hosted solutions to adjust to the proper number of devices or servers, or when and how to balance departmental needs with current server/print capacity.

Future Outlook

Next-Gen Print Infrastructure as a Service: Modernized Print to Accelerate DX Initiatives

IDC views next-gen print infrastructure-as-a-service (NGPIS) platforms as critical to supporting the broader, more strategic needs of the enterprise. Enterprise customers are focused on several key strategic initiatives in support of their digital transformation efforts: IT outsourcing, cloud migration, IoT, data analytics, and security. Bringing print under the umbrella of these broader strategic initiatives will facilitate a modernized print infrastructure and shift the discussion from managing devices to managing business outcomes.

Taking advantage of IoT-enabled hardware and a cloud-based print management platform, print service providers can leverage NGPIS to help customers migrate to a fully outsourced, consumption-based model for print. The value proposition of NGPIS is consistent with current requirements in the enterprise space: Shift to cloud computing to eliminate IT infrastructure, reduce costs, drive operational efficiencies, and free up IT resources for more strategic programs.

Central to the NGPIS offering is the ability to offload the entire print infrastructure. It is important to note, however, that this is not just outsourcing the management of onsite devices. With NGPIS, infrastructure is lifted from the physical environment, eliminating on-premises print servers, server provisioning, the need for multiple print drivers, and queue management. The ability to eliminate the need for on-premises print servers by moving the entire infrastructure to the cloud is the fundamental starting point for this technology.

This approach not only reduces IT burden but also results in an always-available and up-to-date print infrastructure that is able to grow organically as customer needs evolve. By leveraging a true SaaS architecture, IT departments would no longer need to worry about print server management, device driver management, installing various hosted solutions to adjust to the proper number of devices or servers, or when and how to balance departmental needs with current server/print capacity. Adding new print devices and users could be done with a few simple clicks, with an ability to add functionality and respond to customer needs virtually and in real time.

The NGPIS platform provides the service provider with complete visibility into all aspects of the print infrastructure, leveraging real-time data to analyze system performance, improve service delivery, and optimize device usage and deployment. Through IoT-enabled hardware, providers could deploy predictive services to

The ability to improve security of the print and document infrastructure is another important benefit of NGPIS.

monitor and assess device status through algorithms based on alerts and sensor readings to reduce interventions and maximize equipment uptime. Real-time data analytics would allow businesses to drive additional operational and process improvement with a seamless ecosystem for printing, scanning, and document process insight. While IoT technology is still emerging in the print space, 93% of IT decision makers already view IoT as having potential to improve printer fleet management, and almost half view it as having great potential.

The ability to improve security of the print and document infrastructure is another important benefit of NGPIS. By removing on-premises print servers, firmware updates and security patches could be automated and deployed systemwide as needed. This has become a common pain point for businesses with aging print infrastructure, often made up of multiple hardware brands and disparate servers that have been acquired over time. With NGPIS, customers could expect consistency in security protection with a cohesive set of solutions, services, and best practices deployed across a standardized fleet of devices. The cloud-based solution also provides customers with a mobile-ready print ecosystem that would allow users to authenticate to and access any print device on the network, supporting secure printing between physical locations within a single office environment or across multiple remote locations.

Modernized MPS

It should be noted that NGPIS is radically different from traditional managed print services (MPS). With NGPIS, the entire print infrastructure is owned and managed by the service provider. The elimination of print servers alone provides opportunity for achieving significant additional cost savings. Leveraging data-based print fleet design tools, print service providers can work closely with enterprise customers to develop a fleet design plan based on current usage patterns, security concerns, business processes, and future printing and scanning needs. There is an obvious cost benefit to eliminating on-premises servers, but the program also offers flexibility in terms of print acquisition and operating expense accounting.

NGPIS could be offered under multiple types of pricing and billing models, including a subscription-based all-in model, a flat-rate billing model to provide for consistency in monthly budgeting, and a hardware purchase plus utility model for organizations that want the benefit of cloud infrastructure but prefer to own the printing hardware. By moving to a subscription model, enterprise customers would have complete flexibility when it comes to recognizing print infrastructure on the balance sheet. New accounting rules and FASB guidelines that restrict treating long-term leases as opex are a cause for concern, leading more organizations to consider a shift to a “product as a service” acquisition model to avoid a capex impact.

Key to this approach is the intelligence of the global IoT platform, which allows the service provider to monitor device needs and resolve issues without the need to engage with the customers' own IT staff. A broad set of smart services allows the service provider to deliver proactive and automated supplies management and fulfillment, predictive services, proactive device notifications, and live data analytics. At the same time, NGPIS could help customers along their digital transformation journey, with the ability to layer in workflow and other solutions that can evolve as organizations become more digital ready.

Essential Guidance

Enterprise organizations face significant challenges as they look to modernize IT infrastructure and establish a digital-first operational model. As you think about your organizational approach to digital transformation, consider the following questions:

- » Is your organization struggling to advance its DX strategy?
- » Are you actively working to offload IT infrastructure?
- » Can your current print environment keep pace with future IT plans and objectives?

IDC believes that it is time for organizations to start thinking about print more strategically to elevate the conversation around print and include it within the broader context of their DX discussions related to cloud migration and document process strategies. Businesses currently identify cloud migration as the top factor influencing decisions being made around print and print infrastructure, but other drivers include IT outsourcing, data analytics, digital workflows, and IoT. Bringing in the appropriate stakeholders that understand your current print environment to consider how future IT strategies could be impacted — either by adoption of advanced technologies or by failure to recognize the need to modernize your print infrastructure — is imperative.

Next-gen print infrastructure as a service could help jump-start your current DX programs. Keep in mind that NGPIS is not just another form of managed print services. Instead, it is a fully hosted cloud-based print acquisition model designed to simplify the acquisition and management of print — freeing up IT resources and driving significant cost savings while facilitating a move to a more predictable, subscription-based billing model. At the same time, NGPIS leverages cloud, IoT, analytics, and mobile-ready technologies to drive business insights and inform critical decisions around process improvement and workflow automation. Don't let limitations with your existing print infrastructure derail your DX strategy. Better

yet, consider how NGPIS could advance and accelerate your DX program. For some organizations, transforming the print environment as part of the DX strategy could be viewed as a low-hanging fruit — one of the fastest and easiest moves an organization can make, especially compared with the complexity of other DX initiatives.

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3. IDC's Modernizing Infrastructure for the Digital Enterprise — Future Enterprise Planning Guide (IDC #US46297920, June 2020)

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About Lexmark

Lexmark creates smart IoT print devices and cloud-native solutions that help customers worldwide achieve their vision of print simplicity, security, savings and sustainability. Combining innovative technology with deep industry expertise, Lexmark serves customers in retail, financial services, healthcare, manufacturing, education, government and more.



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