

PDF has been the market's de facto standard for sharing documents for 30 years. New market potential for PDF has emerged to address changing document processing requirements fueled by a growing hybrid workforce.

PDF Plays Pivotal Role in Addressing the Essential Printing Requirements of a Growing Hybrid Workforce

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Questions posed by: Adobe Inc.

Answers by: Keith Kmetz, Program Vice President, Imaging, Printing, and Document Solutions Research

Q. What is the relevance of print in a world of electronic documents?

A. Print is a mission-critical function of work as this easy-to-use format is ubiquitous and portable and offers physical evidence for transactions. IDC's global page volume forecast showed that 2.81 trillion pages were produced in 2020 with desktop and office devices. While this volume is expected to decline, the 2025 projection of 2.33 trillion pages signifies that print will be a relevant form of business communication in the future.

Print's future use should be examined within the context of new market conditions. The COVID-19 pandemic ushered in working from home (WFH) as a necessity to continue business operations. In the initial stages of COVID-instituted office shutdowns, this work location was thought of as a short-term, stopgap measure. Two years later, the pandemic's lingering impact normalized WFH. According to data from IDC's July 2021 *Future Enterprise Resiliency and Spending Survey, Wave 6*:

- » 9% of respondents worked primarily from home or another remote location prior to the pandemic.
- » 28% worked primarily from home or another remote location in July 2021 — three times the pre-pandemic figure.
- » 16% expected to continue working primarily from home or another remote location when the organization operates in its future desired steady state — double the pre-pandemic figure.

The provision of printing needs to adapt to a hybrid workstyle, where barriers to work location are largely removed. Mobile and cloud support are essential with a continued reliance on core functionality (e.g., speed and quality) that must be maintained. However, not all printing devices may have the necessities built into the hardware to provide for these requirements.

Q. What is the relevance of PDF as a document format in the context of electronic documents and print?

A. Globally, there are hundreds of billions of PDF documents (.pdf) in use today. It may surprise some to find out how common PDF is. In IDC's June 2020 *Generational Print Survey*, 82% of respondents indicated using PDF as a tool to get work done. This percentage rivals similar responses for the use of Word, Excel, and even email and texting; so clearly, PDF is an essential computing tool to get work done for the majority of office workers.

PDF is an established standard to share and print documents as it maintains a document's appearance and integrity across various devices and computing platforms. PDF embeds all elements of the document (e.g., text, photos, illustrations, and graphics), and the quality of the document is the same whether it is viewed or printed. This core benefit allows users to share and consume content in their preferred manner.

In addition to being a standard for documents, PDF is also a format understood by many printers and MFPs used in the market today. Desktop machines have the capability to convert print jobs into PDF and then send these jobs to the printer via Microsoft IPP driver and Mopria driver in Windows and AirPrint in macOS. With the help of PDF-enabled printers, users get a consistent experience with what they see on their desktop and in their print output.

Another critical component impacting current and future PDF use is its support within a mobile and cloud computing environment. PDFs are increasingly sent to printers from mobile devices using such services as AirPrint (for Apple iOS devices) and Mopria (for Android devices) as well as cloud print platforms (e.g., Microsoft Universal Print).

IDC's *Generational Print Survey* indicated that workers spend over 25% of their work time consuming business content on mobile devices. We believe this percentage will steadily rise over time. In IDC's August 2021 *Managed Print Services Benchmark Survey*, the consideration of adopting a cloud-based print management platform is not a matter of if but when. The study revealed that just under half of all organizations (49.7%) have already adopted a cloud-based print management solution. Another 44% expect to adopt such a solution within two years.

Overall, PDF supports conventional office desktop printing with evolving capabilities. In addition, it provides support for the emerging mobile and cloud computing landscape.

Q. What is the relevance of PDF as a page description language in the context of the office and home printer?

A. The pandemic initiated the need for employees to shift their work location from traditional offices into home offices. This change came with substantial obstacles. One primary challenge was that certain work process capabilities available in the office were not always available in remote or home locations.

This includes print. Any single low-cost, home office printer or multifunction peripheral (MFP) typically cannot match the range of capabilities available in a fleet of office devices. Even as firms begin to return to the office, we anticipate a continued reliance on the home office as a work location. This means that organizations should examine and look for solutions that address work efficiency and the delta between the home office and the traditional office work experience.

For print, PDF as a page description language is key for supporting this new hybrid working model by leveling the playing field between desktop and enterprise-class solutions. This is important when considering the pandemic's effect on changing workstyle behaviors. Hybrid working requires the use of a broad range of devices from low-cost, single-user home office printers and MFPs to more robust enterprise-class office-located devices. The technology available in SOHO-class desktop devices can be resource constrained, so it is difficult to rely solely on hardware to meet the essential requirements of business document processing (e.g., PDF support) from home offices without sacrificing efficiency. Having PDF as a page description language embedded at the device level means greater performance consistency (e.g., print speed, output quality) across all types of printing products used for work, regardless of device type or location.

Q. What are the benefits of printers with native-PDF printing support?

A. Several benefits are associated with printing devices that have native-PDF support. These generally translate into better print performance, faster processing, and more predictable output (especially for color) versus standard raster printers. There are also other advantages:

- » **Accurate output** is available as printed content that resembles what is viewed on screen. This "what you see is what you get" ("WYSIWYG") promise means that users' print experience will be equal to what is displayed on the desktop or mobile device screen. PDF can be used for a wide variety of jobs (e.g., manuals, images, presentations, engineering drawings), and a native-PDF printer can then provide an accurate representation of the content on paper.
- » **Consistent print output across devices** is possible through native-PDF integration when embedded in the desktop printer used in home offices or in the enterprise-class device found in the traditional office setting.
- » **Higher color quality** is achieved through support for the International Color Consortium (ICC) profiles. This provides more accurate color representation. WYSIWYG is especially critical when it comes to color printing. With an infinite number of colors and shades at the user's disposal to produce output, exact color printing accuracy can be a huge challenge.
- » **Cloud and mobile support** ensures users can print from anywhere. Two key processing efficiencies available with this support are:
 - **Efficient transmission over mobile networks with limited bandwidth**, which is available due to PDF's small document size
 - **Better print quality**, which is possible by printing at device resolution versus raster formats when using mobile devices
- » **No conversion is needed between PDF and a format supported by the printer** (e.g., PCL, PostScript, or raster). This capability translates into greater processing efficiency and faster printing.

Q. What is the future of printing for work as more people work from home or in a hybrid arrangement?

A. IDC believes the future of work will be maintained with a hybrid model where work location is more about wherever the employee is and less about the location of the physical office. Legacy applications will remain, so support for conventional desktop printing in the office will not only be warranted but it will also continue to represent most work-related print volumes. At the same time, the evolution of mobile and cloud computing technologies will demand support as this platform will represent a growing share of work-related print content.

Support for the anticipated emergence of mobile and cloud computing was revealed in recent IDC primary research. In IDC's December 2020 *Print Market Recovery in the Aftermath of COVID-19 Survey*, respondents indicated the change in importance of 12 printer and MFP features from the pre-pandemic period to current pandemic conditions. Remote connectivity features (e.g., mobile support, Wi-Fi, and ability to print/scan to the cloud) showed the greatest rise in importance between the two periods. This response demonstrates the need to focus on mobile and cloud to meet the changing business market requirements in the post-pandemic period. PDFs, as a result, will come from an expanded range of sources — be it the desktop, mobile devices, and/or the cloud. In this anticipated development, printing solutions will need to incorporate the essential future-proof technology for what is needed in the printers of tomorrow.

The emergence of a hybrid working model will facilitate a more distributed environment for print. Print remains a requirement for business operations, but a wide range of printing devices will need to incorporate specific functionality to conduct work anywhere — homes, offices, or in the field. Since the assumption is that work will increasingly be conducted outside of the traditional office setting, the requirement for "no compromise" performance will be demanded in all devices (desktop or standalone) used for work applications in a decentralized workforce.

About the Analyst



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Keith Kmetz is the Program Vice President of IDC's Imaging, Printing & Document Solutions programs. He is responsible for all written research in these areas, including analysis on the printer, multifunction peripheral (MFP) and 3D printing markets as well as related transformational hardcopy software/services developments. Based on his 25+ year experience at IDC, Kmetz's research coverage has spanned a wide variety of significant print industry topics with an emphasis on forecast and survey analysis, vertical market opportunities, and client go-to-market strategies.

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