

Introduction

Digital color is clearly on the ascent in the high-speed, high-volume transaction mail industry. Dozens of organizations in the U.S and abroad have already adopted digital color technology and are reaping impressive benefits. These include customer messages with vastly improved visual appeal and far more customization, which in turn yields more effective messaging, superior customer relations and an improved bottom line.

Yet the migration from a proven effective and near trouble free print technology like monochrome laser printing can be challenging. Particularly for those managers who are responsible for assuring the continued smooth, low-cost and efficient operation of the high-speed, high integrity print/mail finishing process.

Pitney Bowes Document Messaging Technologies has worked hand-in-hand with many early adopters of digital color and helped implement the technologies in a variety of demanding ADF environments. In the process, Pitney Bowes has identified many of the potential impediments to a smooth migration as well as developed strategies and recommendations to overcome the most common obstacles.

This Position Paper is intended to help managers of print/mail finishing operations understand the potential impacts of digital color print technology on the ADF workflow so they can effectively manage the migration from monochrome to digital color while maintaining maximum throughput.

Why is there concern among operations managers over the migration from monochrome laser print to digital color?

The short answer is: continued efficiency. Operations managers are responsible for assuring the productivity of the high-volume customer messaging process. Monochrome laser print is a mature, proven and universally adopted technology that is highly integrated into high-speed print/mail finishing process. Monochrome laser printing is a key reason the whole process operates as efficiently as it does.

However, the decision to adopt digital color is often driven by stakeholders who are concerned with improving the effectiveness of the customer message. They may not

What key operational aspects of the print/mail finishing process are affected by the migration to digital color?

Virtually every aspect of the high-speed production process – from the data and communications infrastructure, to the perception of print quality, to the assured integrity of the message – can be impacted by the introduction of digital color. However, advance planning and preventative measures can help lessen the potential adverse impacts. Here are a few examples.

Infrastructure

A color print stream can be up to ten times the size of a monochrome print stream. So print servers, along with the available communication bandwidth for transmitting the color

Migration from Monochrome to Color

Monochrome Statement

Monochrome Statement with Color Inserts

Color Off-set Statement and Selective Inserts

Digital Color Statement with Onsets

Full Color Statement with Relevant 1:1 Messaging (TransPromo)

appreciate how the switch to digital color can impact the overall operational efficiency of the high-speed print/mail finishing process or alter the cost structure.

Once the decision to adopt digital color is made, it is the responsibility of the operations manager to assure that the new technology is implemented as smoothly and cost-effectively as possible. A fast, trouble-free implementation will enable the organization to quickly maximize its investment in digital color. This will result in higher quality customer messages that are more effective for the organization, more valued by the recipient and produced in the most efficient and low-cost manner possible.

print stream, will likely require significant upgrading to assure maximum processing capability. Otherwise, processing delays may occur and throughput may be compromised.

Number of Pages

Adding digital color may impact both the assembly of customer messages and the operational workflow. For example, the number of pre-printed inserts enclosed per statement may decline as marketing messages are printed in color on the statement document. As a result, the number of statement pages per customer account may increase. Processing a multiple-page-count application instead of a one-page application will adversely impact the overall

production yield. In some cases the decline in yield may exceed 50 percent.

Quality of Color

Attention to image quality – and achieving the desired heightened visual impact of color – is a priority once digital color print is deployed. The expectations among internal customers for quality and accuracy of the color image are significant and require operations managers to quickly develop and master the new and essential skill of color management.

In monochrome applications, the use of black toner is almost exclusively text-based. The key visual measurement centers on the sharpness or crispness of the text and its contrast against the document for easy readability. Even financial documents that may utilize a gray scale, for example, to distinguish segments on a pie chart or bar chart are not held to critical standards. And in the few instances when the monochrome black is used as part of a graphic design, the black or gray image is generally large and illustrative and not expected to be a pure or accurate representation of a concrete object.

Just as important, existing monochrome customer documents are generally designed to emphasize the black, text-based message. These documents use white space and pre-printed color as secondary elements to help focus the attention of the recipient on the critical text message. The techniques to optimize print quality and production in monochrome environments are well known and understood.

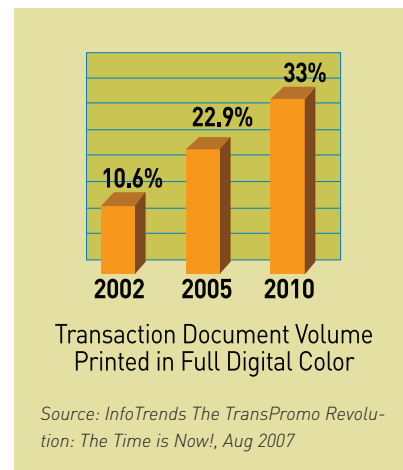
However, when digital color is utilized in customer messaging the expectations for quality are multiplied. The black, text-based message is still important and must communicate the essential account or payment details quickly and effectively. But operations managers must also be concerned with the accuracy, quality and overall appearance of the various colors themselves. At the most simple level, even the 'standard' colors, such as those utilized for logos, corporate branding and borders and highlights, now take on far greater significance.

Previously, these colors were likely pre-printed and the "quality" of the color was considered outside the scope of responsibility of the operations manager. But when digital color print technology is deployed as part of the print/mail

finishing process, the operations manager becomes responsible for assuring the colors are "true" and standards such as corporate identity are maintained.

TransPromo

The quality and accuracy of color in customer messaging applications takes on even greater significance when color is used as part of the newly emerging TransPromo applications. With TransPromo applications, data-driven, relevant promotional messages are embedded within the transaction mail statement. Here color is added to the document to attract customer attention and enhance the appeal of specific marketing offers and messages.



In TransPromo applications, the accuracy of the color image can be absolutely critical to the success of a marketing offer. As an example, consider how the color of an ocean or beach might enhance or diminish the appeal of a get-away vacation offer. Or how the accuracy of color might impact the appearance of scores of objects, such as automobiles, jewelry and articles of clothing.

Previously, such marketing offers, if included, were pre-printed as inserts, and the operations manager was responsible only for assuring their enclosure during the mail piece assembly process. Now, operations managers are still responsible for assuring the high speed processing of the customer message. But they are also responsible for assuring the accuracy of a myriad of colors, all of which can portray important distinguishing characteristics of the offer and may impact the return on marketing investment.

Accountability

The requirements for assured mail piece integrity expand when digital color is adopted, particularly when the color is utilized to custom-tailor or enhance individual messages. The need encompasses all applications, but it is particularly critical in applications such as health care and personal finance which involve both the individual customer message as well as the entire mail run.

Consider the example where a customer message is an enhanced explanation of benefits (EOB) that also includes information related to a medical procedure or perhaps a reminder or warning concerning the possible side effects of a particular drug administered as part of a treatment regimen. That medical information must be both accurate and specifically related to the individual recipient, otherwise, a medical disaster may result.

Similarly, an enhanced financial account statement, such as a brokerage account or mutual fund statement, may include references to other possible investment vehicles or opportunities that may be suitable for the recipient. However, if those references or recommendations are somehow mixed up, and a customer receives improper advice, it could damage that customer relationship.

And in both cases, if the personal medical or financial information is printed out of sequence, or is printed properly but is somehow inserted into another customer's mail piece, the repercussions would also be significant.

Reprint Processing

Occasional equipment stoppages – along with the resulting damaged mail pieces – are an unfortunate reality in high-speed, high-volume print/mail finishing. The key to maintaining high productivity, as well as mail piece and mail run accuracy, is to quickly isolate and out sort the suspect mail pieces, reprint them, and re-enter them into the document factory with no loss of productivity.

This process is easily accommodated in monochrome print environments. But some digital color print technologies are designed for the uninterrupted processing of long runs and are ill suited to accommodate the ad hoc reprinting of a small number of marred mail pieces. Indeed, many digital color print engines accept only one print language. In these cases, reprinted mail pieces must be manually separated out and rescheduled as part of a subsequent job. This involves

“Our two biggest challenges were centered on initial operator training to assure consistent quality output and paper selection to achieve cost-effectiveness. Color print devices have more print heads and are just more complex than monochrome laser printers. There is also a wider variance in image output. We found that comprehensive initial training helped our operators master the learning curve and maintain high-speed production while achieving a consistent quality of color. We even specified that new hires should have a print shop background to help bolster our color competence.

Finding the best paper value will also take some time. We tested samples from several vendors to identify the brand and grade that yielded the best results in terms of cost, operability and color quality for our configuration.”

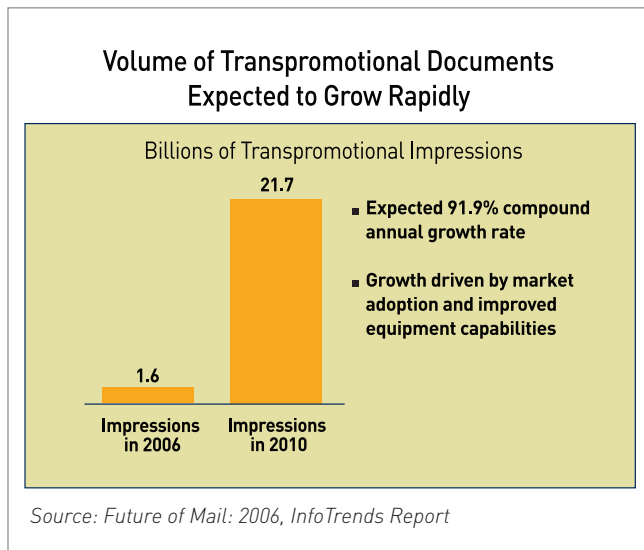
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altering and mixing jobs, which potentially impacts integrity and can also delay eventual delivery.

Several options are available to expedite the processing of reprinted color documents. These should be reviewed and modeled as part of the conversion to digital color to determine which work best in any specific configuration.

What are the ongoing or life cycle costs of digital color?

When migrating to digital color, operations managers should plan on incurring additional costs beyond just the acquisition of new hardware. At a minimum, these ongoing costs will include added expenses for color ink or toner as well as paper. They may also include higher costs for storage, handling and employee training to help achieve fast set-up, maintain color consistency, and assure optimum throughput.



Depending on the type of digital color print technology deployed and the amount of color imaging applied per page, the cost for color ink or toner will likely be four to five times the cost of monochrome alone.

The shift to digital color will have a similar impact on the cost of paper. The paper used in laser-based monochrome printing is extremely cost-effective. The specifications are broad and multiple suppliers furnish the product, which makes the paper easily interchangeable and largely a commodity purchase.

However, the paper used in digital color applications can be highly specialized and have as much an impact on image quality as the print engine itself. If a paper with less than ideal specifications is used, it will likely produce an image that is less than satisfactory. As a result, operations managers have less choice in selecting paper and the costs can be three to ten times higher than monochrome, depending on the specific paper utilized. Additionally, using the highest quality imaging paper may also result in an unintended adverse impact on the efficiency of downstream processing.

The costs for initial and ongoing operator training, to assure awareness of and adherence to the increased demands for quality and consistency, will likely be higher than in monochrome environments. Other ongoing costs related to preventative maintenance and hardware cleaning may also be higher.

How does the selection of the “right” kind of paper affect processing efficiency?

There is a wide spectrum of digital color print technologies. These range from devices that are intended to produce photo-quality images at relatively slow speeds to engines that can produce near-offset quality at high speed. For optimum results, each of the various print technologies specifies the use of paper with distinct characteristics that are designed to yield consistent quality images along with efficient high speed handling and processing. These characteristics include the percentage of recycled content, the orientation or direction of fiber, the existence and type of coating, as well as a wide range of physical and chemical properties.

Depending on how well these and other paper characteristics match with the specifications designed for the particular digital color device will determine whether the paper produces superior images at high speed – or results in additional operational challenges. Some operations managers who initially did not adhere to the recommended paper specifications encountered lowered productivity due to a range of challenges, including excessive curl or dust, impaired feedability and lessened fold quality.

How do I choose the “best” digital color print technology?

The “best” approach is three-phase. First, thoroughly review your current and anticipated customer messaging applications and select the digital color print technology that is best suited to your existing and anticipated needs.

Second, make sure your choice is fully compatible with your existing investment in mail finishing equipment and technology. And also be certain your existing configuration and equipment can be adjusted to accommodate the added demands of processing color output.

Not all downstream devices are “color-friendly.” Adjustments to various components, such as inputs, folders/accumulators and feeders, may be necessary to reduce the risk of damaged documents and assure the continued high speed, low cost and efficient processing of customer messages. A recommended best practice is to test prior to making a final selection and to include all pertinent vendors so each can validate the integrated solution.

And third, remain flexible. Digital color print technology is evolving rapidly, yet not all technologies are advancing at the same rate. The best choice for your needs today may be a toner-based technology. Tomorrow it might be inkjet-based. Next week there may be advances related to water, heat or UV-based technologies that make those choices more compelling. Print vendors are also reducing energy consumption while increasing speeds. So a technology that is not right today may be just right tomorrow.

Where can I find more information on implementing digital color print in customer messaging operations?

Pitney Bowes has already helped dozens of customers evaluate, select and implement color digital print solutions with mail finishing platforms. Pitney Bowes is printer neutral and works closely with all major vendors to test and assure that existing and planned devices operate efficiently in the high-volume print/mail finishing environment.

Pitney Bowes understands the full range of digital color print technology and can advise on the best approaches for both equipping, and retrofitting, the entire print/mail finishing operation if necessary.

For more information, contact your Pitney Bowes Document Messaging Technologies Account Executive or call: 1-877-536-2736.

“Managers should also be aware that file format and adequate back-up capacity are potentially troublesome issues. The increased investment in color print requires that jobs be as lengthy as possible to minimize switchovers and keep throughput and productivity high. Files should be prepared to yield fewer, longer runs rather than more frequent, shorter ones.

Adequate back-up color print capacity is critical as well. When migrating from monochrome to color, there may be a desire to switch over in phases. However, if a single color print device is deployed, and it requires servicing, or a large number of exceptions require reprinting, a back-up device is essential to maintaining productivity.”

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