

MADISON | ADVISORS

Enterprise Output and Customer Communications Expertise

Intelligent Document Processing

Special Assessment Report

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EXECUTIVE SUMMARY

Customer-facing, mission-critical documents are among the most highly valued assets in an enterprise. Thanks to new technology that can triple the productivity of an automated document factory (ADF), a sea change is occurring in the management of document processes. Leading-edge corporations are looking at documents strategically, as the central component in a holistic approach to communication that also includes web, call center and other channels.

Corporations are beginning to realize that the information captured within and provided through documents is invaluable. Not only are documents central to an organization's business processes, they are also one of the most important communication mechanisms that an organization has with its customers, suppliers, business partners and employees. Given this, it is understandable why organizations spend millions on their creation and delivery systems.

Business communications take many forms, from email with attached reports to printed letters that contain billing statements. Whether it travels digitally or physically, both the sender and the receiver expect accurate, timely and secure communications. Organizations, small and large, seek and depend on vendor partners to provide services and technology that meet these expectations.

Government regulations also play a role in the need for more accurate communication channels. Corporations must comply with Gramm-Leach-Bliley Act of 1999, as well as other regulations designed to assure the privacy of sensitive communications such as those in financial services and health insurance. Indeed, there are those who would claim that the acronym HIPAA stands as much for High Integrity Processing and Accountability as it does Health Information Portability and Accountability.

As a result of all these factors, intelligence, accuracy, integrity and productivity, even more than sheer speed, are the attributes most widely sought by companies when choosing document lifecycle management vendors.

An intelligent document output strategy can organize the flow of knowledge, ideas, data and information. Through the creation of centralized data repositories – where content is stored, shared and managed – businesses have achieved systematic productivity gains and considerable savings. More importantly, they have enhanced their overall thought process while attaining the level of consistency necessary for quality service. Clearly, intelligent output processing is a cornerstone of better business communication.

DOCUMENT LIFECYCLE MANAGEMENT

The intelligent document production lifecycle starts with the creation of a print file using a legacy application or document composition tool. At this step the customer data is merged with a static or variable document format to create print images. Further post-processing software can be used to cleanse old formats, perform page counts or add bar codes to each page. File-based processing systems rely on information collected from these initial processes to monitor and manage the rest of the production process.

Each print file is sent to production for printing. Once the production job has printed, it is prepared for insertion. In addition to the printed pages, a number of other pieces can be inserted into the envelope based on customer specifics.

While the insert selection can be coded within a bar code that is read at the inserter, file-based processing uses a reference file to track which inserts are to be placed with each document. The inserter reads a small bar code as each page is picked and checks with the reference file to determine how to process it.

Intelligent Mail

Intelligent mail uses data-rich, machine-readable markers to give each mailing piece a unique, trackable fingerprint. The encoded information can be communicated remotely to the postal carrier and to other parties. It can be incorporated into reporting, accounting and planning systems and processes. Intelligent mail makes the mail a safer and richer communication channel than it has ever been before, enhancing the USPS-delivered mail channel.

Companies can leverage intelligent mail by utilizing two tracking numbers per document, an internally defined piece ID, and a channel-tracking symbology such as the USPS Planet barcode. This tandem of data allows the mailer to track the document through the entire **Create > Produce > Distribute > Response** cycle. The aggregated data includes customer-specific information, the status of the mail piece within the document factory, and an accounting of its movement via the USPS CONFIRM database for both outgoing and incoming delivery.

Intelligent mail is next-generation file-based processing in that it leverages the traceability of file-based processing and extends it throughout the USPS delivery system from the moment the mailed document enters the mailstream to when the reply envelope returns to the enterprise.

Intelligent mail provides the means with which to accomplish myriad aspects of quality, including:

- Verification of mail piece integrity
- Piece-level tracking
- Proof of mailing and acceptance processing
- Fraud detection
- Collections
- Image archiving
- Integration with customer call centers
- Customer self-help
- Early detection of undeliverable mail and proactive delivery notification

Intelligent Mail is a method to affiliate documents to customer-focused, mission-critical, document-producing business processes and is largely a result of file-based processing.

FILE-BASED PROCESSING

Traditional inserter control systems use scanned code information (bar codes) to directly control the inserting process. The account numbers, page counts, and machine instructions are directly represented in the code on each page. The inserter interprets the code during processing. Essentially, the bar code directs or controls the insert operation. This solution depends on the inserter's ability to read and interpret the code on each page. Unscanned or unreadable pages are usually diverted or outsourced, as are all associated pages within the mail piece.

An alternative to traditional control through direct bar code scanning is file-based processing. With file-based processing the barcode string on the document is used to point to a larger information record in a database or reference file that accompanies the mailing. This allows a relatively short barcode on the document to point to a much larger information-rich data record, keeping the code from growing as inserting complexity increases.

With file-based processing, smaller codes, such as 2D or DataMatrix, can be placed anywhere on the document without affecting the accuracy of the inserting process. Smaller codes are less obtrusive and require less document real estate.

Since the inserter uses the mail run data file (MRDF) reference file as a backup, the error processing of unrecognized codes is minimized. The file provides information about what the insertion equipment should expect and can fill in for a missed item, correcting item status without a special application or user intervention. The result of this high level of integrity is higher quality mailings at reduced costs.

The additional data provided by the MRDF can be used for end-of-process applications including exact postage metering, envelope addressing, or one-to-one personalization on the envelope. The MRDF includes expected page counts, envelope counts and insert usage, necessary for materials inventory planning.

Most importantly, file-based processing supports item reconciliation by identifying the missing data elements. Missing items are tracked and requests can be sent up stream for an automated re-creation. A list of “late envelope pull” items can be added to the file and these items can be diverted from the mail stream for special handling. File-based processing ultimately provides full mail piece integrity and process control. For critical, high-volume document delivery applications, file-based solutions are becoming the de facto standard for high-quality operations and the minimum standard for service providers.

The following figure illustrates the differences between direct-control processing and database/file-based processing.

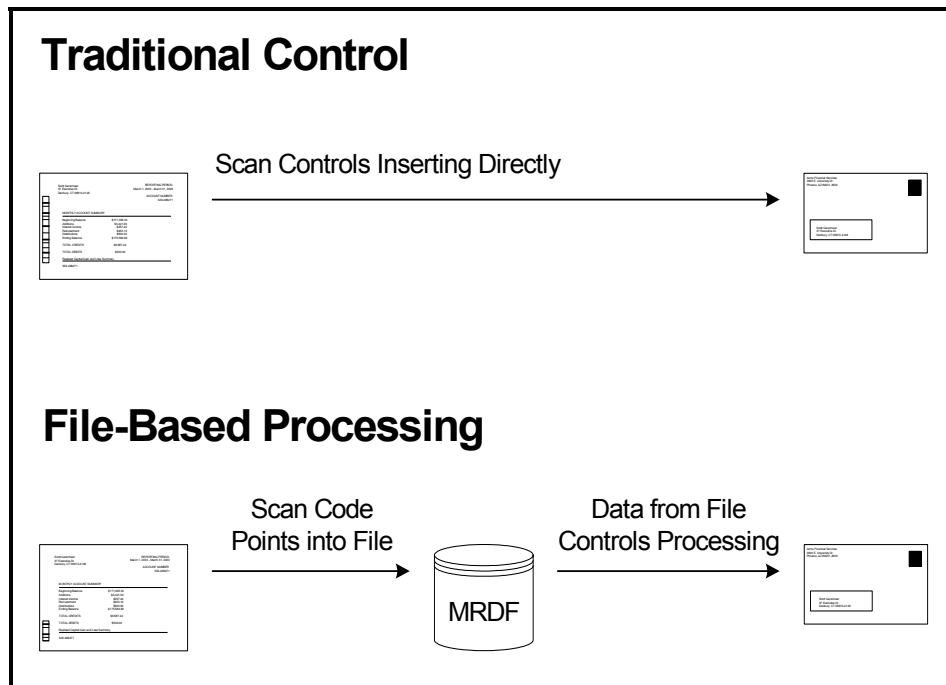


Figure 2 – Traditional Versus File-based Processing

Traditional control drives processing from the printed barcode, requiring a larger footprint on the document to support the larger barcode. Conversely, file-based processing represents an index, and therefore a considerably smaller barcode with the robust data available for each mail piece. The process supports the ability to “look ahead” into the MRDF, providing the ability to prepare for the next envelope before the machine processes the document. This method provides increased quality and enhanced flexibility not found in traditional control systems.

The following table provides a high-level comparison of traditional control and database/file-based processing.

Control Methodologies Summary		
	Traditional Control	Database/File-based Processing
Code Size	Medium to large	Small, low impact on document design
Code Placement Requirements	Usually on leading edge of a document for timing reasons	Can be anywhere along length of document
Code Technology	Requires high-reliability code	Works with any code
Scan Error Correction	Not automatic, limited correcting possible with special application programming	Automatically built into the control process. No special application programming required
Network Required	No. May be desirable for reporting and software management	Yes
Reconciliation	Must be performed off-line. No automatic catching of missing pieces, especially at end of run	Built-in to the control process
Application Support	Limited to applications requiring a small amount of data	Can support all, especially in-line addressing
Database Planning	None, must be done separately	Database inherently provides information for planning

Table 1 – Control Methodologies Summary (source Pitney Bowes)

FILE-BASED PROCESSING SOLUTIONS

The following table outlines the leading hardware and software insertion providers. With the recent merger of Bowe and Bell+Howell, it is premature to evaluate the combined organization's solutions and impact on the market. For this exercise, both the Bell+Howell ImpactServer and JETs solutions were examined.

Feature	Pitney Bowes	Bowe, Bell+Howell	Gunther	Kern
File Definition	User defined	Predefined	Log file	Log file
Record Format	Variable length	Fixed length	Fixed length	Fixed length
Scan Capabilities	Read-ahead	Document / File-based	Read before Feed	Document Based
Reconciliation	Yes	Yes	No	Limited

Table 2 – Industry Solutions Matrix (source Madison Advisors)

The following list describes the table features relative to file-based processing:

- **File definition** – The physical attributes of the file, specifically the record description is important to determine flexibility, scalability and efficiency. The ability of the system to create a user-defined file with site-specific elements determines the flexibility and extensibility. Without a customer-defined file, most systems produce a general log file that may meet a site's requirements.
- **Record format** – File-based processing is driven by data records, typically one per envelope or document. Generally variable (or user defined) records are preferred, as they are more flexible and typically smaller, therefore more efficient and cost effective.

- **Scan capabilities** – Describes the system’s ability to identify the document and lead times available to process the information and prepare the inserter for maximum efficiency. Using file-based processing, the system can read ahead in the file and anticipate the upcoming sequential documents to be processed. With this information, the inserter can auto-correct miss-reads, prepare selective insertion stations, and prepare the inserter track for proficient processing. Document page counts and special handling information enable the machine to prepare for the event before the document arrives, allowing for smoother and more effective processing.
- **Reconciliation** – The ability to automatically initiate a process to regenerate documents damaged in processing through a closed-loop method that identifies the specific rework items without human intervention. When missing or damaged documents are identified during the process, the system updates the file in real time to mark the envelope for reprocessing. This can occur immediately at the inserter for placement in the associated outbound mail tray, or collected for efficient batch processing.

PITNEY BOWES

Pitney Bowes is a leading provider of mail and document management solutions including solutions for Bill and Statement Mail, Software Services and Support, Document Solutions Management, Hardware, Software, and Data Management, and Mail Distribution Centers. Based in Stamford, Connecticut, the \$4.4 billion company helps organizations of all sizes “engineer the flow of communication” to reduce costs and increase impact, and enhance customer relationships.

The company's 80-plus years of technological leadership has produced many major innovations in the mailing industry and more than 3,500 active patents with applications in a variety of markets, including printing, shipping, encryption, and financial services. With approximately 33,000 employees worldwide, including professional services consultants, developers, sales and marketing, and management, Pitney Bowes serves more than 2 million businesses through direct and dealer operations.

In the United States, Pitney Bowes sells its solutions primarily via a direct sales force focused on addressing vertical markets, principally financial services (banking, insurance, investment, and consumer credit organizations, and the service bureaus that support them). Pitney Bowes clients include many of the top ten banks, investment firms, and service bureaus. Overall, Pitney Bowes reports an installed base of 2 million customers globally.

Complementing and supporting its software solutions, Pitney Bowes' industry-renown, professional services organization can assist companies with the implementation of sophisticated document production systems. The professional services organization is dedicated to implementation and system integration in support of client installations of document production solutions. In addition, system service client support is well established, and has an excellent reputation for customer responsiveness and assistance.

Pitney Bowes Document Messaging Technologies

Pitney Bowes Document Messaging Technologies provide a range of equipment, software and service solutions to engineer the flow of critical business communications for high-volume mail and digital document output customers. These intelligent mail solutions empower clients to use their customer communications—digital and paper—to further drive profitability by integrating the document channel with enterprise and CRM solutions.

The following figure shows the process flow of the Pitney Bowes file-based processing offering from the creation of the document through the creation of the MRDF by StreamWeaver, through the printer and into the file-based control system enabled by Direct Connect within the inserter, which finishes the process.

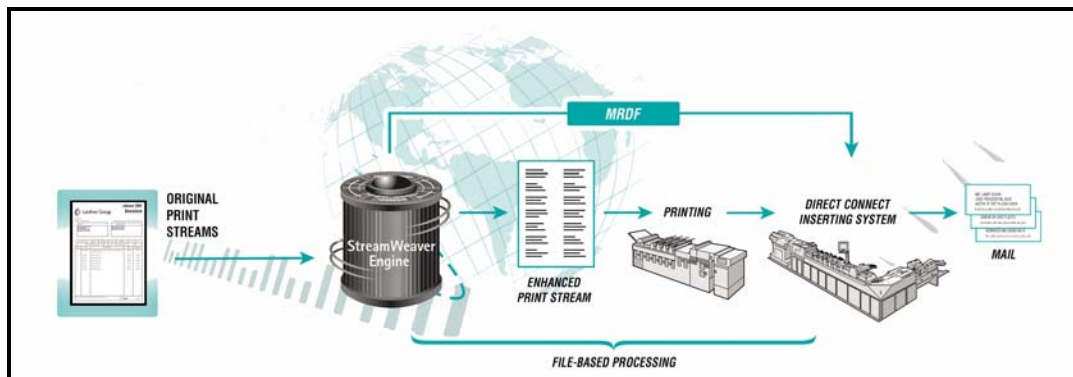


Figure 1 – Pitney Bowes File-based Processing Process Flow (source Pitney Bowes DMT)

SOLUTION COMPARISONS

Hardware

This section provides a comparison of equipment-based offerings across multiple industry solutions. The review of competitive mechanical insertion systems illuminates current industry trends and customer feedback through a variety of industry verticals and applications to ensure the broadest array of input possible. The review of hardware solutions focuses on a few critical criteria key to high throughput and increased uptime. Often buyers are asked to compromise solution flexibility with workload throughput and processing quality. To do this they typically allocate particular equipment to a specific application and throttle back the cycles to maintain quality and reduce interruptions or machine faults.

Pitney Bowes has separated itself from the market with its latest inserter systems through superior workmanship, materials handling, integrated technology and support services. The result is a formidable solution that is penetrating non-Pitney operations, and displacing competitive products with enormous success.

The advances of both the APS series and FlowMaster series^{*} show the progress Pitney Bowes has made in delivering the robust and highly dependable systems the industry demands. The advanced paper processing architecture and reduced mechanical components decrease the probability of hardware failure, thereby increasing the reliability and performance of the system.

Competitors continue to struggle as they attempt to extend existing legacy platforms to meet customer demands. Niche suppliers such as Gunther in the flats or insurance markets, or Kern in the high performance low-page count applications, attempt to expand product offerings, while established competitors struggle with shrinking product footprint and market share. The recent merger of Bowe and Bell + Howell has posed as many questions as answers, and has raised doubts as to which technology will ultimately prevail.

^{*} It should be noted that both the APS series and the FlowMaster series leverage the Direct Connect file-based control system.

In particular, the APS Series solutions deploy HealthCheck software, which proactively monitors and reports any irregularities in the system. For example, faults such as component malfunctions and unexpected material behavior are reported as issues. This new software feature provides the ability to identify corrective action, as required, to maximize system uptime. The impact on operations is demonstrated by higher throughput and reduced operator interventions.

The high-speed insertion engine of the APS series utilizes the latest facedown paper path architecture and precision motion control technology for the envelope insertion. The improved paper path architecture enhances paper path visibility and reduces the number of adjustments. The use of precision motion control technology provides better control over the material before and after the insertion process, hence improving both the productivity and document integrity.

Several recent visits to production sites that have historically utilized Bell + Howell equipment exclusively, have revealed the introduction of the APS Series systems with notable success and tremendous praise. Most noteworthy is the ability to swap at least two competitive devices out for a single APS system, providing significant footprint and maintenance savings. APS technology has given Pitney Bowes a significant upsurge in system placements in the lucrative insurance and service bureau vertical markets, historically underserved by Pitney Bowes solutions.

Flexibility remains a key criterion for mailers of all applications and volumes, as expense controls retard the acquisition of new systems. Output providers that were forced to trade off highly tuned, super efficient chassis for slower but more flexible systems find that the easily configurable FlowMaster series excels in both letters and flats processing. Although Pitney Bowes was not traditionally strong in flats processing, the FlowMaster Series represents a significant technological leap, which further distances Pitney Bowes from the competition.

The following chart highlights Pitney Bowes' dominant position in this space and testifies to the robustness of its solution. The chart compares the overall platform throughput of each vendor's high-end solution, representing the processing speed in envelopes per hour, and processing integrity, inherent quality features, as well as supplemental capabilities available in the overall solution, including motion controls, mechanical simplification, high-integrity inspection, and proactive monitoring and reporting.

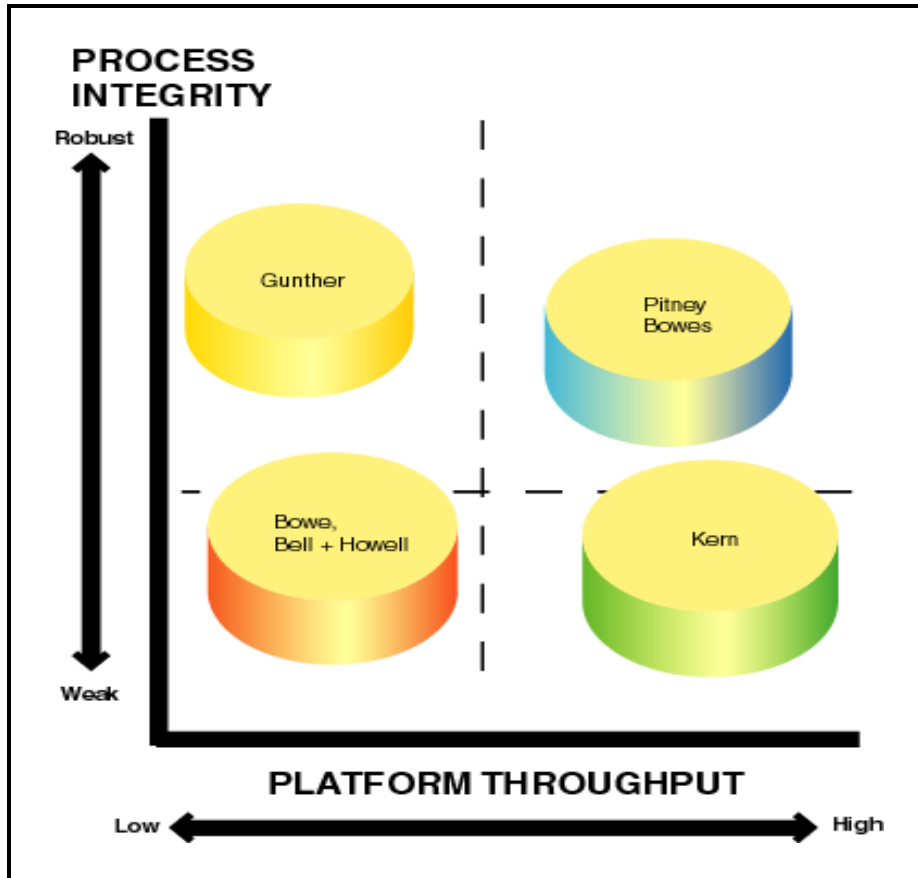


Figure 3 – Solution Comparison chart (source Madison Advisors)

While there may be individual vendors that excel in any single function, such as faster transport speeds or guaranteed integrity, no other vendor offers as much functionality as the Pitney Bowes' comprehensive product suite.

Operations can utilize Pitney Bowes' APS Series and FlowMaster Series for their current high-volume insertion needs, and subsequently increase quality through file-based processing, while also maximizing application integrity and accuracy through rules based processing. This flexibility drives noteworthy operational efficiencies and fuels a rapid ROI.

Software

Historically, Pitney Bowes has led the charge in the development of robust, technology-grounded solutions to support varied intelligent mail and customer communications. Starting with the advent of “Host to Post” in the early 1990s, the automated document factory (ADF) in mid-1990’s, and, more recently, solutions that address production workflow, job-level and piece-level tracking. In addition, with the acquisition of Mailcode in 2002, an innovative track and trace solution that extends tracking through the USPS Confirm system, Pitney Bowes offers the products that render superior quality control and complete document package integrity that creates a truly holistic, closed-loop system.

StreamWeaver

A key document process technology is StreamWeaver, an easy-to-use, and graphical, post-processing, print stream management toolkit. StreamWeaver’s value is in its ability to modify, customize, and enhance print-ready files before final distribution, and in its support for advanced hardcopy printing and web distribution strategies. StreamWeaver is the accepted market leader worldwide in this technology.

StreamWeaver can create the MRDF for each document to be printed, which is then opened by the operator to begin running a particular job. The documents are fed into the input section of the inserter, where a scanner reads the barcode on the documents.

Document Composition

Through a partnership with Group1 Software, Pitney Bowes enjoys a strong relationship with one of the industry’s leading document composition systems. DOC1 is a market-leading, comprehensive suite of tools for high-volume, dynamic content creation and delivery. It includes a graphical designer environment, a high volume generation engine, print spooling ability and high-volume document archiving capabilities.

Professional Services

To help operations with resource constraints put the pieces together, Pitney Bowes has built a robust professional services organization that engineers the flow of communication and has a strong record of completing digital and paper document projects within tight deadlines. The company's extensive expertise with Pitney Bowes products and tools reduces project time to market, saving organizations money in development costs and lost opportunities. In addition, by maintaining a highly skilled and concentrated services staff, Pitney Bowes can quickly deliver high-quality services that meet customers' needs, which includes the migration to file-based processing. Pitney Bowes employs a Work Flow Solutions team within its professional services organization that can help organizations better understand their needs vis-à-vis a file-based solution.

Direct Connect

Direct Connect enables the file-based processing system within the Pitney Bowes APS series and FlowMaster series that logs each mail piece through every step of the inserting and finishing process, delivering a higher level of mail piece integrity. Direct Connect also controls inserter systems that use traditional scan techniques in lieu of a file-based system.

Operating on the MS Windows NT platform, Direct Connect archives and retrieves job specifications and data, reconciles actual results with job specifications, regenerates mail without manual handling, and offers flexible network connectivity.

SiteView

SiteView is a workflow management and analysis tool that is capable of tracking any process running on a computer, including system-to-system file transfers. It also monitors associated work steps, from inception through completion. SiteView accomplishes this by collecting vital status information, measuring performance and displaying it in real-time on a desktop. The automation client is capable of launching processes and essentially automates the ADF.

MANAGING FILE-BASED PROCESSING

No review of the migration path to file-based processing is complete without considering the advantages of a process management solution. DF Works has an open architecture and data handling capabilities that allow customers the flexibility in deploying these solutions with reduced integration and cost. There is value in creating metadata about documents (job-level data, piece-level data, control files, production information, etc.) and tracking this information throughout the document lifecycle.

DFWorks

DFWorks is a modular software suite that works with Direct Connect to monitor and manage the document production process using data collected directly from the process. The product is comprised of integrated and expandable modules for controlling the manufacturing processes by which documents are produced, handled and packaged for delivery. The combination of file-based processing and DFWorks produces a powerful ADF tool that increases the effectiveness and efficiency of the document factory and the staff that manages these factories.

Functionality

The modules of DFWorks are designed to manage postage, produce production statistics, track jobs in real-time, measure and identify productivity opportunities, control workflow, produce production schedules, manage materials and cost jobs. These capabilities leverage the power of file-based processing.

The central modules are the Production Workflow and InSite Job and Production tracking modules. These modules in conjunction with file-based processing provide unmatched visibility of jobs and pieces to their SLAs and quality criteria.

By monitoring the intelligent inserting process, DF Works presents the real-time status of each job and allows users to access both job-level and piece-level data. Each mail piece is tracked by barcodes read throughout the process, including at the inserter. The InSite module uses this information to track each piece and provide feedback. Piece-level data can be shared through integration with customer facing or customer service systems to respond to inquiries about item status, such as what date a specific piece entered the mail stream.

The architecture that enables this capability in real time is built upon files that are updated continuously by the Direct Connect file-based control system. These

files are read by DFWorks and placed in an Oracle database to provide real-time and historic views to stakeholders.

Customer facing stakeholders have the ability to access this data to find specific mail pieces or to find all mail pieces relating to a given account. The architecture supports integration to call center applications as well as other systems for inventory control and billing.

DFWorks Online module is an option that provides secure browser-based access to production reports generated by data collected through the equipment monitoring devices and other DFWorks modules. Detailed reports are available for overall job production, operator and inserter performance and statistics. Other reports present data at the job or shift level. Current production and overall throughput can be presented graphically.

The online module allows for personalized presentation of the report information with secure access controlled by passwords. It also acts as the interface for defining production alerts based on job or machine-specific thresholds. Notification is provided through e-mail, voice mail, or pagers.

DFWorks is designed to provide integration into front- and back-end systems to provide data about inventory, materials procurement, and billing. Front-end integration into customer service software and marketing automation systems is critical for campaign development and response tracking.

BUSINESS BENEFITS OF FILE-BASED PROCESSING

File-based process control delivers a greater level of mail piece integrity than any other inserting platform available today. Virtually an unlimited amount of information about each mail piece can be sent to the inserter and back to your host computer via input and output files. The “data-driven mailing” enables:

- **Multi-channel delivery** – While hardcopy document processing represents the bulk of customer communication delivery for most organizations, the need to support electronic delivery continues to grow. The Pitney Bowes file-based solution allows for the re-purposing of existing legacy data to provide multi-channel delivery. Utilizing the electronic version of the MRDF, the eMRDF, enables consistent handling of all customer communication regardless of delivery medium. Supporting the entire document delivery process, regardless of physical representation, lowers unit processing unit costs and provides consistency across back-end support systems.
- **Mail piece integrity** – The Direct Connect file-based inserter control system is a fully integrated component of the Pitney Bowes inserter systems and is designed for high-volume, transaction print and mail organizations. Direct Connect provides core file-based tracking to significantly improve system reliability and integrity. In addition, file-based insertion allows increased security and cost savings of closed-face envelope processing, leveraging the MRDF to provide name and address information for presentation on the outbound envelope. DFWorks’ Self-correcting Scan Sequence Verification algorithm corrects missing or incorrect scan data by reading in the MRDF file to adjust for potential mis-reads, thereby assuring integrity.

The regulatory constraints that govern many industries can be met and reported through file-based processing. Compliance assurance is systematic and documented with either job or piece level data, providing documented verification that critical documents were processed and delivered.

- **SLA performance** – File-based solutions provide both piece and job-level tracking at critical processing functions, supporting robust historical reporting data on processing trends and performance metrics. The historical data provides a reality-based commencement for service goals, rather than best guess or industry averages. This data drives the 100 percent real-time reconciliation, with the added benefit of automated damaged mail piece regeneration. Because the data is captured and monitored real time, system alerts can be incorporated into the system, allowing for management notification and intervention in user defined situations.
- **Integrated postal processing** – Pitney Bowes offers a single data repository to manage the insertion-based and postage metering equipment. With a single source of rich postage costing data, management can actively and efficiently manage one of the largest cost drivers in the entire document delivery process. Interfaces with Pitney Bowes data quality and mail efficiency software products such as ForwardTrak, Finalist and Mailer's Choice provide a robust solution set to assist organizations in reducing postage costs across all applications.
- **Intelligent mail** – file-based, intelligent mail solutions help marketing organizations coordinate multi-channel campaigns with greater accuracy by allowing them to subsequently target mail campaigns on the exact day of delivery. Sales calls tied to receipt data likewise have more relevance and a better rate of success. Tracked mail campaigns also improve the ability of inside sales and call center operations to forecast call volumes. It allows the organization to close the loop on targeted messaging and renders a holistic view of the customer communication process from customer data and message creation through customer response and fulfillment effectively and efficiently.

CONCLUSION

For document professionals dedicated to serving the customer—either internal or external customers—two key issues are addressed by file-based processing: productivity and process integrity.

File-based processing provides numerous benefits for high-volume document production. The benefits are better quality control and customer service and the automation of production tracking and reporting, which allows for productivity process improvements. To review, file-based processing has the following advantages:

1. Provides more data to the insertion process
2. Increases integrity
3. Automates reprint regeneration
4. Increases performance
5. Allows late modifications and account pulls
6. Gathers “as-built” mail piece data for customer service and other applications
7. Gathers real-time data on operations through DF Works

The benefits of file-based processing for high-volume document production are achieved with a mix of hardware and software components. These benefits are reflected in better quality control and customer service as well as in automated production tracking and reporting, which allows for production process improvement. Operational cost savings are tangible and fungible, creating opportunities for short ROIs.

With the introduction of the APS system and the FlowMaster system, Pitney Bowes has taken significant strides to distance itself from the competition. The flexibility and the throughput speeds are resulting in the conversion of competitive operations to the more complete APS solution.

The DFWorks system provides a clear and comprehensive file-based methodology, ensuring consistent and quality processing. This system works internally to provide extensive data collection and uses this data to control and report on document production processes. The control functions allow the system to manage a production job at the work step level and to direct the processing of individual pieces. The reporting functions provide a historical basis for evaluating performance and responding to inquiries regarding a single function.

Organizations that are interested in migrating to a file-based processing solution are encouraged to evaluate their workflow and applications in order to better understand the procedures that will need to be followed. Pitney Bowes employs a Work Flow Solutions team within its professional services organization and Madison Advisors is fully capable of providing this service as well.

Madison Advisors also recommends that, as part of their due diligence, organizations interested in adopting file-based processing solutions carefully evaluate competitor solutions to ensure that they are properly architected and fully integrated into a uniform tracking mechanism.

Overall, the Pitney Bowes solutions provide unmatched processing control, throughput, and reporting functionality to allow organizations to meet broad objectives including stringent performance measurement and service-level agreements, while also accounting for detailed process improvement and piece-level integrity. The technology is sound and the business merits of the closed-loop document solution make it a natural fit for organizations needing to engineer the flow of high-volume, high-value, customer communication.

APPENDIX: ABOUT MADISON ADVISORS

Madison Advisors exists to advance the output and electronic communications objectives of Fortune 1000 companies. Madison Advisors specializes in offering context-specific guidance for a range of content delivery strategies, particularly those addressing enterprise output technologies and customer communications.

Madison Advisors offers expertise for advancing output and electronic communications initiatives, primarily through short-term, high-impact consulting services. With no-nonsense, quick engagements (measurable in days or weeks, not months), Madison Advisors directly targets helping our clients achieve very hard and specific Returns on Investment (ROI).

Madison Advisors' analysts are dedicated to technology and market research that is delivered through short-term project engagements as well as articles, publications, and presentations. We specialize in customer communication technologies including enterprise output management, content management, customer relationship management, e-billing, and infrastructure technology.

Madison Advisors offers a range of standard consulting engagements that allow us to provide tangible results quickly. These standard services address specific challenges common to sophisticated customer communication operations. Challenges we address include:

1. Rationalization of in-house v. outsourced output responsibilities
2. Refinement of pricing strategies for in-house services
3. Reassessment of output operation responsibilities and relationships
4. Advancement of electronic communications capabilities

For more information about Madison Advisors, visit our Web site – www.Madison-Advisors.com.

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