

THE POWER OF INTELLIGENT MAIL (“I-MAIL”)

Pitney Bowes believes that technology can be deployed to help:

- Mailers and recipients interact more effectively with the Postal Service;
- The Postal Service manage its activities more cost-effectively; and
- Manage the movement of mail, the movement of information about the mail, and the movement of payments for use of the mail.

Description of the Elements of the Technology

The foundational element for all technology enhancement is information. The ability to produce information is made possible by placing unique, machine-readable information on each mailpiece, whether it is directly on a letter or through a label applied to a letter or package. The other enabling technologies are the ability to capture that information in real time through high-speed scanning, the ability to store and forward the data captured through high-capacity, high-speed computing, the ability to present the information to all interested parties over the Internet, and the ability to create a network among the Postal Service, the mail users, and intermediaries which help those users manage their interaction with the Postal Service. In the remainder of this paper, we will describe some of the identifiable benefits of an information-rich mail system. We call this system an Intelligent Mail, or “I-mail” system.

The vision of I-mail – the use of data-rich, machine readable information on each mailpiece – is that each mailpiece can be uniquely marked to identify the sender, the recipient, the postal product used, the payment received, a piece identification number, and, if desirable, a content identifier. One of the critical elements of I-mail as well is the marking of the containers in which the mail is moved throughout its journey, whether the container is a tray, a palette, a container, or a transport vehicle, and an information-based linkage between the individual mailpiece and the container or containers in which it is stored or moved.

The preferred methodology for marking mail today is by one-dimensional or two-dimensional bar codes, but there is no reason that, with costs of radio frequency identification technologies continuing to come down, the marking technology on certain items might not be RF-ID. The differences between bar code marking and RF-ID is that bar code marking enables the tracking at selected points in the journey of the mail from origin to destination, whereas RF-ID allows for more continuous monitoring; and bar code marking typically requires the mail to be moved past a scan point, whereas RF-ID enables the mail information to be captured in a bulk container. Because RF-ID technology will remain far costlier than bar code-driven scanning technology, the likelihood is that RF-ID will be deployed mostly for high value items that customers will pay a great deal of money to track more continually.

Whether the preferred technology is bar code based or RF-ID based, the information "lives" with the mailpiece or package. The technologies exist today, and the further development and deployment of networked, digital I-mail technology can benefit mailers of all sizes from "Aunt Minnie," the citizen mailer, to the operators of document factories for the largest business mailers. Leveraging these technologies to develop I-mail can increase the value of the mail

while, at the same time, increasing Postal Service operating performance and reducing operating costs, and improving mail security. In addition to Pitney Bowes, many companies have invented technologies and processes to make I-mail feasible – Lockheed Martin Distribution Technologies, Acxiom Corporation, and Symbol Technologies, to name a few.

I-Mail Increases the Value of Mail for Large & Small Customers

The Postal Service must focus on constant, vigorous improvement (not just maintenance) of customer value to enable mail to remain a viable communications medium in the 21st century. This is the way to face the challenges from electronic media. Research and everyday experience confirms that paper messaging will remain part of American life for decades to come. Research shows that consumers and businesses are comfortable with paper because they can: scan it quickly and know immediately if it is a bill, a direct mail piece or a love letter; identify the sender easily; skim it and decide whether to read it now or later; mark it up; classify it and store it in familiar places (magazines in the living room, coupons in the shopping bag, catalogs on the kitchen table, bills next to the checkbook or computer, birthday cards posted on the refrigerator door, and personal letters in a place that affords privacy). This cannot be done with electronic messages and is one powerful reason for slower electronic substitution than previously anticipated. The key is to increase the value and affordability of mail.

For these reasons, postal policies, programs, and operations must be judged by the value they bring to those using the mail system – recipients and mailers of all types and sizes. Pitney Bowes supports efforts to increase the value of mail, particularly the use of I-mail. Pitney Bowes has been a provider of leading mail technology for more than 80 years. Based on the wealth of our experience, we believe that I-mail is the next generation of technology that will undoubtedly enhance the value to mail, reduce its cost and improve its security for all who use and depend upon the postal network.

1. I-Mail Enables New, Valuable Services

Intelligent mail can open new possibilities to create value for large and small mailers. How? A consumer, business or any user of mail technology creates a mail piece containing information that is uploaded to a network. Upon induction into the mail stream, the I-mail letter or package is scanned or tracked throughout the system and often at point of delivery. If a mailer applies a unique identifier such as an encrypted 2D barcode, it can embed information only it understands and track and trace the mail piece from information posted on the web by the post. An e-mail message also can be transmitted to the sender notifying them that the item has reached its destination. Value added services such as E-Certified and E-Return Receipt and E-Insured will be available.

One of the features of physical mail that we know to be highly valuable to mailers is the ability to know that the mailpiece has been received by the intended recipient and/or that the intended recipient has confirmed receipt by a signature. Even individuals can use I-mail to track packages being returned to a merchant, so that they know when they are entitled to a credit for the item returned. Today, delivery confirmation, certified mail, and return receipt are valued services provided by the Postal Service, but their penetration is limited by the significantly

higher cost to the mailer. In an I-mail system, these services would be available at a much lower cost than they are today.

One of the other benefits of end-to-end tracking of individual letters or packages is the ability of mailers or recipients to direct a re-routing of the letter or package in transit. This is called dynamic routing, and it is another service for which either individuals or organizations will pay extra.

Recipients of these letters and packages could receive these items at a centralized efficient commercial location, which is an “automated delivery” parcel station open 24/7 that facilitates secure retrieval of the item, or could direct the Postal Service to route the delivery to their workplace or their second home.

I-mail also increases the value of mail to the sender by allowing coordination with other services based on when a piece of mail is received. As the Mailing Industry Task Force noted: “Technology integration into the mail system via intelligent mail could greatly expand the mailing industry’s business. In comparison with other mediums, mail can be a more targeted and cost effective means to advertise.” Knowing when the mail will arrive enables companies to time follow-up e-mail or phone calls accordingly.

This use of multiple marketing channels in combination with one another is called “integrated marketing,” and is emerging as one of the most effective ways to enable marketers to get the desired response from their target customers. For companies that receive a large number of payments through the mail, I-mail can provide crucial information on when customers have truly put the check into the mail, and can route those payments to a lockbox or other processing point for improved cash flow.

All of these options provide a higher level of service at the same or reduced cost with less inconvenience for the customer since no trip to the post office is required. The maximum value will only be created if the postal system provides open access to data collected by the postal infrastructure, and the industry is free to innovate and create solutions for mailers and benefit from value added services.

2. Technology Exists Today To Implement I-Mail

I-Mail uses information about the sender and the recipient to increase the value of a mail piece. This information can be applied in a variety of ways by the mailer and/or by the Postal Service upon receipt.

I-mail can benefit all mailers, large and small alike. Today, metered mail is 46% of the First-Class Mail stream and accounts for more than \$24.8 billion in Postal Service revenues or about 37.5% of total revenue. Digital meters are in use by almost 1.5 million consumers and businesses. These meters create indicia that identify the sender. They provide security (see discussion below of sender identified mail), but do not provide recipient information. When combined with additional information from separate POSTNET and PLANET Code barcodes, a mail piece becomes I-mail.

The next generation of meters, available in the market today, create indicia that identify both the sender and recipient with no need for separate barcodes – true I-mail. A focus for the future is to make this technology available to an even wider range of consumers and retail applications. Information rich bar codes or indicia also can be applied by the Postal Service upon receipt of letters and packages. Thus, the information necessary for I-mail to work also can be applied at different stages of the process by different parties, greatly increasing the flexibility and applicability of I-mail.

Another generation of technology in the final stage of development is the personal postage printer, which prints “smart stamps” and can serve as a low cost postage printer for homes and small businesses. Wireless devices are possible. These products can provide convenient access to postage while also providing the added security of smart stamps that identify the creator of the mail piece. When combined with separate barcodes, a single letter with a smart stamp becomes I-mail.

These same technologies can be available through retail kiosks to those who choose not to purchase the hardware. This is accomplished by using a scaleable architecture that allows critical components of a personal postage printer to be embedded and integrated into retail kiosks or ATM’s. The result is that the general public or those without access to the Internet would have 24 hour a day, seven day a week access to on-demand postage and a network of postal services.

I-Mail Reduces Postal System Costs

In addition to providing significant benefits to both senders and receivers of mail, I-mail also provides advantages to the Postal Service. This is an example of utilizing opportunities within the existing regulatory and administrative structure to reduce costs and make the Postal Service more efficient. For example, I-mail not only increases the value of mail, it also provides the Postal Service with valuable information to manage its workload and workforce to achieve greater efficiency and reduce costs.

I-mail could improve operating efficiencies for the USPS by leveling production peaks and valleys that drive up processing and transportation costs. I-mail could enable dynamic rerouting of mail and provide data on which components of the system could be optimized. An effective system of this sort would require cooperation among the USPS, postal equipment vendors, and solutions providers like Pitney Bowes who support mailers.

I-mail also creates an opportunity for large mailers to coordinate their production and processing of mail with the Postal Service to insure the most seamless hand-offs between the mailers and the Postal Service. I-mail has become a critical component in the worksharing system that has reduced Postal Service costs by billions of dollars over the last two decades, and can be the foundation for an even more cost-efficient worksharing system. If major mailers and the Postal Service can jointly manage the flow of large volumes of the mailstream on a real-time basis through tracking enabled by I-mail, they can continually improve the postal network.

Technology is also usable to automate and enhance the retail interface between mailers and the Postal Service.

The use of an indicia also substantially reduces the costs of payment evidencing for the Postal Service. The Postal Service says it costs 24 cents for each dollar in revenue to provide stamps over its retail counters. The comparable USPS cost for mail with meter indicia is 1/10 of one cent. With seven million customers visiting post offices each day, many for the simple purchase of a stamp or roll/booklet of stamps, there exists the opportunity to leverage existing retail kiosk technology to provide 24/7 low-cost access to these transactions. This retail technology effectively leverages an available low cost secure metering platform. An infrastructure could be designed to increase the availability of low-end metering systems that could displace stamps.

The use of I-mail for value-added services such as certified, registered and insured mail also reduces Postal Service costs, in addition to providing revenue enhancement opportunities. With I-mail technology, these mailpieces can be created at the desktop and deposited in collection boxes, thereby avoiding manually intensive procedures that currently take place in thousands of Postal Service lobbies every day.

I-Mail Improves Mail Security at the Lowest Additional Cost

There are three different kinds of security risks with which the users of the postal system and the Postal Service have concerns:

1. The risk that letters or packages contain hazardous content that can create health, injury, or death risks for people or create damage risks to property;
2. The risk that high value content in the mail can be lost, stolen, damaged, or destroyed; and
3. The risk that the revenue required to be collected by the Postal Service for provision of mail services will not be collected.

I-mail helps reduce all of these risks.

1. Hazardous Content Risk

In the wake of the October 2001 anthrax attacks on the postal system, the Postal Service must implement new security protocols to ensure the safety of its customers and its employees. I-mail, with its capability to make each piece of mail unique, is an important means to address mail system security requirements in the most cost effective manner. While the Postal Service has begun to implement security processes that leverage the value of I-mail, there is more that it can and should do within the confines of existing legislative and regulatory constraints.

Last year, the House Committee on Appropriations directed the Postal Service to report by December 31, 2002:

“on the evaluation of the cost effectiveness and security benefits that may be

provided by a system of cooperative security or ‘trusted mail’ efforts (including incentive options) between USPS and commercial mailers, whereby mail received from a commercial mailer that has complied with security standards, such as unique traceable identifiers, would not be scheduled to receive any special handling for the detection and neutralization of biohazardous contaminants.”

Similarly, the Senate Committee on Appropriations directed the Postal Service to:

“provide the Committee with a report by December 31, 2002 on their efforts to further enhance ‘trusted mail.’ That report should include an analysis of the feasibility of using unique, traceable identifiers applied by the creator of the mail piece, and the feasibility of providing incentives for the creation of trusted mail.”

In responses to the Committees, we understand that the Postal Service discussed the basic types of mail in the mail stream, described in general terms the security initiatives it has undertaken, and explained the value of “sender identification” (preferring that term rather than the Committees’ use of “trusted mail”).

Sender Identified Mail (“SIM”), as envisioned by the congressional committees and as discussed with various Postal Service officials, is “mail that contains a unique identifier applied by the originator of the mail piece.” The Postal Service recognizes that Sender Identified Mail can be a valuable tool in detecting and deterring attacks through the mails. Those who seek to commit terrorist attacks generally seek to do so anonymously in order to evade detection. Sender Identified Mail (“SIM”) has the potential to increase mail security by assuring traceability of mail to the sender.

The Postal Service understands that the key to balancing the need for security measures with the need to preserve and promote a universal, efficient, cost-effective and affordable postal system is to recognize there are two mail streams: “commercial” and “retail.” Commercial mail originates with known mailers prepared under processes amenable to security precautions. We estimate that the “commercial” mail stream constitutes about 75 percent of USPS domestic mail volume. Most commercial mail is also sender-identified mail. For these reasons, it is the most secure type of mail and can by-pass facer/canceller operations and the initial PCR hazard detection technology upon induction into the postal system.

But more can and should be done. To further secure the commercial mail stream, the Postal Service should require sender identification on all mail that enters the commercial mail stream. Commercial mail should be “Sender Identified Mail (SIM).” Mail that does not meet SIM requirements should be excluded from the commercial mail stream.

For letter mail, this can be accomplished in large part by requiring letter mail to meet SIM requirements in order to qualify for presort or automation discounts. It is our opinion that the Postal Service can implement the SIM security requirements for letter mail without involving the Postal Rate Commission or any other regulatory body. The Domestic Mail Classification Schedule (DMCS) generally provides that workshared mail (e.g., presort and automation mail)

shall be “presorted, marked, and presented as specified by the Postal Service.” Under this specific DMCS authority, the Postal Service can initiate SIM requirements on its own consistent with existing legislative and regulatory requirements.

There remains the issue of cost-effective steps to reduce security risks and increase the value of retail mail. Retail mail, or “at risk” mail, is generally anonymous, stamped, collection box mail. Of course, some retail mail includes a return address. Other retail mail – particularly that generated by those in small or home offices – may also evidence their identity because they use meters. However, technology exists today that can allow for expanded low-cost desktop printing of secure and even “personalized” I-mail.

The Postal Service should encourage the production of sender-identified retail mail, i.e., meter indicia or PC Postage mail, through pricing incentives as has been suggested by various parties in the past.

2. High Value Content Security Risk

By allowing for either tracking of mail containing high value content at selected points from origin to destination or continuous tracking through RF-ID technologies, I-mail helps deter actions that would result in loss, damage, destruction, or theft of high value content, and it helps in the process of detecting or recovering the high value content. For example, if credit cards in the mail can be tracked along their journey using I-mail technology, credit card theft can be detected faster and the losses resulting from it can be minimized.

3. Revenue Security Risk

Pitney Bowes has been a leader in helping postal services around the world minimize revenue security risks for more than 80 years. By enabling a convenient, secure pre-payment system, the postage meter has enabled the Postal Service to collect billions of dollars of revenue each year at a much lower cost than the postage stamp system, and at a much higher level of security than the permit mail system.

Today, I-mail enables many of the security features of the postage meter to be available at a cost that will be affordable for consumers and that will enable more secure permit mail revenue collection.

For some individuals, PC Postage has been a less expensive, reasonably convenient alternative to the postage meter, with considerably more functionality than a stamp. Current PC Postage offerings enable mailers to pay conveniently and securely for postage, but they also could allow mailers to print a bar code on the envelope that gives them the ability to track their mail through the postal system.

The problem with permit mail and with mail that is submitted by large mailers who claim a discount for worksharing activity is that the current Postal Service technology does not readily allow for verification of the attributes that drive the revenue collection or that qualify the mail for discounts.

Since permit mail is often inducted into the postal system at an acceptance point at which 100% piece count verification is impractical, the downstream scanning and counting of bar codes that link individual mailpieces to a specific mailing enables verification that is not possible at the induction point.

With respect to the verification of worksharing attributes, the Postal Service today uses a technology called MERLIN, which stands for "mail evaluation and readability look-up instrument." MERLIN is a technology by which the Postal Service samples mail from a large mailing, and determines whether the sample achieves a targeted percentage compliance with postal requirements. This is a major leap forward from when the Postal Service depended upon mail acceptance clerks to make a sampling at the acceptance station.

However, I-mail enables the Postal Service to validate the correct postage due earlier in the process, and correct any problems earlier. Certified I-mail scanning and reporting processes could be deployed at mail processor sites to detect and correct revenue discrepancies before the mail is brought to the Postal Service for induction. If given financial incentives to deploy this technology, mailers would prefer to know about a revenue shortfall issue before they have wasted the effort to induct mail into the system. The Postal Service would avoid having to sample mail after it is received, and to reject non-compliant mailing.

Address Management Technology

Closely related to I-mail is the revolutionary change that is occurring in address management technology. Ultimately, the recipient address is one of the key pieces of information represented in bar code or other symbolic form, and the ability to track it is one of the key benefits of I-mail. Having a "correct" deliverable address is a foundation of an effective mailing event.

We have put the adjective "correct" in quotes to highlight a point about addressing: what matters more than accuracy is getting a letter or package delivered to the address that insures that the recipient will receive it at the time and location most desired by the recipient, and most likely to trigger the response desired by the mailer. The earlier in the process that a correct address can be placed on the letter or package, the lower the cost or risk that the item will not get to its intended recipient. Bar coding of a correct address is a result of having a robust, real-time system for correcting addresses to put the final destination address on the letter. The Postal Service's Postal Address Retrieval System (PARS), which will be deployed within the next two years, will be a step in the right direction by intercepting incorrectly-addressed mail as early in the automated sorting process as possible, but the best solution is to correct addresses before printing, or at least before the mail is inducted into the postal system.

Just as we discussed the concept of dynamic routing for packages, mail recipients can redirect mail to their place of business, their vacation homes, or a post office box close to where they work, so that they can take actions caused by the receipt of the letter as soon as it is delivered to them. For example, if I am receiving a large check in the mail, I may prefer that it be delivered to me at the office during the work day, so that I can deposit it into my bank

account. I would pay extra to have it in the bank a day or a weekend sooner. I-mail enables the tracking that allows for re-routing individual pieces of mail after the sender has directed them to a home address.

Address management would also save significant cost for the Postal Service. Today, incorrect, undeliverable, or obsolete addresses cost the Postal Service almost \$2 billion and cost mailers and recipients at least another \$5 billion.

I-mail, combined with address management, is a powerful tool for enhancing the value of mail and improving Postal Service operating efficiency and lowering operating costs.

Summary

There are many other technologies that continue to improve to make I-mail not only a reality, but a system that can revolutionize the postal system for all mail users.

We have only indicated some of the value-added services enabled by I-mail, some of the operating efficiencies it can deliver, and some of the opportunities for security enhancement it can put into place. We believe that widespread deployment of this technology will result in an explosion of innovation that will help all communications and transportation methods that work in tandem with the mail.

In the future, as noted earlier in this White Paper, RF-ID will complement the bar code as a method of producing information-rich mail, and will spawn its own set of inventions to make the movement of information, documents, and packages even more of a driver of positive political, economic, and social change.

In closing, we are pleased to have this opportunity to present a glimpse into the future of I-mail technology and its potential.