Several years ago Siemens sent a message to the United States Postal Service that basically said, “We can save you a bundle on processing undeliverable mail.” It was a concept the USPS could not afford to ignore. The U.S. Postal Service delivers some 200 billion letters and packages annually — more than any other postal service. But about 3 percent, or roughly 4 to 6 billion mail pieces, are not deliverable as addressed. The price tag for all that undeliverable mail, including millions of man-hours and plane-loads of mail, amounts to $1.8 billion per year.

The reason that so much mail is undeliverable as addressed is unique to the United States: Each year, around 16 percent of all American families move. In 2001, for instance, the USPS registered 44 million requests for changes of address. Naturally, most people who move inform everyone from friends to financial institutions of their new address. They also file change-of-address forms with the USPS. But until now, no technology was available to automatically screen addresses and compare them with the huge change-of-address database.

All that is about to change thanks to the impending implementation of the Postal Automated Redirection System (PARS), a combination of software and hardware developed by Siemens Dematic, that is now undergoing testing in Virginia and Florida.

In the age of the Internet, many people may wonder if postal services still have a future. But the answer is a very definite “yes.” Although the number of letters has certainly declined in recent years, letters still represent about 80 percent of all mail. And total mail volume is stable or increasing. The reason is the Internet itself. “As more and more people use the Internet, they tend to make small purchases that are delivered by mail,” explains Raj Kumar, an automation equipment technology acquisition manager who is the primary interface between Siemens and the Postal Service for the project’s implementation. “This also leads to more advertising volume,” he adds.

High Speed Shortcut. Slap a 37 cent stamp on an envelope, drop the envelope in a mailbox anywhere in the U.S., and your message is on its way. Its first stop will be a distribution center where mail is separated according to whether it’s coming in to the area or going out. Let’s say your letter originates in Washington, D.C. and is addressed to your old school buddy Rick in Los Angeles. The only problem is that Rick recently retired and moved to Florida.

Siemens’ new Postal Automated Redirection Technology is set to save the United States Postal Service hundreds of millions of dollars per year.
Once the PARS system is implemented, rather than being sent to L.A. and then being redirected to the correct new address as is currently the case, the envelope will take a high speed shortcut. Traveling at over three meters per second (about 11 km per hour) through a sorting machine, the envelope will be turned so that it moves through the machine face up. A digital image will then be lifted of the entire face of the envelope and optical character recognition (OCR) technology will read the target address.

As soon as the target address has been successfully read, the information will be sent to a PARS server and checked against a list of moves. “A PARS change of address server can interrogate a USPS directory of 60 to 80 million address changes in only a few milliseconds,” says Gert Seidel, Vice President for PARS systems. “It’s a patented technology we developed at our Arlington, Texas center.” Assuming Rick filed a change of address form, the server will recognize that the envelope is undeliverable as addressed (UAA) and only about a second after entering the sorter, the envelope will slide into a special stacker for redirection processing.

**Split-Second Decisions.** “At this point all we know is that the letter is UAA,” says Seidel. “To find out exactly what to do with it, the image of the envelope face will be transmitted to a system called a forwarding reader. This is a new technology we developed in Constance, Germany that analyzes the mail class, the service endorsements, such as ‘Forwarding Service Requested’ and other information on the mail piece that affects its final disposition. If information is detected that can not be determined automatically, it is entered by specialized personnel using video encoding at a remote center.” All results, explains Seidel, whether they are determined automatically by the forwarding reader or by video encoding, will be transmitted to a server called a redirection image controller. “This is the heart of the PARS system,” he says. “It takes the coded information from the envelope image and analyzes it with reference to nearly 4,000 USPS rules.” The rules govern how the final disposition of a mail piece and associated services are affected by mail class, endorsements and the age of the change of address record. For instance, suppose the endorsement on the envelope says “Address Service Requested,” but the recipient’s location is confidential because of a court order. In such a case, the letter would go to the recipient, but the sender’s request for an address update would have to be ignored.

Within a split second the redirection image controller makes a decision as to which rules apply to Rick’s letter. Based on this decision, it generates an electronic label that is stored for that particular letter. Assuming that everything is legible and the controller does not direct the letter to be processed manually, Rick’s letter will zip over to a combined input-output subsystem (CI OSS) which will scan the envelope for an identification tag and query the controller for information.

The redirection image controller will, in turn, transmit its label information for that particular envelope to CI OSS and, as the letter whizzes through the machine, it will be automatically labeled and a barcode tag representing the controller’s decision and a new address (if applicable) will be printed on a yellow label. “The label text and barcode determine the new disposition of the mail piece,” says Seidel. “And the bar code tells other machines down the line whether and where to forward the letter, return it, or — if it is third class mail — to treat it as waste.”

In all, a single “production line” of this sort could process up to 30,000 “undeliverable” mail pieces per hour. Siemens and the USPS estimate that UAA delivery times will be reduced from days to hours thanks to the new technology. All in all, Rick’s letter is automatically redirected at its point of origin — Washington — to its new final destination, Miami.

Although eliminating the full $1.8 billion price tag for all undeliverable mail is probably an impossible dream, Siemens expects the USPS to save millions of working hours and up to $420 million per year once the PARS system is fully implemented. “This is an incentive-based contract,” says Seidel. “The more the customer saves, the more we earn. So you can bet your boots we will continue improving the system as our technology evolves.”

*Arthur F. Pease*