Smart Cards, Smarter Health Care

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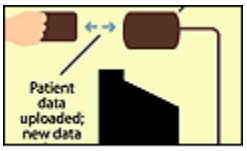
Case Study: Taiwan's Bureau of National Health Insurance

While genomes and robotic surgery get the glory and the Discovery Channel documentaries, one of the biggest advances in health care can be found in your back pocket. Assuming, that is, that you're living in Taiwan.

Two years ago, in a move to increase efficiency—and decrease errors and fraud—Taiwan's Bureau of National Health Insurance (BNHI) decided to replace its paper-based patient identification system with one built around Sun Microsystems' Java-based smart cards. Less than a year after the first cards were distributed in July 2002, the system was up and running nationwide for the country's 22 million people.



Going Paperless

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On first glance, the move may seem like just another high-tech way to make sure that patients are who they say they are. But identity theft is a nagging problem in health care, with an increasing number of patients using stolen identities to seek treatment to which they are not entitled.

Moreover, with a paper-based system that's hard to monitor and open to abuse, unnecessary procedures are apt to slip through. The cards are intended to clamp down on the abuses and thus cut down on health-care costs. They are also intended to make treatment more efficient and safer.

The patient cards each have just 32 kilobytes of memory but can store vital data including allergy information, organ donor status, emergency contact numbers, medication, prenatal information, and personal insurance data. All this gives doctors ready access to information they need to make quick and accurate medical decisions.

In setting up its smart-card system, BNHI had two requirements: Deploy the system fast and stay within the $115 million budget. Working with Taiwan-based TECO Electric & Machinery Co. and a German company called Giesecke & Devrient, BNHI set up the infrastructure and began distributing the cards, which use chips from Hitachi and Infineon. The total time from planning to nationwide launch was just 25 months. "It was the fastest 0-to-60 deployment I know of for a smart-card program," says Peter Cattaneo, director of Sun's Java Card business.

Deploying on such an aggressive schedule and within a fixed budget required certain design choices—and sacrifices. A card-based payment capability was discussed and later rejected. "Payment is usually a complicated, controversial area, so the decision was made to deploy the card without a payment capability for the first phase," says Cattaneo. Biometric-based security was also passed over in favor of a standard PIN-based system. And a wireless version of the card was rejected in favor of a card that must be placed in a reader at the doctor's office or hospital. All of these compromises enabled a quicker, less costly rollout but also resulted in a less sophisticated system.

On the other hand, since each card runs a Java Virtual Machine, the data on the cards can be expanded with minimal cost and bother. When a new application is available, a central server can download it directly to a card in a reader. This means that new applets can be added without all the cards having to be replaced. Each

applet runs in a separate, firewall-protected space on each card.

With the cards costing between $2 and $4 each, upgradability delivers substantial savings. That's not to say the cards will never need to be replaced. Typically, the lifespan of the cards is about five years, according to Sun. Wear and tear in back pockets eventually take their toll.

BNHI invested in a significant infrastructure for its smart-card system. At the health-care provider, smart-card readers are attached to PCs via USB. These PCs are connected to a central back end consisting of a variety of servers (for authentication, data management, card maintenance, and other tasks), including Sun Enterprise 10000, 4500, 3500, and 450 systems running Solaris.

Integrating the back end was relatively simple compared with educating an entire country about the new health card. To that end, BNHI created a public-awareness program, running commercials explaining how people can use the cards.

BNHI recently completed the rollout and has already seen dramatic reductions in medical costs. The bureau won't say how much exactly, but you can be sure that other health-care systems are making guesses—and plans.

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