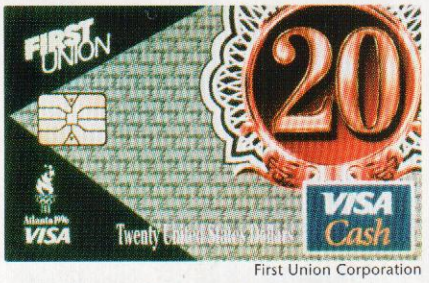
Technology Today

Alan J. Pierce

Digital Money

FOR almost three decades, futurists have predicted the death of the cash part of our currency system and its replacement with some form of electronic or digital money. Even though credit cards are a form of digital money, too many people lack the credit history to take advantage of these cards. This has caused many to believe that the digital cash revolution has stalled.

The truth is that 90 percent of our American money supply already exists in digital form. Every business day, $2 trillion moves between banks and other financial institutions as electronic currency. Since all the coins and dollar bills stashed in American wallets, piggy banks, mattresses, and vaults are estimated to equal only $400 billion, the digital cash revolution is clearly running at full throttle. The hardware and software necessary to replace most of the rest of this real cash is now in place. In fact, there is a good chance that you already use digital money for some of your purchases. Let's explore some of the new forms of digital money that are about to change how we use cash in our daily lives.



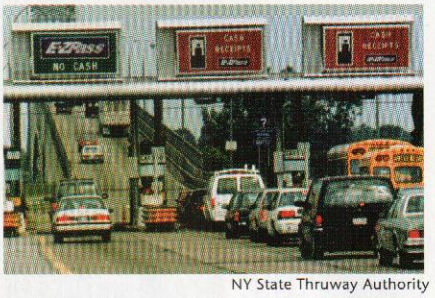
First Union Corporation

Photo 1—Visa Cash card

The Visa Cash card in Photo 1 actually contains a computer chip embedded in its plastic. This tiny chip can hold around 4 KB of data. The ones now being introduced will be thrown away when their cash is depleted. You must remember that these cards contain cash, and if they are lost or stolen, the money is gone. Refillable smart cash cards are expected to hit the American market within a year. When making purchases with a cash card, you sign nothing, show no identification, and don't use a personal identification number to complete your transaction.

When you use the card, a terminal at the store validates your card's authenticity and then reduces the amount of cash stored on the card's chip by the amount of your purchase. The new Visa and Mastercard Cash cards require physical contact between the money card and the card-reading terminal.

Electronic money cards and debit



NY State Thruway Authority

Photo 2—Digital money at work

How Thruway E-ZPass™ Works

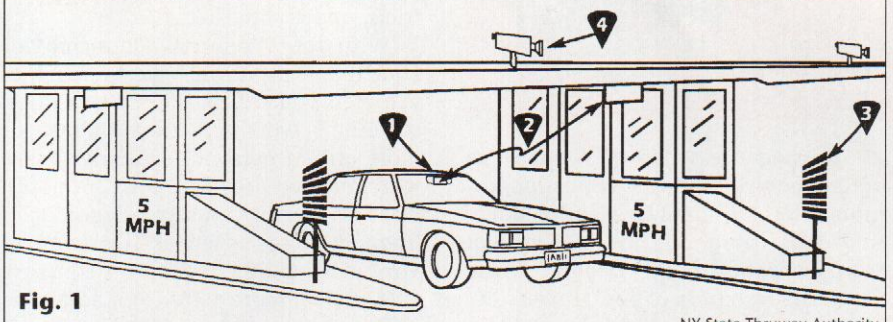


Fig. 1

NY State Thruway Authority

1. As vehicle approaches the toll lane, windshield-mounted "tag" sends a signal that identifies the vehicle.
2. As vehicle passes through the toll lane, an electronic reader communicates with the tag. When the car enters the Thruway, the toll plaza number is encoded onto the tag. At the Thruway exit, the entry toll plaza number is "read" from the tag, the toll is calculated, and the information is relayed to a computer containing the customer's E-ZPass account information. The toll is deducted from the account.
3. Message board provides information about the E-ZPass transaction and the account status.
4. If there is no tag or the tag is not valid, a video camera records the vehicle's rear license plate for issuing a violation notice.

cards have been marketed in Europe for years. Since governments have chosen to stay out of the cash card business, many different card systems are vying for consumer confidence throughout the world. The Mondex European cash card system actually allows you to transfer money to a friend if both of you are using Mondex phone equipment.

Equivalent cash systems such as Cybercash, E-Cash, and digital wallets are now appearing on the Internet. Each system is trying to guarantee safe commerce on the World Wide Web where credit card security just doesn't exist.

Telephone cash cards can now be purchased from convenience store vending machines. These cash cards allow the bearer to make telephone calls by charging the call to the card. When the card is depleted you can throw it away or, in some cases, refill the card with new money. If the telephone cash card is stolen, large telephone bills can't be charged to its former owner.

Not all digital cash systems require physical contact between the card and the card reader. Many daily train riders just wave their card at the turnstile reader for entry. Motorists in some metropolitan areas have the option of using a cash card that is automatically read by a reader positioned in the toll both area. Here you pay the toll without stopping or even rolling down your window.

The E-ZPass system (Photo 2 and Fig. 1) provides the motorist with a special bag for their smart card when it's not in use. If a motorist should drive through the toll plaza with an unprotected card stored anywhere in the car, odds are better than 98 percent that the reader will communicate with the card and reduce the card's cash reserve by the toll booth price. The E-ZPass and many other cash cards are called debit cards because they don't contain money on a chip or magnetic stripe. The card, when used, is automatically linked to a special account from which the money is withdrawn electronically for each purchase.

Will the cash card create the electronic bandit who can pick your pocket from across the street? Can an error in manufacturing or a clever counterfeiter create an "ever green" card that just never runs out of money? Will contact with a strong magnetic field put you in the poor house? Only time and the consumers' willingness to stop carrying real cash will determine the future of digital cash.

Recalling the Facts.

1. What is the difference between a cash card, a credit card, and a debit card?
2. What are the significant differences between a Visa Cash card and an E-ZPass card?
3. How does the Mondex European cash card system differ from the Visa or Mastercard system? TD

Alan J. Pierce is associate professor, Department of Technology, Elizabeth City State University, Elizabeth City, NC 27909.