Payment Systems For Electronic Commerce

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Online Payment Basics

- Cash, checks, credit cards, and debit cards account for more than 90 percent of all consumer payments in the United States

- Most popular consumer electronic transfers are automated payments of:

    – Auto loans

    – Insurance payments

    – Mortgage payments made from consumers' checking accounts

- Scrip

    – Digital cash minted by a company instead of by a government

    – Cannot be exchanged for cash

    – Like a gift certificate that is good at more than one store

Type	Number of transactions	Dollar value of transactions
Cash	35%	15%
Checks	21%	32%
Credit cards	19%	26%
Debit cards	17%	12%
Electronic transfers	5%	11%
Other	3%	4%

Adapted from Table 1182, *2004-2005 Statistical Abstract of the United States*, Washington, D.C.: U.S. Census Bureau, p. 746.

FIGURE 11-1 Payment methods for all types of U.S. consumer transactions, 2005 projections

Payment Cards

- The term payment card describes all types of plastic cards used to make purchases

- Credit card

  - Has a spending limit based on a user's credit history

- Debit card

  - Removes an amount from a cardholder's bank account

  - Transfers it to the seller's bank account

- Charge card

  - Carries no spending limit

  - Amount charged is due at the end of the billing period

- Advantages:

  - Worldwide acceptance

  - Built-in security for merchants

- Disadvantage:

  - Payment card service companies charge merchants per-transaction fees and monthly processing fees

Payment Acceptance and Processing

- Steps followed once a merchant receives a consumer's payment card information:

  - Merchant authenticates payment card

  - Merchant checks with payment card issuer

    - To ensure that credit or funds are available

    - Puts a hold on the credit line or the funds needed to cover the charge

  - Settlement occurs

- Closed loop systems

  - Card issuer pays the merchants that accept the card directly and does not use an intermediary

- Open loop systems

  - Involve three or more parties

  - Systems using Visa or MasterCard are examples

Merchant Accounts

- To process payment cards for Internet transactions an online merchant must set up a merchant account

- New merchants must supply:

Why are controls needed?

  - Details about existing bank accounts

  - Business and personal credit histories

Processing Payment Cards Online

- InternetSecure
  - Provides secure payment card services
- First Data
  - Provides merchant payment card processing services with the following programs:
    - ICVERIFY and WebAuthorize
- Banks connect to an Automated Clearing House (ACH) through highly secure, private leased telephone lines
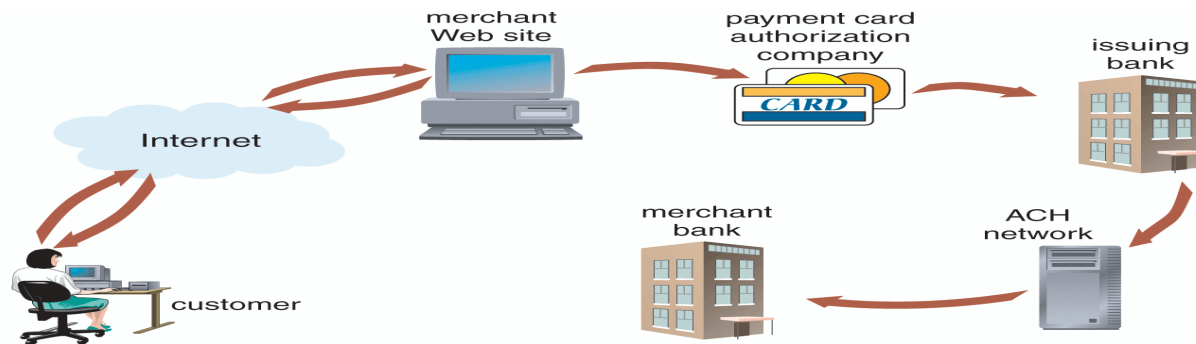

FIGURE 11-3   Processing a payment card transaction

Electronic Cash

- Term that describes any value storage and exchange system created by a private entity that:
  - Does not use paper documents or coins
  - Can serve as a substitute for government-issued physical currency
- Attractive in two arenas:
  - Sale of goods and services of less than $10
  - Sale of goods and services to those without credit cards

- Concerns about electronic payment methods include:
  - Privacy and security
  - Independence
  - Portability
  - Convenience
- Advantages of electronic cash include being:
  - Independent and portable

Micropayments and Small Payments

- Micropayments

  – Internet payments for items costing from a few cents to approximately a dollar

- Small payments

  – Payments of less than $10

Holding Electronic Cash: Online and Offline Cash

- Online cash storage
  - Trusted third party is involved in all transfers of electronic cash
  - Holds consumers' cash accounts
- Offline cash storage
  - Virtual equivalent of money kept in a wallet
  - No third party is involved in the transaction
- Double-spending
  - Spending electronic cash twice

- Advantages of electronic cash:
  - Transactions are more efficient
  - Transfer on the Internet costs less than processing credit card transactions
- Disadvantages of electronic cash:
  - Use provides no audit trail
  - Problem of money laundering arises
  - Susceptible to forgery

Providing Security for Electronic Cash

- Cryptographic algorithms
  - Keys to creating tamperproof electronic cash that can be traced back to its origins
- Anonymous electronic cash
  - Electronic cash that cannot be traced back to the person who spent it
- Creating truly anonymous electronic cash
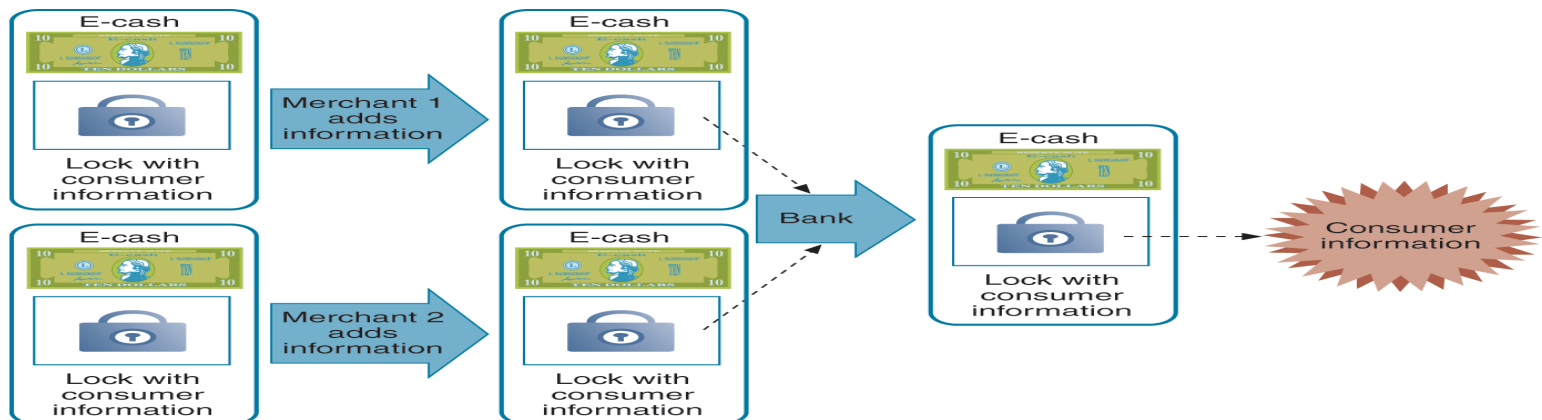 - Requires a bank to issue electronic cash with embedded serial numbers

FIGURE 11-4 Detecting double spending of electronic cash

Electronic Cash Systems

- CheckFree

  - Largest online bill processor in the world

  - Provides online payment processing services

- Clickshare

  - An electronic cash system aimed at magazine and newspaper publishers

- PayPal
  - Provides payment processing services to businesses and to individuals
  - Peer-to-peer (P2P) payment system
    - Free payment clearing service for individuals

FIGURE 11-6   PayPal home page

Electronic Wallets

- Hold credit card numbers, electronic cash, owner identification, and contact information

- Give consumers the benefit of entering their information just once

- Make shopping more efficient

- Server-side electronic wallet

  - Stores a customer's information on a remote server belonging to a particular merchant or wallet publisher

- Client-side electronic wallet

  - Stores a consumer's information on his or her own computer

Other Cards

- Stored Value Cards
  - Stored-value cards can be an elaborate smart card with a microchip that records currency balance
  - Common stored-value cards include: Prepaid phone, copy, subway, and bus cards
- Magnetic strip cards
  - Cannot send or receive information
  - Cannot increment or decrement value of cash stored on the card
  - Processing must be done on a device into which the card is inserted
- Smart cards are better suited for Internet payment transactions
  - Are stored-value cards
  - Can hold private user data, such as financial facts
  - Can store about 100 times more information than a magnetic strip plastic card
  - Safer than conventional credit cards

Phishing Attacks

- Basic structure:
    - Attacker sends e-mail messages to a large number of recipients
    - Message states that an account has been compromised and the matter should be corrected
    - Message includes a link
    - User enters a login name and password, which the perpetrator captures
    - Once inside a victim's account, the perpetrator can access personal information

- Countermeasures
    - Most important step that companies can take today is to educate Web site users
    - Many companies contract consulting firms that specialize in anti-phishing work
    - Anti-phishing technique is to monitor online chat rooms used by criminals

Thanks…