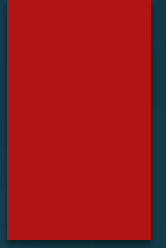


Topic 4- Payment Systems for e- Commerce



Topics covered:

- ▶ Basics of online payment
- ▶ Payment cards
- ▶ Electronic cash
- ▶ Electronic wallets
- ▶ Smart cards
- ▶ Threats to payment systems

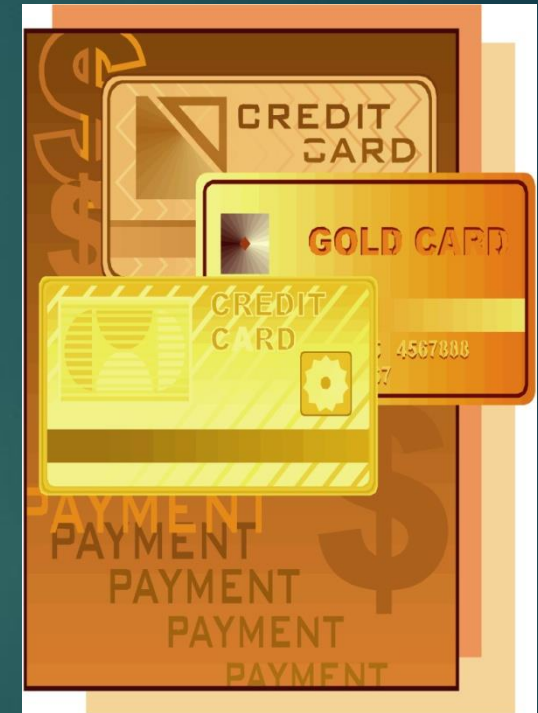
Basics of Online Payment

- ▶ Convenient for customers and can save companies money
- ▶ 85% of eCommerce purchases are made by credit cards
- ▶ Payment technologies are:
 - ▶ Payment cards
 - ▶ Electronic cash
 - ▶ Software wallets
 - ▶ Smart cards

Payment Cards

“Generic term to describe all types of plastic cards used to make purchases”:

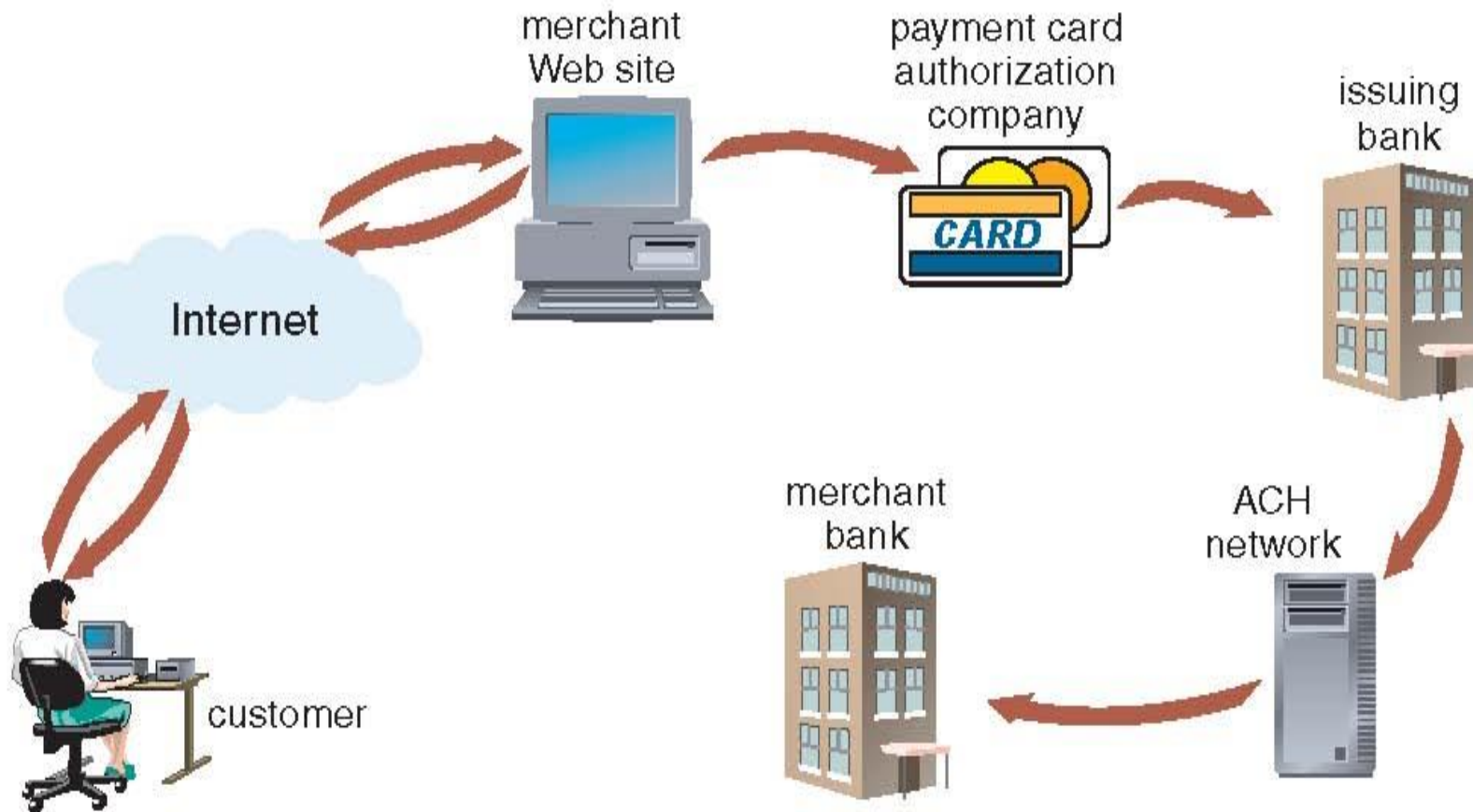
- Credit cards
- Debit cards
- Charge cards



Advantages and Disadvantages of Payment Cards

<i>Advantages</i>	<i>Disadvantages</i>
<i>Provide fraud protection for merchants</i>	<i>Merchants are charged transaction and monthly processing fees</i>
<i>Worldwide acceptance</i>	<i>Most consumers pay an annual fee for credit cards and charge cards</i>
<i>Consumer does not require any special hardware or software</i>	<i>Payment cards are increasingly targeted by fraudsters</i>

Processing a Payment Card Transaction



Electronic Cash

- ▶ “A form of electronic payment that is anonymous and can be spent only once”
 - ▶ Issued by private entities
 - ▶ Substitute for Government issued currency
 - ▶ Ideal for micro-transactions

Micro-payments and Small Payments

- ▶ **Micro-payments** – payments between a few cents and \$1
- ▶ **Small payments** – payments between \$1 and \$10
- ▶ Levels of payment not suitable for credit cards
- ▶ BUT micro-payment providers have had little success to date

Potential Problems With Electronic Cash

- ▶ No audit trail
- ▶ Money laundering
- ▶ Susceptible to forgery
- ▶ Lack of a common standard
- ▶ Potential for double spending

PayPal

- ▶ Provides payment processing services to businesses and individuals
- ▶ Eliminates need to pay for online purchases via cheques or using payment cards



Cheques reveal your financial details...

Pay with PayPal and keep them hidden

[Find out more](#)

billion

The advertisement features a stack of cheques on the left. A magnifying glass is positioned over a cheque, highlighting the account number '00000' and the card number '161629772'. The text 'Cheques reveal your financial details...' is written in white on a dark blue background. To the right, the text 'Pay with PayPal and keep them hidden' is also in white, with a yellow button containing the text 'Find out more'. The word 'billion' is partially visible on the right side of the image.

Electronic Wallets

- ▶ Similar concept to physical wallet
- ▶ Holds credit card numbers, electronic cash, owner ID and contact details
- ▶ Provides this information at checkout
- ▶ Main benefit is that customer only has to enter this information once
- ▶ Two types – server-side and client-side
- ▶ Client-side wallets not portable

Smart Cards

- ▶ Has an embedded microchip
- ▶ Can hold large amount of information:
 - ▶ Private user data
 - ▶ Encryption keys
 - ▶ Account information
 - ▶ Credit card numbers
 - ▶ Health insurance information
 - ▶ Medical records
- ▶ Information stored on the card is encrypted

Threats to Payment Systems

- ▶ Phishing attacks
- ▶ Spear phishing attacks
- ▶ Identity theft

Phishing

Phishing

- ▶ Large volume of emails sent out
- ▶ Recipient informed their account has been compromised
- ▶ Directed to bogus website where they are instructed to confirm their account details
- ▶ Attacker takes these details, accesses the account and withdraws funds

Spear Phishing

- ▶ As above but attack is highly targeted, often at businesses, looks like email has come from a colleague
- ▶ Same result as above

Identity Theft

- ▶ Perpetrator gathers personal information about the victim
- ▶ Can obtain this online via a pharming attack
- ▶ Information used to set up credit accounts
- ▶ Fraudulent purchases made via credit and perpetrator then disappears
- ▶ Increasingly carried out by organised crime

Types of Information Useful to Identity Thieves

- ▶ Social security number
- ▶ Driver's licence number
- ▶ Credit card numbers
- ▶ Card verification numbers
- ▶ Passwords (PINS)
- ▶ Credit reports
- ▶ Date of birth
- ▶ Telephone number
- ▶ Home address

Summary

- ▶ Number of different payment technologies are available
- ▶ Credit cards account for 85% of all purchases
- ▶ Electronic cash not yet a significant factor
- ▶ Smart cards are becoming popular
- ▶ Major growth in fraud is a concern, particularly for credit cards
- ▶ Identity theft is a considerable threat