Chapter 5

Online Payment System

Types of Payment Systems

- Cash
- Checking Transfer
- Credit Card
- Stored Value
- Accumulating Balance

Cash

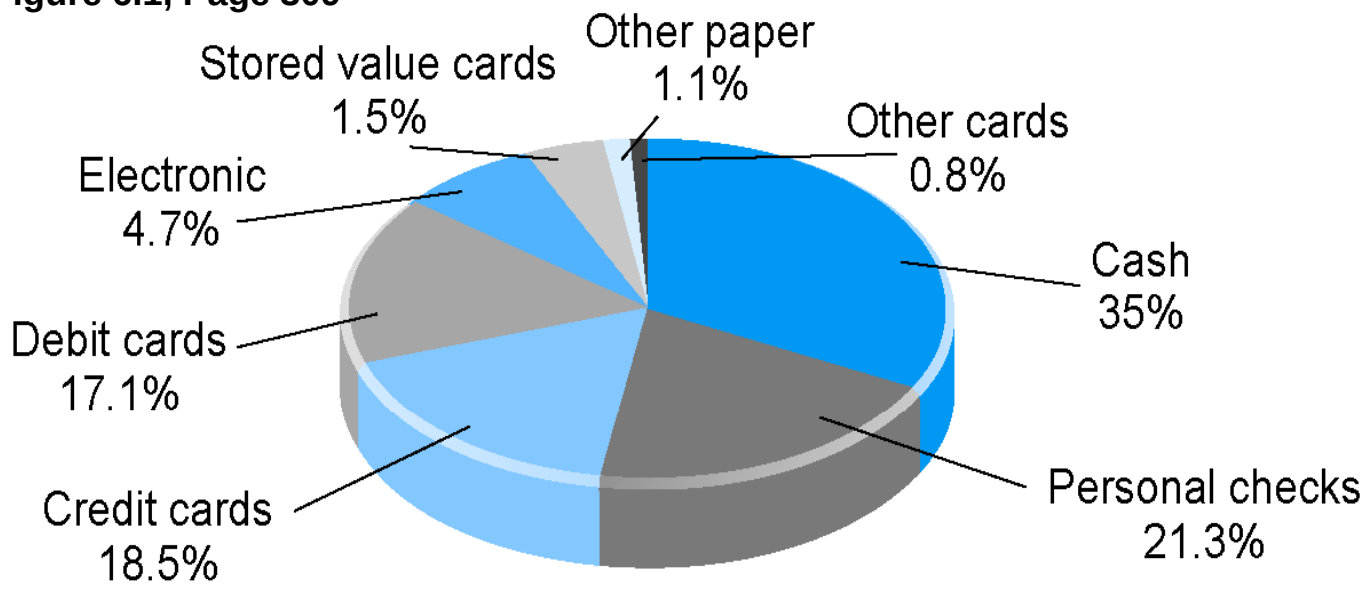
- Legal tender defined by a national authority to represent value
- Most common form of payment in terms of number of transactions
- Instantly convertible into other forms of value without intermediation
- Portable, requires no authentication, and provides instant purchasing power
- “Free” (no transaction fee), anonymous, low cognitive demands
- Limitations: easily stolen, limited to smaller transaction, does not provide any float

Checking Transfer

- Funds transferred directly via signed draft/check from a consumer’s checking account to merchant/ other individual
- Most common form of payment in terms of amount spent
- Can be used for small and large transactions
- Some “float” (can take many days for checks to clear)
- Not anonymous, requires third-party intervention (banks)
- Introduces risks for merchants (forgeries, bounced checks, stopped payments), so authentication typically required

Most Common Payment Systems, Based on Number Of Transactions

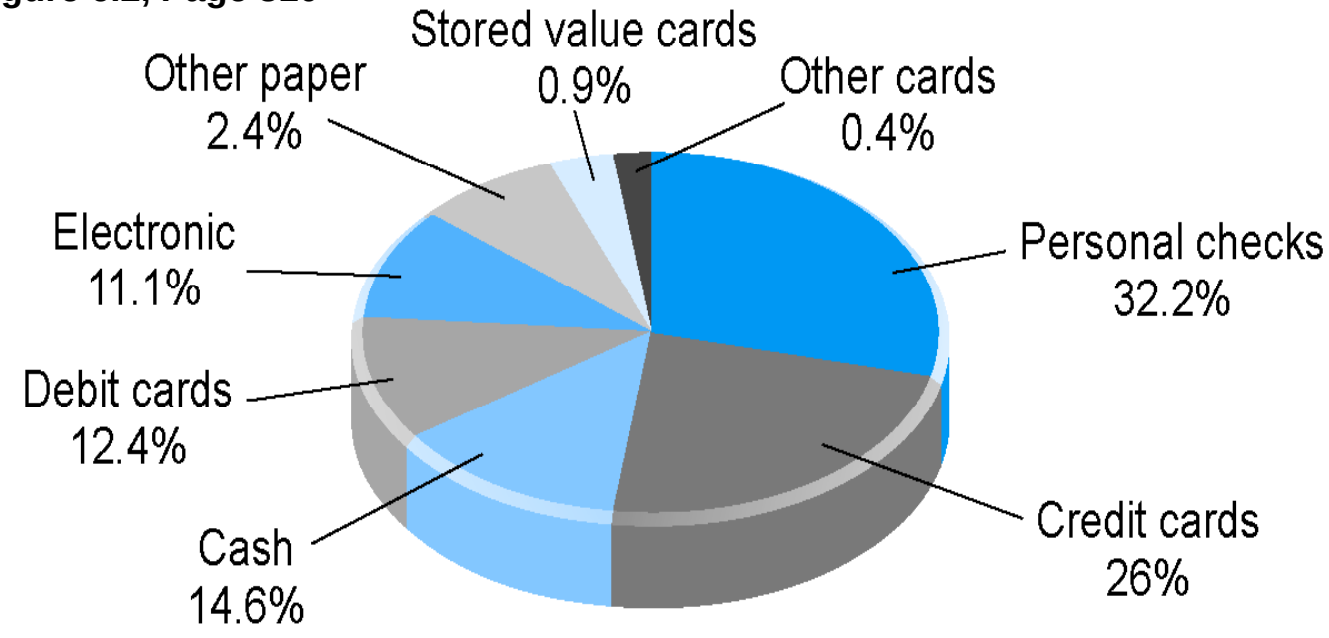
Figure 6.1, Page 309



SOURCE: Based on data from U.S. Census Bureau, 2005.

Most Common Payment Systems, Based on Dollar Amount

Figure 6.2, Page 310



SOURCE: Based on data from U.S. Census Bureau, 2005.

Credit Card

- Represents account that extends credit to consumers, permits consumers to purchase items while deferring payment, and allows consumers to make payments to multiple vendors at one time
- Credit card associations: Nonprofit associations (Visa, MasterCard) that set standards for issuing banks, e.g., CitiBank
- Issuing banks: Issue cards and process transactions
- Processing centers (clearinghouses): Handle verification of accounts and balances

Credit Card

- Are widely accepted as a form of payment
- Reduce risk of theft related with carrying cash
- Increase consumer convenience
- Offer consumers considerable “float”
- Merchants benefit from increased consumer spending, but pay a hefty transaction fee of 3-5% to the issuing banks
- Consumers are liable to $50 for unauthorized transactions occurring before card issuer is notified
- Consumers can refute or repudiate purchases under certain circumstances
- Limit risk for consumers while raising it for merchants and banks

Stored Value

- Accounts created by depositing funds into an account and from which funds are paid out or withdrawn as needed
  - Examples: Debit cards, gift certificates, prepaid cards, smart cards
  - Debit cards: Immediately debit a checking or other demand-deposit account
  - Peer-to-peer payment systems such as PayPal a variation
  - PayPal requires an account with either a checking account or a credit card

Accumulating Balance

- Accounts that accumulate expenditures and to which consumers make period payments
  - Examples: Utility, phone, Internet access, American Express accounts
  - Accumulate balances over a specified period and are paid in full at the end of the period

Dimensions of Payment Systems

Table 5.6, Page 305

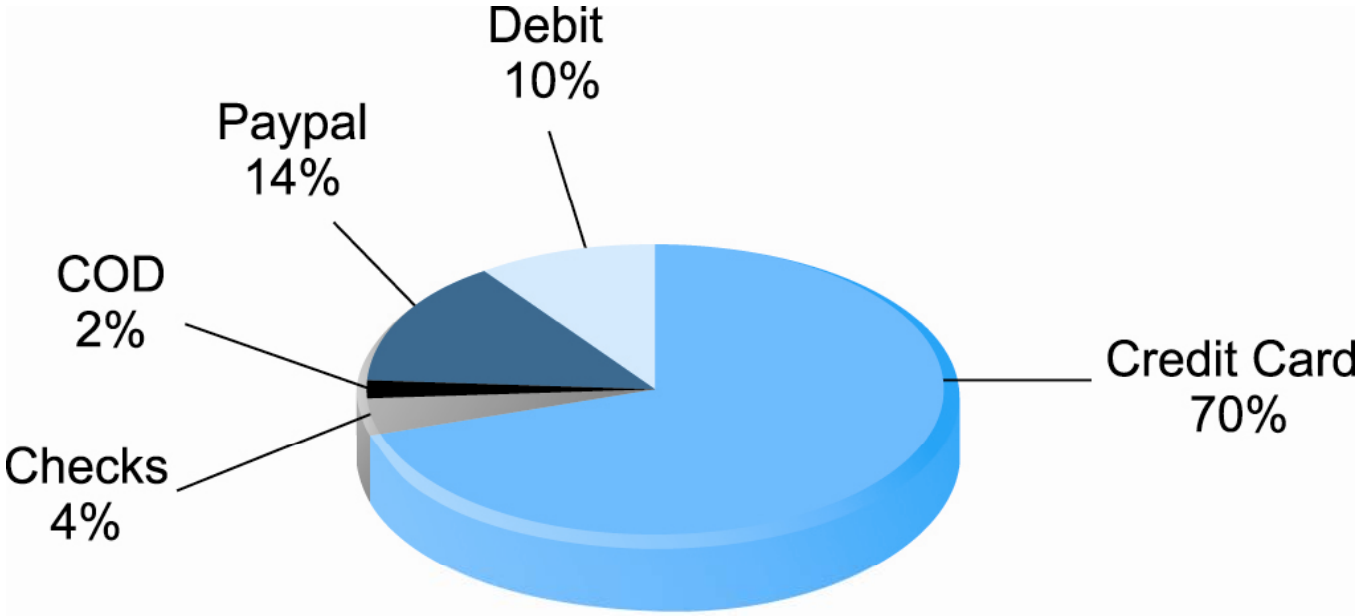
TABLE 5.6 DIMENSIONS OF PAYMENT SYSTEMS

DIMENSION	CASH	PERSONAL CHECK	CREDIT CARD	STORED VALUE (DEBIT CARD)	ACCUMULATING BALANCE
Instantly convertible without intermediation	yes	no	no	no	no
Low transaction cost for small transactions	yes	no	no	no	yes
Low transaction cost for large transactions	no	yes	yes	yes	yes
Low fixed costs for merchant	yes	yes	no	no	no
Refutable (able to be repudiated)	no	yes	yes	no (usually)	yes
Financial risk for consumer	yes	no	up to $50	limited	no
Financial risk for merchant	no	yes	yes	no	yes
Anonymous for consumer	yes	no	no	no	no
Anonymous for merchant	yes	no	no	no	no
Immediately respendable	yes	no	no	no	no
Security against unauthorized use	no	some	some	some	some
Tamper-resistant	yes	no	yes	yes	yes
Requires authentication	no	yes	yes	yes	yes
Special hardware required	no	no	yes—by merchant	yes—by merchant	yes—by merchant
Buyer keeps float	no	yes	yes	no	yes
Account required	no	yes	yes	yes	yes
Has immediate monetary value	yes	no	no	yes	no

E-commerce Payment Systems

- Credit cards are dominant form of online payment, accounting for around 70% of online payments in 2007
- Other e-commerce payment systems:
  - Digital cash – private form of currency that can be spent at e-commerce sites
  - Online stored value systems – prepayments, debit cards, checking accounts to create value in online accounts
  - Digital accumulating balance payment systems – accumulate small charges and bill consumers periodically
  - Digital credit accounts – “virtual” or online versions of traditional credit cards
  - Digital checking – digital checks for e-commerce remittances and extend functionality of existing bank checking systems

Online Payment Methods in the United States



Online Payment Methods in Other Parts of the World

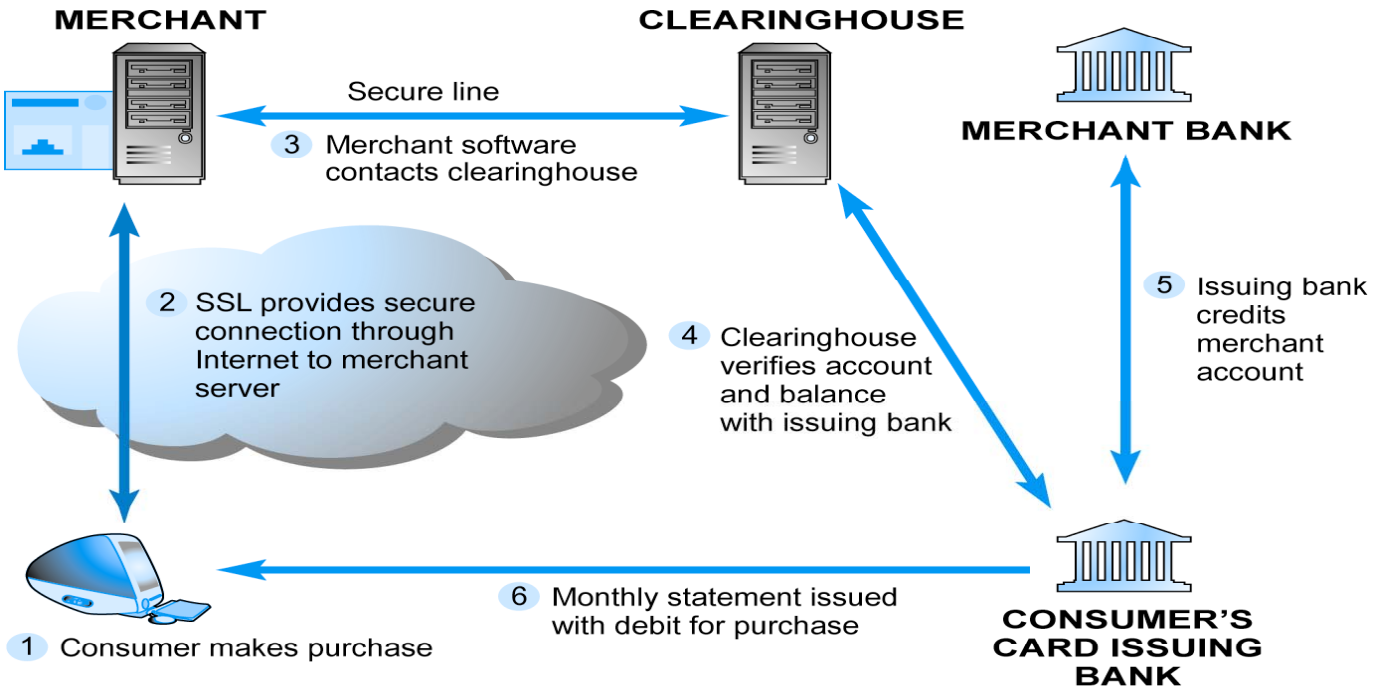
- Europe: mostly bank debit cards and some credit cards
- China: paid by check or cash and pick up at local store
- Japan: postal and bank transfers and CODs, using local convenience stores as pickup and payment point; also use accumulated balance accounts with telco for purchases made from home PCs

How an Online Credit Card Transaction Works

- Processed in much the same way that in-store purchases are
- Major difference is that online merchants do not see or take impression of card, and no signature is available (CNP transactions)
- Thus are major reasons that charges can be disputed later by consumers
- Participants include consumer, merchant, clearinghouse, merchant bank (acquiring bank) and consumer's card issuing bank

How an Online Credit Transaction Works

Figure 5.18, Page 308



Limitations of Online Credit Card Payment Systems

- Security: neither merchant nor consumer can be fully authenticated
- Cost: for merchants, around 3.5% of purchase price plus transaction fee of 20 – 30 cents per transaction + other setup fees
- Social equity: many people do not have access to credit cards (young adults, plus almost 100 million other adult Americans who cannot afford cards or who have low incomes)

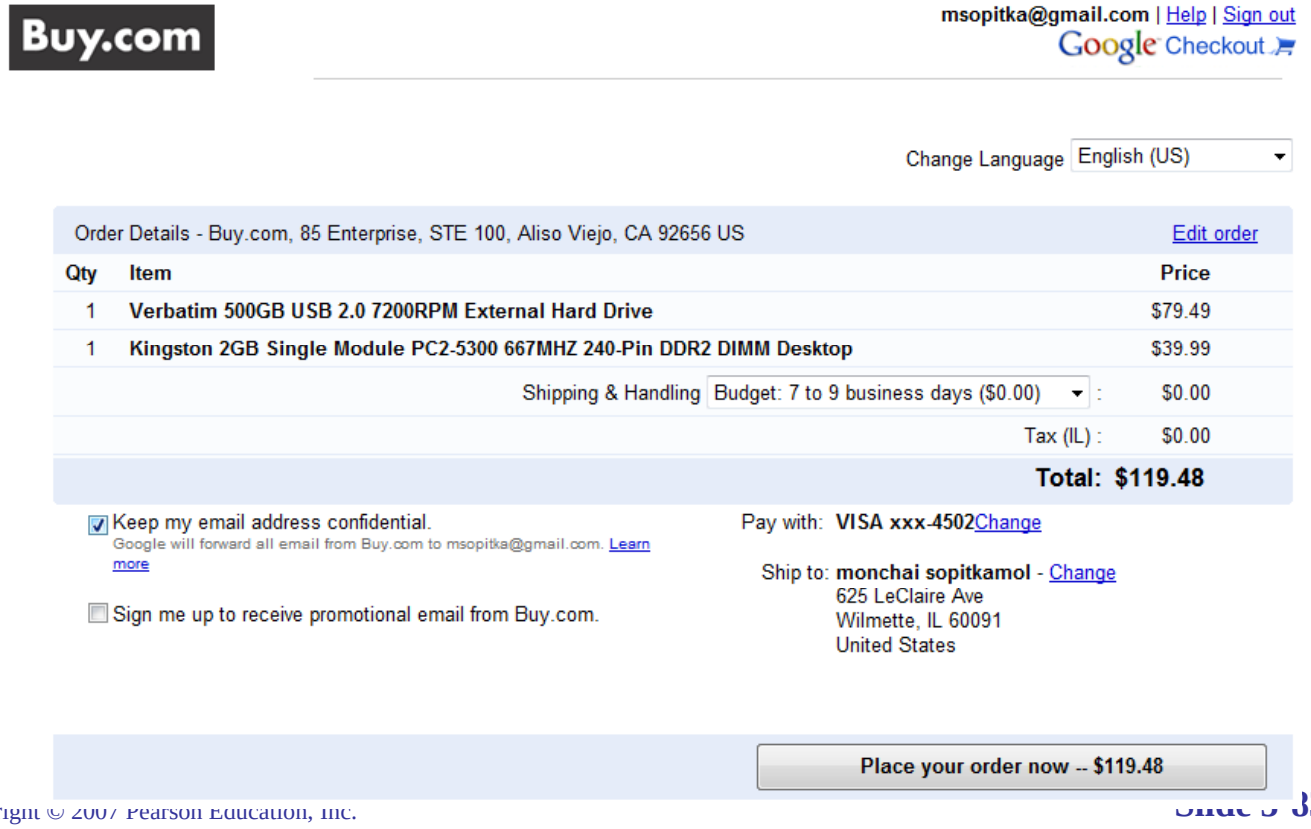
Digital Wallets

- Concept relevant to many of the new digital payment systems
- Seeks to emulate the functionality of traditional wallet
- Most important functions:
  a) Authenticate consumer through use of digital certificates or other encryption methods
  b) Store and transfer value
  c) Secure payment process from consumer to merchant
- Advantages: convenience for consumers, lower transaction costs for merchants (no need to fill out forms manually), expanded marketing, easier consumer retention, conversion of visitors into buyers, and reduction in fraud

Digital Wallets

- Good concept, various forms have existed since late 1990s, but have not been widely adopted
- Several reasons: under-publicized, offered by small, unknown companies and not deemed trustworthy enough by consumers, or proprietary solutions
- Microsoft's server-side Passport and later MSN Wallet also finally jumped ship in Feb 2005
- Newest effort: Google Checkout

Google Checkout Sample Screen

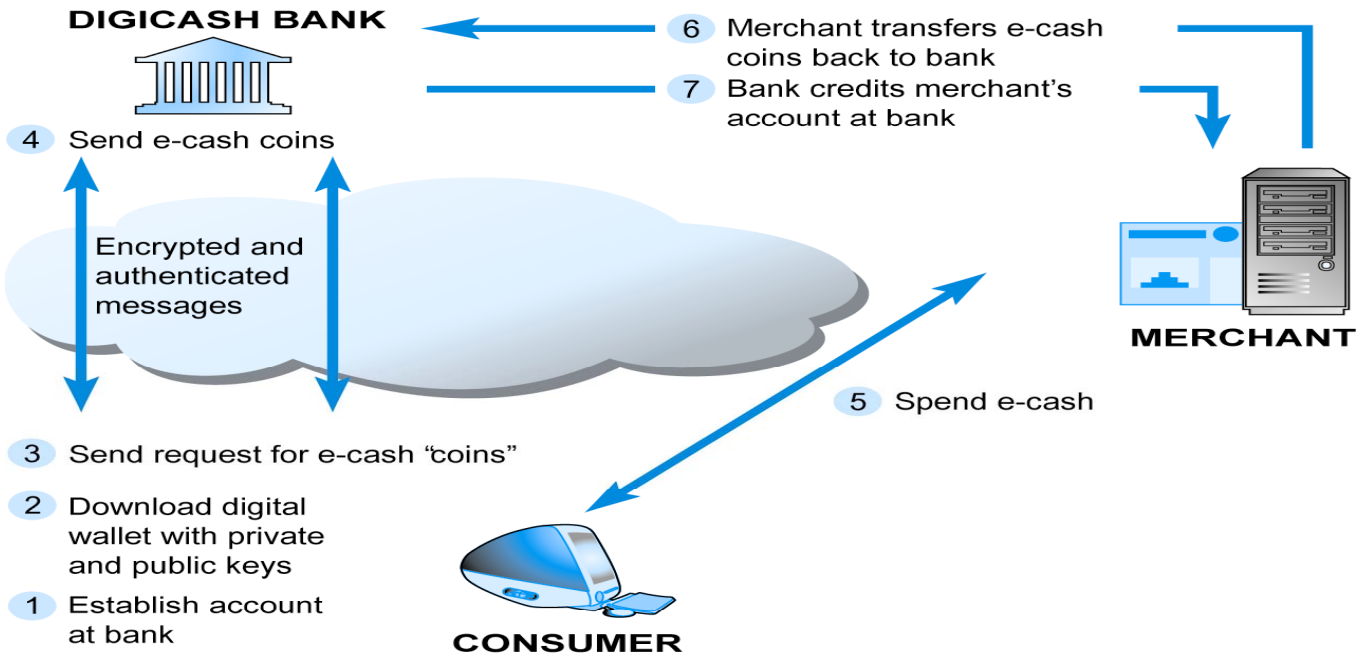


Digital Cash ("e-cash")

- One of the first forms of alternative payment systems
- Not really "cash": rather, form of value storage and value exchange that has limited convertibility into other forms of value, and requires intermediaries to convert
- Most early examples have disappeared; concepts survive as part of P2P payment systems

Digicash: How First Generation Digital Cash Worked

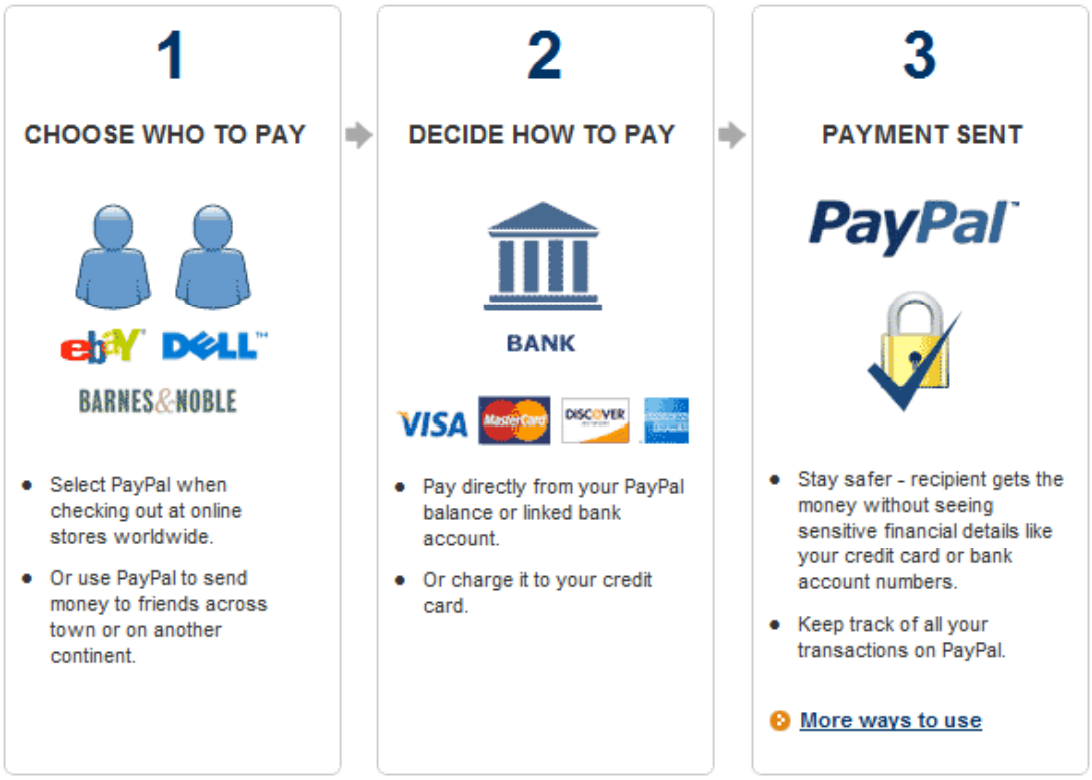
Figure 6.6, Page 324



Online Stored Value Systems

- Permit consumers to make instant, online payments to merchants and other individuals based on value stored in an online account
- Rely on value stored in a consumer's bank, checking, or credit card account
- PayPal most successful system with $45 billion transferred in 2007, available in 190 countries, 165 million account holders
- Good sides: no personal info shared among the users; service can be used by individuals to pay one another even in small amounts

How PayPal Works



Online Stored Value Systems

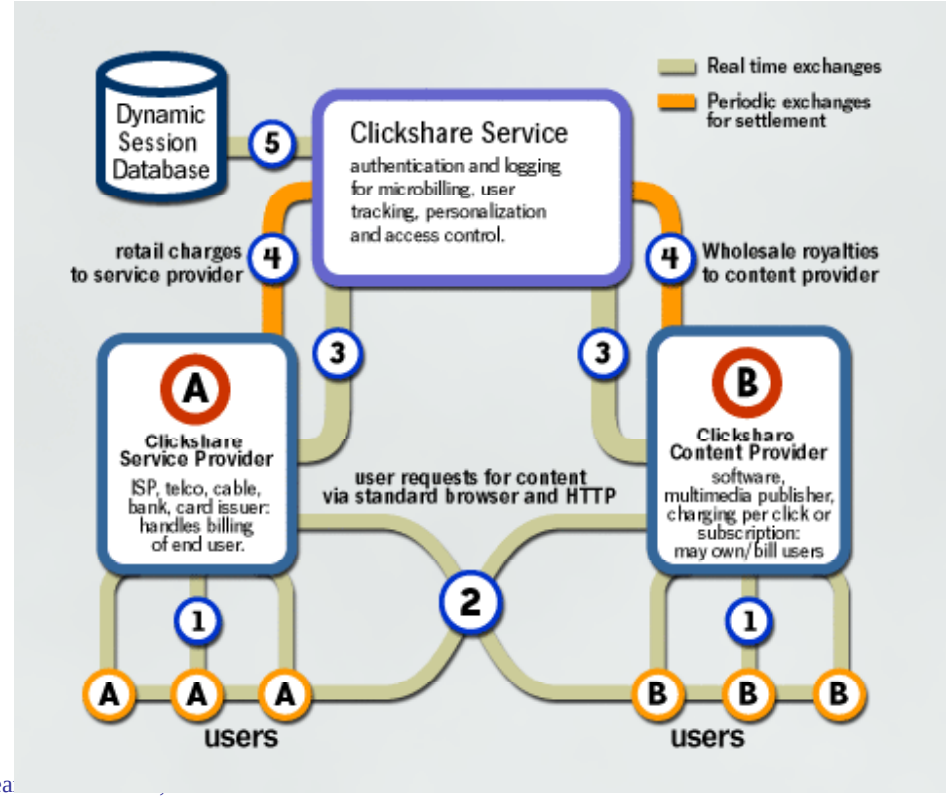
- Down sides: high cost and lack consumer protections when fraud occurs or charge is repudiated
- Smart cards: plastic cards with embedded chips storing personal data (e.g., multiple credit card no's and info about health insurance, transportation, personal ID, bank accounts, and frequent fryer accounts)
  - Contact type: certain-value retail store gift cards
  - Contactless type: EZPass, MRT tokens

Digital Accumulating Balance Payment Systems

- Allows users to make micropayments and purchases on the Web, accumulating a debit balance for which they are billed at the end of the month
- Ideal for buying intellectual property, e.g., music tracks, book chapters, or newspapers articles
- Examples: Valista's PaymentsPlus, Clickshare

Clickshare Enables Billable Hypertext Links

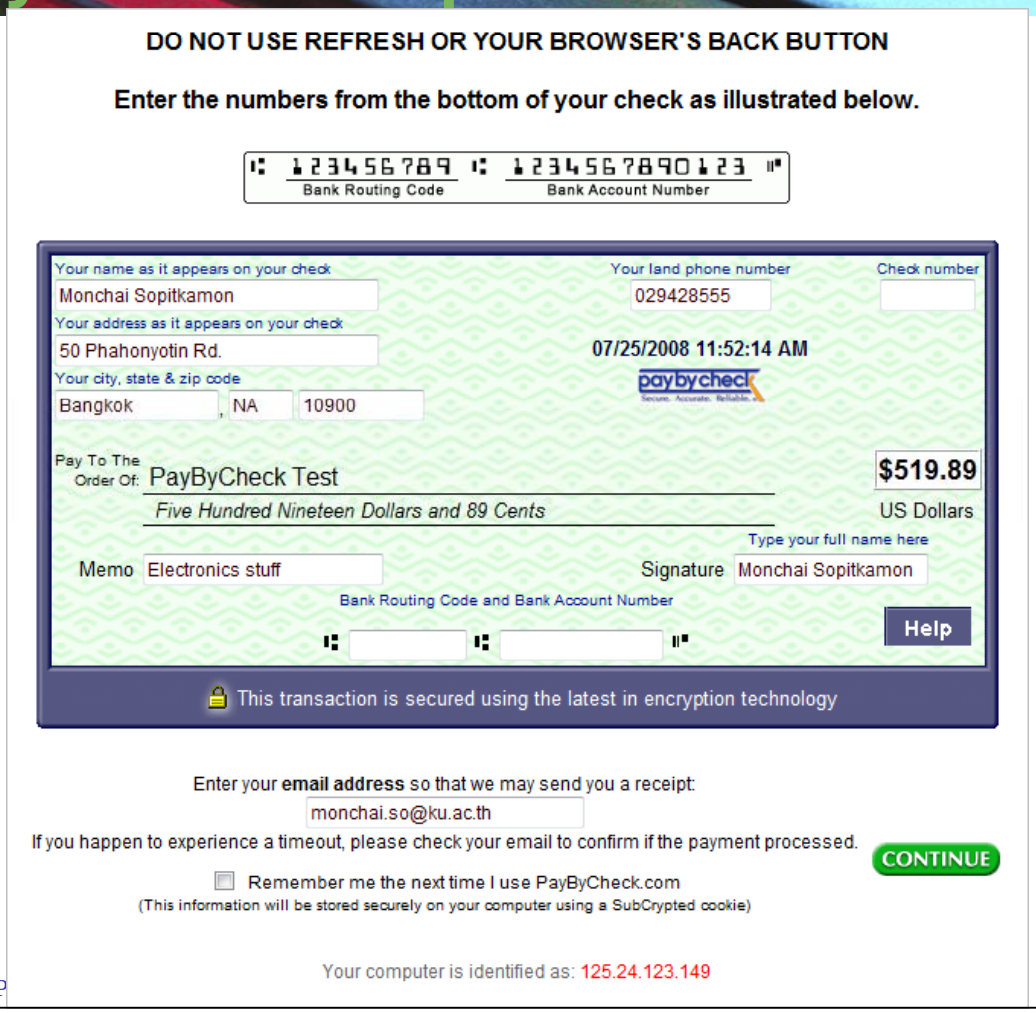
Service Provider A can sell its users information from Content Provider B; B sets its royalty (wholesale); A charges retail to user



Digital Checking Payment Systems

- Extends functionality of existing checking accounts for use as online shopping payment tool
- Advantages: do not require consumers to send sensitive info over the Web, cheaper than credit cards for merchants, much faster than paper checks
- Example: PayByCheck

PayByCheck Sample Screen



Wireless Payment Systems

- Use of mobile handsets as payment devices well-established in Europe, Japan, South Korea
- Three types of mobile payments systems in Japan: e-money (tied to credit cards or bank accounts), mobile debit cards (tied to bank accounts), and mobile credit cards
- Japan's NTT DoCoMo launched wireless RFID cell phones and related payment system (FeliCa) in 2004
- Not very well established yet in U.S, but with growth in Wi-Fi and 3G cellular phone systems, this is beginning to change

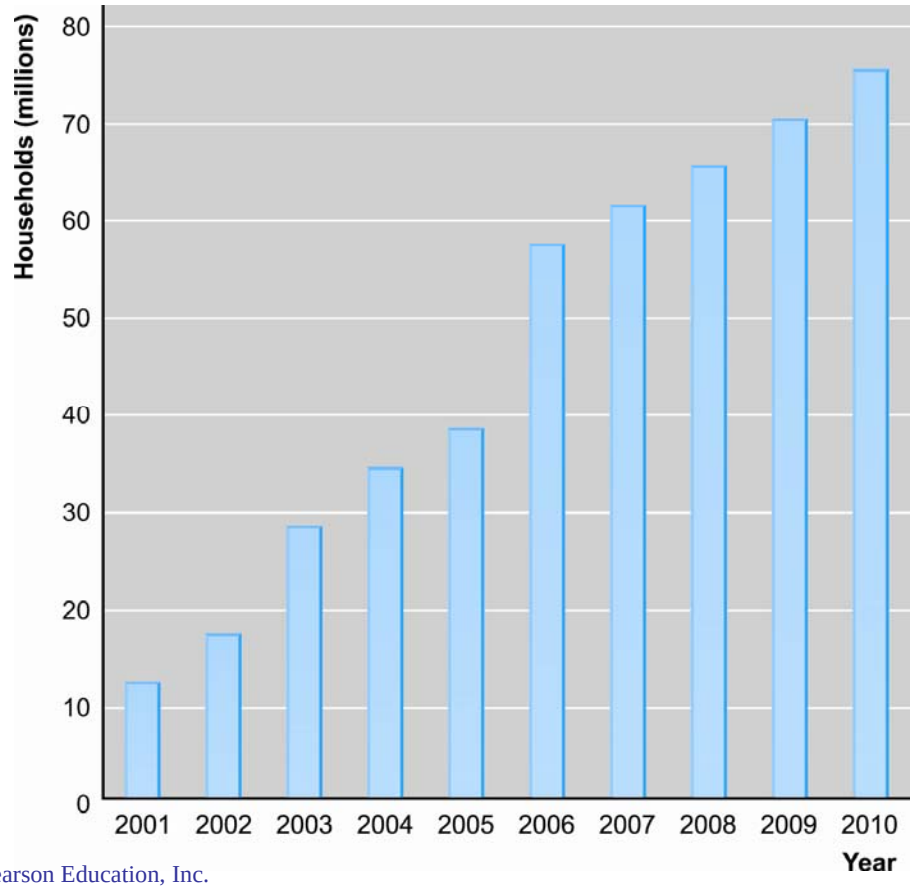
FeliCa System Demo YouTube

FeliCa Video about NFC RFID

Electronic Billing Presentment and Payment (EBPP)

- Online delivery and payment of monthly bills
- EBPP expected to grow rapidly, to an estimated 50% of all households by 2007
- Main business models in EBPP market include:
  - Biller-direct – used by utility, phone, and credit card companies, and individual stores
  - Consolidator – third party (financial institution or portal) aggregates all bills for consumers and permits one-stop bill payment
- Above are supported by EBPP infrastructure providers

Growth of the EBPP Market



Major Players in the EBPP Marketspace