

E-Commerce

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30th November 2006

Agenda

- E-Commerce Domains
- Traditional Payment Methods
- Desirable Properties of Digital Money
- Accepting Credit Cards Online
- Typical E-Commerce Transaction
- Chargebacks

E-Commerce Domains

	Targeted to consumers	Targeted to businesses
Initiated by business	B2C (business to consumer)	B2B (business to business)
Initiated by consumer	C2C (consumer to consumer)	C2B (consumer to business)

B2C (Business to Consumer)

- The online selling of goods and services to final consumers
- Expected to generate \$428 billion in 2004
- There is increasing diversity in buyers
 - This provides increasing opportunities for targeting markets
- Is customer initiated and controlled

B2B (Business to Business)

- By 2005, more than 500,000 enterprises will participate as buyers, sellers, or both
- Most major B2B marketers offer product information, purchasing, and support services online
- More private trading networks being developed

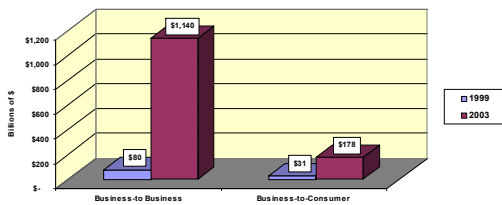
C2C (Consumer to Consumer)

- Occurs on the Web and includes a wide range of products and services
- Online Auctions (eBay)
- Forums: discussion groups located on commercial online services
- Newsgroups: the Internet version of forums

C2B (Consumer to Business)

- Consumers can search out sellers, view offers, initiate purchases, and give feedback
 - Example: on priceline.com, one can bid for airline tickets, hotel rooms, etc. and decide whether to accept company offers

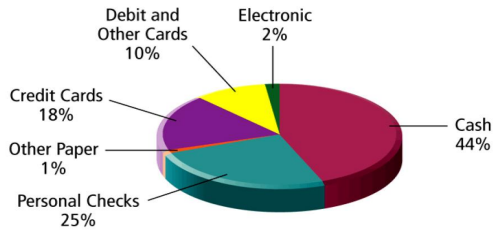
Worldwide E-Commerce Revenues



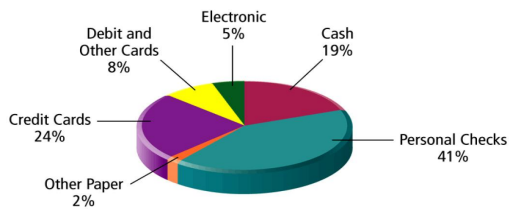
Traditional Payment Systems

- Cash
- Check
- Credit Card
- Stored Value
- Accumulating Balance

Most Common Payment System, Based on **Number of Transactions**



Most Common Payment System, Based on **Value of Transactions**



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 of any kind
- Portable, requires no authentication, and provides instant purchasing power
- "Free" (no transaction fee), anonymous, low cognitive demands
- Limitations: easily stolen, limited to smaller transactions, does not provide any float

Check

- Funds transferred directly via a signed draft or check from a consumer's current account to a merchant or other individual
- Most common form of payment in terms of amount spend
- Can be used for both small and large transactions
- Some float
- Not anonymous, require third-party intervention (banks)
- Introduce security risks for merchants (forgeries, stopped payments), so authentication typically required

Credit Card

- Represents an account that extends credit to consumers, permitting consumers to purchase items while deferring payment, and allows consumers to make payments to multiple vendors at one time
- Credit card associations, non-profit associations such as Visa and MasterCard, set standards for issuing banks
- Issuing banks –Issue cards and process transactions
- Processing centres (clearinghouses) –Handle verification of accounts and balances

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, pay as you go mobile phones, smart cards
- Debit cards: Immediately debit a checking or other demand-deposit account

Accumulating Balance

- Accounts that accumulate expenditures and to which consumers make period payments
- Examples: utility, phone

Desirable Properties of Digital Money

- Universally accepted
- Transferable electronically
- Divisible
- Cant be stolen or forged
- Private (no one except parties know the amount)
- Anonymous (no one can identify the payer)
- Work off-line (no online verification needed)

- At present, there is no known system that satisfies all these requirements

Current E-Commerce Payment Systems

- Credit cards are dominant form of online payment, accounting for around 80% of online payments in 2002
- New forms of electronic payment include:
 - Digital cash
 - Online stored value systems
 - Digital accumulating balance payment systems
 - Digital credit accounts
 - Digital checking

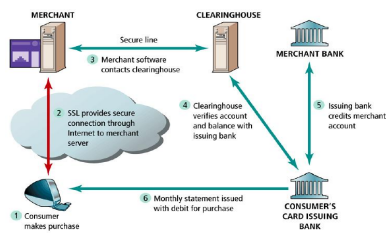
Accepting Credit Cards Online

- Merchant Account
- Third Party Services Providers
- Virtual Malls
- Person to Person (P2P) Payment Systems

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 - Card Not Present (CNP) transactions
- CNP transactions incur a higher fee
- Participants include consumer, merchant, clearinghouse, merchant bank (acquiring bank) and consumer's card issuing bank

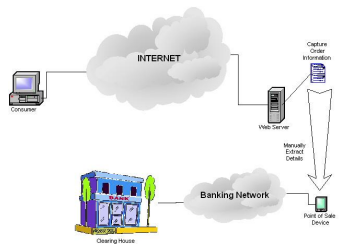
Typical E-Commerce Transaction



A Typical E-Commerce Transaction

- An online credit card transaction begins with a purchase. When a consumer wants to make a purchase, he or she adds the item to the merchant's shopping cart.
- When the consumer wants to pay for the items in the shopping cart, a secure tunnel through the Internet is created using SSL (Secured Sockets Layer). SSL does not authenticate either the merchant or the consumer.
- Once the consumer credit card information is received by the merchant, the merchant's software contacts a clearing house. A clearing house is an intermediary that authenticates credit cards and verifies account balances.
- The clearinghouse contacts the issuing bank to verify the account information. Once verified, the issuing bank credits the account of the merchant at the merchant's bank (usually this occurs at night in batch process).
- The debit to the consumer is transmitted to the consumer in a monthly statement.

A Simple Strategy for Credit Card Processing



Drawbacks to this approach

- Manual processing is required
- The merchant is storing consumers' credit card details

Merchant Accounts

- A merchant account is a type of bank account a retailer uses in order to accept credit card orders from customers
- A business is considered a "merchant" once they have authorisation from an acquiring bank, or other financial institution to accept credit cards
- Merchants receives a Point Of Sale (POS) device for processing credit card transactions

Mail-Order/Telephone-Order (MOTO) Account

- Enables you to accept credit card payments without a cardholder's signature
- With a MOTO account, the merchant and the cardholder do not need to be in the same physical location
- MOTO accounts are also known as Card Not Present or CNP accounts
- Internet merchants must secure an Internet merchant account in order to process orders from the Internet
- Existing MOTO account may not suffice

Real Time Online Transaction Processing

- To process a credit card means to accept the card number for payment online and have the transaction immediately authorised through a third party
- Requires two components
 - Merchant account
 - A gateway service

Third Party Service Providers

- Third party service providers can provide gateway services and if required a merchant account
- Allow you to integrate their payment processing system, and sometimes shopping cart, into your existing website
- For example, Realex (www.realex.ie) provide a credit card transaction service, in return for a percentage of each sale
- WorldPay, Royal Bank of Scotland's Internet Services Division, also offer a similar service

Service offered by Realex



- Realex offer a system that includes the following:
 - A secure, bank certified and approved payment-processing service that can be integrated into any online application
 - An option to redirect the cardholder to a secure server within the Realex domain, so that you do not have to collect credit card details on your own server
 - Alternatively you may keep the customer on your own site if you have a secure server of your own and send the card authorisation message to them in the background
 - The option to send additional reference data with each payment request for ease of subsequent reporting and reconciliation
 - A real time reporting system that provides a rich and powerful search function along with the option to process ad-hoc payments, voids, refunds etc
 - Support for integration into a large range of technical environment - the server platform is independent and they will supply sample code in an assortment of languages
 - An integrated transaction fraud scoring service that pattern checks all data for each transaction across multiple accounts

Third Party Processing Services

- | | |
|---|--|
| <ul style="list-style-type: none">■ Advantages<ul style="list-style-type: none">□ Low Risk - Buying a proven solution□ Easier to get a merchant account from a third party service provider than from a bank□ Limited liability for handling credit cards | <ul style="list-style-type: none">■ Disadvantages<ul style="list-style-type: none">□ Sometimes inflexible□ Setup fees, monthly fees, gateway fees all add up□ A single point of failure outside your control |
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WorldPay Denial of Service Attack

"WorldPay, the Royal Bank of Scotland's internet payment transaction outfit, is continuing to fight a sustained internet attack which has left its services largely unavailable for a third successive day.

Since Saturday (2 October), WorldPay's online payment and administration system has been reduced to a crawl, due to a malicious DDoS attack by unidentified computer criminals. A spokesman for the company stressed that although is fighting a serious "denial-of-service" attack, its systems is uncompromised and customer data remains secure. "We are processing transactions securely but the attack is blocking our ability to operate normally. We apologise unreservedly for any inconvenience caused," he added. WorldPay's techies are working overtime to restore service but can't say when normal service will be restored.

http://www.theregister.co.uk/2004/10/04/worldpay_ddos/

Virtual Malls

- eDirectory.ie recently went live in Ireland
- Allows you to display your products in their virtual shopping mall
- A Managed service, so no technical knowledge is required
- Cheap to list your items on their site, but commission can be quite high (up to 20%)

Limitations of Online Credit Card Payment Systems

- Security – neither merchant nor consumer is fully authenticated
- Merchant Risk – Consumers can repudiate charges
- Cost – for merchants, around 3.5% of purchase price plus transaction fee of 20-30 cents per transaction
- 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 are considered poor risk)

Chargeback

- A *chargeback* means that the customer refuses to pay, claiming that the purchase was made by someone else
- Happens in Internet transactions:
 - Four times more frequently than catalogue sales
 - Nine times more frequently than in brick-and-mortar sales

PayPal

- PayPal is a “peer-to-peer” payment service provider
- Allows people to send or receive electronic payments to anyone with an email address
- Users don’t need a credit card
- Fills a niche that credit card companies avoided – individuals and small merchants
- Low transaction fees (3-4%)

PayPal

- World leader in Micro Payments
- Piggybacks on existing credit card and checking payment system
- Multifunctional
 - Online Auctions, Merchants, Charities
- Flexible transaction types
 - Set price or allow user to specify amount
 - Collect additional info such as address & comments

How PayPal Works

- Create a PayPal account by filling in a one page application form and providing credit card or current account details
- This information is held by PayPal and is not available to anyone else
- When you send money to another person, the money is stored in an Automated Clearing House and the person receives an email informing them that money is waiting

How PayPal Works

- If they have a PayPal account the money is automatically deposited into their account, otherwise they must sign up for a PayPal account
- The recipient can then transfer the money to a current account, request a paper cheque or use PayPal to send the funds to someone else

How PayPal Works



PayPal

- Has over 17 million users
- More than 42,000 websites accept PayPal as an alternative to direct credit card payment systems
- 61% of the business comes from eBay
- 75% of eBay users have a PayPal account
- Acquired by eBay in 2002 following the failure of their own system, BillPoint
- Competitors include Western Union (MoneyZap), AOL (AOLQuickcash) and Citibank (C2it)
- Weakness
 - Suffers from relatively high levels of fraud
 - Users must have a PayPal account

Is PayPal right for me?

- Is Currently the micro-payment leader
- Is the most used payment system on eBay
- Can be used in 45 countries
- Many people can't accept credit card payments
- The majority of the world doesn't have a credit card

PayPal versus Merchant Account



B2C Payment Systems

- The Alternatives to Credit Cards
 - Digital Wallets
 - Digital Cash (DigiCash)
 - Online Stored Value Systems
 - Digital Accumulating Balance Payment Systems
 - Digital Credit Card Payment Systems
 - Wireless Digital Payment Systems

Digital Wallets

- Concept of digital wallet relevant to many of the new digital payment systems
- Seeks to emulate the functionality of traditional wallet
- Most important functions:
 - Authenticate consumer through use of digital certificates or other encryption methods
 - Store and transfer value
 - Secure payment process from consumer to merchant
- Two major categories
 - Client based digital wallets, Gator.com, MasterCard Wallet
 - Server based digital wallets, MSN Wallet

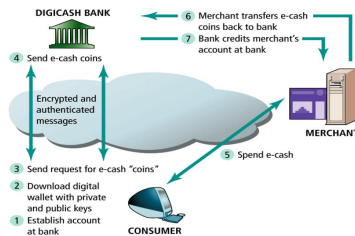
Promised Functionality of Digital Wallets

- Authentication
- Processing of Payments
- Privacy/Password Management
- Receipt Management
- Bill presentment
- Loyalty programs
- Coupon delivery/discounts
- Spending allowances
- Micro payments
- Integration with other software

Digital Cash

- One of the first forms of alternative payment systems (around 1994)
- Not really “cash”, rather forms of value storage and value exchange that have limited convertibility into other forms of value, and require intermediaries to convert
- Many of early examples have disappeared
- Concept still exists in P2P payment systems

How DigiCash worked



Other Alternative Online Payment Systems

- 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
- Digital Accumulating Balance Payment Systems
 - Allows users to make micro payments and purchases on the Web, accumulating a debit balance for which they are billed at the end of the month
 - Examples: Qpass and iPin

Other Alternative Online Payment Systems

- Digital Credit Card Payment Systems
 - Extend the functionality of existing credit cards for use as online shopping payment tools
 - Focus specifically on making use of credit cards safer and more convenient for online merchants and consumers
 - Example: eCharge

Wireless Digital Payment Systems

- Mobile payment (m-payments) systems not very well established, but with growth in Wi-Fi and 3G mobile phone systems, this is beginning to change
- Example: mPark from itsmobile.com
- Gartner predicted m-payments worldwide would total at least \$30 billion by 2002; majority of transactions will be micro-m-payments

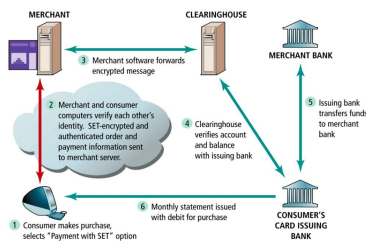
The Problems?

- There is no standard for these alternative payment system
- Both the merchant and the consumer must be signed up to use the same service
- None of these are universally accepted
- Resistance to change

Secure Electronic Transaction (SET) Protocol

- An open standard developed by MasterCard and Visa with backing of Microsoft, Netscape, IBM and others
- Transaction process similar to standard online credit card transaction, with more identity verification
- Contrasted with Secure Socket Layers (SSL) protocol, SET validates consumers and merchants in addition to providing secure transmission
- Thus far, has not caught on much, due to costs involved in integrating SET into existing systems, and lack of interest among consumers

SET Protocol



B2B Payment Systems

- More complex than B2C systems
- Must link into existing ERP and EDI systems
- Two main types
 - Systems that replace traditional banks
 - Existing banking systems extending to the B2B marketplace

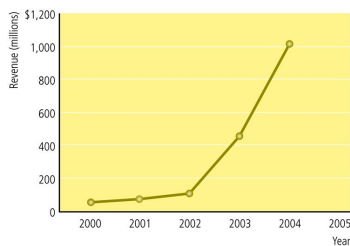
Key Features of B2B Payment Systems

FEATURE	DESCRIPTION
Credit verification and guarantee	Provides an assessment of creditworthiness and payment guarantee
Escrow service	Helps assure that both parties will perform their obligations
Nonrepudiation	Ensures that purchases are not reversible; allows unknown parties to trade with one another more confidently
Funds collection for seller	Handles funds transfer, transmittal, and storage
Financing	Provides "float" or variable payment delay to buyers in return for a fee
Integration with other business documents	Integrates purchase orders, invoices, shipping documents, and payments
Fraud detection	Helps seller trade more securely
Accounting	Provides account summary and invoice details
Dispute handling	Provides a method for adjudicating disputes
Integration to back-end corporate systems	Links payment systems with shipping, accounting, and other corporate systems
Online bill presentation	Has the ability to generate and present electronic bills
Multiple payment options	Ensures that buyers may pay with credit card, debit card, ACH check, electronic funds transfer, or other means

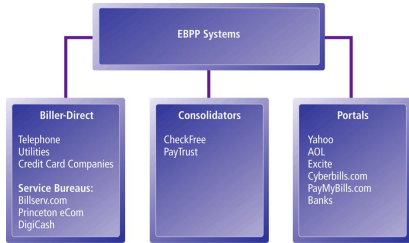
Electronic Billing Presentation and Payment

- New forms of online payment systems for monthly bills
- Allow consumers to view bills electronically and pay them through electronic funds transfers from bank or credit card accounts

Growth of EBPP Market



Types of EBPP Systems



Getting Online

- Online shopping malls
- Storefront building services
- Hiring a Third Party Service Provider
- Building a site in-house

Online Shopping Malls

- Provide a quick and easy way of selling your products online
- Offers a toe in the water approach
- Lack of control over the site
- Lack of prominence

Storefront Building Services

- Build an online store using simple to use tools
- Relatively cheap to setup
- Can be quite inflexible
- Can prove expensive over time

Hiring a Third Party Service Provider

- Can produce excellent results
- Control over the scope of the project
- Can be extremely expensive
- Can become dependent on the third party

Building a Site in-House

- May need to buy in the skills
- Often produces unprofessional results
- Can become extremely expensive

Checklist for E-Commerce

- Act promptly when customers with valid disputes deserve credits
 - Provide data rich responses to transaction receipt requests
 - Provide timely responses to transaction receipt requests
 - Know your rights to avoid unnecessary chargeback losses for your business
- Protect your merchant account from intrusion
 - Conduct daily monitoring of authorisations and transactions
 - Change the password on your payment gateway's system regularly
