this week’s lectures are on ecommerce
- because it’s a major "cultural event"
- because it draws together many of our concerns
  - markets, economics, communication, data
  - the “coevolution” at the center of the class

technology (and opportunities)  
organizational form and practice

technology and practice co-evo1
- new forms (e.g. ecommerce) arise out of old
- new technologies provide new opportunities
- there are some substantive impacts

think about this material on three levels
- those that haven’t changed at all
  - e.g. markets, costs, speed
- changes in mechanism but not in practice
  - e.g. payment systems, disintermediation
- fundamentally new
  - e.g. demand aggregation, mass customization

the context for organizational life
- the organization’s environment changes all the time
  - remember the organism argument
  - much ecommerce is a response to those changes
  - in other words, it’s more of the same

efficiency arguments part of first category
- “things that haven’t changed at all”
- efficiency was always important

"disintermediation"
- “dis” + “intermediary” + “-ation”
- non-technically, cutting out the middleman

"disintermediation"
- producer → wholesaler → retailer → consumer
payment systems

- a second impact area
- two traditional problems of payment systems
- establishing value
  - barter, exchange value, etc
  - the difference between barter and monetary systems is that money should have the same value to everyone
  - paying people in goats only works for people who like goats
- effecting (n.b. not “affecting”) exchange
  - actually carrying it out
  - what am I going to give you?

fiduciary vs scriptural money

- fiduciary money (fiat money, legal tender)
  - issued by a central (government) bank
  - has real “discharging power” (to discharge debts)
  - cannot be refused
- scriptural money (not legal tender)
  - money not issued by central bank
  - bank accounts, travelers checks, gift certificates, scrips
  - discharging power based on trust in issuer
  - can be refused

token vs notational money

- token money (value represented by physical article)
  - represented by a physical article
  - e.g. cash, gift certificate, traveler’s check
  - can be lost
- notational money (value held in account balance)
  - examples: bank accounts, frequent flyer miles
  - transferred by order
  - requires clearance (determining net effect of multiple orders)
  - requires settlement (payment in fiduciary money)
- hybrid money
  - check, telephone card (carries promise of future service)

forms of money

<table>
<thead>
<tr>
<th>Token</th>
<th>Fiduciary</th>
<th>Scriptural</th>
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<tbody>
<tr>
<td>Notational</td>
<td>bank account</td>
<td>balance</td>
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credit cards

- most expensive payment mechanism
  - MasterCard: $0.29 + 2% of transaction value
  - a $100 charge costs the merchant $2.29
- currently the most convenient method
- advantage: allows credit
  - people can buy more than they can afford
  - (this is a disadvantage too!)
- disadvantages:
  - doesn’t work for small amounts (too expensive)
  - doesn’t work for large amounts (too expensive)

credit card transaction
**digital cash**

- bit strings as tokens representing value
  - amount, serial #
  - digital signature to protect integrity
- issued by banks
  - similar to 19th century bank notes
- advantages
  - anonymous
- disadvantages
  - can be easily duplicated
  - need to prevent double spending
    - monitor serial numbers

**digicash model**

1. Consumer asks Bank for Digicash
2. Bank sends Digicash bits to consumer
3. Consumer sends Digicash to merchant in payment
4. Merchant checks that Digicash has not been double spent
5. Bank verifies that Digicash is valid

**advantages**
- Privacy, Scalability

**Disadvantages**
- Complexity
  - Detecting double spending
  - Robustness against failure
  - Accountability

**micropayment systems**

- the Internet operates on a large scale
  - billions of users
  - billions of pages
- regular payment systems don’t scale
  - transaction costs
  - minimum charges
- micropayments allow for tiny charges
  - e.g. paying for page views

**millicent**

- HP’s (Compaq’s (DEC’s)) micropayment system
- vendor-specific currency, called scrip
- consumer buys scrip from broker
  - merchant checks for double spending
- transactions:
  - calues down to 0.1 cents
  - cost down to 0.002 cents
- minimize crypto processing

**thoughts on micropayments**

- once upon a time...
  - micropayments once seemed inevitable
    - early days of the Internet
    - commercialising existing activity (e.g. page views)
  - many competing schemes
- these days
  - some notable advocates (e.g. Neilsen)
  - arguably, actual ecommerce is macro-payments
    - large scale items
    - more likely to buy a large-screen TV than a newspaper article!

**subscription model**

- subscription services
  - like micropayments
    - payment mechanism for repeated small charges
  - unlike micropayments
    - paying for right to purchase/view/use
- advantages for merchants
  - predictable income model
  - opportunity to learn about customers
- advantages for customers
  - familiar model (e.g. newspapers, AAA)
  - understand consequences for action
payment system costs

- dispute resolution costs
  - non delivery (Internet is unreliable)
  - processing refunds
- credit risk
  - losses due to overdrawn debit (credit) account vs costs of real time verification
- record keeping costs
  - statements
- communication and processing costs
  - number of messages
  - cryptographic processing
  - privacy protection
- costs of availability
  - realtime versus deferrable communications

ecommerce impacts (level 2)

- payment systems are a level 2 phenomenon
  - a change in mechanism
    - new forms of exchange and notation
    - not just a recoding, but a new set of structures
  - but not in practice
    - the principles of money systems remain the same

ecommerce impacts (level 3)

- level 3 phenomena are fundamental changes
  - new opportunities we couldn’t have had before
  - features that depend on the new medium
- two examples
  - mass customisation/personalisation
  - demand aggregation

the information aspect

- commercial transactions always informational
  - but now the information is:
    - more pervasive
    - available in real time
    - directly communicated between customer and vendor
- so what can we do?
  - what we can do depends on what we can know
    - target marketing information better
      - depends on knowing who’s where
    - create more appealing products
      - adapting to individual tastes
    - lower costs
      - integrating information about multiple people

adaptation vs anonymity

adaptation vs anonymity
within-site tracking

products
  office products
    presentation
    fax machines
    phone #1
    phone #2
  home products
    calendars
    telephones
    laser pointer #1
    laser pointer #2
    laser pointer #3

between-site tracking

products
  office products
    presentation
    fax machines
    phone #1
    phone #2
  home products
    calendars
    telephones
    laser pointer #1
    laser pointer #2
    laser pointer #3

building customer profiles

- customer profiles
  - integrate information from different places
    - where customer has been
    - what they were doing there
- target audience
  - browsing tables at bookstores
  - the amazon.com front page
- personalise experience
  - replace the in-person experience of f2f
  - but now, can do this on a massive scale
**personalisation/customisation**

- **mass personalisation**
  - in the everyday world
    - there's only one store
    - you have limited information about customers
    - manufacturing and sales are decoupled
  - in the online world
    - everyone's experience can be uniquely tailored
      - indeed, tailored not just to Joe, but to Joe-at-this-moment
    - can integrate sales and manufacturing directly
      - build-to-order
      - personalised profiles

**demand aggregation**

- the balance between supply and demand
  - supply -- how much of something is available
  - demand -- how much the market wants
- however, this balance isn't quite right
  - suppliers frequently have the upper hand
    - various legislative arrangements exist to counter this
      - there's no monopoly law for customers!
    - a small number of suppliers can affect outcomes for many customers
      - but the inverse generally isn't true

**demand aggregation**

- traditional commerce aggregates **supply**
  - doesn't make sense to make just one computer
    - first make a number of them, then sell to many people
- **ecommerce allows aggregation of demand**
  - "exercising buying power"
    - buying power comes from putting people together
      - aggregating demand
      - e.g. Priceline; Mercata
- **two domains**
  - business-to-consumer
  - business-to-business

**ecommerce**

- two models
  - ecommerce is a radical shift in business
    - ecommerce is just more of the same (online)
- the truth lies somewhere in between
  - factors that remain the same
    - efficiency arguments
  - factors that change in form but not kind
    - disintermediation, payment systems
  - factors that are truly new
    - demand aggregation, mass personalisation

**demand aggregation**

- bargaining power
  - aggregating demand aggregates bargaining power
- examples
  - school districts buying PCs
  - this is different, though
    - no preexisting or ongoing relationship
    - depends on easy mechanisms of contact and coordination
- it's a question of information economics
  - this was always possible; it was just too hard
  - now it's easier to get the information you need