# ICS 132: Organizational Information Systems

Review

## organisations

- arrangements of people and processes that achieve collective action
- organisational life is about managing diversity
  - an organisation competes with others
  - organisations are made up of different groups and different people with different agendas
  - the trick
    - aligning personal welfare with organisational welfare

## alter's view

- organisations are *systems*
  - "a set of interacting components that operate together to accomplish a purpose"
    - focus on: separation and interconnection
    - examples: manufacturing; retail
- five aspects of systems
  - set of components with some defined *purpose*
  - operating within *boundaries*
  - that separate it from the *environment*
  - transforming some set of *inputs*
  - into *outputs*

## work system analysis
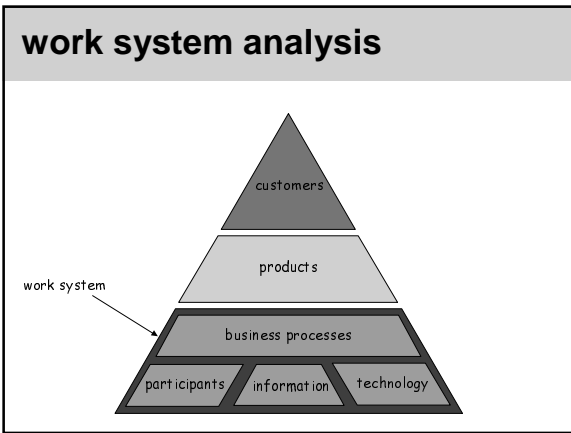


## achieving collective action

- first, deciding what to do
  - ensuring an adequate basis to make decisions
    - Mintzberg's observation about executives
  - achieving consensus
- then, putting it into action
  - communicating decision
  - executing actions
  - ensuring coordination
  - monitoring effectiveness

## decision-making

- organisations turn information into decisions
  - decisions have both winners and losers
  - the criticial issue is decision-making authority
  - organisational structures manage authority
    - the colocation of authority to responsibility
- the absence of perfect information
  - bounded rationality and satisficing

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## the role of information systems

- organisations depend critically on information
  - monitoring internal actions
  - building models of past and future performance
    - systematic management is a novel invention
- information systems extend organisational scope
  - improved information processing
  - improved coordination

## the role of information systems

- information systems *measure*
  - internal and external factors
- information systems *control*
  - enforce processes and procedures
- information systems *communicate*
  - distribute information between people
- information systems *process*
  - information begets information...

## performance and competition

- goal is making organisation more competitive
- models of competition
  - basic competitive strategies
    - cost leadership, product leadership, niche focus
  - Bakos & Treacy
    - bargaining power
      - switching costs, search costs, unique features
    - comparative efficiency
      - internal efficiency, interorganisational efficiency
- how do information systems contribute?

## process-based systems

- processes regularise organisational action
  - monitoring, measuring, standardising
- process systems encode processes
  - monitor progress
  - enforce compliance
  - ease coordination
- but...
  - exception management?
    - people may have to step outside bounds of system
    - this may or may not be possible
  - mindless automatons?
  - the accuracy of the process model

## communication systems

- extending organisational reach
  - communication supports coordination
  - communication supports integration
- different roles
  - the imagined role of email
    - communicating decisions
  - the practical role
    - sharing information
    - peer to peer communication & networking
    - new structures emerge...

## designing information systems

- finding out what's going on
  - people generally can't tell you what they want
    - because they don't know what they can get
    - you need to develop requirements jointly
  - systems need to fit with what people do
    - it's about their needs, not your clever design
  - what people tell you isn't always what they do
    - often, people don't know what they do
    - real detail is often invisible and unnoticed
      - or people think, "that's not important"
  - if you want to find out, *GO AND LOOK*

## ethnographic investigation

- draw on techniques from anthropology
  - ethnography is a method for conducting fieldwork
    - intensive observation
    - interviewing
  - this is a qualitative method
    - designed to find out what's there, not to measure it
      - quantitative methods help you answer specific questions
      - qualitative methods help you figure out what the questions are
    - focus is not just what people do but what they experience
      - getting the member's (user's) point-of-view

## eight questions
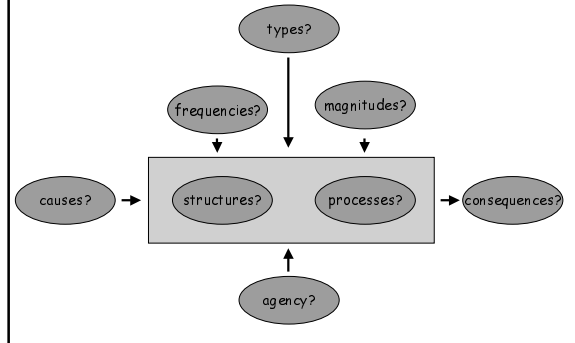


## designing information systems

- planning
  - it's easier & cheaper to catch problems early
    - planning is an opportunity to anticipate and test
    - also – getting political buy-in
  - cost-benefit analysis
    - one form of analysis for system planning
    - figure out the costs, figure out the benefits, compare
      - advantages: clear-cut, forces you to think things through
      - disadvantages: not everything easily expressed in monetary terms, intangibles and knock-on costs, etc
- need to accommodate entire system lifecycle
  - how will system change over time?
    - scalability, modularity, flexibility, evolution

## information management

- databases
  - the point of putting stuff in is to get it out
- what sorts of queries might we want?
- what needs to be true to support them?
  - key field
    - uniquely identify a record
    - tie together different records

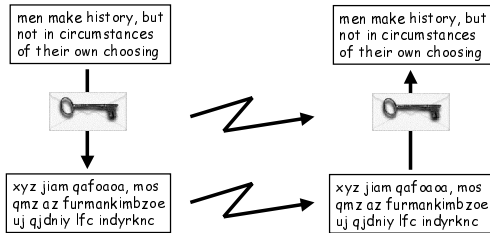## information management

- normalisation
  - canonical forms of database structure
    - maximise processing efficiency
    - minimise redundancy and potential inconsistency
  - first normal form
    - eliminate repeating groups
  - second normal form
    - no non-key attributes dependent on *part of* key
  - third normal form
    - no non-key attributes dependent on non-key attributes

## security

- managing risk
  - risks from accidental sources
    - system failure, loss, damage
  - risks from intentional sources
    - theft, malicious damage
- there's always risk
  - manage, not eliminate
  - allow people to make an informed judgement
    - encryption
    - identification
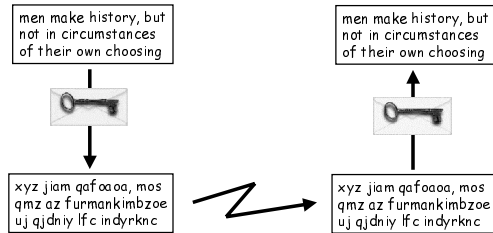    - reducing opportunities for failure
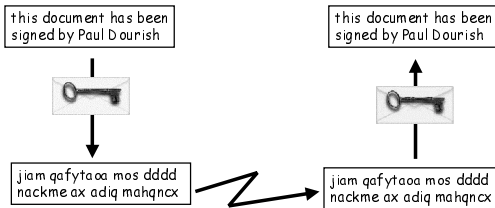
## cryptosystems

- private key encryption

| men make history, but not in circumstances of their own choosing | | men make history, but not in circumstances of their own choosing |
|---|---|---|

| xyz jiam qafoaoa, mos qmz az furmankimbzoe uj qjdniy lfc indyrknc | | xyz jiam qafoaoa, mos qmz az furmankimbzoe uj qjdniy lfc indyrknc |
|---|---|---|

## cryptosystems

- public key encryption
  - encrypt with the RECIPIENT's public key

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|---|---|---|

| xyz jiam qafoaoa, mos qmz az furmankimbzoe uj qjdniy lfc indyrknc | | xyz jiam qafoaoa, mos qmz az furmankimbzoe uj qjdniy lfc indyrknc |
|---|---|---|

## cryptosystems

- public key encryption – digital signature
  - encrypt with YOUR OWN private key

| this document has been signed by Paul Dourish | | this document has been signed by Paul Dourish |
|---|---|---|

| jiam qafytaoa mos dddd nackme ax adiq mahqncx | | jiam qafytaoa mos dddd nackme ax adiq mahqncx |
|---|---|---|

## electronic commerce

- ecommerce brings lots of these ideas together
  - commerce always had an information component
  - questions for ecommerce:
    - improving the use of the information
    - replacing the physical aspects of traditional commerce
  - information use
    - personalisation, integration, demand aggregation
  - payment systems
    - credit cards, digital cash, micropayments, subscription

## the fundamental concepts

- diversity
  - internally to an organisation
  - the organisation and its operating environment
- structure
  - decision-making and authority
- information and information systems
  - monitoring, predicting
  - control
  - making it *fit*

## next time

# Good luck!