ICS 132: Organizational Information Systems

Basic Concepts

- last time, we looked at three metaphors
  - organisations as machines, organisms, & cultures
- now we’ll look at organisations in more depth
  - what are organisations
  - how do they work
  - what is the role of information and information systems?
- there’s a lot of material in chapter 2
  - need to understand it in depth
  - more than I can cover here today

Analysing organisations

- Perrow’s task typology

<table>
<thead>
<tr>
<th>Exceptions</th>
<th>Search procedures</th>
<th>Unanalyzable</th>
<th>Analyzable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Craft work</td>
<td>Routine technology</td>
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<tr>
<td></td>
<td></td>
<td>(e.g. silversmithing)</td>
<td>(e.g. assembly line)</td>
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<tr>
<td></td>
<td></td>
<td>Nonroutine technology</td>
<td>Engineering technology</td>
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<td></td>
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<td>(e.g. R&amp;D)</td>
<td>(e.g. civil engineering)</td>
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Analytic approach

- organisations are diverse
  - set up a model
    - description of setting
    - explanatory power
  - draw upon a framework
    - a set of concepts that apply broadly
    - a way of organising the information around us
    - helping to show what’s interesting
      - “Perspective is worth 50 IQ points” – Alan Kay

Systems

- 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

Systems of processes

- the components of the system are processes
  - business processes
    - sets of steps or activities that create value for customers
    - customers may be internal or external
    - processes are relatively well defined
- the value chain
  - processes that add value for customers
    - primary processes
    - secondary processes
primary or secondary?
- hiring new employees
- designing a new product
- monitoring sales
- teaching classes
- doing research
- analysing market data
- monitoring employee satisfaction
- payroll processing

functional organisation

functional organisation
- alternatives to functional organisation?
  - does UCI exhibit a functional organisation?

- limitations of functional organisation?

where do inf. systems fit?
- how can information systems add value?

where do inf. systems fit?
- how can information systems add value?
  - primary processes
    - e.g. computer-aided design or manufacture; e-commerce
  - support processes
    - e.g. accounting or management support
  - execution and coordination
    - e.g. organisational communication
- what is the scope of information systems?
  - it’s not simply the technology, but the process of putting the technology to organisational uses

work-centered analysis
## Work-Centered Analysis

<table>
<thead>
<tr>
<th>Elements</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customers</strong></td>
<td>Remember, both internal and external. Processes can generate information products that are of internal value. The role of intermediaries. Sometimes it's not &quot;customers&quot; who make purchasing decisions. Recognise the different roles that people play.</td>
</tr>
<tr>
<td><strong>Products</strong></td>
<td>Not just physical products. Services. Information. The product of the work system might not be the same as the product of the organisation.</td>
</tr>
<tr>
<td><strong>Business Processes</strong></td>
<td>Have more to say next week...</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td>Systems rely on people's interests, skills and involvement. What motivates people to participate? Example - service engineers and salesforce.</td>
</tr>
<tr>
<td><strong>Information</strong></td>
<td>Data... information... knowledge.</td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td>Not just &quot;hi-tech&quot; - remember the filing cabinet! Technology itself is not enough. Has to be hooked into the other processes to be effective.</td>
</tr>
</tbody>
</table>

## Five Perspectives

<table>
<thead>
<tr>
<th>Architecture</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Architecture</strong></td>
<td>How does everything fit together?</td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td>How well do the pieces perform? The whole?</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td>What are we relying upon?</td>
</tr>
<tr>
<td><strong>Context</strong></td>
<td>What are the potential impacts?</td>
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<tr>
<td><strong>Risks</strong></td>
<td>What could go wrong? What are the dangers?</td>
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<td><strong>People</strong></td>
<td>How the whole system works. People and processes as well as technology. Looking for problems of execution. High or low degree of structure? Examples...</td>
</tr>
<tr>
<td><strong>Systems</strong></td>
<td>Software systems are always highly structured... But the ways that they fit into organisations are not striking a balance. Reduce redundancy, increase interdependence. What happens in case of failure?</td>
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</tbody>
</table>
**performance**

- how well do things work?
  - different metrics apply
    - speed? quality? cost? space?
  - each person's view of performance differs
    - performance isn't compositional, either...

**infrastructure**

- "the stuff that has to be in place"
  - think of buying a CD...
  - infrastructures have costs and benefits
    - who maintains the infrastructure? can I rely on it?
  - where does technology end and infrastructure begin?
    - one person's infrastructure is another person's technology... especially in service settings

**context**

- what else is going on around?
  - remember the "organism" metaphor...
  - many different elements to the context
    - the personal context of participants
    - the context that the organization puts in place
    - the context of the marketplace
    - the regulatory context imposed by government, etc.

**risks**

- probably the most-overlooked aspect
  - process risks
    - delivering on-time and on-budget is very rare!
    - the world is changing around you...
  - systems inevitably have flaws
  - but externally-imposed risks are just as bad
  - this isn't only an ethical issue
  - risks multiply
    - Perrow, "Normal Accidents"

**matrix of concerns**

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<td>Customer</td>
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<tr>
<td>Product</td>
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<tr>
<td>Process</td>
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<tr>
<td>Participants</td>
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<td>Info.</td>
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<tr>
<td>Tech.</td>
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**the lifecycle**

- WCA helps you to understand opportunities
### asking questions

- where can technology help?
  - where are we focusing our attention?
- what do we expect it to do?
  - which aspects are we attempting to improve?
- what are the factors that affect performance?
  - how is this piece connected to the rest?
  - what impacts might that have?

### what’s next

- now that we’ve gotten the basics down
  - look at processes in more detail
  - look at information system design
  - understand how they contribute value
- next time...
  - business processes and workflow technology
  - read Alter chapter 3