New IT direction

- IT as strategy
- IT management as broader business enterprise
- IT Manager as concerned beyond IT

The Enabling Role of IT

<table>
<thead>
<tr>
<th>Old Rule</th>
<th>Intervening Technology</th>
<th>New Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information appears in only one place at one time.</td>
<td>Shared databases, client/server architecture, Internet, intranets</td>
<td>Information appears simultaneously whenever needed.</td>
</tr>
<tr>
<td>Only an expert can perform complex work.</td>
<td>Expert systems, neural computing</td>
<td>Novices can perform complex work.</td>
</tr>
<tr>
<td>Business must be either centralized or distributed.</td>
<td>Telecommunication and networks: client/server, Internet</td>
<td>Business can be both centralized and distributed.</td>
</tr>
<tr>
<td>Only managers make decisions.</td>
<td>Decision support systems, enterprise support systems, expert systems</td>
<td>Decision making is part of everyone’s job.</td>
</tr>
</tbody>
</table>

Mutual Benefit Life (MBL)

1980’s from Turban et al

- issuing an insurance policy (pre-reengineering)
- specializations were swept away
  - IS empowered single person decision-making

- issuing a policy (pre-reengineering)
  - 5 departments
  - 19 specialists
  - 30 internal checks
  - 7 computer systems
  - 225 administrative staff
  - several months elapsed in some cases

- issuing a policy post-reengineering)
  - 1 case manager
  - 5 internal checks
  - 1 computer system
  - 100 administrative staff
  - 1 day elapsed
Business Reengineering

- the basic idea was that the “information revolution” must spawn a revolution in the ways that organizations are designed and operate
  - processes seen as the key determinants of organizational structures
- a lot of the hype (notably from Hammer & Champy) stemmed from claims that existing organizations were designed according to outmoded principles
  - hierarchy
  - structured devolution of authority
  - stable reporting lines and methods
  - functional specialization (division of labor)

Business Reengineering ctd

- Customer disillusion 1980’s and 1990’s
  - delay
  - poor quality
  - poor service – speed?
  - unresponsive – I’ll see if I can
  - tunnel vision – this is all we do
  - inisconsistency – service depends on who serves you
  - overhead – we cannot afford to do that
- marketing
  - customer focus – assessing what the market wants & provide it

Process Structures

- currently process structures and designs tend to be designed and controlled by the relevant organizational area
  - purchasing processes the responsibility of the purchasing area
  - selling processes the responsibility of the sales and marketing area etc.
- traditionally TP systems were built to meet the needs of functional areas and the specific processes being automated
  - billing system
  - general ledger system
  - faults repair management system
  - credit-approval system
  - inventory management system etc.

System Design Consequences

- different data structures in different systems
- different process structures to perform similar or even identical functions
- the need for inter-system interfaces including data conversion and translation routines
- the systems supported existing organizational structures and actually impeded change processes

Business Process Redesign Technique

- business reengineering theory assumes that business process redesign (BPR) techniques can be broadly applied throughout an organization
- BPR principles included:
  - use IT to streamline information transmission
  - implement an end-to-end perspective
  - provide consistent information support for processes
Business Process Redesign

- the analytical techniques required are those you are already familiar with:
  - functional decomposition
  - process analysis
  - data-flow analysis
  - data analysis
  - entity life-history analysis etc.
- however, the analysis is focused at the level of the overall process ("end-to-end" perspective)

The New Business Paradigm

- reengineering is seen to be based on a new network "philosophy" of organization and business
- the new philosophy encompasses operating principles such as:
  - open, user-oriented, network computing
  - an open, competitive, dynamic market-place
  - network-based, information-oriented business organizations
  - business and economic volatility
  - the globalization of business

Mass Customization

- One of the most successful models of e-Commerce is mass customization.
  - the production of large quantities of customized items.
- It supplements or even replaces one of the most innovative concepts of the Industrial Revolution, mass production.

Mass Customization & EC

- EC transforms the supply chain from a traditional push model to a pull model.
  - Push model - the business process starts with manufacturing and ends with consumers buying the products or services.
  - Pull model - the process starts with the consumer ordering the product (or service) and ends with the manufacturer making it.
- The pull model enables customization since orders are taken first.

Networked Organizations

- Today some organizations are turning away from the hierarchical organization toward the networked organization.
  - Networked organizations refer to organizational structures that resemble computer networks and are supported by information systems.
- In the information-based economy, most people do knowledge work, and the subordinate often has more expertise than the "hierarchical" supervisor.
- A flattened organization has fewer layers of management and a broader span of control than the hierarchical organization.

version: Jan 97 updated by H. Smith
Topic: Maintenance

**IT Roles in Reengineering**
- IT lends itself as a tool for organisational re-engineering
- IT facilitates
  - the increased productivity of "knowledge workers"
  - enhanced quality programs
  - flatter, more responsive, and more flexible organizations
  - a greater emphasis on teams and other dynamic structures
  - senior managers being closer to the business (shorter chains of authority)
  - elimination (reduction) of middle management
  - mergers, acquisitions and joint ventures
  - inter-organizational alliances (IOS)
  - social and environmental responsiveness

**IT as an “Enabling” Technology**
- IT lends itself as a tool for change (“improvement”)
- key aspects to IT:
  - "shrinks" time and space
  - can routinise unstructured activities
  - can enable instantaneous information transfer
  - can replace human labor
  - can support the application of complex analytical techniques to process evaluation and measurement
  - can be used to consolidate and integrate all the information used throughout a process
  - can enable changes in action sequences

**Principles of Reengineering**
- a clean-slate approach to organizational change
- an orientation to broad, cross-functional business processes
- the need for, and possibility of, radical change in process performance
- the application of information technology as an enabler of change
- changes in organizational and human arrangements that accompany changes in technology

*from Davenport & Short, MISQ, 1994*

**Critical Reengineering Concepts**
- “end-to-end” process management
- managers assigned specific process responsibilities
- complex transactions facilitated rather than stalled
  - the aim is to negate the tendency for difficult transactions to be stalled or badly handled (with a total process perspective it is easier to highlight and expedite the exceptions)

**Reengineering as an IT Strategy**
- it is possible to implement BPR continuously and on a relatively small-scale (along TQM lines) - this can have strategic implications over a long time
- the "strategic" option is however usually presented as a major reengineering initiative in which the organization as a whole is put to the torch
- the strategic aim is to improve relative efficiencies and is therefore focused mainly on costs savings and throughput - these can be very significant

**Ford Motor Co.**
from Turban et al
- Ford accounts payable (reengineered)
  - established an online database
  - eliminated paper copies of documentation, and automated checking for mismatches
  - checked 3 items (part #, quantity, supplier code) rather than 14
  - automatically generated cheques for vendors
  - 75% reduction in headcount (375 people)
  - improved financial information

version: Jan 97 updated by H. Smith
The Process of Reengineering

- Develop business vision and process objectives
- Identify processes to be redesigned
- Understand and measure existing processes
- Identify IT levers
- Develop and design a prototype of the process
- Implement the new process (organizational change)

(from Davenport & Short)

The Process of analysing/designing BPR

- successful reengineering requires the logical business processes to be rethought from the ground up
- critical questions for process analysts are
  - how should the problem be scoped?
  - do we know the existing processes are genuinely in need of redesign?
  - how broadly should the analyst look during the redesign process?
  - how can analytical insights be gained?

The Process of analysing/designing BPR

- how likely is reengineering to deliver good results?
- are the necessary skills and expertise available internally or externally?

The IT Contribution (Traditional)

- an interesting question is whether IT fumbled the ball in earlier years...
  - analysts were reputed to be concerned with the automation of existing processes rather than doing a genuine analysis
  - legacy systems are therefore impeding organizational change
  - IT (and business staff!) have simply failed to see the broader implications of IT
  - is this a valid view?

Current Business Process Structures

<table>
<thead>
<tr>
<th>Business Process</th>
<th>System 1</th>
<th>System 2</th>
<th>System 3</th>
<th>System 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supporting Systems</td>
<td></td>
<td></td>
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</tbody>
</table>

Reengineered Process Structures

<table>
<thead>
<tr>
<th>Business Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharable Automated Business Functions</td>
</tr>
<tr>
<td>Integrated Corporate Databases (common definitions)</td>
</tr>
<tr>
<td>Integrated Technology Infrastructure</td>
</tr>
</tbody>
</table>
**Organizational Structures**

- there are always inefficiencies in complex organizations
  - if optimising the whole, will inevitably sub-optimize some parts
- the aim should be to identify major sources of inefficiencies which are affecting the way the organization does business in fundamental ways - this does not always involve headlong BPR
- note many problems stem from issues not easily susceptible to an IT solution
  - "frozen" work practices
  - demarcation disputes
  - skill limitations (end-to-end management imposes its own problems)
  - some processes just are inherently complex

**Success Rates**

- nevertheless reengineering has become a major industry - however
  - after the initial wave of "big" results such as Ford and MBL, there have been relatively few dramatic success stories
  - estimates of success rates have been as low as 1% (Hayward: “Facing the firing squad”, Computing 2/11/95)
  - many traditional systems activities have been rebadged as reengineering

**Some Reengineering Paradoxes**

- radical redesign has to be driven from the top
  - improvement is usually driven bottom-up
- radical change has to be enforced
  - successful reengineering requires active cooperation
  - reengineering means reductions in middle management
  - reengineering requires commitment and support from all levels of management
  - reengineering is associated with increased automation
  - reengineering is associated with increased autonomy for staff and more flexible management
  - these provide some of the explanation for why reengineering initiatives are difficult to bring off

**Requirements for Success**

- **planning**
  - don’t wait for the ideal solution
  - conceptualize new processes in detail
  - use an appropriate BPR methodology
- **implementation**
  - requires a champion
  - deal responsively with genuine resistance
  - ensure management & technical support is adequate
  - commit the necessary funds and other resources
- **organizational culture**
  - do not rely on technology to solve the problems
  - emphasize communication and education
  - commit to a strong training program
  - do not allow unrealistic expectations to develop

**An Accident Management System**

- Have accident → Report accident → Select Towtruck → Negotiate price → Towtrucks arrive → Get vehicle to repairer → Exit

**A Reengineered Accident Management System**

- Have accident → Report accident → Towtruck arrives → Towtruck Management System → Vehicle to repairer → Exit
Reference

Turban, Leidner, McLean & Wetherbe
Chapter 14