Chapter 3
Organizational Impacts of Information System Use

Managing and Using Information Systems: A Strategic Approach
by Keri Pearlson & Carol Saunders

Introduction

• How does the use of information technology impact the organization?
• What type of organizational structure tends to be most willing to embrace technological change and sophistication? Why?
• What are the advantages and disadvantages of the networked organizational structure?
• How has IT changed the way managers monitor and evaluate?
• Are virtual organizations just a passing fad?
• What challenges are faced by virtual teams?

Real World Examples

• Diamond Technology Partners (DTP).
  – Every consultant has a laptop to permit automatic connectivity with the corporate intranet.
  – Intense use of computers, shared data, extensive electronic communications foster high levels of interaction & fluid, highly adaptable work arrangements.
• Mrs. Fields IS focused on sales skills not simply production.
  – Implemented a computer system that automated much of the baking and planning tasks.
  – Employees able to focus on sales not on baking issues.
• IS is fundamental to the way these companies are organized to do business.
• IS can leverage human resources, capital and materials.

INFORMATION AGE ORGANIZATIONS
Key Characteristics

• 1988 three professors at Harvard Business School predicted what would be key characteristics of information age organizations.
• Their predictions were close to what happened.
• These predictions can be related to three categories (Figure 3.2):
  – Organizational structure.
  – Human resources.
  – Management processes.
• Information age organizations use a different organization structures.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Characteristics</th>
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<tbody>
<tr>
<td>Organizational Structure</td>
<td>Companies have benefits of small and large scale simultaneously.</td>
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<tr>
<td></td>
<td>Lg. organizations adopt flexible/dynamic structure</td>
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<td></td>
<td>Centralized/decentralized control blur</td>
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<tr>
<td></td>
<td>Focus on projects/process vs. tasks/procedures</td>
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<tr>
<td>Human Resources</td>
<td>Workers better trained, autonomous, transient</td>
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<tr>
<td></td>
<td>Work environment exciting, engaging</td>
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<td></td>
<td>Management shared, rotated, even part-time</td>
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<td></td>
<td>Job descriptions tied to defined tasks non-existent</td>
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<td></td>
<td>Compensation tied directly to contribution</td>
</tr>
<tr>
<td>Management Processes</td>
<td>Decision-making is well understood</td>
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<tr>
<td></td>
<td>Control separated from reporting relationships</td>
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<tr>
<td></td>
<td>Computers support creativity at all levels</td>
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<tr>
<td></td>
<td>IS retain corp. history, experience, expertise</td>
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</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational variables</td>
<td></td>
</tr>
<tr>
<td>Decision rights</td>
<td>Authority to initiate, approve, implement, and control various types of decisions necessary to plan and run the business.</td>
</tr>
<tr>
<td>Business processes</td>
<td>The set of ordered tasks needed to complete key objectives of the business.</td>
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<tr>
<td>Formal reporting relationships</td>
<td>The structure set up to ensure coordination among all units within the organization.</td>
</tr>
<tr>
<td>Informal networks</td>
<td>Mechanism, such as ad hoc groups, which work to coordinate and transfer information outside the formal reporting relationships.</td>
</tr>
<tr>
<td>Control variables</td>
<td></td>
</tr>
<tr>
<td>Data</td>
<td>The information collected, stored, and used by the organization.</td>
</tr>
<tr>
<td>Planning</td>
<td>The processes by which future direction is established, communicated, and implemented.</td>
</tr>
<tr>
<td>Performance measurement and evaluation</td>
<td>The set of measures that are used to assess success in the execution of plans and the processes by which such measures are used to improve the quality of work.</td>
</tr>
<tr>
<td>Incentives</td>
<td>The monetary and non-monetary devices used to motivate behavior within an organization.</td>
</tr>
<tr>
<td>Cultural variables</td>
<td></td>
</tr>
<tr>
<td>Values</td>
<td>The set of implicit and explicit beliefs that underlie decisions made and actions taken.</td>
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</tbody>
</table>

INFORMATION TECHNOLOGY AND ORGANIZATIONAL DESIGN
**IT & Organizational Structures**

- Traditional organizations are hierarchical, flat or matrix in design (Fig. 3.3).
- In hierarchical orgs. middle managers tell subordinates what to do and tell superiors the outcomes. IS supports this hierarchy.
- In flat structured orgs. work is more flexible and employees do whatever is needed. IS allows offloading extra work and supports intra-firm communications.
- In matrix organizations, work is organized into small work groups and integrated regionally and nationally/globally.
  - IS reduces operating complexes and expenses by allowing information to be easily shared among different managerial functions.

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**Hierarchical Organizational Structure**

- Based on the concepts of division of labor, specialization, and unity of command
- Key decisions are made at the top and filter down through the organization
- Middle managers do the primary information processing and communication function
- IS is typically used to store and communicate information along the lines of the hierarchy and to support the info management function of the managers

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**Flat Organizational Structure**

- Decision-making is centralized
- As everyone does whatever needs to be done, they can respond quickly to dynamic, uncertain environments
- However, this organizational structure often becomes less flexible as the org. grows
- Routine IS work is often off-loaded but, as a hierarchy develops, becomes the ‘glue’ tying parts of the organization that would not otherwise communicate
Matrix Organizational Structure

- This typically assigns workers with two or more supervisors in an effort to make sure multiple dimensions of the business are integrated, with each supervisor directing a different aspect of the employee’s work.
- Matrix organizations often fail to enable managers to achieve their business strategies because of the inability to cope with increased information processing demands.

Networked Organizational Structure

- “Rigid hierarchies are replaced by formal and informal communication networks that connect all parts of the company.”
- Defined by their ability to promote creativity and flexibility while maintaining operational process control, which is achieved by substituting hierarchical controls with controls based on IS.
- Extensive use of communication technologies and networks also makes it easier to coordinate across functional boundaries.

<table>
<thead>
<tr>
<th>Description</th>
<th>Hierarchical</th>
<th>Flat</th>
<th>Matrix</th>
<th>Networked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bureaucratic w/ defined levels of management</td>
<td>Decision-making pushed down to lowest level</td>
<td>Workers assigned to 2 or more supervisors</td>
<td>Formal/informal communication networks that connect all</td>
<td></td>
</tr>
<tr>
<td>Characteristics</td>
<td>Division of labor specialization, unity of command</td>
<td>Informal roles, planning and control; often sm., young orgs.</td>
<td>Dual reporting based on function/purpose</td>
<td>Known for flexibility and adaptability</td>
</tr>
<tr>
<td>Type of Environment Best Supported</td>
<td>Stable Certain</td>
<td>Unstable Uncertain</td>
<td>Unstable Uncertain</td>
<td>Unstable Uncertain</td>
</tr>
<tr>
<td>Basis of Structuring</td>
<td>Primary function</td>
<td>Primary function</td>
<td>Functions and purpose</td>
<td>Networks</td>
</tr>
<tr>
<td>Power Structure</td>
<td>Centralized</td>
<td>Centralized</td>
<td>Distributed</td>
<td>Distributed</td>
</tr>
<tr>
<td>Key Tech. Supporting this</td>
<td>Mainframe, centralized data and processing</td>
<td>Personal computers</td>
<td>Networks</td>
<td>Intranets and Internet</td>
</tr>
</tbody>
</table>

Figure 3.4 Comparison of Organizational Structures

Figure 3.5 The networked organization.
T-Form Organization

- T-form ("technology-based") organizations take the networked structure one step further by combining IT with traditional components to form new types of components.
- These include electronic linking, production automation, electronic workflows, electronic customer/supplier relationships and self-service Internet portals.
- Work is often coordinated electronically, while systems enable information to move around the organization, and decentralizing decision-making.

Management Control

- IT profoundly affects the way managers control their organizations.
- People and processes are monitored in ways that were not possible only a decade ago.
- The activities of management control are summarized in figure 3.6.
- Depending upon the organizational structure will determine the level of control that a manager must exercise over their employees.
- IS play three important roles in management control processes: Collection, Communication, and Evaluation.

<table>
<thead>
<tr>
<th>Control Activities</th>
<th>Brief Definition</th>
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<tbody>
<tr>
<td>Monitoring</td>
<td>Observing and keeping track of the progress, quality, cost, time and other relevant parameters.</td>
</tr>
<tr>
<td>Evaluating</td>
<td>Comparing the data collected through monitoring to standards or historical data.</td>
</tr>
<tr>
<td>Providing Feedback</td>
<td>Communicating the results of evaluation to the individuals responsible for the activities and tasks.</td>
</tr>
<tr>
<td>Compensating</td>
<td>Deciding on salary or other forms of payment to those individuals who preformed the tasks.</td>
</tr>
<tr>
<td>Rewarding</td>
<td>Deciding and delivering bonuses, recognition, or other types of prize for exemplary work.</td>
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</table>

Figure 3.6  Model of management control activities.
IT Changes Management Functions

- IT changes the way managers:
  - **Monitor**: IS makes possible new ways to track performance and behavior.
  - **Evaluate**: models are easily built, making it easier to understand progress and performance.
  - **Provide Feedback**: IS makes rapid feedback possible (e.g., through electronic forms).
  - **Compensate & Reward**: team-based efforts can be evaluated and complex formulas used.
  - **Control Processes**: IS also used extensively in industrial processes, and makes it easier to collect, analyze and move information.

Virtual Organizations

- IT has made it possible for an individual to work for an organization and live anywhere.
- Virtual organization structure is “networked.”
  - Extensive collaboration takes place electronically (e-mail).
- Managers in a virtual environment monitor results, not progress.
- Forms are electronic, tech. support through a web interface.
- Business processes are designed differently.

Virtual Teams

- Virtual Teams are geographically and/or organizationally dispersed coworkers assembled using telecommunications and IT to accomplish an organizational task.
- Several reasons explain their growing popularity:
  - As information needs mushroom, firms rely on the skills and knowledge of individuals dispersed across countries/time zones, etc.
  - Enhanced bandwidths promote the use of networks linking individuals, internal and external to the organization.
  - Technology (group support systems, groupware, etc) is available to assist collaboration.
  - Difficulties in getting relevant stakeholders together physically are relaxed.
  - Growing pressures for off-shoring has resulted in systems development by global virtual teams whose members are located around the world.
Because of commonalities, communications are easier to complete successfully.

- Harder to establish a group identity.
- Necessary to have better communication skills.
- More difficult to build trust, norms …

Because members are more homogeneous, group identity is easier to form.

Members typically come from different organizations and/or cultures which makes it:

- Harder to establish a group identity.
- Necessary to have better communication skills.
- More difficult to build trust, norms …

Teams are collocated in same time zone. Scheduling is less difficult.

Teams may use richer communication media.

Team members must have proficiency across a wide range of technologies.

Technology offers electronic repository.

Work group effectiveness may be more dependent on alignment of group & technologies used.

Technology is not critical and tools not essential for communications.

Electronic repositories are not typically used.

Task technology fit may not be as critical.

Members typically come from different organizations and/or cultures which makes it:

- Harder to establish a group identity.
- Necessary to have better communication skills.
- More difficult to build trust, norms …

Because members are more homogeneous, group identity is easier to form.

Because of commonalities, communications are easier to complete successfully.

Figure 3.7 Comparison of challenges facing virtual and traditional teams.

Immediate Responsive Organizations

To accomplish the goal of instant “customization”, an organization must master five disciplines:

1. **Instant value alignment** – ready to provide exactly what the customer wants
2. **Instant learning** – building learning directly into the company’s tasks and processes
3. **Instant involvement** – using IT to ensure that everyone is ready to deliver products, services, etc
4. **Instant adaptation** – creating the culture to support this
5. **Instant execution** – During IT to cut cycle times to appear instant to the customer

**FOOD FOR THOUGHT: IMMEDIATELY RESPONSIVE ORGANIZATIONS**

**SUMMARY**
Summary

• IS must be a key component of organizational design.
• Organizational designers must have an understanding of what IS can do.
• The flow of information can inhibit or facilitate organization structures.
• Virtual and networked organizations are rising in use and are replacing older legacy structures.
• IT affects managerial control mechanisms and managers must ensure that these controls are in place.
• Virtual organizations make it possible for employees to live anywhere.
• Virtual Teams are increasing in frequency and the challenges that they pose must be addressed.