Chapter 4
Information Technology and the Design of Work

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

Introduction

• How can the automation of work lower morale and job satisfaction?
• How can management help to prevent or at least minimize this impact?
• What is a job design framework?
• How does IT change the way work is done and where it is done?
• Discuss the advantages and disadvantages of telecommuting?

Real World Examples

• In her book, “In the Age of the Smart Machine: The Future of Work and Power”, Shoshana Zuboff studied the effects on data clerks of a new computer system that automated insurance claims processing.
• She discovered that the new system:
  – Created confusion and workers felt distanced from the work process.
  – Data lost meaning and importance.
  – The clerks actually lost skills.
  – The work became “mechanical”.
• This chapter should help managers understand the challenges in designing work systems that overcome resistance to IT

JOB DESIGN FRAMEWORK
JOB DESIGN FRAMEWORK

• A simple framework can be used to assess how emerging technologies may affect work.
• This framework is useful in designing key characteristics of jobs by asking key questions (see figure 4.1). Such as:
  – What tasks will be performed?
  – How will the work be performed?
  – Who will do the work?
  – Where will the work be performed?
  – How can IS increase performance, satisfaction and effectiveness of the workers doing the work?

Figure 4.1 Framework for job design impacts.

Creating New Types of Work

• IT has created many new jobs or types of work.
• Examples of newly created jobs now common in traditional organizations include:
  – Knowledge managers
  – Systems analysts
  – Database and network administrators
  – Webmasters and web site designers
  – IT Security professionals, and more.
• It has changed not only the organizational decision-making process, the information used in making decisions, plus the amount and type of information available to workers.
• The ITAA places the number of IT workers at 10.5 million in 2004.
New Ways to do Traditional Work

- Many traditional tasks are now done by computers, while many work processes have been greatly changed by the introduction of IT.
- Communication patterns have also changed, workers now use mobile devices to send and receive messages and tap into databases, greatly affecting sales and service tasks.
- The cost and time needed to access information is dramatically lower, giving workers new tools.
- Work has become much more team oriented - an effect amplified by the Internet.

New Challenges in IT HR Management

- Organizations face the challenge of managing a work force that is no longer in a single location.
- Work is more team oriented, making it more difficult to assess individual contributions.
- One solution is to use electronic employee monitoring systems automating supervision, but possibly hurting morale and undermining efforts encourage workers to contribute their ideas to the organization.

<table>
<thead>
<tr>
<th>Traditional Approach: Subjective Observation</th>
<th>Newer Approach: Objective Assessment</th>
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<tbody>
<tr>
<td>Supervision</td>
<td>Electronic, or assessed by deliverable. As long as the employee is producing value, he does not need formal supervisions</td>
</tr>
<tr>
<td>Focus is on process through direct observation. Manager sees how employee performed at work. Subjective (personal) factors are very important.</td>
<td></td>
</tr>
<tr>
<td>Focus is on output by deliverable or by target. As long as deliverables are produced and/or targets achieved, the employee is meeting performance expectations adequately.</td>
<td></td>
</tr>
<tr>
<td>Compensation and Rewards</td>
<td>Often team-based or contractually spelled out</td>
</tr>
<tr>
<td>Personal with little reliance on computers. Often more reliance on clerical skills</td>
<td></td>
</tr>
<tr>
<td>Personal. Manager is usually present or relies on others to ensure that employee is present and productive.</td>
<td></td>
</tr>
<tr>
<td>Often individually-based.</td>
<td></td>
</tr>
<tr>
<td>Hiring</td>
<td>Often electronic with recruiting websites and electronic testing. More informed work that requires a higher level of IT skills.</td>
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Figure 4.3 Summary of IT's Effects on Employee Life

- It creates millions of new jobs, some in entirely new industries.
- More work is team-oriented, enabled by communications and collaboration technologies. Geographic constraints of some professions are eliminated, enabling telecommuting.
- New strategies are need to supervise, evaluate, and compensate remotely performed, team-oriented work. IT requires new skills workers often lack.
The Growth of Telecommuting

- Telecommuting has gained popularity since the late 1990s because:
  - It lowers corporate overhead. Telecommuting workers don’t take up office space, lowering facilities costs.
  - Workers who are giving increased flexibility are more productive and express higher levels of job satisfaction.
- 2/3’s of Cisco employees occasionally work from home.
  - This has saved them $1M in overhead and increased productivity by 25%, as workers prefer to set their own schedules and work in more comfortable surroundings.

Enabling Factors for Telecommuting

- Three factors support the growth of telecommuting growth (Figure 4.4):
  - Work is increasingly knowledge-based so workers don’t need to be “at work” to do their jobs.
  - Telecommuting enables workers to shift their work to accommodate their lifestyles, esp. parenting or living in locations far from the office.
  - More powerful PCs + cheap, high speed telecom (ADSL, cable modem) mean telecommuters can connect to corporate network efficiently.

<table>
<thead>
<tr>
<th>Driver Effect:</th>
<th>Shift to knowledge-based work</th>
<th>Changing demographics and lifestyle preferences</th>
<th>New technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eliminates need that some work be done in a specific place</td>
<td>Provide workers with geographic and time-shifting flexibility</td>
<td>Make remotely performed work practical and cost-effective</td>
</tr>
</tbody>
</table>

Figure 4.4 Driving factors of telecommuting
New Technologies Supporting Telecommuting & Mobile Work

- Sales and service personnel can now quote orders at point of sale, improving customer satisfaction, reducing sales cycle time and cutting costs.
- Roles changing due to heavy use of four technologies: laptops, PDAs, handheld terminals and mobile phones (See Figure 4.5).
- High quality laptops are the most important and widely used of all mobile work technologies.

Disadvantages of Telecommuting and Mobile Work

- More difficult for managers to evaluate and compensate performance
- Workers must be extremely self-disciplined
- Can disconnect them from corporate culture
- Labor unions, politicians, etc., worry about foreign outsourcing of software development and computer services enabled by the same technologies

<table>
<thead>
<tr>
<th>Technology</th>
<th>Used By</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laptop computers</td>
<td>Professionals, particularly consultants and salespeople</td>
<td>Eliminate constraints of travel. Enables workers to be productive anywhere</td>
</tr>
<tr>
<td>PDAs</td>
<td>Mostly professionals, but gaining mass acceptance</td>
<td>Provides a low-cost, simple way of organizing information and data</td>
</tr>
<tr>
<td>Handheld terminals</td>
<td>Service professionals, particularly delivery, technical support, and service and repair technicians</td>
<td>Enhances productivity and adds capabilities and real-time communication</td>
</tr>
<tr>
<td>Portable phones</td>
<td>Any worker who travels during his or her work routine communication</td>
<td>Allows immediate voice (and sometimes data)</td>
</tr>
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[Image 23x26 to 284x374]

[Image 23x418 to 284x766]

[Image 328x26 to 589x374]

[Image 328x418 to 589x766]

Figure 4.5 Key technologies in redesigning work

<table>
<thead>
<tr>
<th>Employee Advantages of Telecommuting</th>
<th>Potential Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced stress due to increased ability to meet schedules, heightened morale, and lower absenteeism</td>
<td>Harder to evaluate performance, Increased stress from inability to separate work from home life</td>
</tr>
<tr>
<td>Geographic flexibility</td>
<td>Employee may become disconnected from company culture</td>
</tr>
<tr>
<td>Higher personal productivity</td>
<td>Telecommuters are more easily replaced by electronic immigrants</td>
</tr>
<tr>
<td>Housebound individuals can join the workforce</td>
<td>Not suitable for all jobs or employees</td>
</tr>
</tbody>
</table>

Figure 4.6 Advantages and disadvantages of telecommuting

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Managerial Issues In Telecommuting and Mobile Work

- Planning, business and support tasks must be redesigned to support mobile and remote workers
- Training should be offered so all workers can understand the new work environment
- Employees selected for telecommuting jobs must be self-starters

Groupware and Electronic Collaboration

- Groupware tools such as Lotus Notes, and technologies, such as video conferencing have made it cost-effective for distant workers to create, edit and share electronic documents and processes.
- Collaboration adds value to many types of tasks, particularly those that benefit from an exchange of ideas.

INFORMATION SYSTEMS ENABLE MORE GROUP WORK

Whirlpool's Product Design Management (PDM) system

- PDM unites design teams electronically using a central data repository.
- Engineers around the world collaborate online to create several basic designs using PDM.
- Each region then customizes generic design for local use.
- PDM halves design time, saves money and brings products to market more quickly.
Ford Motor Company

- Ford now develops cars for world markets by electronically linking design and engineering centers via videoconferencing and corporate intranets.
- Faster more efficient communication allows Ford to design and produce cars in less time.

Gaining acceptance for IT-induced Change

- To avoid resistance to change, system implementers and managers must actively manage the change process.
- The Technology Acceptance Model (TAM) (Figure 4.7) suggests that employee attitudes may change if they think the new system will help them to do more or better work for the same effort, and that it’s easy to use.
- Employee participation in the system’s design and implementation also helps.

Figure 4.7 Technology Acceptance Model
FOOD FOR THOUGHT: THE PRODUCTIVITY PARADOX

Does IS/IT Investment Improve Worker Productivity?

- Some researchers argue ongoing costs outweigh productivity gains
- Other research suggests employee productivity is rising
- Some argue the measurement of productivity is flawed; e.g., fails to capture gains in service.
- Recent research suggests that heavy investment in IT is finally paying off.

Summary

- Technology has played a major role in transforming the way work is done.
- Individuals must become comfortable with new technologies to stay marketable.
- Managers must be sensitive to employees as new technologies are rolled out.
- Telecommuting is a reality and many corporations have a percentage of their workforce involved in this practice.