

Chapter 4

Work Design: Enabling Global Collaborations

**Managing and Using Information Systems: A
Strategic Approach**

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Learning Objectives

- Understand how IT has changed the nature of work.
- Define virtual organizations and how they work.
- List the technologies that are used to support communication and collaboration.
- Explain telecommuting and the technologies that support telecommuting.
- Discuss how managers need to manage virtual teams, and the challenges this creates.
- Understand how attitudes impact technology acceptance in organizations.

Real World Example

- Best Buy, the leading U.S. retailer in electronics, completely transformed its view of the ordinary workday.
- Known for killer hours and herd-riding bosses, it ushered in a new approach to work: Results-Only Work Environment (ROWE).
- Brainchild of two passionate employees who thought that Best Buy managers were mired in analog-age inertia and did not recognize that employees could use technology to perform work from a variety of places.
- ROWE is a program that allows limitless flexibility when it comes to work hours.
 - Employees can choose where and when they will do their work --- as long as project goals are satisfied.
 - Employee decisions about working hours and location are framed by 13 guideposts --- the most surprising of which is “Every meeting is optional.”

Real World Example

- Best Buy claims that productivity soared 41% between 2005 and 2007 on ROWE teams, and voluntary turnover plummeted 90%.
- This helped Best Buy save \$16 million each year.
- Other companies (IBM, AT&T) have adopted similar strategies.
- The nature of work is changing before our eyes - -- and information technology is supporting, if not propelling, the changes.

Approach to Work

- Technology has now brought the approach to work full circle.
 - Time and place of work are increasingly blended with other aspects of living.
- People now can do their work in their own homes at times that accommodate home-life and leisure activities.
- They are able to enter cyberspace --- a virtually unlimited space full of opportunities.

Virtual Organizations

- A structure that makes it possible for individuals to work for an organization and live anywhere.
- The Internet and corporate intranets create the opportunity for individuals to work from anyplace they can access a computer.
- The structure of a virtual organization is networked.
- Everyone has access to everyone else using technology.
- E-mail is the most widely used means of communication.
- Success in a virtual organization is the amount of collaboration that takes place between individuals

Real World Example

- VeriFone, a leading manufacturer of credit verification systems, is well known for its virtual organization.
- Founded in 1981 by an entrepreneur who hated bureaucracy.
- By 1990 the leading company for transaction automation with products and services used in more than 80 countries.
- Limited presence at corporate headquarters, employees are placed close to their customers (limits travel).
- At the heart of the company culture is constant and reliable sharing of information.

WORK DESIGN FRAMEWORK

WORK 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 work by asking key questions (see figure 4.1). Such as:
 - What work will be performed?
 - What is the best way to do the work?
 - Who is going to do the work?
 - Where will the work be performed?
 - How can IS increase the effectiveness of the workers doing the work ?

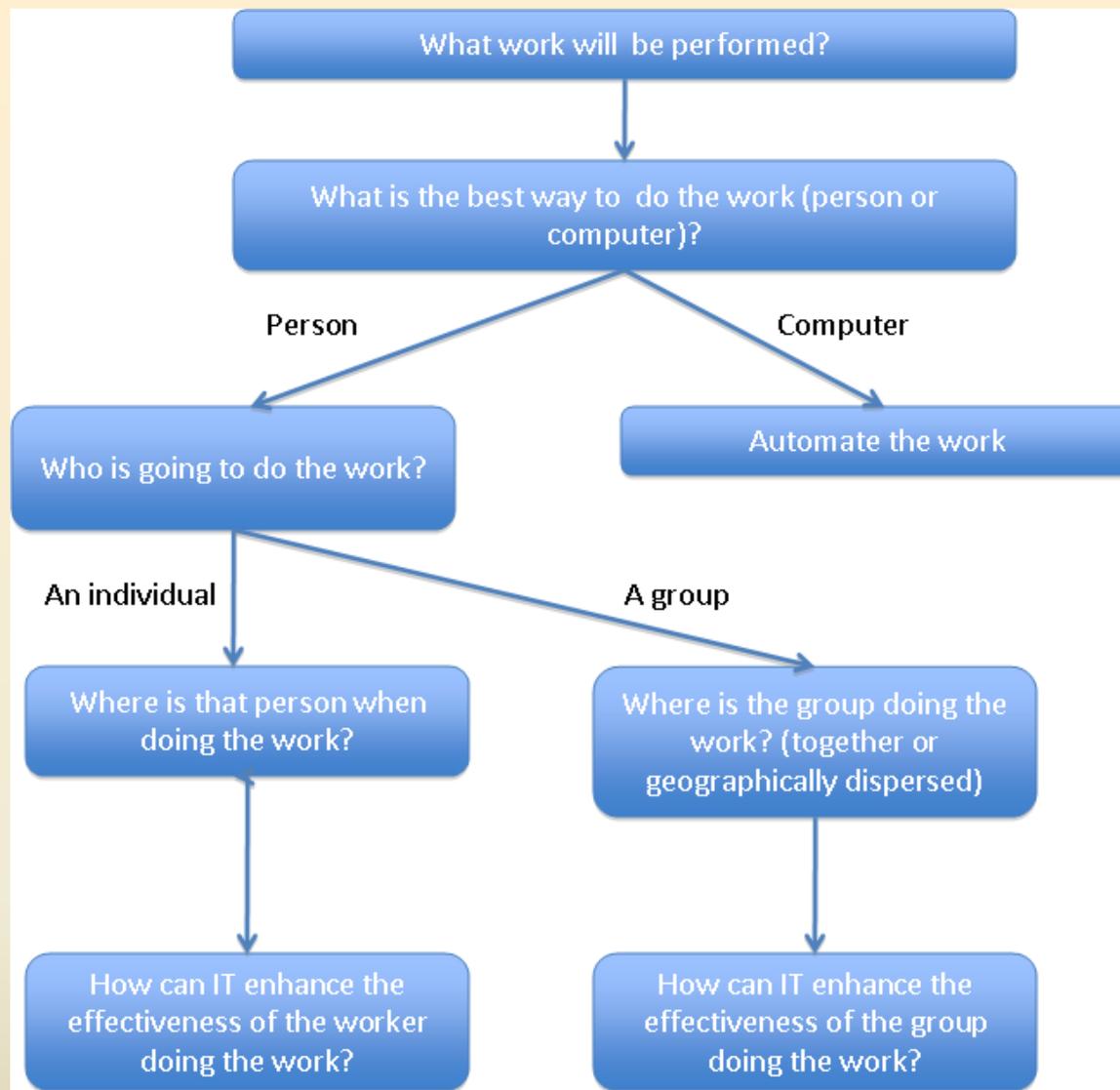


Figure 4.1 Framework for work design.

**HOW INFORMATION
TECHNOLOGY SUPPORTS
COMMUNICATION AND
COLLABORATION**

IT to Facilitate Communication

- **E-mail** - a way of transmitting messages over communication networks.
 - First uses of the Internet.
 - Composed primarily of text but can include other mediums (video, audio, etc.).
 - Mailing list server
- **Intranet** - Looks and acts like the Internet
 - Comprised of information used exclusively within a company
 - Unavailable to the Internet community as a whole.

IT to Facilitate Communication

- **Instant Messaging (IM)** – an IP-based instant communication application.
 - Provides convenient communication between people using computers, cell phones, etc.
 - Can be used to check on telecommuting employees by managers.
- **Voice over IP (VoIP)** - Method enabling telecommunications (phone calls) to be transmitted over an IP based network.
 - Skype is a type of VoIP system that permits users to make free phone calls over the Internet.
 - Very useful for communicating with remote workers.

IT to Facilitate Communication

- **Video Teleconferencing** - set of interactive telecommunication technologies allowing two or more locations to interact via two-way video and audio transmissions simultaneously.
- **Unified communications (UC)** - an "evolving communications technology architecture which automates and unifies all forms of human and device communications in context, and with a common experience
- **RSS** - refers to a structured file format for porting data from one platform or information system to another.
 - Commonly used to keep up to date data at hand.

IT to Facilitate Communication

- **VPN** (Virtual Private Network) - private data network that leverages the public telecommunication infrastructure.
 - It maintains privacy through the use of a tunneling protocol and security procedures.
 - Very useful for telecommuters.
- **File Transfer** - consists simply of transferring a copy of a file from one computer to another on the Internet.
 - File transfer protocol (FTP), the most common type. Permits transfer of files, of almost any size, to be sent across a company or the globe.

IT to Facilitate Collaboration

- Thomas Friedman argues that collaboration is the way that small companies can “act big” and flourish in today’s flat world.
- **Social networking** - a web-based service that allows its members to create a public profile with their interests and expertise, post text and pictures and all manner of data, list other users with whom they share a connection, and view and communicate openly or privately with their list of connections and those made by others within the system (MySpace, Face Book, etc.).
- **Virtual worlds** - computer-based simulated environments intended for its users to inhabit and interact via avatars (like Second Life).

IT to Facilitate Collaboration

- **Web logs (Blogs)** - Online journals that link together into a very large network of information sharing.
 - Companies use for a variety of communication purposes.
- **Wikis** - software that allows users to work collaboratively to create, edit and link webpages easily.
- **Groupware** - software that enables group members to work together on a project, from anywhere, by allowing them to simultaneously access the same files.

HOW INFORMATION
TECHNOLOGY CHANGES
THE NATURE OF WORK

Creating New Types of Work

- IT has created many new jobs or redefined existing ones.
- Positions in IT include:
 - Programmers, analysts, IT managers, hardware assemblers, web site designers, software sales personnel, and IT consultants
- The Bureau of Labor Statistics places the number of IT workers at 3.7 million in 2006.
 - But, it is expected to grow by 25.2% to 4.0 million by 2016.

New Ways to do Traditional Work

- Changing the way work is done.
 - Many traditional jobs are now done by computers
 - The introduction of IT into an organization can greatly change the day-to-day tasks performed by the workers in the organization.
 - The cost and time needed to access information is dramatically lower, giving workers new tools.
 - Different workers must learn new skills to do work that was previously done with more human interaction but is now largely performed and/or controlled by IS.
 - The Internet enables changes in many types of work.

- **Changing Communication Patterns**
 - Cell phones and other portable communication devices have changed our communication environment.
 - IT is changing the communication patterns of workers.
 - Some workers do not need to communicate with their co-workers on a regular basis.
 - But, many need access to up-to-date information and communications between co-workers, customers, and suppliers
 - For example Wal-Mart connects its truck drivers with a radio and satellite to maximize their efficiency.

- Changing Organizational Decision Making and Information Processing
 - IT changes the decision making process, it also changes the information used in making those decisions.
 - Data processed to create more accurate and timely information are being captured earlier in the process.
 - Through technologies such as RSS web feeds information that they need to do their job can be pushed to them.
 - IT can change the amount and type of information available to workers.
 - IT has increased the flow of information to upper level management, reducing the ranks of middle managers.

- Changing Collaboration
 - An increasing amount of work being performed by teams is more fluid.
 - Teams have learned to collaborate by continually structuring and re-structuring their work.
 - IT helps make work more team-oriented and collaborative.
 - Workers can more easily share information with their teammates.
 - The Internet greatly enhances collaboration, especially through Web 2.0 technologies.

New Challenges in Managing People

- 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.
 - This can possibly hurt morale and undermine efforts to encourage workers to contribute their ideas to the organization.
- These changes are summarized in Figure 4.2.

	Traditional Approach: Subjective Observation	Newer Approach; Objective Assessment
Supervision	Personal and informal. Manager is usually present or relies on others to ensure that employee is present and productive.	Electronic, or assessed by deliverable. As long as the employee is producing value, he does not need formal supervisions
Evaluation	Focus is on process through direct observation. Manager sees how employee performed at work. Subjective (personal) factors are very important.	Focus is on output by deliverable (e.g., produce a report by a certain date) or by target (e.g., meet a sales quota). As long as deliverables are produced and/or targets achieved, the employee is meeting performance expectations adequately. Subjective factors may be less important and harder to gauge.
Compensation and Rewards	Often individually-based.	Often team-based or contractually spelled out
Hiring	Personal with little reliance on computers. Often more reliance on clerical skills	Often electronic with recruiting websites and electronic testing. More informed work that requires a higher level of IT skills.

Figure 4.2. - Changes to supervision, evaluation, compensation, and hiring

- Hiring is different because of IT.
 - Workers must know how to use the technology for their job or be trainable.
 - IT affects the array of non-technical skills needed in an organization.
 - IT has become an essential part of the hiring process for many firms (online job postings, online applications, etc.).
 - Companies often look at potential employees social networking sites when considering them for a position.
 - Employees must maintain their IT skills or risk becoming unemployable.
 - IT has drastically changed the landscape of work today.

HOW INFORMATION
TECHNOLOGY CHANGES
WHERE WORK IS DONE
AND WHO DOES IT

Telecommuting and Mobile Work

- Telecommuting has been around since the 1970s but has gained popularity since the late 1990s.
- Approximately 45 million Americans telecommuted in some fashion in 2006.
- This number is expected to increase to 100 million by 2010.
- Recent survey revealed that 12% of an organization's workforce is at a remote location.
- Figure 4.3 show factors that are driving this trend.

Factors Driving Telecommuting and Mobile Work

- Several factors support the growth of telecommuting:
 - First, work is increasingly knowledge-based so workers don't need to be "at work" to do their jobs.
 - Second, telecommuting enables workers to shift their work to accommodate their lifestyles, esp. parenting or living in locations far from the office.
 - Third, more powerful PCs + cheap, high speed telecom (ADSL, cable modem) mean telecommuters can connect to corporate network efficiently.
 - Fourth, the increasing reliance on web-based technologies by all generations (particularly younger generations).
 - Fifth, the mounting emphasis on conserving energy

Driver	Effect
Shift to knowledge-based work	Eliminates requirement that certain work be performed in a specific place.
Changing demographics and lifestyle preferences	Provides workers with geographic and time-shifting flexibility.
New technologies with enhanced bandwidth	Makes remotely performed work practical and cost-effective
Reliance on Web	Provides workers with the ability to stay connected to co-workers and customers, even on a 24/7 basis.
Energy concerns	Reduces the cost of commuting for telecommuters and reduces energy costs associated with real estate for companies

Figure 4.3 Driving factors of telecommuting and virtual teams

Disadvantages of Telecommuting and Mobile Work

- More difficult for managers to evaluate and compensate performance
- Workers must be extremely self-disciplined
- May end up working more hours.
- Can disconnect them from corporate culture
- Offshoring and outsourcing of software development and computer services enabled by the same technologies is another risk.

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

Figure 4.4 Advantages and disadvantages of telecommuting

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
- Managers must find new ways to evaluate and supervise those employees without seeing them every day in the office.

VIRTUAL TEAMS

Virtual Teams

- Virtual Teams are geographically and/or organizationally dispersed coworkers assembled using telecommunications and IT to accomplish an organizational task.
- Factors Driving Virtual Teams:
 - The same drivers for telecommuting can be applied to virtual teams.
 - Follow the sun – teams in different parts of the world can cooperate to get work done faster due to time zone differences.

Disadvantages and Challenges of Virtual Teams

- Different time zones
- Security is harder to ensure.
- Considerable number of challenges could turn into disadvantages.
- Electronic communications may not allow the person to convey the nuances that are possible with face-to-face conversation
- Trust may be slower to form.
- Diversity of team members (language, culture, etc.)

Challenges	Virtual Teams	Traditional Teams
Communications	<p>Multiple Zones can lead to greater efficiency but can lead to communication difficulties.</p> <p>Communication dynamics such as non-verbal are altered.</p>	<p>Teams are collocated in same time zone. Scheduling is less difficult.</p> <p>Teams may use richer communication media.</p>
Technology	<p>Team members must have proficiency across a wide range of technologies.</p> <p>Technology offers electronic repository.</p> <p>Work group effectiveness may be more dependent on alignment of group & technologies used.</p>	<p>Technology is not critical and tools not essential for communications.</p> <p>Electronic repositories are not typically used.</p> <p>Task technology fit may not be as critical.</p>
Team Diversity	<p>Members typically come from different organizations and/or cultures which makes it:</p> <ul style="list-style-type: none"> -Harder to establish a group identity. -Necessary to have better com. skills -More difficult to build trust, norms ... 	<p>Because members are more homogeneous, group identity is easier to form.</p> <p>Because of commonalities, communications are easier to complete successfully.</p>

Figure 4.5 Comparison of challenges facing virtual and traditional teams.

Managerial Issues in Virtual Teams

- Require different style and type of management.
- Observation is less likely to occur.
- Performance is more likely to be based on output.
- Providing feedback is important.
- Compensation should be based heavily on the team's performance.
- Align reward systems with achievement of team goals.

- **Communication challenges** – managers must learn to keep the lines of communication open.
 - Frequent communication is essential to success.
 - Need appropriate technological support (video conferencing, interactive groupware, etc.)
- **Technology challenges** – all team members must have the same or similar technologies at their locations.
 - Policies and norms for use must be provided.
- **Diversity Challenges** – different cultures have different perceptions on time and task importance.
 - Providing the appropriate technologies for each culture is key.

GAINING ACCEPTANCE FOR IT-INDUCED CHANGE

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.

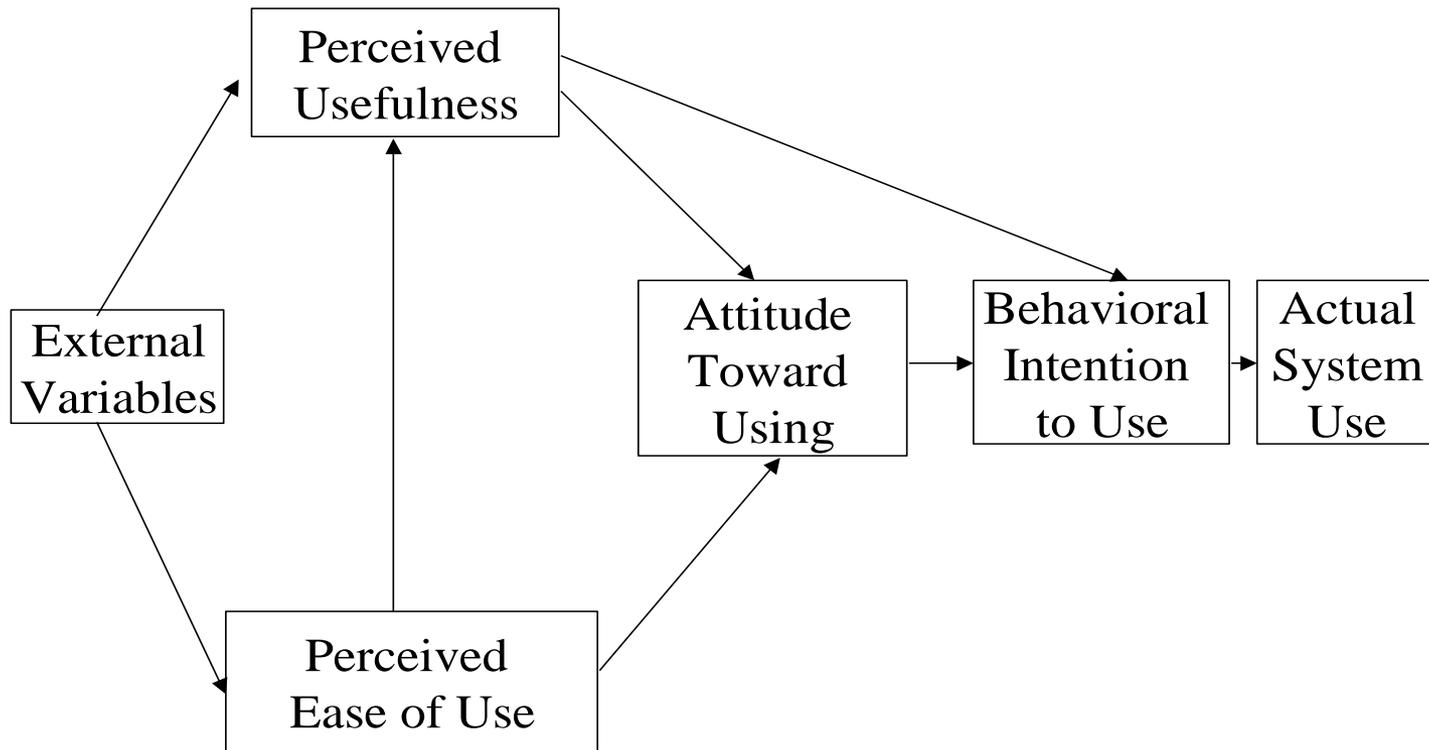


Figure 4.6 Technology Acceptance Model

**FOOD FOR THOUGHT:
SECURITY WITH REMOTE
WORKERS**

Security With Remote Workers

- VA laptop with sensitive, unencrypted information on more than 2.2 million active duty military personnel was stolen from a worker's home.
- Security policies and procedures must be clearly posted, communicated, and enforced.
- A policy should include those rules necessary to protect sensitive and proprietary data.
- It is impossible to make remote workers totally secure, but organizations must do their best to educate and support secure practices.

SUMMARY

Summary

- Technology has played a major role in transforming the way work is done.
- Virtual organizations permit workers to work from anywhere.
- Communication and collaboration is becoming increasingly important in today's work .
- IT affects work by creating new work, and more.
- Hiring and supervising employees is being driven more and more by technology.
- Companies must support and encourage telecommuting to attract and retain employees.
- Virtual teams are becoming more common.