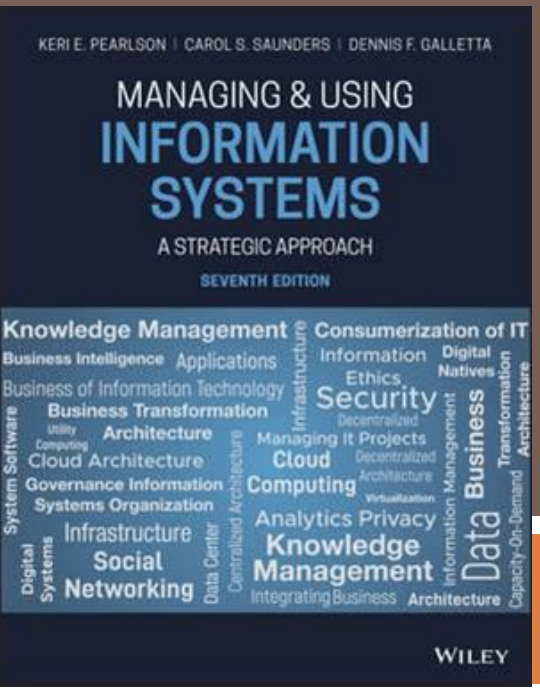
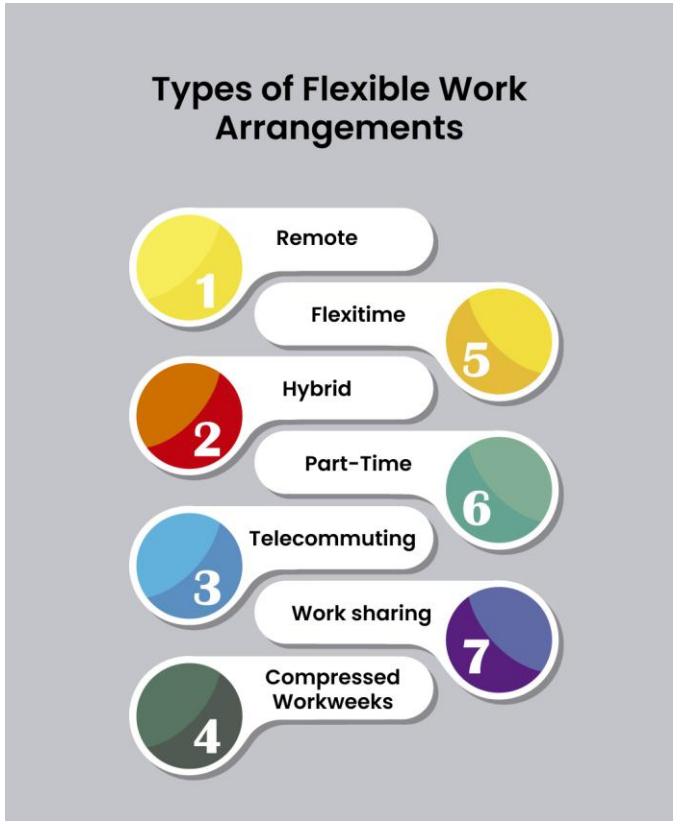
CHAPTER 4
DEGITAL SYSTEMS AND THE DESIGN OF WORK



Managing & Using Information Systems: A Strategic Approach (7th Edition), Pearlson, Saunders, & Galletta

Chapter Introduction

- Flexible work arrangements (유연근무제) made possible by remote work combined with collaboration, social, mobile, cloud, robotic, and analytic technologies have opened up dramatically different ways to work.
- This chapter explores the impact technology has on the nature and design of work.
- A Work Design Framework is used to explore how digital technology can be used effectively to support these changes and help make employees more effective.



Chapter Introduction

- In particular, this chapter discusses technologies to support:
  - Communication and collaboration,
  - New types of work,
  - New ways of doing traditional work,
  - New challenges in managing employees, and
  - Issues in working remotely, with robots and on virtual teams.
- It concludes with a section on change management.

CASE: American Express, “BlueWork”

- Consumer financial services powerhouse (최강 조직) American Express viewed workplace flexibility as a strategic lever.
- Its award-winning BlueWork program was a good example of turning strategic intent into action.
- In addition to receiving the Chairman's Award for Innovation (i.e., the Top Innovators Prize), the BlueWork program enabled increased employee productivity and more than $10 million in annual savings from reduced office space costs.

CASE: American Express, “BlueWork”

- BlueWork was Amex's term for arrangements for flexibility in workspace.
- Integrated into the company's human resource policies, the flexibility included staggered working hours (근무시간 시차제), off-site work areas such as home/virtual office arrangements, shared office space, touch-down (laptop-focused, temporary) space, and teleworking.
- The corporate focus is on results rather than on hours clocked in the office and face-to-face time.

➢ Stagger: to arrange (things) in a series of different positions or times

CASE: American Express, “BlueWork”

- But BlueWork also supported the sustainability and corporate social responsibility objectives.
- According to the Amex website,
  - *Our sustainable facilities story is also woven into the fabric of our employees' daily routine.*
  - *BlueWork, our flexible workplace program, allows American Express employees to better utilize company work space and work remotely.*
  - *The installation of 63 telepresence (원격현장감) studios in 46 office locations encourages virtual meetings, reduces the need for travel, and contributes positively to our carbon reduction target.*

CASE: American Express, “BlueWork”

Figure 4.0 Examples of Telepresence Studios

CASE: American Express, “BlueWork”

- Employees are assigned to a type of work arrangement based on their role.
  - Hub employees require a fixed desk because they work in the office every day.
  - Club employees can share time between the office and other locations because their roles involve both face-to-face and virtual meetings.
  - Home employees work from home at least three days a week.
  - Roam employees are on the road or at customer sites.

CASE: American Express, “BlueWork”

- Susan Chapman-Hughes, then Senior Vice President at American Express commented on the importance of technology's role in alternative work arrangements:
  - “Technology drives workplace flexibility .... Technology has become a strategic competency that drives revenue growth.
  - It's not just about enabling productivity.”

CASE: American Express, “BlueWork”

- How has BlueWork impacted the staff?
- In addition to the productivity improvements and savings in office expenses, overall employee satisfaction is up.
- American Express managers are happy with these arrangements too.

CASE: American Express, “BlueWork”

- They have found employees to be more engaged while working, more committed to the company, and better able to drive needed results.
- American Express has adopted one of the most accommodating (cooperative) approaches to work hours, but many employers allow their employees some flexibility in their work schedule.
- A third or more of IBM, Aetna, and AT&T employees have no official desks at the company.

CASE: American Express, “BlueWork”

- Communications giant Cisco, which has about 75,000 employees on six continents, uses technology-enabled flexible work practices such as telecommuting, remote work, and flex time.
- Sun Microsystems Inc. calculates that it has saved over $400 million in real estate costs by allowing nearly half of its employees to work anywhere they want.
- Even the U.S. Government has a flexible work program, Flexiwork, that enables eligible employees to do their job under alternative work arrangements such as working from home.

CASE: American Express, “BlueWork”

- The American Express example illustrates how the nature of work has changed -- and information technology (IT) is supporting, if not propelling, the changes.
- In preindustrial societies, work was seamlessly interwoven into everyday life.
- Activities all revolved around nature's cyclical rhythms (i.e., the season, day, and night; the pangs of hunger) and the necessities of living.

- Revolve around/round something: ~을 중심으로[~ 주위를] 돌다[회전하다]
- Pang: 갑자기 격렬하게 일어나는 육체적.정신적 고통.아픔

CASE: American Express, “BlueWork”

- The Industrial Revolution changed this.
- With the practice of dividing time into measurable, homogeneous units for which they could be paid, people started to separate work from other spheres of life.
- Their workday was distinguished from family, community, and leisure time by punching a time clock or responding to the blast of a factory whistle (공장의 사이렌).
- Work was also separated into space as well as time as people went to a particular place to work.

Work Design Framework

- Technology has now brought the approach to work full circle.
- Time and place of work are increasingly blending with other aspects of living.
- Employees can work at home via cyberspace and at times that accommodate home-life and leisure activities.
- Increasingly, places are being constructed in cyberspace using Web 2.0 tools that encourage collaboration.

IS Effect on How the Work is Done

- What work will be performed?
  - An assessment of specific desired outcomes, inputs, and the transformation needed to turn inputs into outcomes.
- Who is going to do the work?
  - Work can be automated.
  - If a person is going to do the work, what skills are needed?

IS Effect on How the Work is Done

- Where will the work be performed?
  - Does the work need to be performed locally at a company office?
- When will the work be performed?
- How can the acceptance of IT-induced change be increased?
  - How to leverage IT to improve work.
  - How to keep IT from inhibiting work.

IS Effect on How the Work is Done

- Figure 4.1 shows how these questions can be used in a framework to incorporate (include) technologies into the design of work.

➢ Incorporate
1. To include (something) as part of something else
2. To form into a corporation

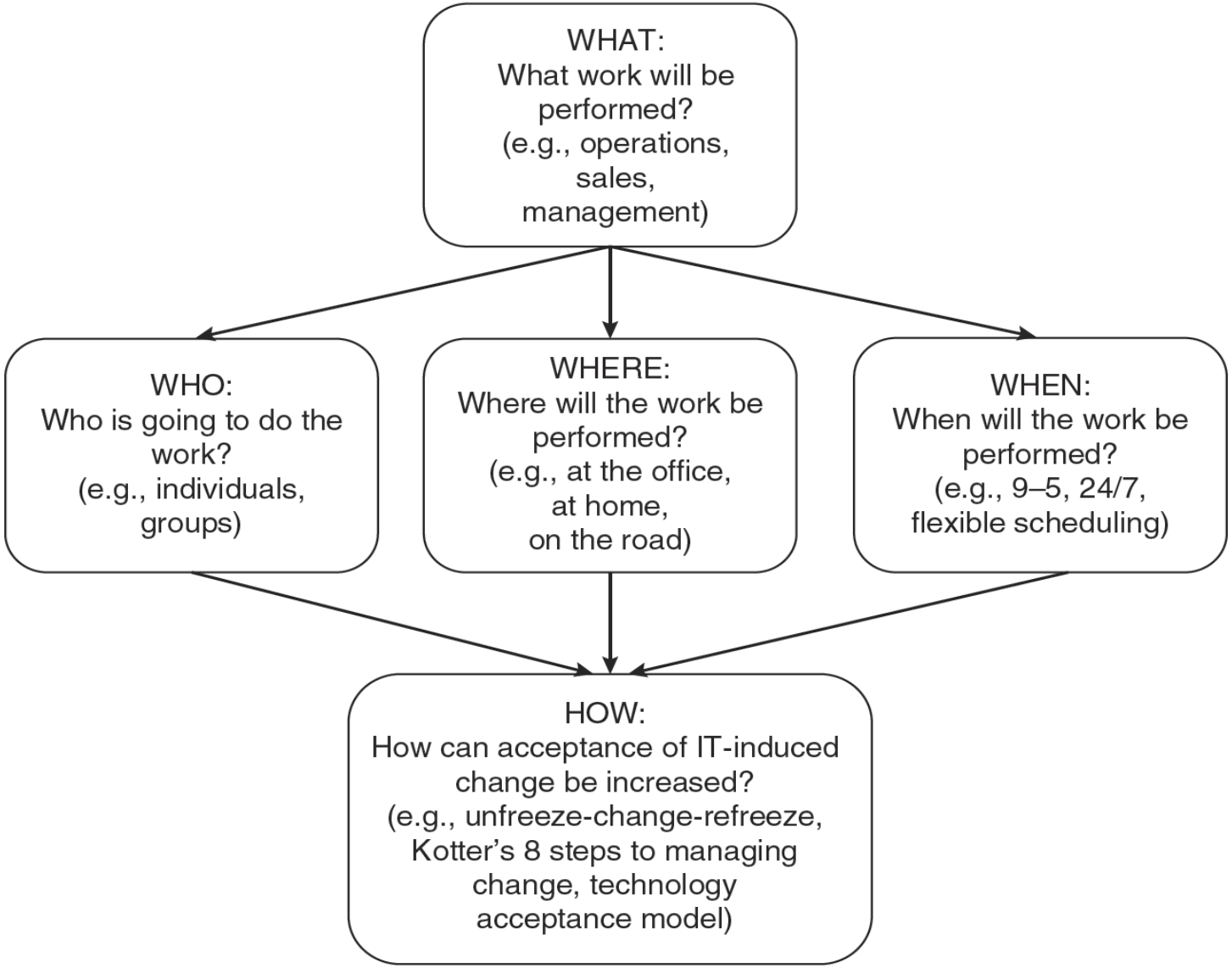


Figure 4.1 Framework for Work Design.

How IT Changes the Nature of Work

- The three ways in which new IT alters employee life:
  1. Creating new types of work.
  2. Enabling new ways to do traditional work.
     ① Changing the way work is done.
     ② Changing communication patterns.
     ③ Changing organizational decision making and information processing.
     ④ Changing collaboration.
     ⑤ Changing the way to connect.
  3. Supporting new ways to manage talent.

Creating New Types of Work

- IT often leads to the creation of new jobs or redefines existing ones.
- Positions in IT include:
  - Programmers, analysts, IT managers, hardware assemblers, website designers, software sales personnel, social media specialists, and IT consultants.
- New jobs such as:
  - Data scientists/data miners
  - Social media managers
  - Communications managers

Creating New Types of Work

- The Bureau of Labor Statistics (노동통계국) places the number of IT workers at 11.5 million.
- New types of jobs:
  - Knowledge managers - manage the firm's knowledge systems.
  - Community managers - manage the firm's online communities.
  - Communications managers - manage the use of communication technologies for the business.

Creating New Types of Work

- IS departments also employ:
  - Systems analysts, database administrators, network administrators, and network security advisors.
- Every department in every business has someone who “knows the computer” as part of his or her job.

New Ways to Do Traditional Work

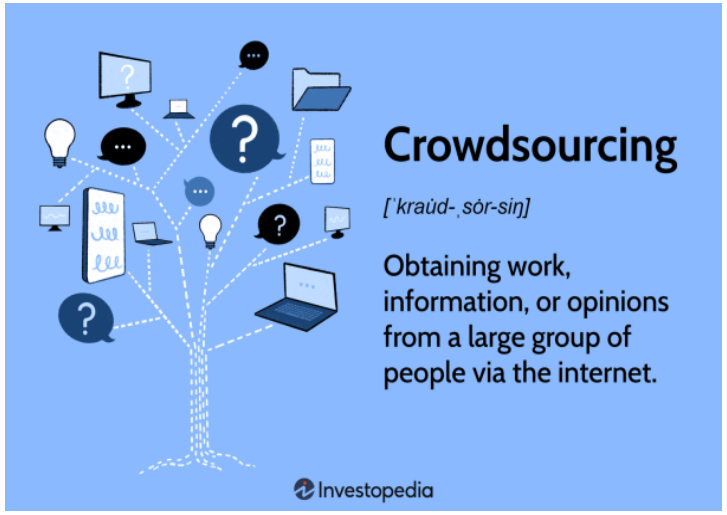
1. Changing the way work is done.
2. Changing communication patterns.
3. Changing organizational decision making and information processing.
4. Changing collaboration.
5. Changing the way to connect.

New Ways to Do Traditional Work (Changing the Way Work is Done)

- Many traditional jobs are now done by computers (i.e., using spell check instead of an editor).
- The introduction of IT into an organization can greatly change the day-to-day tasks performed by the employees.
- Data entry workflow is faster.
  - Data is captured directly when it is entered by the user via web-based entry, GPS (Global Positioning System) signal, RFID (Radio Frequency IDentification) code.
- The Internet enables changes in many types of work.

New Ways to Do Traditional Work (Changing the Way Work is Done)

- The cost and time required to access information has plummeted, increasing personal productivity and giving workers new tools.
- Broadens skills; faster but more tasks.
- Sometimes IT disconnects us from the tasks.
- Sometimes people can perform more strategic tasks.
- Few staff are engaged in order entry any longer.
- Crowdsourcing (Crowd + Outsourcing) is now possible at very low cost.



New Ways to Do Traditional Work (Changing Communication Patterns)

- Cell phones and other portable communication devices have changed our communication environment.
  - Talking on the cell phone, texting, and using apps to search for information.
- Applications (apps) such as Skype, Twitter, and Sina Weibo (Chinese Twitter) have changed how people communicate.
- IT is changing the communication patterns of workers.

New Ways to Do Traditional Work (Changing Communication Patterns)

- Some workers do not need to communicate with their co-workers for the bulk of the workday.
- Some workers need access to up-to-date information and communications between co-workers, customers, and suppliers.
- More asynchronous and more irregular.
- Social networking has provided new opportunities for customer interaction.
- Collaboration allows a firm to look “big” with new tools.

New Ways to Do Traditional Work
(Changing Organizational Decision Making and Information Processing)

- IT changes not only the decision making process but also 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 (e.g., RSS/web feed), information that employees need to do their job can be pushed to them.
  - RDF (Resource Description Framework) Site Summary
  - Rich Site Summary
  - Really Simple Syndication

New Ways to Do Traditional Work
(Changing Organizational Decision Making and Information Processing)

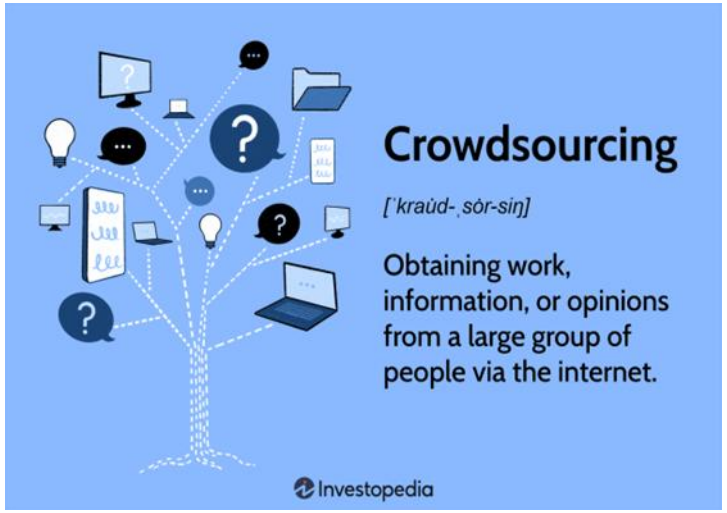
- IT can change the amount and type of information available to workers.
- IT has increased the flow of information to upper level management, reducing the ranks of middle managers.
  - Middle management ranks have shrunk by the 1980s as Leavitt/Whisler predicted in 1958 HBR article.
- Real-time information; more information available.
- Data mining can identify new insights.
- Ideas can be gleaned (gathered) from social networks.

New Ways to Do Traditional Work (Changing Collaboration)

- Teams work more fluidly despite an increasing workload.
- Teams have learned to collaborate by continually structuring and re-structuring their work.
- IT helps make work more team-oriented and collaborative via:
  - Blogs, virtual worlds, wikis, social networking, and video teleconferencing.
- Workers can more easily share information with their teammates.

New Ways to Do Traditional Work (Changing Collaboration)

- The Internet greatly enhances collaboration—especially through e-mail, instant messaging, and Web 2.0 technologies.
- Work is now more team oriented; more collaborative.
- Sharing is easier than ever, using multiple methods.
- Crowdsourcing (Crowd + Outsourcing) can now provide quick answers from tens, hundreds, or even thousands of people.
- We now can disconnect PLACE and TIME (Figure 4.2).



New Ways to Do Traditional Work (Changing Collaboration)

	Team Works at the Same Time	Team Works at Different Time
Team Works in the Same Place	• Face-to-face meetings • Meeting room technologies • Document sharing systems (wikis) • Team collaboration software suites	• Electronic bulletin boards • Document sharing systems (wikis) • Team collaboration software suites
Team Works in Different Places	• Video conferencing • Chat rooms • Texting (SMS) and instant messaging (IM) • Document sharing systems (wikis) • Team collaboration software suites	• E-mail • Microblogs (e.g. Twitter) • Texting (SMS) and instant messaging (IM) • Document sharing systems (wikis) • Team collaboration software suites

Figure 4.2 Collaboration Technologies Matrix: Examples of Key Enabling Technologies.

New Ways to Do Traditional Work (Changing the Ways to Connect)

- New technologies enable people to be always connected.
- The boundaries between work and play are being blurred, and people often struggle with work-life balance.
- Technology at home differs from that at work:
  - Home: People use social media tools on tablets, laptops, and smart-phones.
  - Work: Computers have limited Internet connectivity.

New Ways to Do Traditional Work (Changing the Ways to Connect)

- CIOs have the ability to drastically improve productivity by making directories of knowledge-holders available through newer social media tools.
- IS can greatly change day-to-day tasks, which in turn change the skills needed by workers.

New Ways to Manage People

- New challenges in how workers are supervised, evaluated, compensated, and hired.
- Three Types of formal control:
  - Behavior controls – direct supervision.
  - Outcome controls – examining outcomes not actions.
  - Personnel controls – pick the right person for the task.
- The digital approach provides new opportunities at any of those three levels.
  - Figure 4.3

New Ways to Manage People

	Traditional Approach: Subjective Observation	Digital Approach: Objective Assessment
Supervision	• It is personal and informal. • Manager is usually present or relies on others to ensure that the employee is present and productive.	• It is electronic or assessed by deliverables. • As long as the employee is producing value, he or she does not need direct formal supervision.
Evaluation	• Behavior controls are predominant. • Focus is on process through direct observation. • Manager sees how employee performs at work. • Subjective (personal) factors are very important	• Outcome controls are predominant. • Focus is on output by deliverable (e.g., produce a report by a certain date) or by target (e.g., meet a sales quota). • Fewer subjective measures are used.

Figure 4.3.1 Changes to Supervision, Evaluations, Compensation, and Hiring

New Ways to Manage People

	Traditional Approach: Subjective Observation	Digital Approach: Objective Assessment
Compensation And Rewards	• It is often individually based.	• It is often team based or contractually spelled out (상세히 설명하다).
Hiring	• Hiring is done through meetings with HR personnel with little concern for computer skills	• It is often electronic with recruiting Web sites and electronic testing for more information-based work that requires a higher level of IT skills.

Figure 4.3.2 Changes to Supervision, Evaluations, Compensation, and Hiring

Where Work Is Done and Who Does It: Mobile and Virtual Work Arrangements

- This section examines another important effect of IT on work.
  - The ability of some employees to work anywhere at any time.
- With wi-fi (short for "wireless fidelity" but more commonly used to refer to popular wireless networking technology) virtually ubiquitous, individual employees can connect to the web from almost anywhere.
- And with powerful technologies available in the consumer space, employees often find that the tools and apps they have at home function as well as, or even better than, their workplace technologies.

Remote Work and Virtual Teams

- Much work can be done anywhere, anytime.
- People desire the flexibility.
- Telecommuting = teleworking = working from home or even in a coffee shop.
- Mobile workers work from anywhere (often while traveling).
- Remote workers = telecommuters + mobile workers.
- Virtual teams include remote workers as well as those in their offices, perhaps scattered geographically.
  - Virtual teams have a life cycle.
  - Figure 4.4

Phase	Preparation	Launch	Performance Management	Team Development	Disbanding
Key Activities	• Mission statement • Personnel selection • Task design • Rewards system • Technology selection and installment	• Kick-off meeting • Getting acquainted • Goal clarification • Norm development	• Leadership • Communication • Conflict resolution • Task accomplishment • Motivation • Knowledge management • Norm enforcement and shaping	• Assessment of needs/deficits • Individual and/or team training • Evaluation of training effects • Trust building	• Recognition of achievements • Re-integration of team members

Figure 4.4 Key Activities in the Life Cycle of Virtual Teams.

Remote Work and Virtual Teams

- A poll of 11,300 employees in 22 countries
  - 1 in 6 (17%) telecommute.
- When employees in 13 countries were asked if they need to be in the office to be productive:
  - Overall 39% said "yes".
  - But specific countries differed in the "yes" votes:
    - Only 7% in India, but
    - 56% in Japan
    - 57% in Germany
  - Figure 4.5

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 employees with the ability to stay connected to co-workers and customers and to access work-related apps, even on a 24/7 basis.
• Energy concerns	• Reduces the cost of commuting for telecommuters. • Reduces energy costs associated with real estate for companies.

Figure 4.5 Driving Factors of Remote Work and Virtual Teams

Advantages of Remote Working	Potential Problems
• Reduced stress due to increased ability to meet schedules and to have fewer work-related distractions	• Increased stress from inability to separate work life from home life
• Higher morale; lower absenteeism	• Harder for managers to evaluate and communicate about performance
• Geographic flexibility for worker; capitalization on distant expertise for organization	• Employee may become disconnected from company culture
• Higher personal productivity	• Lack of suitability for all jobs or employees
• Inclusion of housebound individuals in the workforce	• Telecommuters are more easily replaced by offshore workers
• Very informal dress is acceptable	• Harder to achieve high security

Figure 4.6 Some Advantages and Disadvantages of Remote Work

Remote Work and Virtual Teams

- Virtual Teams: geographically and/or organizationally dispersed coworkers:
  - Assembled using telecommunications and IT.
  - Aim is to accomplish an organizational task.
  - Often must be evaluated using outcome controls.
- Why are they growing in popularity?
  - Information explosion: some specialists are far away.
  - Enhanced bandwidths/fast connections to outsiders.
  - Technology is available to assist collaboration.
  - Less difficult to get relevant stakeholders together.

Remote Work and Virtual Teams

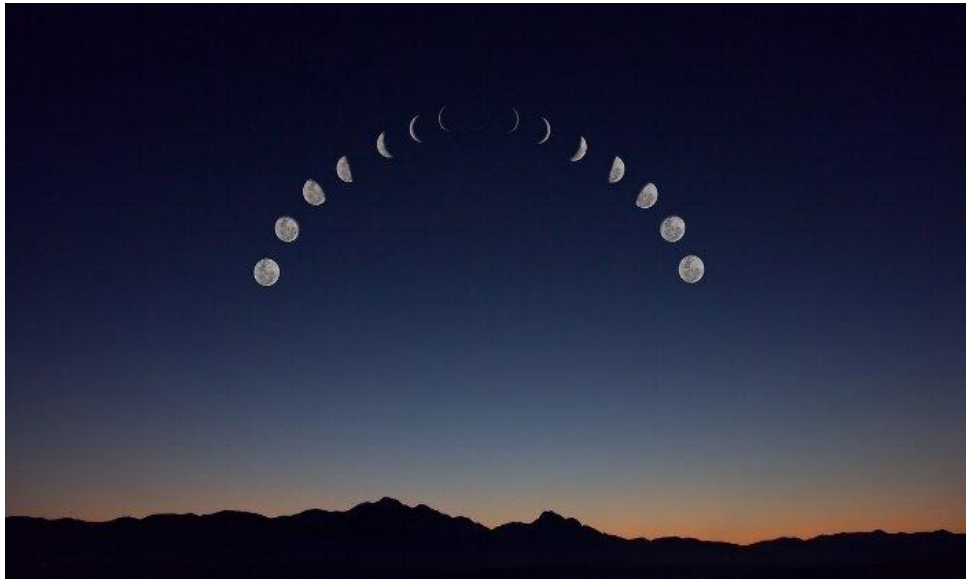
- Virtual teams can benefit from Following the Sun.
  - Teams in different parts of the world can cooperate to get work done faster due to time zone differences.

Remote Work and Virtual Teams

- Virtual teams can benefit from Following the Sun.
  - One classic example of this can be found in software development.
    - ✓ London members of a virtual team of software developers at Tandem Services Corporation initially code a project and transmit its code each evening to a U.S. team for testing.
    - ✓ The U.S. team forwards the tested code to Tokyo for debugging.
    - ✓ London team members start their next day with the code debugged by the Japanese team, and another cycle is initiated.

Remote Work and Virtual Teams

- Following the Moon
  - Scheduling work to be performed specifically during local night-time hours in order to, for instance, save on datacenter costs by using cheaper night-time electricity or spare processing power.



Remote Work and Virtual Teams

- There are some clear disadvantages to virtual teams.
- For example, different time zones, although helpful when following the sun, can work against virtual team members when they are forced to stay up late or work in the middle of the night to communicate with team members in other time zones.
- There also are a considerable number of challenges that if not correctly managed could tum into disadvantages.
- A summary of these challenges in comparison with more traditional teams can be found in Figure 4.7.

Issue	Virtual Teams (VT) Challenges	Co-located Teams Comparison
Communication	• Difficulties in terms of scheduling meetings and interactions • Increased inefficiencies when passing work between time zones • Altered communication dynamics such as facial expressions, vocal inflections, verbal cues, and gestures	• Collocated in same time zone • Scheduling is less difficult. • Use of richer communication media, including face-to-face discussions
Technology	• Need for proficiency across wide range of technologies • Automatic creation of electronic repository to build organizational memory • Need for ability to align group structure and technology with the task environment	• Support for face-to-face interaction without replacing it • Electronic communication skills not needed by team members • Task technology fit less critical
Team Diversity	• Harder to establish a group identity • Require better communication skills • More difficult to build trust, norms, and shared meanings about roles because team members have fewer cues about their teammates' performance • More likely to have different perceptions about time and deadlines	• Group identity easier to create • Easier communication among members

Figure 4.7 Challenges Facing Highly Virtual Teams in Comparison to Co-located Teams.

Managing Remote Workers and Virtual Teams

- 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.

Managing Communication Challenges

- Policies and practices must support the work arrangements.
- Must prepare differently for meetings.
- Slides and other electronic material must be shared beforehand.
- Soft-spoken people are difficult to hear; managers must repeat key messages.
- Frequent communications are helpful (hard to “over-communicate”).

Managing Technology Challenges

- Provide technology and support to remote workers.
- Use high quality web conferencing applications.
- Clarify time zones for scheduling.
- Information should be available for everyone (cloud storage can help).
- Policies and norms about use of the technology can be important.

Managing Diversity Challenges

- Concept of time differs throughout the world.
  - Anglo-American cultures view time as a continuum (deadlines are important; many prefer not to multitask).
  - Indian cultures have a cyclical view of time (deadlines are less potent; many prefer to multitask).
- Team diversity might need nurturing:
  - Communications differences
  - Trust building
  - Group identity formation

Robots in the Workplace

- A robot is "a reprogrammable, multifunctional manipulator designed to move material, parts, tools, or specialized devices through variable programmed motions for the performance of a task."
- Advantages
  - They can perform tasks that are "dangerous, dirty, or dull".
  - They can lift and move heavy objects and place them with an accuracy within minute fractions of a millimeter.
  - They can reliably perform boring tasks over and over again-with enviable consistency.
  - Their capabilities are increasing in terms of variability and complexity at the same time that their price tag is dropping.

Robots in the Workplace

- Disadvantages
  - Most notably in relation to safety, integration into the workplace, and negative impact on human jobs.
  - Robots cannot just be placed on factory floor and expected to immediately start generating savings.
    - ✓ Rather, employees need to learn to work with and around them.
  - The fear that they will generate massive job losses and contribute to a growing economic divide.

Robots in the Workplace: Amazon

- Amazon has over 100,000 robots worldwide in its warehouses.
- The robots pick and move the inventory needed to fill customer orders.
- The Amazon warehouses that use robots have realized a 50% increase in storage efficiency.
- Robots have also dramatically increased the efficiency of the humans at these warehouses.

Robots in the Workplace: Amazon

- Despite initial concerns, Amazon has not laid off any workers (though robots and its automated systems have triggered layoffs in the retail sector).
- In fact, a number of high-skilled jobs (e.g., designing and training the robots) and middle skilled jobs (repairing the robots) have been created.
- Robots rule the core of the Amazon warehouse while humans have learned to "dance seamlessly" around them on the periphery of the facility.

Gaining Acceptance for IT-induced Change to Work

- Many changes might be a major concern for employees.
- Changes might be resisted if they are viewed as negative impacts.
- Several types of resistance:
  - Denying that the system is up and running.
  - Sabotage by distorting or otherwise altering inputs.
  - Believing and/or spreading the word that the new system will not change the status quo.
  - Refusing to use the new system (if voluntary).

Managing Change

- To avoid resistance behavior, John Kotter builds upon Lewin's change model of unfreezing, changing, and refreezing.
- Kotter recommends eight specific steps in bringing about change.
  - Figure 4.8

Lewin's Stage	Unfreezing	Changing (Moving)	Refreezing
Definition	Creating motivation to change	Providing stakeholders with new information, systems, products, or services	Reinforcing change by integrating stakeholder's changed behaviors and attitudes into new operations resulting from change
Kotter's Stage	1. Establish a sense of urgency: Create a compelling reason why change is needed. 2. Create the guiding coalition: Select a team with enough expertise and power to lead the change. 3. Develop a vision and strategy: Use the vision and strategic plan to guide the change process. 4. Communicate the change vision: Devise and implement a communication strategy to consistently convey the vision.	5. Empower broad-based action: Encourage risk-taking and creative problem solving to overcome barriers to change. 6. Generate short-term wins: Celebrate short-term improvements and reward contributions to change effort. 7. Consolidate gains and produce more change: Use credibility from short-term wins to promote more change so that change cascades throughout the organization.	8. Anchor new approaches in the culture: Reinforce change by highlighting areas where new behaviors and processes are linked to success.

Figure 4.8 Stages and Steps in Change Management.

Managing Change

그림 1 커트 레빈의 변화 관리 3단계 모델

- 현재 상태를 유지하려는 힘이 약화되고 변화 추진력과 저항력 사이의 균형이 파괴
- 새롭게 요구되는 사고 및 행동 방식과 기존 방식과 차이에 대한 인식 확산

- 변화에 대한 믿음, 지지, 지원이 표출되고 새로운 조치가 행동으로 나타나고 새로운 단계로 이동

- 새로운 가치관이 인정되고 변화된 행동이 반복됨으로써 조직 및 직무 안정화
- 모든 업무에 변화가 정착되고 내면화되어 구성원들의 자신감 확산

자료 : Don Hellriegel & John W. Slocum, Organizational Behavior, SOUTH-WESTERN CENGAGE Learning, 2011

Managing Change

그림 2 존 코터의 변화 관리 8단계 프로세스

❶ 위기 의식 고조	- 상황이 긴급하다는 사실을 절실히 느끼게 함으로써 실천적 행동 유도
❷ 변화선도팀 구성	- 능력과 기업에 대한 애착을 가진 사람들로 지도자 그룹 형성
❸ 올바른 비전 정립	- 나갈 방향에 대한 큰 그림(비전)과 이를 이루기 위한 전략 수립
❹ 소통과 비전 전달	- 조직 구석구석에 반복적으로, 솔선수범을 통해 비전 전파
❺ 권한 부여	- 직원들이 넓은 범위에서 의사결정권을 가지도록 과감한 임파워먼트
❻ 단기성과 확보	- 단기적으로 눈에 보이는 성공체험으로 사기 진작과 도전적 열정 자극
❼ 변화의 속도 유지	- 성공에 대한 자만과 안주를 경계하고 후속 변화 과제 도전
❽ 변화를 기업문화로 정착	- 위의 일곱 단계가 확고한 조직 문화로 정착되도록 함

자료 : John P. Kotter, Leading Change, HBR Press, 1996

Managing Change

- Managers should:
  - Keep the eight steps in mind as they introduce change into their workplaces.
  - Inform workers why the change is being made prior to the change happening.
  - Follow the change with reinforcement behaviors.
  - Reward employees who have successfully adopted new desired behaviors.

Technology Acceptance Model and Its Variants

- The Technology Acceptance Model (TAM) was developed by Fred Davis and his colleagues (Figure 4.9).

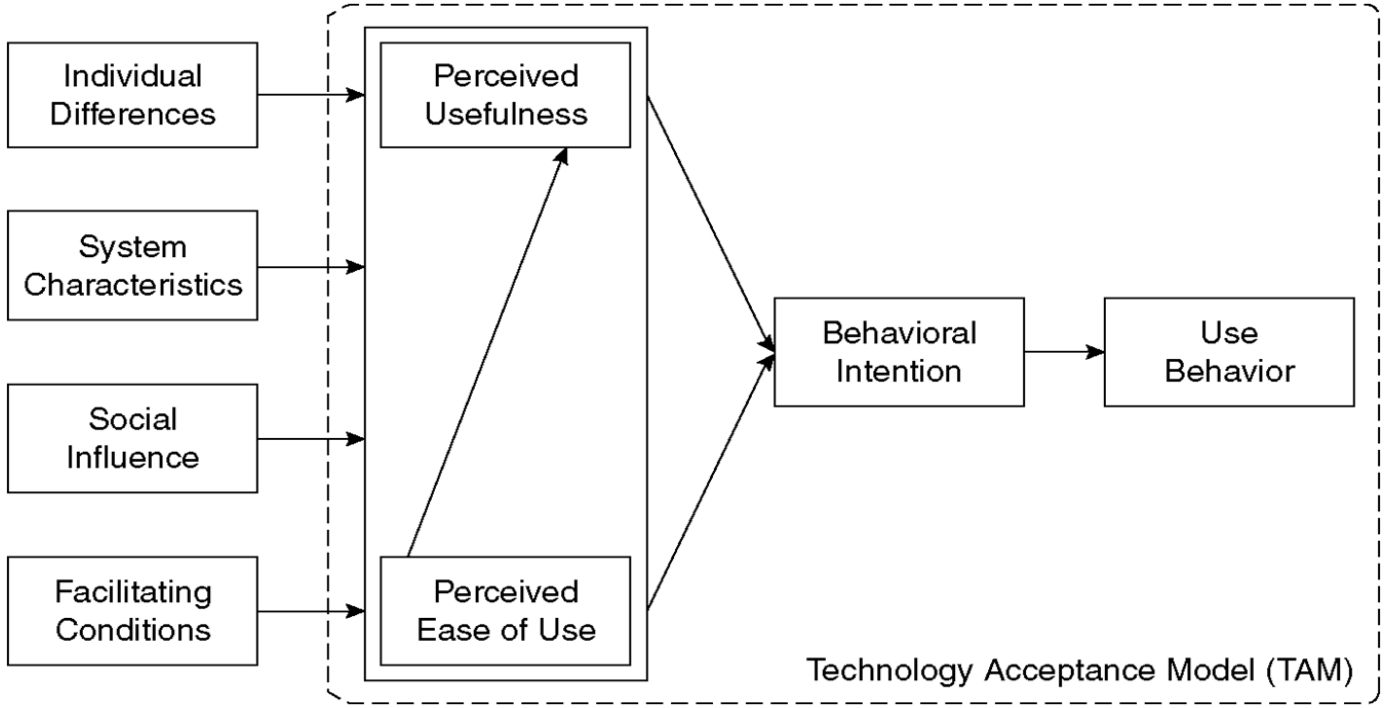


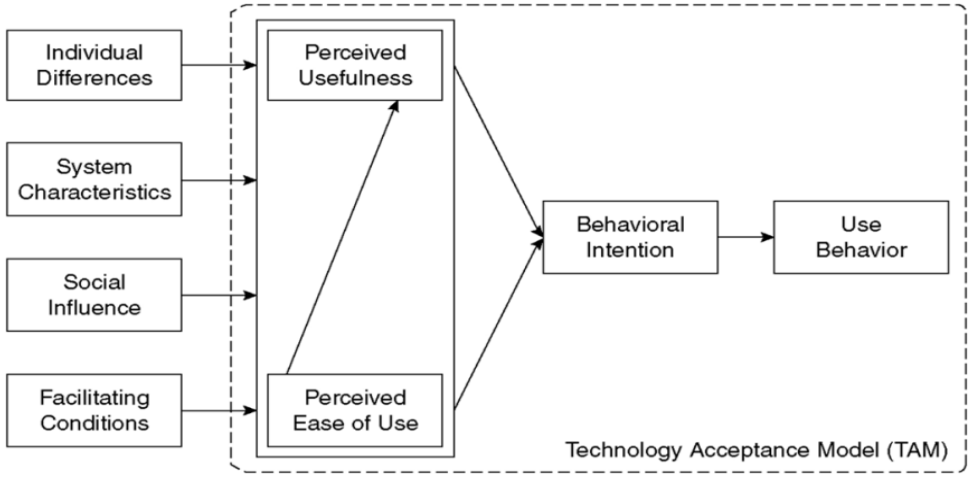
Figure 4.9 Simplified Technology Acceptance Model 3 (TAM3)

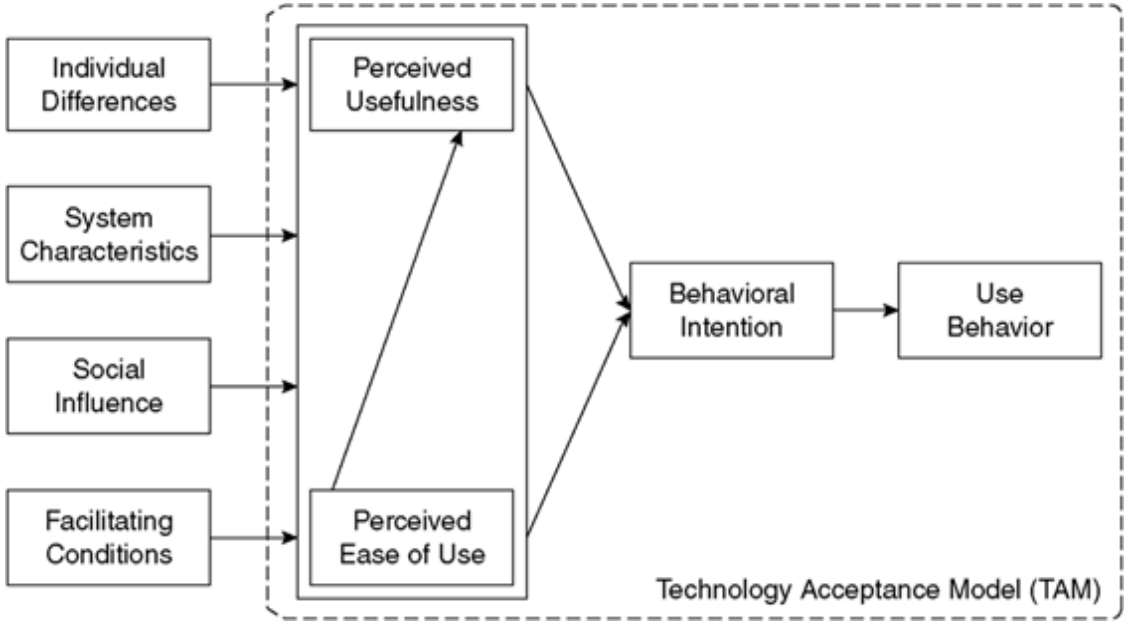
Technology Acceptance Model and Its Variants

- TAM suggests that managers cannot get employees to use a system until they want to use it.
- Managers may need to employ unfreezing tactics to change employee attitudes about the system.
- Employee attitudes may change if:
  - They believe the system will allow them to do more or better work for the same amount of effort (perceived usefulness: PU).
  - They believe the system is easy to use (perceived ease of use: PEU).

Technology Acceptance Model and Its Variants

- Individual difference variables include personality and/or demographics (e.g., traits or states of individuals, gender, and age) that can influence individuals' perceptions of perceived usefulness and perceived ease of use.
- System characteristics are those salient features (e.g., output quality, job relevance) of a system that can help individuals develop favorable (or unfavorable) perceptions regarding the usefulness or ease of use of a system.



Technology Acceptance Model and Its Variants

- Social influence captures various social processes and mechanisms (e.g., subjective norms) that guide individuals to formulate perceptions of various aspects of an IT.
- Facilitating conditions represent organizational support (e.g., top management support) that facilitates the use of an IT.