CHAPTER 4
SYSTEM USERS AND DEVELOPERS

Management Information Systems, 10th edition,
By Raymond McLeod, Jr. and George P. Schell
© 2007, Prentice Hall, Inc.

http://www.dedent08m.wordpress.com

Learning Objectives:

• Learn that the organizational context for systems development and use is changing from a physical to a virtual structure.
• Recognize the benefits and disadvantages of the virtual office and the virtual organization.
• Know who the information specialists are and how they can be integrated into an information services organization.
• Be alerted to new directions that the information services organization might take.
• Understand what is meant by end-user computing and why it came about.

http://www.dedent08m.wordpress.com
Learning Objectives (cont.):

- Appreciate that users, especially those with an end-user computing capability, are a valuable information resource.
- Know the benefits and risks of end-user computing.
- Be aware of the types of knowledge and skill that are important to systems development, practiced by both end-users and information specialists.
- Understand knowledge management and the challenges that must be addressed for successful implementation.
- Be aware of the special constraints that face developers of global information systems.

Introduction

- The first office automation applications were mostly designed for secretarial and clerical tasks; but soon spread to managerial and professional ranks, leading eventually to the virtual office.
- As firms evaluated the advantages and disadvantages of centralized and decentralized IS organizations, three structures were identified: the partner, platform, and scalable models.
- Systems development is an evolving activity, with the organizational setting and the roles played by the users and information specialists constantly changing.
THE BUSINESS ORGANIZATION

- Information systems have been developed to support all organizational levels (Figure 4.1)
- At the strategic level, executive information systems are used by the firm's top managers
- An MIS is designed to meet the information needs of managers throughout the firm
- At the lowest, operational level systems are designed to meet the firm’s day-to-day information needs in those business areas
OFFICE AUTOMATION

- **OA** includes all of the formal and informal electronic systems primarily concerned with the communication of information to and from persons inside and outside the firm.
- Figure 4.2 shows an OA model of computer- and non-computer-based applications used by a firm.
- Innovations in IT made it possible for many firm activities to be conducted independent of their location.
- This is called a *virtual organization*, and evolved out of office automation.

http://www.dedent08m.wordpress.com
A Shift from Clerical to Managerial Problem Solving

• The first OA applications supported secretarial and clerical personnel
• As managers and professionals became more computer literate they learned to use the computer applications in problems solving
• They began using e-mail to communicate, electronic calendaring to schedule meetings, video conferencing to link problem solvers over a wide geographical area, and so on
• OA applications have also been extended by such technologies as hand held computers and PDAs

Figure 4.3 PDAs Provide a Wireless Communication Ability.

Source: Photograph of the Palm 6705 Handheld printed with permission.

http://www.dedent08m.wordpress.com
THE VIRTUAL OFFICE

• Evidence of the virtual office began to emerge during the 1970s as low-priced microcomputers and communications equipment made it possible for individuals to work at home
• At the time, the term teleprocessing was used, later the term telecommuting was introduced to describe how employees could electronically “commute” to work

http://www.dedent08m.wordpress.com

Advantages and Disadvantages of Telecommuting

• **Advantages:**
  – Provides employees with scheduling flexibility so that personal tasks can also be accommodated
  – Firms typically pay more attention to communications needs of telecommuters

• **Disadvantages:**
  – Employees can develop a sense of not belonging
  – Employees can get the idea that they are expendable
  – The division between home and office responsibilities can become blurred

http://www.dedent08m.wordpress.com
Hoteling

- The concept of “hoteling” is for the firm to provide a “sharable” central facility that employees can use as the need for office space and support rises and falls
- The guiding principles for hoteling include:
  - Design the spaces for functional needs
  - Similar sized offices are built
  - Centralized storage space is provided
  - Fewer enclosed office spaces
  - Assigned offices spaces are eliminated

http://www.dedent08m.wordpress.com

Advantages and Disadvantages of Telecommuting

- Advantages:
  - Reduced facility cost
  - Reduced equipment cost
  - Reduced work stoppages
  - Social contribution
- Disadvantages
  - Low morale
  - Fear of security risks
- The virtual office demands cooperation by both the firm and the employees if it is to succeed

http://www.dedent08m.wordpress.com
THE VIRTUAL ORGANIZATION

- In a virtual organization, firm operations are designed so they are not tied to physical locations.
- Industries that are the most attracted to these concepts are those that add value in the form of: information, ideas and intelligence.
- Such as: education, health care, entertainment, travel, sports, and consulting.
- Workers in this “3I Economy” need to have the knowledge and skills required to succeed as IT and information systems are included in business processes.

http://www.dedent08m.wordpress.com

THE INFORMATION SERVICES ORGANIZATION

Require
- The Information Resources
- The Information Specialists
- Systems Analysts
- Database Administrators
- A Webmaster
- Network Specialists
- Programmers
- Operators
- A structure that is typical of a centralized operation is illustrated in Figure 4.4

http://www.dedent08m.wordpress.com
THE INFORMATION SERVICES ORGANIZATION

- Information services organizations usually require:
  - The Information Resources
  - The Information Specialists
  - Systems Analysts
  - Database Administrators
  - A Webmaster
  - Network Specialists
  - Programmers
  - Operators

- Figure 4.4 shows the structure of a typical information services organization

---

**Figure 4.4** An Organizational Structure for a Firm’s Centralized Information Services Unit

http://www.dedent08m.wordpress.com
Innovative Organizational Structures

• During the 1990s, large firms sought to achieve a "centrally decentralized" organizational structure

• Three innovative organizational structures that have since been identified are:
  – the **partner model**;
  – the **platform model**; and
  – the **scalable model**

• Whereas the organizational structure in Figure 4.4 illustrates how the *information specialists* are grouped, the innovative structures show how the *IT functions* are grouped

---

Three Innovative Structures

• **The Partner Model (Figure 4.5):** IT coordinates business areas to achieve value innovation and accomplish delivery of solutions

• **The Platform Model (Figure 4.6):** IT provides the networks so that innovation can be accomplished by the business areas

• **The Scalable Model (Figure 4.7):** shows that two sourcing networks are utilized to interface with vendors when engaging in infrastructure management and solutions delivery within a flexible structure
Figure 4.5 The Partner Model

Figure 4.6 The Platform Model

Source: Adapted from Rita Archbold and V. Subramaniam, "Patterns and Models for Organizing the IT Function," MIS Quarterly Executive Volume 1, Number 1 (March 2002), pp. 1–16.
What All Three Models Share

- All three models recognize that the IT function is not a self-contained unit, but interfaces with both users and vendors
- Responsibilities for certain functions must be allocated to specialists such as divisional information officers and account managers
- All three models reflect an effort to make the IT unit a team player in the firm's use of information resources sharing and delegating functions when it is best for the firm

http://www.deden08m.wordpress.com
END-USER COMPUTING

- The first Information Systems were developed with IT specialists doing all of the work for the users (Figure 4.8)
- In the late 1970s, users began developing their own computer applications
- End-user computing evolved out of four main influences
  1. The impact of computer education
  2. The information services backlog
  3. Low-cost hardware
  4. Prewritten software
- In Figure 4.9 the end-user relies on the information specialists for some degree of support

**Figure 4.8** The Traditional Communication Chain (note that Webmaster could be considered a Network specialist in the traditional communication chain)
USERS AS AN INFORMATION RESOURCE

- In deciding how the firm will use its information resources, management must consider how end-user computing will be conducted, so as to maximize the benefits and minimize the risks
Benefits and Risks of End-User Computing

**Benefits:**
- Match Capabilities and Challenges
- Reduce Communications Gap

**Risks:**
- Poorly Aimed Systems
- Poorly Designed and Documented Systems
- Inefficient Use of Information Resources
- Loss of Data Integrity
- Loss of Security
- Loss of Control

http://www.dedent08m.wordpress.com

---

**SYSTEMS DEVELOPMENT KNOWLEDGE AND SKILL**

- The development of information systems requires certain knowledge and skills
- It is possible to identify not only the types of knowledge and skill needed by information specialists and users, but also how users can be divided into general management and their staff
- Table 4.1 identifies the types of knowledge needed and whether they are of major, intermediate, or minor importance
- In the same way, we can identify different types of skills and their relative importance (Table 4.2)

http://www.dedent08m.wordpress.com
### Table 4.1

**Knowledge Requirements**

<table>
<thead>
<tr>
<th>KNOWLEDGE</th>
<th>GENERAL MANAGEMENT</th>
<th>PROFESSIONAL STAFF</th>
<th>CLERICAL STAFF</th>
<th>INFORMATION SPECIALISTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPUTER LITERACY</td>
<td>Minor</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Major</td>
</tr>
<tr>
<td>INFORMATION LITERACY</td>
<td>Major</td>
<td>Major</td>
<td>Intermediate</td>
<td>Major</td>
</tr>
<tr>
<td>BUSINESS FUNDAMENTALS</td>
<td>Major</td>
<td>Major</td>
<td>Minor</td>
<td>Intermediate</td>
</tr>
<tr>
<td>SYSTEMS THEORY</td>
<td>Minor</td>
<td>Intermediate</td>
<td>Minor</td>
<td>Major</td>
</tr>
<tr>
<td>SYSTEMS DEVELOPMENT</td>
<td>Intermediate</td>
<td>Minor</td>
<td>Minor</td>
<td>Major</td>
</tr>
<tr>
<td>SYSTEMS MODELING</td>
<td>Minor</td>
<td>Major</td>
<td>Minor</td>
<td>Major</td>
</tr>
</tbody>
</table>

[http://www.dedent08m.wordpress.com](http://www.dedent08m.wordpress.com)

### Table 4.2

**Skill Requirements**

<table>
<thead>
<tr>
<th>SKILL</th>
<th>GENERAL MANAGEMENT</th>
<th>PROFESSIONAL STAFF</th>
<th>CLERICAL STAFF</th>
<th>INFORMATION SPECIALISTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMMUNICATIONS</td>
<td>Major</td>
<td>Major</td>
<td>Intermediate</td>
<td>Major</td>
</tr>
<tr>
<td>ANALYTICAL ABILITY</td>
<td>Intermediate</td>
<td>Major</td>
<td>Intermediate</td>
<td>Major</td>
</tr>
<tr>
<td>CREATIVITY</td>
<td>Intermediate</td>
<td>Major</td>
<td>Intermediate</td>
<td>Intermediate</td>
</tr>
<tr>
<td>LEADERSHIP</td>
<td>Major</td>
<td>Minor</td>
<td>Minor</td>
<td>Intermediate</td>
</tr>
</tbody>
</table>

[http://www.dedent08m.wordpress.com](http://www.dedent08m.wordpress.com)
Knowledge Management

- This knowledge relates to the firm’s processes, technology, management, and interactions with its environmental elements
- Firms are embarking on projects to develop knowledge management systems for the purpose of achieving a competitive advantage
- Firms typically regard KM as another type of system to be developed as an IS that gathers knowledge, stores it and makes it available to users
- Table 4.3 lists the challenges that must be faced by firms in developing KM systems

http://www.dedent08m.wordpress.com
A Successful KM Development Project at Nortel Networks

- Nortel Networks (using knowledge management software from Excalibur Technologies) credits its pilot KM project with enabling its transformation from a technology-focused company to one that is opportunity/customer-focused.

- The old new product development system illustrated in Figure 4.10 consisted of a five-phase process.

- The new project involved an NPD system that enabled Nortel to:
  - leverage multidisciplinary NPD knowledge assets;
  - improve NPD decision making; and
  - facilitate learning and knowledge exchange.

![Figure 4.10 The Original Nortel Networks New Product Development System](http://www.deden08m.wordpress.com)
CHALLENGES IN DEVELOPING GLOBAL INFORMATION SYSTEMS

- **GIS** describes the information system used by multinational companies (MNC)
- GIS developers must address the following constraints:
  - Politically Imposed Constraints
  - Cultural and Communications Barriers
  - Restrictions on Hardware Purchases and Imports
  - Restrictions on Data Processing
  - Restrictions on Data Communications
  - Technological Problems
  - Lack of Support from Subsidiary Managers
PUTTING THE SYSTEM USERS AND INFORMATION SPECIALISTS IN PERSPECTIVE

• Early systems development was accomplished solely by information specialists, but over time the users have played increasingly important roles.
• Not only has systems development work changed, but the setting in which the work is performed has changed as well.
• Electronic communication networks enable firms to become virtual organizations, so now their development work can be done almost anywhere.

http://www.dedent08m.wordpress.com

END OF CHAPTER 4

http://www.dedent08m.wordpress.com