DOCUMENT RESUME

ED 299 430 CE 051 059

AUTHOR O'Neil, Sharon Lund; Everett, Donna R.
TITLE Information Systems Administration. Course Seven. Information Systems Curriculum.
INSTITUTION Association of Information Systems Professionals, Deerfield, IL., Houston Univ., Tex. Coll. of Technology.
SPONS AGENCY Texas Higher Education Coordinating Board, Austin.
PUB DATE 88
NOTE 108p.; For related documents, see CE 051 053-058.
PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS *Automation; Behavioral Objectives; Business Administration; *Business Education; Computer Oriented Programs; *Computer Science Education; Curriculum Guides; Higher Education; Information Processing; *Information Science; *Information Systems; Learning Activities; *Systems Analysis; Word Processing

ABSTRACT

This course is the seventh of seven in the Information Systems curriculum. The purpose of this capstone course is to build on skills acquired in the earlier courses. Emphasis is placed on realistic situations and challenges that exist in the automated office and for which information systems technology and skills are pertinent. These components are provided for each task area: behavioral objective, suggested teaching strategies, content, and summary. Topics covered include principles, skills, and knowledge needed by an information systems analyst, specialist, or high-level end-user; development of organizational and individual strategies to actuate information systems; identification of critical issues in the automated office; demonstration of skills such as negotiation, persuasion, leadership, interviewing, knowledge of subject and organizational structures, and communication to aid in the project planning process; and determination of factors in new and/or existing systems related to data and physical security and integrity. Appendixes include visuals (transparencies and other teacher materials), student materials (student handouts, work sheets, and exercise materials), evaluation (end-of-task and end-of-unit questions, test items, etc.), and references (including an eight-page bibliography, a list of job titles for information systems workers). (YLB)

Information Systems Administration

course seven

Developed by
Dr. Sharon Lund O'Neil, Principal Investigator
Dr. Donna R. Everett, Project Director
UNIVERSITY OF HOUSTON, COLLEGE OF TECHNOLOGY
TECHNICAL EDUCATION DEPARTMENT

In Cooperation with
ASSOCIATION OF INFORMATION SYSTEMS PROFESSIONALS (AISP)

This project was funded by the Texas Higher Education Coordinating Board through a grant utilizing funds from the Carl D. Perkins Vocational Education Act, Project No. 88103024, Project Year 1988.

•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•

Acknowledgements

Development of this Information Systems curriculum took place during the 1987-1988 school year, culminating in June, 1988. Much time, talent, dedication, and expertise were invested in this project by the following individuals who participated in the Information Systems Curriculum Advisory Committee--our sincere "thanks" to each of you:

Gary Baldwin, Datapoint Corporation, San Antonio
Mary Ann Beach, MBank, Dallas
Claudia Bryan, Fluor Daniel, Sugar Land, TX
Charlie T. Cochran, Xerox Corporation, Arlington, VA
Susie Coon, DISC, Inc., Houston
Robert Day, Texas Higher Education Coordinating Board, Austin
Camille Hatfield, North Harris County College, Houston
Allan J. Krueger, Hanscom AFB, MA
Leo Lefkowits, The ELTU Corporation, Houston
Melody Locke, Texaco, Inc., Houston
Linda Mercer, Information Network, Houston
Gay Sweet-Harris, Thomas Jefferson High School, San Antonio

Also, appreciation is extended to all Association of Information Systems Professionals members who participated in various phases of the study and especially to the hundreds of individuals who responded to both rounds of the 300+ item questionnaire which formed the basis of the curriculum. The support of AISP has been wonderful mainly because of three dedicated individuals:

Glen R. Anderson, AISP Executive Director, Deerfield, IL
Claudia Bryan, AISP National President, Sugar Land, TX
Allan J. Krueger, AISP National Director, Acton, MA

Very special recognition is due Allan Krueger who has been a strong link between the project and AISP and who has given so generously of his time and expertise to assure quality products and to promote the project.

Recognition and gratitude also are expressed to Jim Bauser, Valerie Brantley, Bernard Chin, Cappi McNeill, and Donna Siegel, University of Houston, College of Technology, for their time, talents, and skills in the vital areas of administrative support, materials development, graphics layout, research, and writing in bringing this project to completion.

INFORMATION SYSTEMS ADMINISTRATION

Information Systems Administration is the capstone course in this curriculum. The focus of this course is on the case study approach which builds on and utilizes theory, hands-on applications, and knowledges acquired in the courses such as Integrated Information Systems, Business Communications, Human Relations, and Accounting or Managerial Accounting. Emphasis is placed on realistic situations and challenges which exist in the automated office and for which information systems technology and skills are pertinent. A review of organizational goals, policies, and procedures as they relate to productivity, efficiency, and effectiveness are integral to this course.

The variety of topics covered in this course is broad: A review of skills and knowledges of a specialist, analyst, or high-level end-user is included; management functions of planning, organizing, directing, and controlling are stressed to the extent that they are necessary to coordinate and analyze information systems; the role of professional organizations is discussed; research into relevant literature is required; field trips and vendor presentations are included; and project teamwork is emphasized. Heavy emphasis is placed on utilizing written and oral communication skills as well as on interpersonal skills such as negctiating, persuading, leadership, and human relations.

Table of Contents

Appendices:

VISUALS

Includes transparencies and other teacher materials.

STUDENT MATERIALS

Includes student handouts, work sheets, and exercise materials.

EVALUATION

Includes end-of-task and end-of-unit questions, test items, etc.

REFERENCES

Includes bibliography, articles, resources, etc.

INSTRUCTOR NOTES

INFORMATION SYSTEMS ADMINISTRATION

CONDITION	PERFORMANCE/STANDARD
TASK AREA 1: Given the knowledge of problem solving and decision making obtained in case studies, research projects, and design and layout assignments, as well as theories and principles related to information systems,	the student will be able to review the skills and knowledges which an information systems analyst or office systems specialist or high-level end-user should possess to the satisfaction of the instructor.
TASK AREA 2: Given the specific knowledge of information systems,	the student will be able to 1) develop organizational and individual strategies to gain familiarity with planning for and actuating the information systems function in the automated office which includes membership in professional organizations, continuing education to expand the knowledge base, field experiences and vendor demonstrations, and working with project groups; 2) conduct a feasibility study, using the project team approach; 3) utilize research skills; and 4) develop survey and interview skills to the satisfaction of the instructor.

CONDITION	PERFORMANCE/STANDARD
TASK AREA 3: Given an information systems project,	the student will be able to identify the critical issues in the automated office, such as ergonomics, health and safety, human concerns, information policies and procedures, and obsolescence factors to the satisfaction of the instructor.
TASK AREA 4: Given an information systems project,	the student will be able to conduct a feasibility study in a project teamwork assignment which covers the acquisition of hardware, software, peripherals, telecommunications, networking, media, or other needs of end-users and/or management so that the following skills may be demonstrated: negotiation, persuasion, leadership, interviewing, knowledge of subject and organizational structures, and communications to the satisfaction of the instructor.
TASK AREA 5: Given an information systems case study,	the student will be able to determine the factors in a new and/or existing system which relate to data and physical security guidelines to the satisfaction of the instructor.

INFORMATION SYSTEMS ADMINISTRATION

Task Area 1

Given the knowledge of problem solving and decision making obtained in case studies, research projects, design and layout assignments, theories and principles related to information systems, the student will be able to review the skills and knowledges which an information systems analyst, office systems specialist, or high-level end-user should possess to the satisfaction of the instructor.

Specifically, the management functions of planning, organizing, directing, and controlling should be stressed to the extent that they are necessary to coordinate and analyze information systems in any office environment to enhance decision making.

Suggested teaching strategies: Outside readings, review of management principles and review of career opportunities and job skills needed in the automated office. Outside speakers representing persons in information systems careers such as managers and/or supervisors, high-level end users, trainers, vendors, and others. Suggestion: Arrange a panel of speakers representing all levels of information systems workers. Assign the semester-long case study which utilizes problem solving, strategic planning, decision making, and research skills.

Note to instructor: To complete the requirements for this course, the analysis of a case study included in the "Student Materials" section as Exercise 1-1 is undertaken in each task area. Background materials will be included in each task area as needed. A list of reading resources is included in the "References" section.

For Task Area 1, the analysis will focus on management functions and information systems workers' skills which are illustrated in the case study and will provide the basis for outside readings and class discussion.

Timetable: Two weeks or four class periods.

Preparatory Activities: Ask students to read two articles on the management of information and two articles on skills needed by information systems workers and share their findings with the class.

Read the case study in Exercise 1-1.

****

BACKGROUND INFORMATION

Information is one of the most important assets of an organization. The challenge of accessing, manipulating, and processing data into usable information for effective decision making will become even more critical as the amount and availability of data increase.

Alvin Toffler (The Third Wave) and John Naisbitt (Megatrends) address the shift from an industrial society to an information society as one of the major transformations that has taken place in the twentieth century. It is this shift from the focus on manufacturing to the processing of information that is having an effect on the organizational structure and work flow. Peter Drucker (The Frontiers of Management) describes the change in the structure of the organization as one in which "information serves as the axis and as the central structural support." The attention and emphasis given to the emergence of an information society has focused on the fact that larger percentages of the work force are involved with manipulating information--facts, figures, and speculations--not objects. According to Drucker, information is becoming the organizing energy with the capital resource being knowledge.

The key to the transition from an industrial economy to an information economy has been the computerization and automation of the work functions. Often the word "revolution" has been used to describe the impact of the computer, especially the microcomputer, because it not only connotes change, but it also implies rapid change. Increasingly sophisticated tools enable information to be produced, processed, stored, and transferred. In turn, these tools are affecting job design, work group structures, reporting relationships, workers' skills, and individual and organizational performance.

White-collar workers, which include managerial, professional and technical, secretarial and clerical, and sales workers, are now being referred to as "information workers" by the Bureau of Labor Statistics. At the present time, they make up the majority of the work force which exceeded 55 million in 1985. This category is expected to grow by another 5 million in 1990 and top 65 million in 1995. Since an increasingly larger proportion of the work force will be involved in the processing of information, there will be a profound effect on the primary locus of information work: the office.

A variety of people work in information systems. Information systems workers are workers in the office who

will be affected by changes created by integration of information technology, job procedures, and working relationships in the automated office. The jobs that are available for information systems workers include all levels of administrative support personnel, such as data entry, correspondence specialists, administrative specialists; office automation trainers (employed by organizations or vendors); systems analysts who may be employed as telecommunications, networking, or office automation specialists; and supervisors of information centers, word processing centers, or information processing centers. Each of these workers will view information systems from a different perspective but with the same goal in mind--the capability of accessing, processing, and disseminating information throughout the organizational system which will enhance decision making and reduce duplication of effort.

Information Management

Information management is the process of planning, organizing, directing, and controlling the kind of, amount of, access to, and manipulation of information into usable formats for organizational consumption. Information management is, has been, and will continue to be the business of the office. Electronic office technology has increased the amount and availability of, access to, and demand for information in an organization. Organizational structures are being changed to accommodate the flow of information.

Information in the office traditionally flows between and among office components along formal and informal channels. Flows of information disseminate organizational goals and missions, forge the linkages between organizational units, and assist the coordination and integration of the complicated interactions between specialized tasks. To enhance the flow of information, organizational staffing patterns and procedures are developed to accommodate the various business functions or systems of accounting, finance, purchasing, sales, inventory, production, and staffing functions as well as the social environment. Staffing patterns and procedures often control the quality and quantity of information.

The traditional organization basically has rested on command authority; i.e., the flow of authority has been from the top down. The scalar military structure provided this example which many organizations adopted as their own. Businesses lived (and thrived) with the hierarchical structure. It was the right organizational structure at the right time.

However, the success of an information-based organization may depend on asking and answering new kinds of questions arising from the ability to access and "control" information at all levels of the organization, as pointed out by Peter Drucker:

> What should the company expect of me and hold me accountable for in terms of performance and contribution? Who in the organization has to know and understand what I am trying to do so that both they and I can do the work? On whom in the organization do I depend for what information, knowledge, specialized skill? And who in turn depends on me for what information, knowledge, specialized skill? Whom do I have to support and to whom, in turn, do I look for support?

In comparison to yesterday's organization, access to information by all levels of employees may be creating a flatter organization with fewer levels of management. Peter Drucker describes the flatter organization as making irrelevant the principle of "span of control" and replaces it with a new principle he calls "span of communications". The number of people reporting to one person is limited only by the willingness of the workers to take responsibility for their own communications and relationships, upward, sideways, and downward. The questions mentioned above relate directly to this span of communication and to the importance in the organization of the person who can access and manipulate the information for timely consumption and decision making.

Several forms of organizational structures with an organization may evolve which focus on the importance of the individual in the information management process: a matrix format whereby a person may report on a project basis to a number of people depending on the ability to access and communicate information or a reticular organizational pattern where the distribution of information and authority is fluid and shifts as required. Regardless of the formal, published organizational structure, the flow of authority in an information-based organization is circular (having width as well as depth) from the bottom up and then down again.

Implementation of these organizational forms can be seen when top management asks an employee with the most knowledge of computers to research the purchase of the company's first computer system for its applications, such as word processing, spreadsheet, database management, etc. This employee, who may not have had previous management experience, may be given a budget and the authority to buy

the system. OR Work teams of administrative support personnel from various departments in the organization who are familiar with computers may be asked to upgrade and/or expand the present computer system with the support (budgetary) and authority from top management. These personnel also may be expected to install the system, master the applications, and train others in the organization.

Other internal organizational patterns for accommodating an organization's information system represent points on a continuum, as follows:

1. Complete centralization where all systems analysis, design, and implementation are performed by a central group and all equipment is operated centrally and the organization's data are located and controlled centrally.

2. Complete decentralization in which all equipment and staff reside at departmental sites and the data are decentrally located and controlled. There may or may not be assigned responsibility for the management of the organization's information.

3. Distributed data processing where computer systems are decentralized throughout an organization. In the past, large mainframes were maintained in one central location. As these centralized facilities increased in size and the organization became more and more dependent on access to the data, the downtime of the large mainframes became an issue. Distributing the data throughout the organization in smaller, more reliable minicomputers from which data can be downloaded on to desktop computers is seen as one answer to providing timely information.

4. Information resource management (IRM) where responsibility for the management of all information and information systems support tools rests in one department but the resources themselves are distributed throughout the organization. The need for this kind of coordination of an organization's information resources has been brought about by the proliferation of personal computers and applications software which make it possible for many users to access an organization's databases. Centralizing the responsibility for overseeing the internal connectivity and communication networks, setting up standardized procedures, establishing data security and integrity, and establishing guidelines for purchasing and installing equipment enhances the organization's information systems management effectiveness.

An organization's philosophy toward information will determine the most effective organizational pattern for its management. The benefits to the organization of each of these patterns is the development of a structure in which information flows in and out in a timely manner, reflects the organization's purposes, and enhances employee efficiency, effectiveness, and productivity. A basic understanding of the relationship among the various subsystems is provided within the totally integrated information processing system in order to appreciate the interrelatedness of the information. Being able to see the connection between the goals of the organization and the environment in which work is carried out to meet the goals will provide an insight into the role of the individual and technology in meeting the needs of the organization.

These forms of organization may not alter the appearance of the organizational chart to the outside world; but it will have profound effects on the people, role relationships, and job skills inside the organization.

If as Peter Drucker has stated, employees must take responsibility for their communications and relationships, and if a flatter organization is brought about because of access to information, it will mean that the skills of all employees will be enhanced and enriched. If indeed this is true, it makes sense that all employees then will become information managers.

Skills for Information Systems Workers

The evolution to integrated office systems not only will be economically feasible but highly desirable to all levels of workers as electronic storage and retrieval processes combine to encompass office technology. An integrated office structure will include electronic mail and voice messaging systems; local and wide area networks utilizing telephone, microwave, or satellite transmission media; desktop computer configurations referred to as workstations, as well as mainframes and minicomputers; sophisticated word and information processing software; advanced reprographic systems, including intelligent copiers and printers; optics; and desktop management software. New positions, as well as new skill requirements for new and old positions, will evolve. These skill areas include technological, business, management, communications, and interpersonal. Each of these areas is discussed below.

Technological Skills. It has been mentioned that as the organization changes so will the skills change for the

information worker. It goes without saying that technical skills related to the ability to access, process, manipulate, and distribute information are critical. Part of the technological knowledge which workers must possess includes operational knowledge of a wide variety of software and hardware; understanding of the information processing cycle; knowledge of office procedures, terminology, and services; and acceptance of change.

Experts have forecasted that by 1990 virtually all white-collar workers in the United States will be working with electronic keyboards; and most, if not all, nonclerical white-collar employees will be working regularly with a PC or electronic workstation. Further, by 1995, every manager, professional/technical worker, and office salesperson will be working with an electronic workstation. Keyboarding skills will become a necessity for persons at all levels of the organization.

A recent study of office systems consultants, office administration faculty, and other collegiate business faculty focused on the importance of concepts needed by managerial personnel in automated offices. The concepts which were rated as required or essential were found in the areas of integrated office systems, communication and distribution, and filing and records management. The essential or required competencies cover a wide range of technological skills, including the use of:

> ...dictating machines...visual display text editors...electronic keyboard typewriters... computer graphics...magnetic media storage... computer-assisted retrieval...electronic mail systems...facsimile...teleconferencing... executive workstations...distributed logic...decision support systems...and administrative secretarial support workstations...

Advances in electronic communication technology are changing many of the traditional ways communication takes place in the office. Changes have brought about electronic mail; electronic publishing; telecommunications; interactive television; electronic composition using electronic encyclopedias, thesauruses, outliners, spelling checkers, and English syntax style analyzers; networking; speech recognition systems, cordless, high-tech, and cellular telephones; high speed, portable facsimiles and laptop computers; teleconferencing; and microwave- and satellite-linked offices. Hands-on experience in all of these areas is not necessary, but heightened awareness and conceptual knowledge is.

Business Skills. Employees at all levels of the organization must be familiar with the mission of the organization and with its products and services. The mission, goals, and values of an organization, the nature of the business, and the nature of the work and the context in which it is performed provide the conceptual framework into which information systems will converge in an organization. The rate with which technology is changing requires that a successful organization and the people in it remain open, adaptable, and amenable to change.

In general, people in organizations respond differently to technology. Organizations with mechanisms in place to reward those individuals who interact creatively with the technology, who make good decisions, and who remain flexible in accepting change will encourage positive responses. Dealing with change (more precisely, the rate of change) and its effects on work and people will be one of the most important skills information systems workers can acquire.

Today's organization is no longer a classic, multi-level pyramid. It is becoming less hierarchical, flatter, richer, faster, more precise, more innovative, more information dependent, more responsible, and more interconnected. This trend becomes more complex as middle levels of management are compressed and squeezed and the demand for clerical workers with technological skills rises. Increasingly, key decisions are being made by those who can most efficiently input, store, retrieve, disseminate, and communicate information.

Management Skills. The ability to plan, organize, direct people or functions, and control has been recognized historically as the purview of management. If the information-based organization is characterized by a flatter span of control, the ability to access and obtain information will make all employees responsible for setting objectives, controlling, and managing their tasks in harmony with others. Several studies related to office automation skills have supported the value of management skills for office employees. Problem solving and decision making, as well as organizing and scheduling skills, are among the most important skills needed by office employees. With technological equipment taking over much of the repetitive work in the office, tasks no longer are routine but involve decision making and problem solving skills that are used in the design and coordination of a system of people, procedures, and equipment.

In addition to taking responsibility for communication, a flatter organization will require workers to be self

disciplined, to be able to ask questions, to be able to set goals and objectives, to be flexible, to be able to make fast decisions and quick responses, and to be able to accept responsibility. Many of these skills are recognized as management skills.

Communications Skills. Even with the use of sophisticated communication software in the automated office, the ability to relate and communicate effectively with all levels of employees is not likely to diminish. The requisite communication skills are broad-based and include the gamut of verbal, nonverbal, and written skills. Communication still is considered one of the prime competencies for office employees.

Employees in the automated office must pay attention to the communication skills of reading; basic English; writing letters, memos, and reports; proofreading; and preparing and making oral presentations. Even though computer programs are available to check spelling, grammar, syntax, and punctuation, there is no substitute for an efficient, effective proofreader.

Personal traits and good communication skills are the skills that never can be replaced by computers, software, and other technological developments. Computers can never develop interpersonal relations and gain understanding through nonverbal cues. A solid combination of technological skills and human relations skills will become essential in the automated office.

Interpersonal Skills. Human relations involve the mechanisms inside and outside the organization (structural, interactive, managerial, and procedural) which provide for social contact between persons. This interaction of all levels of employees in the integrated office will require critical attention as technology continues to pervade the office and threatens traditional working relationships.

"People skills" still remain critical to employees' success in the changing office. These human relations skills include goal setting, personal appearance, good self concept, communications, listening, ability to cope with criticism, decision making, teamwork, and handling conflict. The rationale for these skills is that increased opportunities to participate in management have imposed greater expectations on employees.

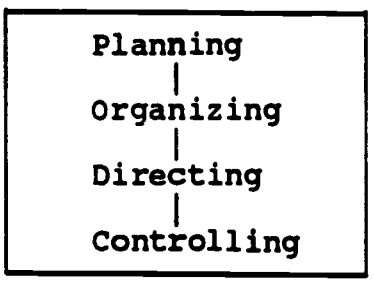
Today's business employee must solve problems in the work place, develop new competencies, and produce in a very competitive atmosphere. Human relations are so critical that more workers lose their jobs because of their inability

to get along with fellow workers than for any other reason. Employers have stated that some of the things they look for are cooperative attitudes, enthusiasm, practical expectations, and punctuality.

Specific human relations skills and personal traits for information workers include discretion in confidential matters; demonstrated interest in their work; acceptance of responsibility; exhibited flexibility, versatility, and leadership; demonstrated initiative, imagination, autonomy, and creativity; acceptance of constructive criticism; following oral and written instructions; willingness to work under pressure; exhibited honesty and loyalty; working effectively with people; care in matters of dress; adaptation to change; acceptance of challenges presented by new office equipment and procedures; continued professional development; and demonstrated good judgment.

Principles of Management

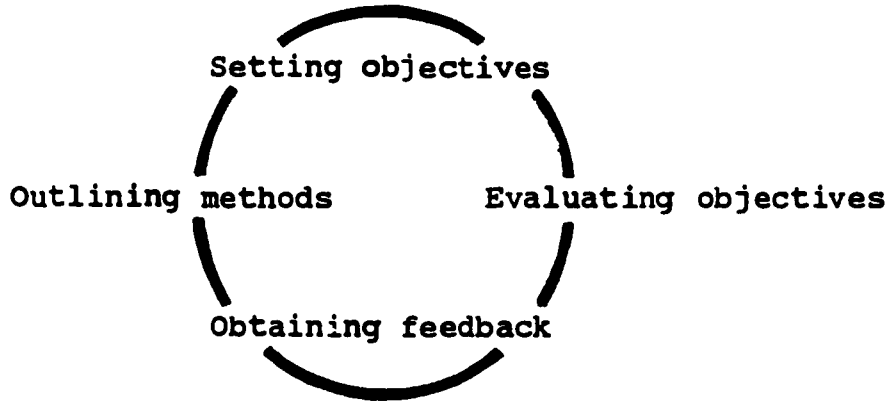
Usually discussions of management have centered on four functions which define the role of management as shown in the graphic below.



Each of these functions is discussed in the following paragraphs.

Planning involves setting objectives, outlining the methods to meet the objectives, ascertaining the outcome, and evaluating objectives to complete the work of the organization and to handle changes in the organization, the environment, and outside regulatory agencies. Planning involves a continuous process which might look like this:

THE PLANNING PROCESS



In the organization which has access to and utilizes automated tools (hardware, software, and related peripherals), much of the planning function (other than setting goals) may be done in one location--the professional workstation--utilizing desktop information systems support tools, such as word processing, database management, forecasting and decision support, graphics, desktop management, and communication. With information management tools, the planning steps are sped up with almost instantaneous response.

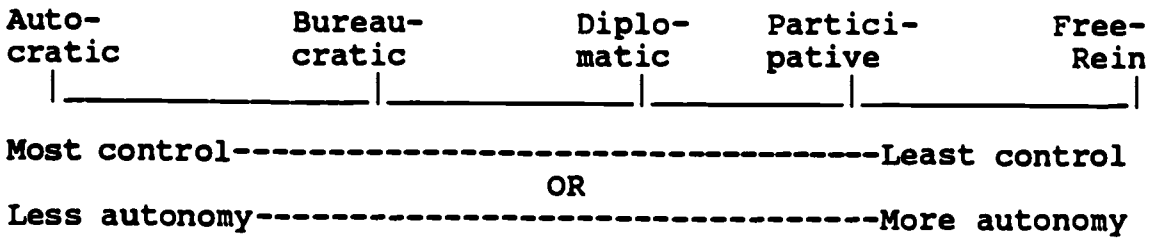
The organizing function in an organization includes structuring people and equipment to carry out the organization's plans. Professional workstations, local area networks, and distributed data processing configurations aid in the organization of work and people to meet the goals of the organization.

Staffing also is part of organizing by matching people's skills with the work to be accomplished. Generally, the organizing and staffing functions have been displayed in organizational charts showing formal reporting relationships and chains of command.

An important element of the organizing function which is displayed in an organizational chart is the span of control: the number of employees one person can effectively supervise. Span of control is dependent on the kind of work to be accomplished (routine vs nonroutine, assembly line vs research lab, freedom to act vs highly proceduralized, etc.), the skill of the supervisor, size of the organization, time spent in supervising, and the nature of the organization. Change in the traditional span of control is entirely possible in the automated office.

Within the established formal organization, an informal organization exists through which much of the work of the organization is accomplished. The informal organization consists of the interpersonal relationships which do not appear on the organizational chart and which arise as a result of the human needs of the workers. The informal organization is credited with being an extremely effective communication system for sending and receiving information. In the automated office, the informal information organization will be reflected in new patterns such as matrix formats and reticular organizational structures.

Directing means motivating, persuading, inspiring, or forcing employees to work effectively and efficiently. This fourth role of management directly affects employee morale, productivity, and creativity. It is directly tied to an individual's personal leadership style. Various styles of leadership have been proffered over the years. One such illustration of styles of leadership is offered in the following graphic:



Experts have pointed out that there is no one best style of leadership, although morale and creativity seem to thrive in organizations where employees are expected to participate in decisions which affect their work assignments, their work goals, and changes in their work environment. Many factors affect the style of leadership which a manager has in his/her repertoire; the key is flexibility in using the right style at the right time.

Controlling is the evaluation function of management. It is the function that determines if and when goals are met and/or when goals or methods should be adjusted or corrected to meet new goals and objectives. It is a continuous process that requires a finger on the pulse of the department and the organization at all times.

Controlling may entail developing, installing, and improving systems and procedures which are now in place or will be put in place to accomplish work assignments which relate directly to the department's and the organization's plans and goals.

In some ways, this is the most tangible function of management, especially if systems and procedures are in place to provide immediate feedback in quantifiable format (improved sales, fewer input errors, higher productivity rates, etc.).

SUMMARY: The traditional definition of "office" as the focal point for the origin of business transactions is changing as computer-based technology allows geographically dispersed individuals and work groups to jointly carry out tasks which handle information. As information technology continues to change the way that work in the office is accomplished, the concept of an office as a location may become secondary to the concept of an office as a system of people working together. At the same time, changes in traditional skills, reporting relationships, work procedure structures, and organizational goals are occurring.

A current listing of titles for information systems workers is included in the "References" section. The number of titles reflects the variety of positions in information systems currently being filled at various levels of organizations. Research has shown that many of these positions have been newly created within the last two to three years.

****

(Note to instructor: Questions to discuss and answer related to the case study are included in the "Student Materials" section as Exercise 1-2.)

INFORMATION SYSTEMS ADMINISTRATION

Task Area 2

Given the specific knowledge of information systems, the student will be able to

1) develop organizational and individual strategies to gain familiarity with planning for and actuating (starting the process) the information systems function in the automated office which includes membership in professional organizations, continuing education to expand the knowledge base, field trips and vendor demonstrations, and working with project groups;

2) conduct a feasibility study, using the project team approach and strategic planning process;

3) utilize research skills; and

4) develop survey and interview skills;

to the satisfaction of the instructor.

Suggested teaching strategies: The use of guest speakers, vendor demonstrations, field trips, and role playing to develop survey and interview skills will enhance students' knowledge as they continue to work on the case study.

Note to instructor: For Task Area 2, the analysis of the case study will focus on project planning methodology. In addition, professional organizations will be researched and membership in professional organizations will be discussed.

Timetable: Three weeks or six class periods.

****

(Note to instructor: Activities and questions related to the case study are included in the "Student Materials" section as Exercise 2-1. For the duration of the case study, you are the project manager. All group discussions, project team meetings, and activities will be conducted by you. You will set up and conduct the meetings and provide the deadlines for activities. Making the case study as "real world" as possible will help transfer the skills learned to the job.)

****

Note to instructor: The questions in Exercise 2-1 relate to a. through g. in the strategic plan steps outlined below which are provided as background material.

BACKGROUND INFORMATION ON STRATEGIC PLANNING

Any approach for implementing an integrated information system must rely on elements of strategic planning. The human, organizational, and technological resources set the stage for the development of an overall strategic plan for integrating information systems tools at all levels of an organization. The elements of the strategic planning process are described and discussed below.

The strategic plan to integrate information systems must include the first four items before the plan can go forward:

a. Knowledge of the functions of the organization's business systems and how they interrelate.

b. Support for the overall organization's goals and objectives with provisions for improved productivity, improved decision making, improved profitability and competitive position, enhanced job enrichment and satisfaction, improved work environment, and consideration of the impact of change on individual employees.

c. Response to management concerns and outside forces which make it imperative that flexibility and sensitivity to change be included in the plan.

d. Support of top management. It goes without saying that integration will not take place at the bottom of the organization if there is no commitment to the plan at the top of the organization.

The next three items in the strategic plan are aimed specifically at the process for implementation of the strategic plan:

e. Selection of the team to develop the plan. The team should include a diagonal cross-section of all levels of employees, from top management to end-user. If the IRM approach is utilized, information specialists will be included. One of the most important steps taken by this team is to establish time lines and target dates.

f. Implementation of a feasibility study or problem analysis. The need for strategic planning includes

phasing in information systems support tools as well as responding to a given problem which has arisen due to the need for expansion or upgrading of a present system, lack of compatibility, bugs in a system, or other situations. At this point, the team looks closely at the problem or situation to get an idea of its scope; conducts interviews with key employees; and looks at memos, reports, or other documentation related to the problem or situation. Some organizations may want a written report at this point to evaluate the scope of the problem or project before proceeding.

g. Analysis of many forms of data. Once the go-ahead has been given to search for a solution, analysis of many forms of data related specifically to the problem will occur. These may include organizational charts, programmers' notes, end-users' notes, data flow diagrams, and files. It also includes observations of the system or jobs that will be affected to give the team members an additional source of information.

h. Evaluation of alternatives to solve problem or complete project. The next step in the process is to be able to evaluate alternatives to solve the problem or to set up an integrated system. Defining the alternatives for an integrated office system may include looking at the following factors:

(1) Output: Will data be presented and saved on paper, microfilm, magnetic tape, monitor, optical disk, or other media?
(2) Input: Will data be entered orally, through the keyboard, electronically from another system, or from magnetic tape? or combinations of the above?
(3) User interface: What level of interaction is needed for communication: two-way, one-way only, or both? Will the system be menu driven? command driven? Both? Is a help feature needed?
(4) Processing: At this point, the programmer on the planning team will need to determine the algorithmic features of the program and to determine what operations are needed to convert the input into the output. Can new inputs be added?
(5) Security: What are the safeguards that will be installed? Who needs what information from the system? What back-up procedures will be installed? What kind of error recovery procedures will be installed? Are audit trails needed? What are the authorization procedures to be followed for individuals to access the data?

i. Choose the best alternative. The next step is to choose the best alternative from several choices. Can the present system be adapted to accommodate the new requirements? Can a commercial system be purchased? What is required to customize a ready-made system or package? Does a whole new system need to be designed? What are the costs involved for each alternative?

Here, top management again is brought in to make the final decision from the alternatives and recommendations presented by the team. At management's direction, the team will start negotiating with vendors/manufacturers before making a final selection based on price, capabilities, and service.

j. The negotiation process. The negotiation process begins with the preparation of a request for proposal (RFP). This is the organization's formal document which outlines the requirements which are needed and which is sent to the selected list of vendors. In addition, a vendors' conference may be initiated by the team to give the vendors the opportunity to ask questions, to clear up misunderstandings on the part of the vendors, and to give vendors an idea of what other vendors are offering.

The next step in the negotiating process is to evaluate the vendors' proposals to see if they match the criteria which were specified. To do this, some sort of evaluation document may be helpful to compare each proposal. The ability to get hands-on evaluation of equipment before making a final decision is helpful. Does the proposal offer a demonstration? a period of trial usage? Involving end-users, technicians, and analysts in this hands-on evaluation affords invaluable input into the final decision.

The final step in the negotiating process is to make the decision regarding a vendor, a system, a piece of software or hardware, etc.

k. Installation of the system, software, or hardware. Installing the system, software, or hardware begins with testing it, analyzing documentation, providing training, and converting to the new system. Conversion can be done several ways:

(1) On a <u>crash</u> basis--completely leaving the old system and turning to the new one;
(2) On a <u>parallel</u> basis--running both systems at once until the new one is completely debugged;

(3) On a pilot basis--one group uses the old system while another group uses the new one and as the new one runs smoothly, the others convert to it; or
(4) On a phased-in basis--the new system is adopted one step at a time.

There are obvious pros and cons of each way.

1. Maintenance of the system. The last step entails maintaining the system by debugging, modifying it as needed by vendors' technicians or by programmers in the organization, and by constantly evaluating the system. The planners in the organization then begin again to study, plan, design, and implement a new system.

INFORMATION SYSTEMS ADMINISTRATION

Task Area 3

Given an information systems project, the student will be able to identify the critical issues in the automated offices, such as ergonomics, health and safety, human concerns, information policies and procedures, and obsolescence factors to the satisfaction of the instructor.

Suggested teaching strategies: Guest speakers, vendor demonstrations, and field trips will enhance students' knowledge as they continue to work on the case study.

Note to instructor: For Task Area 3, the analysis of the case study will focus on ergonomics, human concerns, health and safety, and the need for an information policy. Information pertaining to organizational patterns has been presented in Task Area 2.

Timetable: Two weeks or four class periods.

****

Note to instructor: The questions and activities related to the case study are included in the "Student Materials" section as Exercise 3-1.

****

BACKGROUND INFORMATION RELATED TO HUMAN CONCERNS, ERGONOMICS, HEALTH AND SAFETY, AND THE IMPORTANCE OF AN ORGANIZATIONAL INFORMATION POLICY

Human concerns. The recent history of integrated office systems has shown that the rush to increase efficiency and productivity has resulted in the lack of appreciation for the "people issues" related to acceptance of new technology. These are "technology-driven" concerns. When people in the organization have arrived to find microcomputers at their desks, the natural inclination has been to resist. A very well thought out office automation strategy which takes into account the benefits to the people, as well as to the work and the organization, will go a long way toward enhancing the sociotechnical environment.

The human side is the most important aspect in any consideration of jobs and organizations, and must be considered simultaneously to the technical and production requirements of the work. When information technology reorganizes work and procedures, new patterns of

communication and interaction are possible. In a dynamic work environment, the social network is an important buffer between the worker and other elements in the work place, especially the computer terminal. In this environment, there is a tendency for the worker to spend greater portions of the day interacting with a computer.

Decades of research have established the importance of social communities in the work place and the lengths to which people will go to establish and maintain them. The human resource in an organization is the pivotal ingredient on which the success of the automated office hinges.

Naisbitt (Megatrends, 1980) has called this concept "high tech/high touch". That is, whenever new technology is introduced into the environment there must be a counterbalancing human response of high touch. Without the high touch, the concept is rejected; and the more high tech, the more high touch.

One effective approach which ensures consideration of both the social and technical resources in the automated office is sociotechnical analysis. Typically, the traditional approach taken by individuals within an organization to install and/or introduce new equipment or procedures has not been sensitive to the reactions and feelings of the end-user. The large body of "failure literature" indicates that this approach has not enabled the successful implementation of new products or new systems. When employees have arrived at work to find new equipment at their desks, the first inclination was to resist change. An approach such as sociotechnical analysis focuses attention on the dual nature of the automated office.

Placing people needs ahead of technological needs in an organization emphasizes the importance of expanding the knowledge of the office worker rather than the need to increase keyboarding and filing efficiency. End-users' needs for information and communication drives the integration of information systems. When the people perspective precedes the technological perspective, the results are:

a. Involvement of the end-user from the outset.
b. Participation in the decisions affecting the work environment.
c. Incorporation of human factors into the designs and implementation of the new information system and new work procedures.
d. Provision for education and training of end-users along with their continuing review and refinement of the system.

e. Increased employee satisfaction with the work and the organization.

To provide a thorough technical analysis of an integrated information system, it is necessary to have a conceptual model of the office and the organization as a whole. This model will enable the organization to develop a rational strategy for its automation needs and implementation. Having a better understanding of the functions and relationships in an office will provide a better view of the office and its benefits to the organization. Too often, the office is separated from the organization and changes are made which are not beneficial to the organization as a whole. Therefore, this conceptual model of the office must include:

a. An understanding of the mission (goals) of the organization--a global view.

b. An identification of the key result areas which comprise the objectives of the organization. Key result areas may include higher productivity, organizational growth, organizational stability, employee satisfaction, and stockholder approval.

c. A discrete number of functions or independent operating areas with specified inputs and outputs. These areas include purchasing, marketing, billing, research and development, personnel, accounting, finance, production, etc.

d. A number of processes for executing the specified functions. A process shows the relationship between a series of work activities which are undertaken to perform a given function. For example, managerial, work flow, supervisory, communication, performance appraisals, information processing, and decision making are processes.

e. An understanding of the procedures which are grouped together for specific purposes. These procedures may be structured, routine, semistructured, or relatively unstructured or nonroutine. They may be performed by clerical workers, professionals, and/or managers.

f. A description of jobs in the office and their constituent activities. Jobs include the aggregate of the activities and are assigned to support professionals, accountants, research chemists, engineers, salespersons, etc.

g. An understanding of the relationship of work activities in the performance of office functions and of a given process. Activities include keyboarding, filing, communicating, reading, opening mail, dictating and transcribing, scheduling, selling, meeting, traveling, etc.

Combining the two resources, social and technical, will ensure that the equipment (hardware, software, peripherals, etc.) will be accepted and utilized.

Ergonomics. Increased concern must be given to the planning of facilities, the configuration of the workstation, colors, space, lighting, temperature, privacy, heights, reaches, angles, and sound. Research has shown that these issues are of prime importance in planning for the introduction of and continued upgrading and expansion of automated technology brought about by the need for access to information.

The specific ergonomic issues in the automated office include location of people (open vs traditional office layout); location of cables and wires (safety considerations); provision for routine breaks for those who work constantly in front of a computer screen; adjustable monitors on computers; access to shared resources; background color; climate control; lighting; and provisions for privacy in the open office layout.

Workstation design should take into consideration the psychological factors such as aesthetics, design, territoriality, individuality, face-to-face communications, and a sense of belonging. Maslow's hierarchy of needs should provide a checklist of factors to be considered in bonding the individual to his/her work area.

Health and safety. One of the most controversial issues in the automated office is the concern about the safety of video display monitors. Many workers' groups assert that radiation from monitors may threaten the fertility of men and women and pose a danger to unborn fetuses. Research findings by scientists, however, indicate that the monitor itself is not a hazard to workers. Manufacturers of automated equipment have responded to these concerns by providing monitors which emit lower levels of radiation than the ordinary TV set. This is an issue that bears watching over time.

Other health issues concern posture, visual, and hearing concerns; the need for furniture designs which reduce backaches and neck pains; sound absorbent materials which reduce noise emitted by printers, copiers, and voice

messaging systems; "white" noise or music in appropriate locations; concern for wrist injuries; and attention to complaints about headaches and eyestrain from screen glare and color. Many articles have been written regarding the advantages of the green screen vs the amber screen vs the multi-color screens utilized by some software. Many of these reports are inconclusive as to the long-effects of screen glare and color.

The Need for an Information Policy Statement

Society is becoming increasingly concerned with the ethics of the information processing profession and with the relationship between ethical behavior and criminal behavior with respect to access to information. Many companies are developing policy statements regarding hardware, software, and information ownership. This issue is not going away and must be dealt with by organizations. Management must make it perfectly clear to employees what it considers to be ethical and unethical behavior related to information access and information management.

Federal and state laws also are in place to discourage "hackers" with unauthorized clearance from breaking into private or public data banks using remote terminals to break security codes and passwords. Computer crime, as this is called, will continue to receive more attention and more litigation in the future.

An effective policy which describes for what purposes computers (especially microcomputers) will be used and how they will be used may be necessary to control the access to, processing of, and manipulation of information. In addition, a policy also may cover purchase and maintenance criteria, related software, and end-users' responsibilities. Specifically, elements of an effective policy may speak directly to:

a. The construction of large databases. Microcomputers in general should not be used to construct large databases. This is generally the domain of the mainframe computer.
b. The degree of compatibility, especially if the microcomputer is going to be used as a terminal to the mainframe.
c. The type of hardware and software to purchase and vendors from which to purchase. This cuts down on duplication of effort, ensures smooth flow of information processing, and assures the buyer that the equipment and software have been tested and properly documented for internal use.

d. The role of the user. Guidelines must be established defining the proper methods to be used in extracting and interpreting data. The illegal duplication of software and the misuse of hardware and other peripherals constitutes computer crime. Abuse can lead to violation of federal copyright laws and persons can be prosecuted.

e. The integrity of data. A policy must describe what types of information should be gathered, maintained, updated, and reported; and what controls should be developed to assure that data are correctly treated so that when decisions are made, they are based on valid and sufficient data.

f. The warning about viruses. Computer virus programs (including Trojan horses, time bombs, and worms) can attack any type of computer system. They are passed from one disk to another through contaminated software. These viruses can be programmed to destroy hard disks or floppy ones; they can damage specific data, cause wholesale destructions, or fall somewhere in between. Most viruses are programmed to copy themselves to other disks, thereby spreading the contamination.

f. The type of preventive and emergency maintenance. Directions should be provided to the user which describe the proper channels of contact for malfunctioning equipment, what kinds of malfunctions may be encountered, and to what extent the user may be responsible for troubleshooting before making the request for maintenance. In addition, vendors who have been approved to make repairs or provide maintenance should be issued in this policy.

Without published, well-thought-out policies regarding use of computer equipment and software, the confidence in the information generated may be a bottleneck to timely and accurate information management decisions.

INFORMATION SYSTEMS ADMINISTRATION

Task Area 4

Given an information systems project, the student will be able to complete the project planning process in a project teamwork assignment which covers the acquisition of hardware, software, peripherals, telecommunications, networking, media, or other needs of end users and/or management so that the following skills may be demonstrated: negotiation, persuasion, leadership, interviewing, knowledge of subject and organizational structures, and communication to the satisfaction of the instructor.

Suggested teaching strategies: Guest speakers, vendor demonstrations, and field trips will enhance students' knowledge as they continue to work on the case study. Role playing and oral presentations by individual class members will provide opportunities for students to demonstrate the above-mentioned skills.

Note to instructor: For Task Area 4, the analysis of the case study will focus on project planning methodology to complete the project planning process.

Timetable: Two and one-half weeks or five class periods.

****

Note to instructor: Questions and activities related to the case study are included in the "Student Materials" section as Exercise 4-1. In addition, field trips and guest speakers are suggested to give students a broad exposure to many different types of offices which use automated equipment.

A presentation by a media specialist in a large organization (such as 3M Company or other comparable organization) to the class regarding development of visual aids, such as transparencies and handouts, is suggested to strengthen students' presentational skills.

INFORMATION SYSTEMS ADMINISTRATION

Task Area 5

Given an information systems project, the student will be able to make recommendations for the selection of an automated system, establish the timetable for installation and implementation (including testing and debugging), set up training for end users, and create policies for maintaining the system, data integrity and security of data and facilities to the satisfaction of the instructor.

Suggested teaching strategies: Oral and written communications skills will be utilized to present strategies related to the case study.

Note to instructor: For Task Area 5, the analysis of the case study will focus on determining factors to select an automated system, develop a timetable for installation and implementation, establish training for end-users, and create guidelines for physical and data security.

Timetable: Two and one-half weeks or five class periods.

****

Note to instructor: Questions and activities related to the case study are included in the "Student Materials" section as Exercise 5-1.

Information Systems Administration

course seven

Visuals

•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•

THE MOVE TO AN
INFORMATION SOCIETY
IS CHANGING
THE "OFFICE"
FROM A LOCATION
TO THE CONCEPT
OF AN OFFICE
AS A SYSTEM OF
PEOPLE WORKING TOGETHER
TO CARRY OUT TASKS
WHICH HANDLE
INFORMATION.

THE INFORMATION SOCIETY
HAS CREATED THE FOLLOWING
CHANGES IN THE "OFFICE":

A NEW WORK ENVIRONMENT
NEW REPORTING RELATIONSHIPS
NEW ORGANIZATIONAL STRUCTURES
NEW OFFICE PROCEDURES
NEW SKILLS
NEW TITLES: INFORMATION WORKERS
NEW CAREER OPPORTUNITIES

FLEXIBILITY IS THE
KEY SKILL!

THE PUSH/PULL ON THE OFFICE:

RAPID TECHNOLOGY CHANGE (PUSH)

DEMAND FOR INCREASED PRODUCTIVITY (PULL)

(AT ALL LEVELS)

INFORMATION SYSTEMS

IS THE

INTEGRATION OF 3 RESOURCES:

HUMAN

ORGANIZATIONAL
(AND ADMINISTRATIVE PROCEDURES)

AND

TECHNOLOGICAL

WHICH MAKES IT POSSIBLE
TO ACCESS, PROCESS, AND DISSEMINATE
INFORMATION FOR
EFFECTIVE
DECISION MAKING

INFORMATION

**DEFINED AS DATA
IN THE FORM OF
WORDS, NUMBERS,
SYMBOLS, GRAPHICS,
VOICE, VIDEO
WHICH EXPRESS AN IDEA
OR WHICH CAN BE
MEANINGFUL INTERPRETED.**

**ONE OF THE MOST IMPORTANT
ASSETS OF AN ORGANIZATION**

INFORMATION PROCESSING

is the

MANIPULATION OF DATA
INTO FINAL FORMAT
AND MOVED TO ITS FINAL
DESTINATION
UTILIZING ANY OF THE
3 ELEMENTS:
WORD PROCESSING
DATA PROCESSING
COMMUNICATIONS

INFORMATION MANAGEMENT IS:

THE PROCESS OF
PLANNING
ORGANIZING
DIRECTING
AND
CONTROLLING THE
KIND OF
AMOUNT OF
ACCESS TO
AND
MANIPULATION OF
INFORMATION INTO USABLE FORMATS
FOR ORGANIZATIONAL CONSUMPTION.

THE AUTOMATED OFFICE:

WHERE TECHNOLOGY OF COMMUNICATIONS
AND INFORMATION HANDLING
AND INTERACTIONS AMONG PEOPLE
ARE COMBINED TO MANIPULATE
INFORMATION FOR BUSINESS
DECISION MAKING.

CHARACTERISTICS OF THE AUTOMATED OFFICE:

BETTER WORK DISTRIBUTION
ACCESS TO INFORMATION
INCREASED PRODUCTIVITY
$
FREEDOM FROM BORING, REPETITIVE TASKS
INCREASED SKILL LEVELS
CAREER OPPORTUNITIES

INFORMATION RESOURCE MANAGEMENT (IRM)

RESPONSIBILITY FOR INFORMATION MANAGEMENT RESTS IN ONE DEPARTMENT ALTHOUGH EQUIPMENT IS DISTRIBUTED THROUGH THE ORGANIZATION

RESPONSIBILITIES INCLUDE:

PURCHASING RECOMMENDATIONS
TRAINING END USERS
SYSTEMS ANALYSIS AND DEVELOPMENT
LATEST INFORMATION MATERIALS
STANDARDS FOR COMPATIBILITY
INFORMATION SYSTEMS PLANNING
INFORMATION SYSTEMS UPGRADING

WHITE-COLLAR WORKERS
ARE NOW CALLED
INFORMATION WORKERS.
THEY INCLUDE:

MANAGERIAL
PROFESSIONAL
TECHNICAL
SECRETARIAL
CLERICAL
SALES WORKERS

(BUREAU OF LABOR STATISTICS)

CAREER OPPORTUNITIES FOR INFORMATION WORKERS

SUPPORT PROFESSIONALS AT ALL LEVELS

OFFICE AUTOMATION TRAINERS
(VENDORS AND ORGANIZATIONS)

PROGRAMMERS

SYSTEMS ANALYSIS

TELECOMMUNICATIONS SPECIALISTS

NETWORKING SPECIALISTS

MARKETING SALES REPRESENTATIVES

SUPERVISORS
INFORMATION CENTERS
WORD PROCESSING CENTERS
INFORMATION SYSTEMS CENTERS

MANAGERS
CIS
MIS
DP

INFORMATION SYSTEMS WORKERS

WILL BE AFFECTED

BY CHANGES CREATED BY

INFORMATION INTEGRATION

NEW TECHNOLOGY

CHANGING JOB PROCEDURES

AND

NEW WORKING AND REPORTING RELATIONSHIPS.

INFORMATION MANAGEMENT SKILLS

CRITICAL TECHNOLOGICAL SKILLS INCLUDE KNOWLEDGE OF AND SKILLS IN HOW TO USE:

DICTATING MACHINES
VDT'S
COMPUTER GRAPHICS
MAGNETIC MEDIA STORAGE
STORAGE/RETRIEVAL
E-MAIL
FACSIMILE
TELECONFERENCING
EXECUTIVE WORKSTATIONS
DISTRIBUTED LOGIC
DECISION SUPPORT SYSTEMS
SUPPORT PROFESSIONAL WORKSTATIONS

INFORMATION MANAGEMENT SKILLS

CRITICAL MANAGEMENT SKILLS INCLUDE

SETTING OBJECTIVES
CONTROLLING AND MANAGING TASKS
ORGANIZING AND SCHEDULING
EXHIBITING SELF DISCIPLINE
BEING FLEXIBLE
MAKING DECISIONS
SOLVING PROBLEMS
BEING RESPONSIBLE

INFORMATION MANAGEMENT SKILLS

CRITICAL INTERPERSONAL SKILLS INCLUDE

#1: HUMAN RELATIONS

STILL CONSIDERED TO BE

THE TOP PRIORITY

COMPETENCY FOR OFFICE EMPLOYEES

AS WELL AS

GOAL SETTING
CARE IN APPEARANCE
GOOD SELF CONCEPT
COMMUNICATIONS
COPING WITH CRITICISM
TEAMWORK
PROBLEM SOLVING
DECISION MAKING
HANDLING CONFLICT
COOPERATIVE ATTITUDE
ENTHUSIASM
PUNCTUALITY
FLEXIBILITY
CONFIDENTIALITY
LEADERSHIP
INITIATIVE
CREATIVITY
FOLLOWING DIRECTIONS
ABILITY TO HANDLE PRESSURE
HONESTY
DEMONSTRATED PROFESSIONALISM

INFORMATION MANAGEMENT SKILLS

CRITICAL COMMUNICATIONS SKILLS INCLUDE

VERBAL
NONVERBAL
WRITTEN
LISTENING

TO ALL LEVELS OF THE ORGANIZATION

STILL CONSIDERED TO BE ONE OF THE TWO TOP PRIORITY COMPETENCIES FOR OFFICE EMPLOYEES.

INFORMATION MANAGEMENT SKILLS

CRITICAL BUSINESS SKILLS INCLUDE

KNOWLEDGE OF ORGANIZATION'S MISSION, PRODUCTS AND SERVICES

KNOWLEDGE OF ORGANIZATION'S WORK AND WORK PROCEDURES

KNOWLEDGE OF ORGANIZATION'S ATTITUDE TOWARD CHANGE

ISSUES IN INFORMATION MANAGEMENT

1. OWNERSHIP

WHO HAS ACCESS TO WHAT DATA?
WHO "OWNS" THE DATA?
FOR WHAT PURPOSE?
WHICH DATA ARE USED
TO GENERATE WHICH REPORTS?

2. SECURITY

WHAT ARE THE BACK-UP PROCEDURES
FOR WHAT DATA AND HOW OFTEN ARE
THEY BACKED UP?

3. INDIVIDUAL PRIVACY

WHAT CONTROLS ARE PLACED ON
DATA SO THAT ONLY AUTHORIZED
PERSONNEL HAVE ACCESS TO THE DATA?

4. SOFTWARE PIRACY

WHAT DOES THE SOFTWARE LICENSE
AGREEMENT AUTHORIZE THE USER TO DO?

5. ETHICS

WHAT IS THE ORGANIZATION'S
(MANAGEMENT'S) ATTITUDE TOWARD
INFORMATION?

HUMAN CONCERNS BROUGHT ABOUT BY NEW TECHNOLOGY

ORGANIZATION OF WORK
INTRODUCTION OF COMPUTERS
PATTERNS OF ORGANIZATION
SOCIALIZATION OF PEOPLE
ISOLATION BY COMPUTERS
RESISTANCE TO CHANGE
HEALTH AND SAFETY
ERGONOMICS

"THERE CAN BE NO HIGH TECH WITHOUT HIGH TOUCH."

--JOHN NAISBITT, MEGATRENDS

CHALLENGES TO SUCCESSFUL AUTOMATION

INTEGRATION
HOW, WHEN, WHERE, WHY, WHAT

TRAINING

PRODUCTIVITY

CHANGES TO ORGANIZATION STRUCTURES

NEW CAREER PATHS

NEW SKILLS

ETHICS, SECURITY, PRIVACY, VALUES

PROCEDURES

COPING WITH CHANGE

STEPS IN STRATEGIC PLANNING

KNOW THE ORGANIZATION/GOALS
RESPOND TO MANAGEMENT CONCERNS
RESPOND TO OUTSIDE FORCES
SUPPORT TOP MANAGEMENT

SELECT PLANNING TEAM
IMPLEMENT FEASIBILITY STUDY
ANALYZE DATA

EVALUATE ALTERNATIVES
CHOOSE BEST ALTERNATIVE
PRESENT TO MANAGEMENT

PREPARE REQUEST FOR PROPOSAL

MEET WITH VENDORS
COMPARE VENDORS' PROPOSALS
SELECT VENDOR

INSTALL SYSTEM OR HARDWARE OR SOFTWARE

MAINTAIN SYSTEM

SPACE MANAGEMENT AND OFFICE DESIGN FACTORS

WORK FLOW

PERSONAL SPACE NEEDS

TERRITORIALITY

FUNCTIONAL OFFICE SPACE

ERGONOMICS

CONVENTIONAL
OFFICE LAYOUT PLAN
IS CHARACTERIZED
BY WALL BARRIERS
WHICH ISOLATE WORK AREAS.

DENOTES STATUS

SPECIALIZED WORK FUNCTIONS
ARE GROUPED TOGETHER

MAY HINDER COMMUNICATION
AND HUMAN INTERACTION, AND
SLOW DOWN WORK FLOW

PRIVACY AND TERRITORIALITY
ARE NOT ISSUES IN THIS PLAN

OPEN OFFICE LAYCUT PLAN IS CHARACTERIZED BY MOVABLE/PORTABLE PARTITIONS WHICH MAKE UP WORKSTATIONS.

PRIVATE OFFICES ARE KEPT TO MINIMUM

PRIVACY PROVIDED BY PLANTS, SCREENS, FILING OF WORKSTATIONS

STATUS DETERMINED BY WORK ASSIGNMENTS

LOWERED CONSTRUCTION AND ENERGY COSTS

MORE USABLE FLOOR SPACE

REARRANGEMENT FLEXIBILITY

ENCOURAGES COMMUNICATION, WORK FLOW, AND HUMAN INTERACTION

LACK OF PRIVACY MAY BE AN ISSUE

AN INFORMATION/DATA POLICY SHOULD ANSWER THE FOLLOWING QUESTIONS:

WHAT IS THE VALUE OF INFORMATION TO THE ORGANIZATION?

HOW IS OWNERSHIP OF DATA DETERMINED IN AN ORGANIZATION?

WHAT TYPES OF EQUIPMENT AND MEDIA MAY BE PURCHASED AND FROM WHOM?

WHAT IS THE ROLE OF THE USER OF INFORMATION?

WHAT TYPES OF PREVENTIVE AND EMERGENCY MAINTENANCE MEASURES ARE AVAILABLE?

WHAT VENDORS HAVE BEEN APPROVED TO MAKE REPAIRS OR PROVIDE MAINTENANCE?

WHO IS THE INFORMATION "GURU"?

WHAT IS MANAGEMENT'S ETHICAL POSITION TOWARD INFORMATION?

HEALTH AND SAFETY FACTORS

VIDEO DISPLAY TERMINAL

WRIST

POSTURE

NECK PAINS

BACKACHES

FATIGUE

VISUAL

HEARING

SCREEN GLARE AND COLOR

ERGONOMIC CONCERNS

ANTHROPOMETRIC
HEIGHTS
REACHES
ANGLES
SURFACES

SENSORY
LIGHT
SOUND
CLIMATE CONTROL

PRIVACY
PERSONAL SPACE
TERRITORIALITY

PSYCHOLOGICAL
AESTHETICS
DESIGN
INDIVIDUALITY
FACE-TO-FACE
SENSE OF BELONGING

ARRANGEMENT

SECURITY

READ-ONLY ACCESS

PASSWORDS

LOG ON

SIGN-ON NUMBER

ENCRYPTION

AUDIT TRAILS

AUTOMATIC CLOSE
(TIME-OUT PARAMETERS)

MECHANICAL KEYBOARD LOCKS

GUIDELINES FOR DATA SECURITY

SUGGESTED CLASSIFICATIONS OF DATA TO BE SECURED

PRODUCTION

DATA USED OR PRODUCED ON AUTOMATED OFFICE SYSTEMS THAT SUPPORT AND ENHANCE NORMAL BUSINESS OPERATIONS WITHIN THE COMPANY

CRITICAL

DATA USED OR PRODUCED ON AUTOMATED OFFICE SYSTEMS THAT IF LOST, DESTROYED, DISCLOSED, OR COMPROMISED COULD DISRUPT THE EFFECTIVE OPERATIONS OF THE COMPANY

SENSITIVE

DATA USED OR PRODUCED ON AUTOMATED SYSTEMS THAT IF LOST, DESTROYED, DISCLOSED, OR COMPROMISED COULD CAUSE EMBARRASSMENT OR COULD CAUSE LEGAL OR FINANCIAL LIABILITY TO THE COMPANY

Information Systems Administration

course seven

Student Materials

INFORMATION SYSTEMS ADMINISTRATION

Exercise 1-1
Case Study: Troy Manufacturing Company

The total systems concept is embraced by the Troy Manufacturing Company; that is, top management in this company believes that all of the departments are linked together to meet the goals and objectives of the company. The departments include management, purchasing, accounting, billing, sales, production, transportation, research, public relations, and human resources (including personnel, salary administration, benefits, retirement, and training).

Troy Manufacturing Company is a wholly-owned subsidiary of a large multinational organization. There are approximately 1,200 employees at this location. The total number of employees in the parent organization is over 32,000. The number of employees in each of the departments at this location is noted below. Salaries in Troy are high compared to similar companies and there is a high degree of career mobility. The company is composed of all salaried employees; there are no hourly employees.

The company literature stresses the importance of treating employees well and giving them the freedom, opportunity, and rewards to perform effectively. A second theme is the importance of open communication. Productivity is viewed in terms of a total system, embracing employees, equipment, information, and materials. There is a strong emphasis on innovation, risk taking and implementation, and state-of-the-art knowledge and technology. There also is a strong emphasis on punctuality. All employees clock in every morning. Bonuses are linked to both sales volume and return on assets, providing an obvious incentive for improved performance for the company as well as for the individual salaried employees.

In 1980, Troy acquired a new chief executive officer (CEO) who saw a critical role for an information system which permits a business to collect, store, structure, share, and manipulate information about previous experiences in order to learn from them and improve business performance.

The segment of the consumer product industry in which Troy operates is highly competitive, with many strong players. Troy was holding fourth place among its competitors in 1980 and facing major profit and loss difficulties. This impetus led to an investment in computer technology which was implemented at that time on a department-by-department basis in rather helter-skelter fashion. This method is consistent with the strong emphasis on innovation and state-of-the-art technology and departmental autonomy. At the time, it also was thought that purchasing computers

would allow more of the boring, repetitive work to be automated, freeing employees to take on nonroutine, challenging assignments. Hiring of personnel also was kept to a minimum during these difficult times and computers were seen as an important tool in not losing productivity through attrition of employees who could not be replaced.

Today, the automated technology at Troy includes an IBM mainframe which links a variety of personal computers, including IBM PC's, Wangs, and Macintoshes. Within each office, a variety of peripherals are used: dot matrix printers, laser printers, modems, photocopiers, print servers, file servers, OCRs, Telexes, and facsimiles (telecopiers). A variety of software also is used: word processing, spreadsheet, database management, graphics, E-Mail, communications, integrated applications, and typesetting. Desktop management and decision support applications software is beginning to show up in executive offices.

Networking exists within a few of the departments, specifically, purchasing, accounting, and billing. The networks consist of the same equipment--either all IBM PCs or Wangs. The network used in these offices is Ethernet by Xerox.

Several other departments (notably, sales, personnel, benefits, retirement) desire to network their PCs. As you would suspect, each of the departments has a variety of hardware--some IBM PCs, some Wangs, and some Macintoshes.

There is no standard for hardware or software purchases, no procedures for the safeguarding and protecting data or computer facilities, and no standardized document formats in the Troy Manufacturing Company. A presentation has been made recently to the CEO's staff which points up the need for purchasing standards, for security standards for data and facilities, for data integrity, and for standardized document formats. The CEO's staff is in agreement that standards are needed in these areas.

The CEO's staff also has agreed that it is timely to accomplish the following objectives:

- upgrade the existing automated technology throughout the company
- establish purchasing standards for hardware, software, and other equipment, set up guidelines for maintenance and repair, assign specific responsibilities and accountability
- develop a policy which states Troy's standards for the assurance of data integrity and security of

data and facilities
- .. establish standardized document formats throughout the company for ease of revision and updating
- .. commit a year's time for the entire project to be completed and implemented. Periodic feedback has been requested to the CEO's staff meetings by the project manager.
- .. commit project team time and budgetary support to make this project happen.

A high-level organizational manager (hereinafter called the project manager) has been named to lead the planning and implementation effort to upgrade and revise the automated technology which is being used by Troy. The project manager also has responsibility to incorporate security features, to develop a policy statement which covers data integrity and security, to set up purchasing and maintenance guidelines, and to implement standardized document formats which will be used throughout Troy. The project manager has asked each functional department to set up a project team to facilitate the company's objectives. It was determined that this will be a year-long planning and implementation effort. Solid budgetary support was apportioned as follows:

10% - hardware,
10% - software,
30% - software development and modification,
40% - implementation, and
10% - training.

Background Notes Regarding Computer Purchases and Uses

In the past, computers have been purchased on a department-by-department basis in an unsystematic fashion at employees' requests. There is no formal responsibility for computer support. Although the company does not want to discourage personal computer use, recently concerns about data security have surfaced. Only a few people have more than read-only access to corporate databases. Only analysts can download data from the larger system and upload data that they have entered on-site.

There is a small centralized word processing department doing internal and external correspondence for various departments. Electronic mail is used primarily for external communications to subsidiary locations and to the parent company. E-Mail is not being fully utilized in Troy for two reasons: most employees do not have their own terminals and it is seen as hindering personal communications. The company does use Voice Mail Exchange (VMX) to better manage telephone communications. Primary VMX communication occurs

between sales representatives in the field and the Sales Planning group in the main sales office at Troy.

Background Notes Regarding Users

On the average, computers have been available at Troy since 1980. Their usage by end-users varies. Across the departments, at least one person has his/her own workstation, with the remainder of the employees sharing a workstation with two or more persons. Often getting computer time is a problem. In most departments workstation allocation reflects task demands. In one department, however, status is a factor. Actual time spent working on the computer is extremely variable across the departments. Since few people use the computer all day, it seems reasonable that workstations would be shared, but the tradeoff of cost vs access has not been wholly resolved.

There is considerable choice about how to use the advanced tools. In other words, training is not universal and the end-users usually only learn what they "need" to know about the hardware and software to get their work done. The full range of options from software or hardware is not realized.

Up to this point, users are enthusiastic about the capabilities of the present computer system, although some have specific complaints such as poor graphics capability and difficulty of accessing databases. Other complaints concern the databases themselves--the data are sometimes inaccurate or unavailable. There are too few people to update the data; too many locked files when the data are accessed; and too much downtime on the mainframe. The disadvantages cited by users have more to do with the lack of systems integration than with individual systems. Users had expected more access to the mainframe computer as new databases and capabilities were added. However, this has not occurred universally in Troy.

Background Notes on Job Content and Skills

Most users of computers report variety, challenge, creativity, and responsibility in their jobs. They do not feel that automation technology has or will result in excessive mechanization of their work or in de-skilling. They do think that having access to the computer would save time in some of their tasks, especially if databases were more accurate and available. Employees as a whole feel that if they have more time, it will be spent on new tasks and responsibilities.

Of course, there are some employees (in the minority at this point) who are bored, who lack motivation, and who are working below their abilities. The reasons cited for this include frustration with integration capabilities of the computers and feeling "locked to the terminal" when trying to meet end-of-month or other deadlines due to lack of availability or inaccessibility to the needed data.

At this point in time, training has been spasmodic and variable, depending on the department.

Background Notes on Facilities

Troy Manufacturing is a manufacturing facility; approximately 600 of the approximately 1,200 employees work in production. Many of the offices in the production department are located within a fenced area. The consumer market in which Troy competes has come under fire since the mid-1970's to clean up the environment and to install ecological mechanisms to keep the environment clean. Attention to safety is a top priority within the production department. Attendance at weekly safety meetings is mandated for production workers. Troy is very proud of the fact that it has not had a lost-time injury in over two years.

Office safety has received attention from time to time as office employees report minor accidents, such as tripping, inattention to open file drawers, and the like. Generally, the employees at Troy feel that they work in a safe environment.

Background Notes on Numbers of Employees by Department

Management (25 executives, 14 support professionals)
Sales (35 salespersons, 15 support professionals)
Production/Inventory (815, including superintendents, engineers, technicians, and support professionals)
Transportation/Order Handling/Billing (30 professional and technical; 40 support professionals)
Human Resources Management/Public Relations (25 professional, 15 support professionals)
Purchasing (9 professionals and 5 support professionals)
Accounting (10 accountants, 15 support professionals)
Research (90 professionals, 15 support professionals)

INFORMATION SYSTEMS ADMINISTRATION

Exercise 1-2

Questions to discuss and answer related to the case study:

Individually or in project groups, answer and discuss the following:

1. From the case study, determine the overall philosophy of the Troy Manufacturing Company.

2. From the case study, determine the purpose of the Troy Manufacturing Company.

3. What is Troy's philosophy and attitude toward information?

4. What is Troy's philosophy and attitude toward automation and the use of computers?

5. Who are the information systems workers in Troy?

6. In general, what are the skills required of the information systems workers at Troy?

7. What are some of the jobs that information systems workers have at Troy?

8. What is the attitude of the information systems workers toward computers and automation at Troy?

9. Would you say that the role of management at Troy is different from any other company its size or in its business? Be prepared to defend your answer.

10. List examples of the four functions of management as illustrated in this case study.

11. From the case study of Troy, answer Peter Drucker's questions insofar as possible:

    a. What should the company expect of me and hold me accountable for in terms of performance and contribution? (Who is "me" in this situation?)
    b. Who in the organization has to know and understand what I am trying to do so that both they and I can do the work? (In other words, how do the different departments at Troy interrelate? Which departments are dependent on others to get their jobs done? Which individuals within the departments need information from others? What kind of information? Be as specific as possible.)

c. On whom in the organization do I depend for what information, knowledge, specialized skill? (Put yourself in the place of an information systems worker at Troy in any one of the departments and answer the question to the best of your ability.)

d. Who in turn depends on me for what information, knowledge, specialized skill? (Put yourself in the place of an information systems worker at Troy in any one of the departments and answer the question to the best of your ability.)

e. Whom do I have to support and to whom, in turn, do I look for support? (Same question as in d. and e. above--just asked in a different way.)

12. Draw an organizational chart for the Troy Manufacturing Company. Is the organizational pattern traditional? Are there elements of the matrix format or the reticular organizational structure which may not be on the chart? Give an example.

INFORMATION SYSTEMS ADMINISTRATION

Exercise 2-1

Complete the following activities as suggested:

1. Identify one professional organization to research and join (optional) which has a chapter in the locality or set up a meeting for one of its members to speak to the group on information systems design and implementation and the value of membership in that particular organization. A list of suggested professional organizations might include but not be limited to:

   Association of Information Systems Professionals (AISP)
   Administration Management Society (AMS)
   Association of Records Managers and Administrators (ARMA)
   Association for Systems Management (ASM)
   American Society for Personnel Administration (ASPA)
   Data Processing Management Association (DPMA)
   Office Technology Management Association (OTMA)
   Professional Secretaries, International (PSI)

   Computer users' groups (especially SIGs) also are a source of information and speakers.

2. Read one article regarding professional development and the value of membership in professional organizations. Share your findings with the class.

3. Read two articles related to information systems management, information systems planning, and the project planning methodology. Share your findings with the class.

Answer the following questions and complete the following activities related to the case study in Exercise 1-1:

4. What are some of the problems that exist in Troy regarding office automation? Be specific.

5. What are some of the problems that may not be so obvious? Be specific.

6. What is your perception of the overall "climate" at Troy?

7. What is your perception of top management's role in and support of information systems technology?

8. Set up a project team for each of the functional areas in the Troy Manufacturing Company:

   Management (25 executives, 14 support professionals)
   Sales (35 salespersons, 15 support professionals)
   Production/Inventory (815, including superintendents, engineers, technicians, and support professionals)
   Transportation/Order Handling/Billing (30 professional and technical; 40 support professionals)
   Human Resources Management/Public Relations (25 professional, 15 support professionals)
   Purchasing (9 professionals and 5 support professionals)
   Accounting (10 accountants, 15 support professionals)
   Research (80 professionals, 15 support professionals)

   The number of people in each project team depends on the size of the class. As few as two can be assigned to each area. If there are not enough people to be assigned to each functional area, eliminate the Management and Research functions. OR Assign more than one functional area to each team. The project teams will focus on their functional area(s) for the remainder of the course. The entire project team will participate in the feasibility study.

9. The following information systems support tools have been identified by the CEO's staff as those which the upgraded systems must have:

   telephone (with voice mail), word processing, database management, spreadsheet, forecasting, communications (E-Mail and telecommunications), graphics, desktop management (calendars, ticklers, to-do lists, etc.), and access to stored information on the mainframe all in one executive and/or professional workstation.

   The project team will identify other systems as progress is made on this case study.

10. As a result of the first meeting of the project team, the project manager has identified the following activities to take place over the next month prior to the next meeting:

    a. The project team members must familiarize themselves with the information systems in their departments. This will include an analysis of work flow, documents, equipment (hardware and software), work schedules, and work assignments. Each functional project team should make a diagram of the work flow, a list of documents and

equipment, a tentative work schedule, and assumed work assignments from the work schedule.

b. The project team members must familiarize themselves with the jobs in their departments which now utilize automated technology or which could utilize automated technology. This could be done in class discussion by analyzing jobs that would be handled in each of the departments represented in Troy. Guest speakers could easily contribute to this activity.

c. The project team members must conduct preliminary interviews with a cross-section of workers in their departments to get an objective view of the current status of information systems technology and suggestions from them as to what would be helpful.

To complete this assignment, role playing by members of the class could take place. Since the role of end-users has been spelled out to some extent, these could be fleshed out in roles by students.

d. Complete research on <u>one</u> manufacturer or vendor to share with the group at the next meeting.

The manufacturers/vendors identified were: IBM, Xerox, Wang, Macintosh, PRIMACS, Rolm CBX (telephone system), AT&T, Digital Equipment Corporation (DEC), ITT, Data General, Honeywell, Control Data Corporation, Datapoint, and networks (Ethernet, Net/1000, WangNet, ArcNet, etc.).

e. Complete research on the software which is compatible with the system chosen. Make the list as exhaustive as possible.

11. Choose one person from each project team to act as a reporter from each functional area to respond to each of the activities listed above. A written report should be handed to the project manager (the instructor) from each functional group so that a progress report can be passed on at the next CEO's staff meeting.

INFORMATION SYSTEMS ADMINISTRATION

Exercise 3-1

To complete the objectives of this task area, the following activities and questions are suggested:

1. Read at least two articles regarding ergonomics for the next project team meeting. Share your findings with the class.

2. Read at least two articles regarding health and safety factors in the automated office for the next project team meeting. Share your findings with the class.

3. Take a field trip to an organization in your locality which utilizes automated equipment. Make a note of the health, safety, and ergonomic features which it has in place. Report on the features at the next project team meeting.

4. Invite a speaker to talk to the project team who has specific knowledge or expertise in ergonomics related to the automated office.

5. Research at least one vendor who has developed and sells ergonomic equipment for the automated office and report to the project team. (A good source for vendors of this type is furniture manufacturers: Steelcase, Control Data, ACCO International, Environetics International, Inc., etc.)

6. What are some of the ergonomic problems that Troy must deal with regarding office automation?

7. What are some of the health and safety problems that Troy must deal with as a result of the information systems technology which it will implement?

8. What effect may the upgraded information systems technology have on its present organizational structure?

9. What is your perception of the overall safety "climate" at Troy?

10. What new policies and procedures regarding health and safety, ergonomics, or other factors may need to be developed and implemented with the upgraded technology?

11. What can be done to avoid obsolescence of Troy's upgraded information system?

12. Is it necessary for Troy to have a policy or procedure regarding health, safety, and ergonomics for the upgraded system? Report your views to the project team.

13. Discuss the importance of and need for an effective information policy for Troy.

14. Is obsolescence an issue in the automated office? Read at least one article dealing with this subject and share your findings at the next project team meeting.

15. Choose one person from the project team to serve on a panel to discuss these issues at the next meeting of the project team. A written report will be given to the project manager (the instructor) so that an update can be made at the next CEO's staff meeting.

INFORMATION SYSTEMS ADMINISTRATION

Exercise 4-1

To complete the objectives of this task area, the following activities and questions are suggested:

1. Identify the job functions that are performed in the various departments at Troy Manufacturing Company. The list should be as exhaustive as possible. From the list, determine those which could and should be accomplished on automated equipment. It may be helpful to role play interviews with different levels of employees at Troy. Suggested questions might include: What are your job responsibilities? Which of your job duties are routine and which could be classified nonroutine? What parts of your job could be done on automated equipment? How much of the time are you on the telephone? Do you find yourself playing 'telephone tag' quite a bit of the time? What responsibilities could you assume if you had automated equipment?

2. Identify the automated equipment which will be needed to accomplish the job functions performed in the various departments at Troy.

3. Identify the job functions by level of employee; i.e., job functions accomplished by managers; professionals such as accountants, purchasing agents, personnel interviewers, retirement/benefit counselors, public relations specialists, production engineers, sales professionals, planners, technicians, lab technicians, chemists, and support professionals.

4. Identify from the case study the types of automated equipment that are currently in use at Troy.

5. Discuss the issues and develop the answers to the questions that follow based on the present and future needs of Troy:

   <u>How output will be accomplished</u>: Will paper, microfilm, magnetic tape, floppy or hard disks, optical disks, or monitors be used to save the output?

   <u>How input will be accomplished</u>: Will it be entered orally, through the keyboard, electronically from another system or peripheral, or from magnetic tape?

   <u>User interfaces</u>: What level of communication is needed: Two-way communication? One-way only? Or both? Will the system be menu driven? Will the user type command codes? Both? Is a help feature needed?

Processing: How much modification of software will be needed to accomplish the job functions listed above? How much time of a programmer will be needed? How much can the software be modified by the manufacturer to accomplish the job functions?

Security: What are the safeguards that will be installed? Who needs what information from the system? What back-up procedures will be installed? What kind of error recovery procedures will be installed? Are audit trails needed?

6. Identify the concerns, suggestions, issues, and problems that came out of the interviews with employees in the various departments.

7. Discuss the factors that must be taken into account when considering upgrading and/or purchasing automated equipment. Suggested factors may include but not be limited to:

Flexibility and expandability. To take into account the changing needs of the organization, as well as the changing demands from outside agencies, hardware and software must be purchased with flexibility and expandability in mind. The need to change formats created by new regulations or tax laws or company growth speak directly to the issue of flexibility. The growth of the company points to the issue of expandability. Should a company have to buy a whole new system when it outgrows its old one? Can the present system be upgraded to accommodate faster hardware and software? How easily can new users be added?

Compatibility. There is a critical need in information resource management to achieve compatibility between systems. Compatibility is an issue in connectivity and communication and affects efficiency, as well as cost effectiveness. The ability of two systems to transfer information which does not require rekeying can only be achieved when two word processing packages are compatible.

Convenience. Is the system convenient or easy to use? Is it easy to learn? These are two different issues, but both relate to convenience. A word processing package may offer the right prompts at the right time make it easy to learn, but these same features may also slow down the user who can keyboard at a high rate of speed, thus hampering its convenience.

Speed. Computers are valued because they are fast in what they do. However, speed is more important in some applications than others. An order handling system that takes longer than five minutes to confirm a telephone order is not going to help business; a mailing list that is cumbersome and awkward to update is not going to help a company which relies on current mailing lists for its catalog mailings. On the other hand, speed may not be a factor in many applications.

Cost effectiveness. A system must also be evaluated by the bottom line: Is it worth the cost? To keep costs down, an organization may have to trade off certain optional features to be able to afford the features that are critical. These critical features are determined during the project planning stages as the features that the system must have--the functions that an organization is willing to pay for; optional features are the features that would be nice to have--the functions that the organization might like to have, but is not willing to pay for. When judging a system, it must be viewed in light of these two criteria: function and cost.

Debugging. After testing and retesting a system, bugs often will show up after weeks, months, or years of use. Fixing them may take time and be frustrating and extremely difficult, especially if the persons working on the debugging are not the ones who wrote the program. This points up the need for thorough documentation for the hardware and/or software.

8. Discuss principles of space management and office designs. List the factors as discussed.

Space Management and Office Designs. Space management and office design have a direct effect on the quality and quantity of work which is performed in the office. Factors which affect quality and quantity of work include sufficient space in which to work; effective work flows; workstations that permit and encourage good working methods and habits, as well as setting up effective communication channels; coordinate the use of space and ergonomic factors, such as lighting, color, noise control, and ventilation; provision for comfort and convenience; and support for management's philosophy of effective and efficient space utilization with flexibility in layout for expansion or contraction of space needs.

Define work flow which is the movement of information vertically between superiors and subordinates or horizontally among workers on the same level. Why is it important to know about work flow?

Discuss and list the human needs to be considered in an effective space management program and office design layout.

Personal space is the privacy "bubble" surrounding the worker. It is broken down into four distances:

Intimate space: skin contact to 18" (reserved for those who are invited into this intimate space)
Personal space: 18" to 4' (generally the work area under the worker's control)
Social distance: 4' to 12' (usually the space in which one can hold a social conversation)
Public distance: outward from 12' (generally "waving" distance)

Territoriality is the office area which is under the control of the worker.

Functional space needs makes organizational sense to continue to put people who are performing tasks related to specialized functions together to enhance work flow and to minimize movement and noises that are caused by people as tasks are performed.

Office Design Plans

Conventional plan is characterized by wall barriers to isolate work areas, usually in private offices denoting status. Also, it is called the traditional plan. Specialized work functions are grouped together in departments with workers in private offices or in large offices which are in larger walled offices. Critics of this office design plan believe that it prevents communication and human interaction, hinders effective work flow, and slows down the production process. It is an inflexible arrangement which requires added costs of moving walls when redesigning work areas.

There are benefits in this plan, however. Territoriality issues are not a problem in this plan, as each worker can identify the area of control in his/her work area. Privacy is an integral part of this office design and is not an issue.

Careful consideration should be given in this plan to the placement of departments so that those with the most contact with the public will be placed near the entrance to the office; aisles and doorways should be convenient and unobtrusive for workers in all departments to minimize traffic; and departments which need the most contact with each other or need to have access to equipment will be placed as close to each other as possible.

Open office plan (sometimes called office landscape) is characterized by open space, no permanent walls and corridors, movable/portable workstations with its own lighting, installation of plants and bookshelves and filing cabinets which can be moved, and group arrangements which facilitate access to information and equipment. There are a minimum of private offices. Privacy is provided by using plants and/or sound-absorbing screens or partitions which are usually wired with electrical outlets. Status of workers is determined by the work assignment rather than private offices or locations. The effect of the open plan on the office is a feeling of openness and airiness with enhancing colors and lighting.

In some open office designs, executives and managers may use private offices for isolation and privacy. Other supervisors, however, are located nearer their staffs. Private conference rooms or meetings rooms also may be provided for customers, clients, or other in-house meetings which require a certain degree of privacy. When the open office plan and the conventional plan are combined, it is sometimes referred to as the American Plan.

Advantages to this type of design include lowered construction and energy costs, more usable floor space, flexibility in rearrangement and/or redesign of the work place, and lack of communication and work flow barriers among and between workers. Disadvantages to the open plan are aimed at lack of privacy, noise factors, and poor designs which lack consideration of the factors which enhance work flow, communication, and productivity. Research and surveys are continuing regarding the impact of automated equipment and the open plan on the office environment.

Work center concept. One additional office space plan is the work center or individual workstation. When automated equipment is added to the individual workstation, it is called an automated work center. The work center concept assigns basic furniture and

equipment to each workstation--desk, table, chair, counters, shelves, files, machines, computers, disk drives, modems, interfaces, printers, storage media and facilities, telephone, and other facilities as needed. When two or more of these workstations are put together, they are referred to as group workstations. When a similar facility is provided for executives, it is called an executive workstation and provides a terminal with voice (phone/modem) and data (computer) capabilities.

9. In an earlier assignment, project teams completed research on one hardware manufacturer or vendor and developed a list of compatible software for that manufacturer. The manufacturers were identified as: IBM, Xerox, Wang, Macintosh, PRIMACS, Rolm CBX (telephone system), AT&T, Digital Equipment Corporation (DEC), ITT, Data General, Honeywell, Control Data Corporation, Datapoint, and networks (Ethernet, Net/1000, WangNet, ArcNet, etc.).

   A written report was turned in to the project manager, regarding the findings in that assignment. These written reports will be used again in this section.

10. Complete research on other peripherals, such as facsimile, telex, printers (lasers, dot matrix, letter quality), photocopiers (intelligent), phototypesetting equipment, OCR, portable or transportable personal computers, modems, interfaces, and other equipment. The factors in items 5. to 8. above should be taken into consideration.

11. Complete research on storage media--floppy disks, hard disks, optical disks, magnetic tape, cassette back-up systems, file servers, and others--which are available for hardware, software, and other peripherals. Again, attention must be given to the hardware and software which has been researched in the previous assignment.

    The end result of the four research assignments (research on hardware, software, peripherals, and media) is to decide on a total system package which will ultimately be presented to the CEO's staff by the project manager and project team.

12. With the written reports completed in 9. above and the results of the additional research that has been assigned, project team members are to develop a design and layout plan for their functional departments, focusing on the factors which have been developed in items 1. to 8. above to make the case for their system.

The layout design must be based on principles of space management and human needs. As part of the design layout, the flow of work must be presented for the department.

Factors regarding health and safety, ergonomics, or other factors must be considered in the presentations of the office layouts.

13. Oral presentations of the departmental layouts will be made to the rest of the project team and should focus on demonstrating skills in negotiation and persuasion, leadership ability, and knowledge of the subject and organization. Visual aids will enhance presentations.

    A written report will be given to the project manager (instructor) so that a progress update can be made to the CEO's next staff meeting.

14. What can be done to avoid obsolescence of the upgraded information systems which will be presented?

INFORMATION SYSTEMS ADMINISTRATION

Exercise 5-1

To complete the objectives of this task area, the following activities and questions are suggested:

Prior to Selection of a System

1. Discuss and list as a project team the requirements that will be included in a request for proposal (RFP) to vendors. Decide whether or not to hold a vendors' conference.

2. Discuss as a project team a reasonable timetable which might be expected for the selection of a vendor and the implementation of and conversion to the system that will be recommended by the team.

3. Based on prior research and reporting assignments in this course, the project team will make a decision as to the system to recommend to the CEO's staff. The recommendation will be put into a formal recommendation and presented in an oral presentation by the project team to the project manager. Visual aids will enhance the presentation.

   Specific recommendations should cover the total system: hardware, software, media, peripherals, workstations, telecommunications, networking, design and layout of offices (where appropriate), and policies concerning data integrity, security of data and facilities, and responsibility and accountability for data ownership.

   The oral and written recommendations will use the following format and include:

   I. RECOMMENDATION(S): In one or more sentences, state the overall recommendation(s).

      Example: Install the Xerox 8010 system at Troy Manufacturing Company. Install the Ethernet network system throughout this location and utilize the software which comes with the system.

   II. EXECUTIVE SUMMARY: The second part of the report should include a summary of the justification for the recommendation(s), such as:

A. Operational feasibility
(with summary of arguments)

B. Technical feasibility
(with summary of arguments)

C. Cost feasibility
(with summary of arguments)

D. Installation, security, Etc.

These first two parts (Recommendations and Executive Summary) should be the first page of the report.

III. RATIONALE: The remainder of the report includes the detailed arguments for overcoming the problem, relating directly to the purpose. The background (rationale) material should speak specifically to the numbered items in the executive summary and include any attachments, such as graphs, diagrams, handouts, etc.

The RECOMMENDATIONS are stated at the beginning so that those who read the report will not have to read to the end of a long report to find the answers. Putting the recommendations "up front" will enhance chances of the report being read and favorably accepted.

4. For the remainder of the activities, assume that the CEO's staff has accepted the team's recommendation.

After the System Has Been Selected

5. Discuss the factors which relate directly to the implementation of a new or an upgraded system, new hardware and/or software, and related peripherals.

Implementing the System

Selection of a vendor starts the implementation phase. This phase assumes that a decision has been presented and approved by top management. The money has been committed, the hardware and software selected, and a timetable has been established with the vendor. Implementation of and conversion to the new or upgraded system can be taken all at once or in steps as presented below:

a. on a crash basis--completely leaving the old system and turning to new one;

b. on a parallel basis--running both systems at once until the new one is completely debugged;
c. on a pilot basis--one group uses the old system while another group uses the new one and as the new one runs smoothly, the others convert to it; or
d. on a phased-in basis--the new system is adopted one step at a time. There are obvious pros and cons of each way.

The decision will be made by the CEO's staff as to which way it will prefer to implement the upgraded system, new hardware and/or software, and related peripherals.

Installation process. Hardware and software are delivered in this stage of the implementation process. The software already may be installed or it may need to be installed after it is delivered. In many cases, installation of software is accomplished by inserting it into the disk drives and running a special installation program included with the software. At this time, it also may be installed onto the appropriate hard disks. Originals of software (whether disks or tapes) are kept for back-up purposes.

Installation of the hardware means laying the appropriate cable(s) at the same time the hardware is delivered or prior to the delivery. Appropriate electrical outlets should be provided. Safety concerns regarding exposed wires and cables should be considered at this time.

Testing of the installed system is done first. Normal, complete, and accurate data are run through the system to check the system's ability to perform the intended functions. Next, data of an unusual nature may be run through the system to see how it handles exceptions such as the omission of nonessential data or out-of-sequence data. Lastly, incorrect data are entered into the system to see how it detects errors and how the system responds to them. For example, a "T" may be entered in a field where an "M" or an "F" are the correct entries. If the error message does not make sense to the end-user, it may be modified at this point. Using the same example above, if the error message is "Code Wrong in Field 4", it may be changed to "Error in Gender Field. Enter M or F." This makes the system much more user friendly.

Debugging of the software can be handled at the same time as the testing. Bugs are mistakes in the software

which can be handled by the manufacturer or the company's programmer. Finding bugs during the testing and installation phase is helpful. However, many times bugs do not show up until after the software has been in use for a while. Then the company's programmer will handle the debugging.

Documentation is as important to the end-user as a road map to a traveler. User documentation may not be written until the system itself has been installed and tested and all modifications and debugging have been accomplished. It is important that documentation provided by the manufacturer is appropriate to the specific purchased system, that it takes into consideration the end-user who is likely not to be a systems analyst, and that it is well written and readable, presenting functions in a step-wise fashion.

User training can be accomplished in many ways:

a. reading the documentation, individually, or in classes provided by the manufacturer at its location,
b. hands-on training by the manufacturer at the company's location, or
c. hands-on training by company trainers who are assigned to an information center or who may be designated as experts in the software or hardware.

If training can be accomplished prior to the installation of a system, efficiency is improved and anxiety is alleviated. Training also may be provided through computer-based tutorials which allow the end-users to progress at their own pace.

Generally, computer training of top level executives is handled on a one-on-one basis at their workstations. Usually, it is done in short sessions. Designated employees in their work areas may be assigned as resource personnel or assigned specifically to follow up the initial training on an as-needed basis.

The end of the implementation phase is not the end of the project. Maintaining the system includes further debugging or modifying by company programmers at the request and convenience of end-users. As stated above, many times bugs do not show up until the software or hardware has been in use for a while. Updates and upgrades to software may be part of the system and these upgrades will have to be made to existing software or hardware. On-going evaluation also will turn up potential sources of problems before they have

become evident to end-users. New features which are added to existing systems may introduce new bugs into the system. New tax laws in an accounting department mean that modifications have to be made to software. New ways of manipulating information causes changes in old ways of processing it. This is a continuous cycle which begins again with a new round of study, planning, design, and implementation.

6. Identify the types of data which will be "owned" by each department at Troy.

Data Ownership

Data ownership is becoming a critical issue because of the amount of available information and is a common source of political strife within the organization. This issue strikes at the heart of ethics, values, and standards within the corporation. Some of the issues and questions which arise include:

> Does corporate data "belong" to the organization as a whole? Or, to the user area that updates the data base? Should there be a single data base administrator to play traffic cop for all corporate data? Which elements are really sensitive and which are sensitive only in the eyes of the self proclaimed "owner"? All users want access; but often what data sharing means to users is that they want access to someone <u>else's</u> data, not that they want someone else to access <u>theirs</u>.

7. Identify the security guidelines which will be needed to protect equipment, data, and facilities with the new or upgraded system at Troy.

Security and Integrity Issues

Numerous newspaper reports have been written regarding the ability of "hackers" to access sensitive and private data banks. (Has everyone seen "War Games"? Is it fiction or fact?) With the proliferation of personal computers, access to sensitive information is more convenient. In fact, it can be "filed" on a diskette and transported out of the organization in coat pockets, briefcases, newspapers, etc. Mainframe processing is more likely to control the access to information. The use of passwords, back-door passwords, encryption, dumb terminals, audit trails,

and security systems are becoming more and more prevalent as management begins to grope with the issues of information management and access.

If data stored on mainframes also are to be stored on microcomputer media, integrity issues are raised. Why is there a need for duplication of data? Is the data that are stored accurate? What are the guidelines for downloading (passing from mainframe to user workstation) and uploading (transferring from workstation to minicomputer and mainframe computer) data to preserve security and integrity?

If microcomputers and mainframes are to be connected (and to achieve full integration, they must be), guidelines should be established which provide for security of data, integrity of data, and for access to data: who, what, when, where, why, and how much.

8. Develop as a class (or project team), a policy statement which relates to the following:

   a. When ownership of data can be claimed (when it is created or when it is processed)

   b. Who can access large databases

   c. How large databases will be accessed and how access is given (logon statements, passwords, employee I.D. numbers, voice print, etc.)

   d. How the integrity of the data in the large databases will be maintained: who can alter, when altered, how altered, etc.

   e. How to secure data created, processed, manipulated, and stored by the personal computer

   f. Who is responsible and accountable for data integrity and security

   g. How maintenance is obtained on a routine or an emergency basis

9. Complete additional research which might be required.

10. At the conclusion of the total project, the project team should evaluate the process.

Information Systems Administration

course seven

Evaluation

•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•

CRITIQUE OF ORAL PRESENTATION

The statements below should be evaluated according to the following scale:

5 - Excellent
4 - Good
3 - Average
2 - Fair
1 - Unacceptable

NAME OF PRESENTOR _____

TOPIC OF PRESENTATION _____

DATE OF PRESENTATION _____

Please circle the number which best indicates your feeling toward the presentation.

1.	The manner in which speaker introduced himself/herself	5	4	3	2	1
2.	The manner in which topic was introduced	5	4	3	2	1
3.	Identification of objectives in the presentation	5	4	3	2	1
4.	Manner in which presentation was organized	5	4	3	2	1
5.	Manner in which presentation was delivered	5	4	3	2	1
6.	Degree of enthusiasm projected	5	4	3	2	1
7.	Degree of effectiveness of presentation to students	5	4	3	2	1
8.	Degree of professionalism exhibited during the presentation	5	4	3	2	1
9.	Use of visual aids or materials during presentation	5	4	3	2	1
10.	Degree to which the audience was included in the presentation	5	4	3	2	1

OVERALL POINTS FOR PRESENTATION _____

Comments: _____

_____

_____

CRITIQUE OF WRITTEN REPORT

The statements below should be evaluated according to the scale provided after each component:

NAME OF WRITER _____

TOPIC OF REPORT _____

DATE OF REPORT _____

Please circle the number which best indicates the evaluation of the report.

1.	The physical aspects of the report: (page layout, margins, form and content of title page, placement and spacing of captions, neatness, etc.)	5 4 3 2 1
2.	The organization of the report: (logic in arranging information, wording of captions, etc.)	10 8 6 4 2
3.	Content and analysis of the report: (adequacy of coverage, pertinence, quality and quantity of information, completeness of introductory material, logical analysis)	15 13 11 9 7
4.	Quality of writing of the report: (style: interest quality, objectivity; readability: clarity, conciseness, completeness, sentence structure, word choice; coherence: appropriate summary, conclusion, and forward-looking parts)	20 18 16 14 12
5.	Graphics included in the report: (suitability, correctness, appearance)	(5 4 3 2 1)

OVERALL POINTS FOR REPORT _____

(Total may be more than 50 points if graphics are included.)

Comments: _____

_____

_____

_____

Information Systems Administration

course seven

References

•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•INFORMATIONSYSTEMSCURRICULUM•

RESOURCES

Suggested resources include but should not be limited to the following resources:

Periodicals

ACCESS
ADMINISTRATIVE MANAGEMENT (formerly OFFICE ADMINISTRATION AND AUTOMATION)
ARMA RECORDS MANAGEMENT QUARTERLY

BUSINESS COMPUTER DIGEST
BUSINESS WEEK
BYTE

COMPUTER DECISIONS
COMPUTER WORLD, including their Office automation and Telecommunications issues

DATA COMMUNICATIONS
DATAMATION
DATAPRO REPORTS (available for a number of areas in Office Automation, including Automated Office Solutions, Office systems, Word Processing, Copiers and Duplications, Small Computers, Microcomputer Software, and Telecommunications)

FORBES (excellent source for International Data Corporation white papers written several times a year as an advertisement supplement)
FORTUNE (excellent source for International Data Corporation white papers written several times a year as an advertisement supplement)

GRAPHICS ARTS MONTHLY

HIGH TECHNOLOGY

IMPACT
INDUSTRY WEEK (also an excellent source for International Data Corporation white papers written several times a year as an advertisement supplement)
INFORMATION MANAGEMENT
INFOSYSTEMS
INFOWORLD
INTERFACE AGE

MANAGEMENT REVIEW
MANAGEMENT TECHNOLOGY
MANAGEMENT WORLD
MIS WEEK

MODERN OFFICE TECHNOLOGY (formerly MODERN OFFICE PROCEDURES)

THE OFFICE

PC WEEK
PC WORLD

THE SEYBOLD REPORT ON OFFICE SYSTEMS

TECHNOLOGY IN FOCUS
TODAY'S OFFICE
TRAINING
TYPEWORLD

WORDS

Books and Monographs

APPROACHING THE AUTOMATED OFFICE, Walter S. Kleinschrod, 1987-88.
(Based on a series of four monographs developed from a grant by Olsten Corporation to the AMS Foundation: This monograph and the other four are available from the Administrative Management Society Foundation, 2360 Maryland Road, Willow Grove, PA 19090).

AUTOMATION OF AMERICA'S OFFICES: 1985-2000. U. S. Congress, Office of Technology Assessment, Washington, D. C., U. S. Government Printing Office, OTA-CIT-287, December 1985.

MANAGING NEW OFFICE TECHNOLOGY: Calvin H. P. Pava, 1983.

MEGATRENDS, John Naisbitt (continues to be quoted)

OFFICE AUTOMATION: A USER-DRIVE METHOD, Don Tapscott, 1982.
(Tapscott is considered one of the leading authorities in office automation at the present time.)

THE THIRD WAVE, Alvin Toffler (continues to be quoted)

TITLES FOR INFORMATION SYSTEMS WORKERS
(These titles reflect current research findings.)

Administrative Assistant
Administrative Secretary
Administrative Services Specialist
Administrative Services Coordinator

Administrator, Information Systems

Applications Specialist, Information Services

Assistant VP, End User Systems
Assistant VP, Word Processing Manager
Assistant VP, Word Processing Supervisor

Assistant Word Processing Manager

Automation Conversion Coordinator
Automation Specialist

Chief Word Processing Operator

Communication Specialist

Computer Graphics Specialist
Computer Specialist

Coordinator
Coordinator of Office Information Systems
Coordinator, Word Processing
Coordinator, Word Processing Center
Coordinator, Word Processing Systems

Customer Service Representative

Data Entry Supervisor
Data Processing Operator Manager

Data/Word Processing Coordinator

Department Spokesman, Office Administration

Director, Administrative Services
Director, Bureau of Office Services
Director, Central Communications
Director, Computer Office Production
Director, Information Center
Director, Information Systems
Director, Information Systems Control
Director, Support Services
Director, Training
Documentation Supervisor

Executive Assistant
Executive Secretary
Executive Secretary to President

I R C Manager, Office Information Systems

Information Analyst
Information Center Consultant
Information Center Liaison
Information Center Specialist

Information Manager

Information Processing Secretary
Information Processing Specialist
Information Processing Supervisor/Coordinator

Information Resources Manager

Information Services Supervisor

Information Specialist

Information Systems Administrator
Information Systems Coordinator
Information Systems Lab Tech
Information Systems Program Analyst
Information Systems Supervisor

Lead Word Processing Operator
Lead Word Processing Specialist

Lead Worker, Correspondence Center

Legal Secretary

Management Analyst II, Information Processing
Management Analyst, Administrative Systems Management

Management Assistant
Management Staff Assistant

Marketing Representative, Personal Computer Training
Marketing Support
Marketing-Planning Analyst

Microcomputer Support, Technical Services

Office Automation Analyst
Office Automation Coordinator
Office Automation Consultant
Office Automation Customer Support

Office Automation Specialist
Office Automation Specialist Trainer, Office Automation
Office Automation Support/Trainer
Office Automation Supervisor
Office Automation Systems Training Manager

Office Coordinator, Management Technology

Office Effect Analyst

Office Manager, Services
Office Manager
Office Manager, Computer Control
Office Manager/Supervisor of Office

Office Services Operator
Office Services Manager
Office Specialist, Office of the President
Office Services Supervisor

Office Supervisor
Office Support Manager

Office Systems Analyst
Office Systems Consultant
Office Systems Manager
Office Systems Specialist
Office Systems Supervisor
Office Systems Support Supervisor

Operations Manager, Word Processing
Operations Officer, Office Automation

Principal Business Systems Designer

Production Coordinator

Program Director, Word Processing

Quality Assistant Office Supervisor

Records Manager

Related Assistant Systems Administrator

Research Assistant

Sales Representative
Sales & Marketing Information Technician

Secretary

Senior Computer Applications Analyst
Senior Customer Support
Senior Executive Secretary
Senior Marketing Representative, Information Systems
Senior Office Systems Analyst
Senior Planner
Senior Research Associate
Senior Software Specialist
Senior Supervisor, Office Systems & Technology
Senior Systems Analyst
Senior Word Processing Technician

Software Specialist

Staff Administrator
Staff Office Systems Consultant
Staff Services Administrator
Staff Specialist, Support Services

Supervisor, Administrative Purchasing Services
Supervisor, Communications Center
Supervisor, Computer Services/Systems
Supervisor, Corporate Support Center
Supervisor, Customer Relations and Travel
Supervisor, Department of Communications and Word Processing
Supervisor, DP/WP Center
Supervisor, Headquarters Word Processing Services
Supervisor, Information Systems Unit
Supervisor, Information Systems
Supervisor, Office Services
Supervisor, Office Services Word Processing Center
Supervisor, Office Systems
Supervisor, Publications
Supervisor, Secretarial Support Services
Supervisor, Secretarial Services
Supervisor, Software Administrative Services
Supervisor, Steno-Reprographics
Supervisor, Systems Development Support
Supervisor, Technical Procedures
Supervisor, Technical Information Processes
Supervisor, Trust/Word Processing
Supervisor, Word Processing Center
Supervisor, Word Processing/Administrative Support
Supervisor, Word Processing & Systems Office Services
Supervisor, Word Processing and Office Automation
Supervisor, Word Processing/Office Equipment
Supervisor, Word Production
Supervisor/Specialist, Information Processing

Support Services Officer
Support Services Supervisor
Support Specialist

Systems Administration Supervisor

Systems Administrator, Administrative Services
Systems Administrator
Systems Analyst
Systems Coordinator
Systems Operations Supervisor
Systems Representative
Systems Trainer

Telephone Administrator, Administrative Services

Text Processing Manager

Trainer/Coordinator, Information Systems Department
Training Coordinator for Word Processing Technology

Voice Communications Analyst

Word Communications Coordinator, General Services

Word Processing Administrator
Word Processing Coordinator
Word Processing Group Leader
Word Processing Lead, Support Services
Word Processing Lead Worker
Word Processing Manager
Word Processing Operator
Word Processing Records Supervisor
Word Processing Specialist
Word Processing Supervisor
Word Processing Supervisor/Manager
Word Processing/PC Center Supervisor
Word Processing Systems Administrator
Word Processing/Business Skills Training Instructor, Office Systems

REFERENCES

Arn, Joseph V. and Beverly Oswalt. (1988) Office automation: An Information Systems Approach. Boston, MA: Boyd & Fraser Publishing Company.

Arntson, L. Joyce. (1987) Word/Information Processing, 2nd edition. Boston, MA: Kent Publishing Company.

Asselin, Yves Alain. Competencies required of clerical personnel to work in an automated office by 1990 in the Province of Quebec. (Unpublished doctoral dissertation, University of Missouri-Columbia, 1984). Dissertation Abstracts International, 1984, 44, 514A. (University Microfilms No. 8512195)

Baetz, Mary L. (1985) The Human Imperative: Planning for People in the Electronic Office. Homewood, IL: Dow Jones-Irwin.

Bailey, Andrew D., Jr.; Gerlach, James H.; and Whinston, Andrew B. (1985) Office Systems Technology and Organizations. Reston, VA: Reston Publishing Company, Inc.

Bergerud, Marly and Thomas Keller. (1988) Computers for Managing Information. New York: John Wiley & Sons.

Bergerud, Marly and Jean Gonzalez. (1987) Word and Information Processing: Concepts of Office Automation. 3rd ed. New York: John Wiley & Sons.

Bernstein, William L. (January 1987) Apprentices of technology. Management World. 16(1).

Bikson, Tora K. and Eveland, J. D. (1986) New office technology: planning for people. Work in America Institute Studies in Productivity. New York: Pergamon Press.

Blaazer, Carolyn. (1984) Changing jobs in changing offices. In Alan Simpson (ed.), New Developments in Office Technology. Brookfield, VT: Gower Publishing Company.

Blanc, Iris and Cathy Vento. Spreadsheets: Skill Buidling Exercises and Applications. Dictation Disc Company.

Blanc, Iris. Skill Building Exercises for the Word Processor. Dictation Disc Company.

Blanc, Iris and Elinore Hildebrandt. Database. Dictation Disc Company.

Burford, Anna Marie. Developing trends in office technology and career paths as related to the office of the future. (Unpublished doctoral dissertation, The Ohio State University, 1979). Dissertation Abstracts International, 1979. 40, 72A-73A. (University Microfilms No. 7915961)

Burnett, Mary Joyce and Dollar, Alta. (1986) Business communication skills essential in an information society. In Jeanette W. Vaughn, Myra Bolin, Dorothy Darby, Janis Hutchins and Shirley McClain (eds.) Challenges in Business Education. Canyon, TX: Texas Business Education Yearbook No. 5.

Burns, J. Christopher. (1978) "The Office in the 80's" in Information Systems in the 1980's. Acorn Park, Cambridge, MA: Arthur D. Little, Inc.

Busche, Don. Microcomputer Business Applications and Projects. (To be used with Bergerud and Keller's Computers for Managing Information. John Wiley & Sons, Inc.

Carlisle, James. (1977) Evaluating the Impact of Office Automation Systems. Proceedings of the N. C. C., Dallas, Texas.

Clark, James F. and Judith J. Lambrecht. (1985) Information Processing: Concepts, Principles, and Procedures. Dallas: South-Western Publishing Company.

Clayton, Dean and Ok D. Park. Appleworks^{R}: Integrated Applications for Microcomputers. South-Western Publishing Company.

Crawford, T. James, Erickson, Lawrence W., Beaumont, Lee R., Robinson, Jerry W., and Ownby, Arnola C. Century 21 Keyboarding, Formatting, and Document Processing. (College Edition) South-Western Publishing Company.

Daggett, Willard R. and Branigan, Helen M. (1987) "Projections and implications of social, economic, and demographic changes for Business Education" in Margaret P. Gregory and Wanda Daniel, (Eds.) Business Education for a Changing World. Reston, VA: National Business Education Association Yearbook, 25.

Dennee, J. M. Importance and frequency of entry-level competencies as perceived by word processing supervisors, correspondence and administrative secretaries and word processing educators in Wisconsin. (Unpublished doctoral dissertation, Utah State University, 1981). Dissertation Abstracts International, 1981. 42, 1450A. (University Microfilms No. 8121374)

Denton, Keith. (January 1987) Managing "techies". Management World. 16(1).

DeVore, P. W. (January 1982) Microprocessors, robotics, and work. Man Society Technology. 41(4).

Drucker, Peter F. (1986) The Frontiers of Management. New York: E. P. Dutton.

Ettinger, Blanche. (1982) A study of the requirements and business training procedures for word processing personnel with implications for word processing curriculum development in two-year postsecondary institutions. AERA Annual Meeting, New York, 1982. (ERIC Document Reproduction Service No. ED 213 987).

Everett, Donna R. Competencies for information systems workers. (Unpublished doctoral dissertation, University of Houston, 1988).

Fife, Dennis W., Hardgrave, W. Terry, and Deutsch, Donald R. (1986) Database Concepts. Dallas: South-Western Publishing Company.

Finch, Curtis R. and Crunkilton, John R. (1984) Curriculum Development in Vocational and Technical Education: Planning, Content, and Implementation. Boston, MA: Allyn and Bacon, Inc.

Fisher, Ella H. (1987) "Integrating technological changes into the middle/secondary curriculum" in Margaret P. Gregory and Wanda Daniel, (Eds.) Business Education for a Changing World. Reston, VA: National Business Education Association Yearbook, 25.

Friedheim, Jan V. (1987) "Integrating technological changes into the two-year college curriculum" in Margaret P. Gregory and Wanda Daniel, (Eds.) Business Education for a Changing World. Reston, VA: National Business Education Association Yearbook, 25.

Fruehling, Rosemary T. and Constance K. Weaver. (1987) Electronic Office Procedures. Dallas: Gregg Division, McGraw-Hill Book Company.

Giuliano, Vincent E. (September 1982) The mechanization of office work. Scientific American. 247(3).

Graves, Charlotte K. (Fall/Winter 1985) Concepts needed by managerial personnel in automated offices as perceived by office systems consultants and collegiate business faculty. The Delta Pi Epsilon Journal. XXVIII(2).

Groneman, Nancy and Susan Owen. (1988) Applications Using the Personal Computer. Dallas: South-Western Publishing Company.

Harvey, Evelyn E. (1987) "Human relations skills for the changing office" in Margaret P. Gregory and Wanda Daniel (eds.) Business Education for a Changing World. Reston, VA: National Business Education Yearbook, 25.

Henderson, John C. and Treacy, Michael E. (Winter 1986) Managing end-user computing for competitive advantage. Sloan Management Review. 28(2).

Hopwood, Anthony G. (1983) "Evaluating the Real Benefits" Chapter 2 in Harry J. Otway and Malcolm Peltu (eds.), New Office Technology: Human and Organizational Aspects. Great Britain: Ablex Publishing Corp.

Housel, Thomas J. and William E. Darden III. (1988) Introduction to Telecommunications: The Business Perspective. Dallas: South-Western Publishing Company.

How "intrapreneuring" can change the face of North American business. (1983) In Joseph McKendrick (ed.), "The Generalist". Management World. 12(3).

Howe, Stanford H., II. (1988) Business Telecommunications. Dallas: SRA.

Jarrett, Dennis. (1984) The Electronic Office: A Management Guide to the Office of the Future, 2nd edition. Brockfield, VT: Gower Publishing Company.

Joner, Jacqueline. (November 1986) Information processing needs its professionals. The Office.

Kallaus, Norman F. and B. Lewis Keeling. (1987) Administrative Office Management. 9th ed. Dallas: South-Western Publishing Company.

Karten, Naomi. (1986) Effective corporate PC policies integrate users, business values. Data Management. 40(9).

Kleinschrod, Walter A. (1987) Update 1987-88: Approaching the Automated Office. Willow Grove, PA: Administrative Management Society Foundation.

LaBarre, James E., Mitchell, William M., and Mach, K. A. College Typewriting: A Mastery Approach (Advanced). SRA.

Lucas, Henry C., Jr. and Turner, Jon A. (1982) A corporate strategy for the control of information processing. Sloan Management Review. 23(3).

Luke, Cheryl M. and C. B. Stiegler. (1987) Office Systems and Procedures, 2nd ed. Dallas: Houghton Mifflin Company.

Luft, Roger L. and Schoen, Janice L. (Summer 1986) Nontechnical business employment competencies in Illinois. The Delta Pi Epsilon Journal. XXVIII(3).

Mankin, D.; Bikson, T. K.; and Gutek, B. (June 1982) The office of the future: prison or paradise? The Futurist. 16(3).

Mason, George. (October 1986) A message to business educators from a businessman. Business Education Forum. 41(1).

Meyer, N. Dean. (Winter 1983) The office automation cookbook: management strategies for getting office automation moving. Sloan Management Review. 24(2).

Michael, Donald N. (1984). Too much of a good thing? Dilemmas of an information society. Technological Forecasting and Social Change. 25.

Minnesota Curriculum Services Center. (n.d.) Electronic Information Systems: Post Secondary Business and Office Curriculum. Available from: Minnesota Curriculum Services Center, 3554 White Bear Avenue, White Bear Lake, MN 55110.

Naisbitt, John. (1982) Megatrends. New York: Warner Books.

National Business Education Association. (1987) Business Teacher Education Curriculum Guide. Reston, VA: NBEA, 1914 Association Drive.

Olney, R. J. A study to determine entry-level characteristics of prospective employees for business office positions which utilize components of systems planning and controlling. (Unpublished doctoral dissertation, University of Oklahoma, 1980). Dissertation Abstracts International, 1980. 41, 1906A. (University Microfilms No. 8024419)

O'Neil, Sharon Lund and Donna R. Everett. (1987) Information Systems Curriculum. Developed by University of Houstin, College of Technology, Technical Education Department through a grant from Coordinating Board, Texas College and University System in cooperation with Association of Information Systems Professionals.

O'Neil, S. L. and Pharat, E. M. (November 1982) Balancing the skills of the modern office worker. Journal of Business Education. 58(2).

O'Neil, Sharon Lund. Worker Perceptions of Skills Necessary for Survival in the World of Work. (Unpublished doctoral thesis, University of Illinois at Urbana-Champaign, 1976).

1986 Program Announcement. Des Plaines, IL: Institute for Certification of Computer Professionals, Suite 26B, 2200 E. Devon Avenue, Des Plaines, IL 60018.

Pava, Calvin H. P. (1983) Managing New Office Technology. New York: The Free Press.

Predicasts, Inc. (1983) Office of the Future. Industry Study E 90. Cleveland, OH: Predicasts, Inc.

Purchase, Alan and Glover, Carol F. (April 1976) Office of the future. Menlo Park, CA: Stanford Research Institute Business Intelligence Program Guidelines (1001).

Raymond, H. Alan. (1986) Management in the third wave. The Futurist. September-October.

Roessner, J. David; Mason, Robert M.; Porter, Alan L.; Rossini, Frederick A.; Schwarts, A. Perry; and Nelms, Keith R. (1985) The Impact of Office Automation on Clerical Employment, 1985-2000. Westport, CN: Quorum Books.

Roessner, J. David. (December 1985) Market Penetration of Office Automation Equipment: Trends and Forecasts. Prepared for presentation at the Sixth Internatinoal Conference on Information Systems, Indianapolis, Indiana. Atlanta, GA: Ga. Institute of Technology.

Rosen, Arnold, Feretic, Eileen, and Bahniuk, Margaret Hilton. (1985) Administrative Procedures for the Electronic Office, 2nd ed. New York: John Wiley & Sons.

Rosen, Arnold and William Hubbard. Information Processing: Keyboarding Applications and Exercises. John Wiley & Sons, Inc.

Rumberger, Russell W. and Levin, Henry M. (1985) Forecasting the impact of new technologies on the future job market. Technological Forecasting and Society Change. 27.

Saffer, Sally. (1986) Insight Into Office automation. Dallas: South-Western Publishing Company.

Schroeder, Betty L. and Diane Rouchier Graf. (1984) Module V: Office Administration and Communication. A joint publication of Professional Secretaries International and John Wiley & Sons as part of the Certified Professional Secretary® Examination Review Series.

Seel, John. (October 1985) Education: the gatekeeper in a changing economy. Business Education Forum. 40(1).

Shelly, Gary B. and Thomas J. Cashman. (1984) Computer Fundamentals for an Information Age. Brea, CA: Anaheim Publishing Company, Inc.

Simcoe, Annell Lacy. Word Processing Applications in Automated Offices. New York: John Wiley & Sons.

Stallard, John J. and George R. Terry. (1984) Office Systems Management, 9th edition. Homewood, IL: Richard D. Irwin, Inc.

Stouffer, Bonita. (1983) The office of the future: Its impact on the postsecondary office technology programs. Journal of Business Education. 58(4).

Sullivan, David R., Lewis, Theodore G., and Cook, Curtis R. (1985) Computing Today: Microcomputer Concepts and Applications. Dallas: Houghton Mifflin Company.

Tapscott, Henderson, and Greenberg. (1985) Planning for Integrated Office Systems: A Strategic Approach. Homewood, IL: Dow Jones-Irwin.

Tapscott, Don. (1982) Office Automation: A User-Driven Method. New York: Plenum Press.

Taylor, James C. (Summer 1975) The human side of work: the socio-technical approach to work system design. Personnel Review. 4(3).

Toffler, Alvin. (1980) The Third Wave. New York: Morrow.

U. S. Congress, Office of Technology Assessment, Automation of America's Offices: 1985-2000. Washington, D. C.: U. S. Government Printing Office, OTA-CIT-287, 12/85.

U. S. Department of Labor. (1983) Employment and Earnings. Vol. 30, No. 2. Washington, D. C.: U. S. Department of Labor.

Varner, Jane Terzick. Word Processing Operations. (latest edition). SRA.

Wagoner, Kathleen P. and Mary M. Ruprecht. (1984) Office Automation: A Management Approach. New York: John Wiley & Sons.

Zuboff, Shoshana. (September/October 1982) New worlds of computer-mediated work. Harvard Business Review. 5.