

# UNIT 11: MANAGING PRODUCTION AND CONTROLLING CHANGE

## OVERVIEW

In this unit, we will describe recent technological developments in document production, storage, and retrieval. One goal of this unit is to acquaint you with the variety of document production methods currently available, such as desktop publishing, and the effects these methods can have on the writing process.

Because the technologies chosen can influence the way a document is written, we will help you learn about production technologies and techniques so that you can manage them effectively. Finally, we will discuss the issue of ongoing education for employees involved in document production, especially those with significant writing responsibilities.

## OBJECTIVES

After completing this unit, you should be able to:

- describe recent technological developments in document production, storage, and retrieval that have affected the ways managers and employees work
- list three document production methods prevalent in modern offices
- differentiate between storage on disk, on diskette, and in databases
- describe five problems encountered in controlling changes to information

## DISCUSSION

Once you have written information in the form of memos, letters, and reports, you must produce, archive, change, and often reissue the information. An important part of the information planning process described in unit 4 is production planning in which you identify specific methods and issues associated with producing and storing documents. Often managers are involved in decisions about production and archiving because, in large organizations, such decisions require large financial commitments. For many managers, document retention is also a legal issue, as many corporate policies in addition to state and federal laws require that important documents be archived for specific periods of time.

## DOCUMENT PRODUCTION

Most writers understand **publishing** to mean the step in document production that follows writing. Publishers conventionally are outsiders who buy, edit, assemble, disseminate, and market writing. For many writers, publishers are those who transform manuscripts into saleable commodities, traditionally through the technology provided by the related printing industry. From the invention of moveable type in 1452 to the widespread use of print composition machinery in the Victorian era, publishing specialists have sought to improve both the medium for distributing information and the means of producing it. The twentieth century has seen an explosion of progress in both of these areas as well as in more advanced methods for bringing information directly and quickly to audiences who need it and are willing and able to pay for it.

### Production and Change

Thirty years ago, office document production was mainly the job of secretaries and other support personnel. Unless writers were writing books for production by book publishers, they were rarely exposed to the work that took place after their writing was finished. Most offices employed secretarial pools for document production. If writers were involved at all in the production process, it might have been in checking galleys or proofreading final copy that was then generally sent out to printing specialists.

In the 1970s, the advent of the personal computer, word processing, and electronic publishing changed the way documents were written and changed the writer's role in producing and maintaining the documents. Writers began to assume more responsibility for designing,

formatting, and seeing their documents through to completion than in previous eras. Work was no longer handed off to secretaries for typing, nor was it always automatically sent to printing specialists for final production. In 1985, researcher Joost Kist estimated that at least 80 percent of authors and business publishers were using computers to prepare and publish manuscripts (Kist 1985, 56). Through the computer, writers are able to work independently of other specialists to produce high-quality documents themselves. Even today, as Alfred, Oliu, and Brusaw (1992) note:

The writer's role in preparing a manuscript for printing is changing in many organizations. With the increasing use of electronic publishing, writers and editors are taking a larger role in the production process. They may write or edit at microcomputers, code the text with typesetting instructions, and communicate it to electronic publishing systems. (ibid., 319)

Alternatively, writers may work with others directly to produce a finished writing product, or—as in book publishing—they may play an advisory role in checking and authorizing changes, or completing final research.

With the rise of technology, document production has become big business. Printing technologies, once the province of pressmen only, are now accessible to many through desktop publishing. Word processing and desktop/electronic publishing require special skills. Managers have had to make personnel adjustments to accommodate the need for such skills within organizations. Attitudinal adjustments have also been necessary, as more and more professional employees and managers migrate to desktop computers and to self-generated means of production.

Changes in the area of publishing technology happen so rapidly, however, that even this information may not be as up to date as is possible when you read it. Today's managers face difficult decisions when it comes to investing in publishing technologies and equipment. Trade journals, retail literature, and conversations with industry experts should be standard references for managers who wish to purchase production technologies or equipment. In addition, managers often face the task of educating employees in new technologies that support their jobs. Many of these technologies vary from one organization to another.

Although some organizations still employ secretaries to create and print documents, many are finding it more cost effective to require professional staff to create and print their own letters and memos. In general, letters and memos produced on a word processor are printed

in-house on company printers, frequently laser printers. Often documents are stored on disk, which usually means on a diskette or compact disk; sometimes documents are stored on the organization's mainframe computer system. Accessing the written document once it is stored can, in some instances, involve getting clearance to view or make changes to the document, even if the person attempting to access the document is the original writer.

To control production technologies and techniques, managers should learn enough about the technologies and techniques to manage them effectively. To understand the production process, it helps to examine the roles that are generally played during the process, regardless of who plays them.

### **Roles in the Production Process**

The kinds of people involved in production activities may vary according to the type of production. Print-based production of documents within an organization may be done by a writer, editor, graphics specialist, production specialist, or some combination, working together to format the document and print it using desktop publishing software and a laser-quality desktop printer. Print-based production of a report may also involve the services of bindery or photocopying groups to copy, assemble, bind, and distribute the document. Print-based book production by a publishing company, in addition, may require that the writer work with copyeditors as well as printers and production specialists. In modern writing and production environments, employees other than writers may also be required to have some typing skills, the ability to read at the eighth- to tenth-grade level, and the ability to follow instructions for operating machinery.

New electronic media require new skills and resources—and a new vocabulary. Non-print-based media is generally referred to by referring to the technology that engenders it. Thus, **videotex**<sup>1</sup> is text displayed through video technology, **audiotext** is text heard through audio technology, **online information** is information accessed and displayed through computers, **CD-ROM-based** information is information stored for retrieval on compact discs, and so forth. The definition of roles includes some previously unknown in publishing industries. The skills

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<sup>1</sup>The term *videotex* is defined by Oldrich Standera (1987) in *The Electronic Era of Publishing* to mean, "viewdata," or "a two-way, interactive, electronic publishing system drawing on a computer-based databank from which users select information by keypad or keyboard, often from menus, and have it delivered via telephone lines (or other communications channels) to their TV screens enhanced by decoders. . ." (ibid., 387). Despite similarities to the word *text* the abbreviation *tex* in the suffix remains the correct spelling, perhaps deliberately suggestive of *tech* as well as *text*.

needed can include script writing and editing; mixing and dubbing both for video and audio; mastering (making master tapes) for video, audio, and disc; indexing; and media checking (often accomplished through computer software). In general, such skills and resources are provided to most organizations by expert companies or consultants. Writers with interest in the technologies are rapidly carving roles in the industry that expand their involvement in the production process based on their knowledge of text and graphics; their ability to create generic, or unformatted text; their knowledge of abstracting and editorial principles; and their familiarity with document design (Myers 1986).

### **The Writer as Production Process Manager**

The tendency toward broader roles for writers, and a growing reliance on specialized skills in some areas of publishing, also imply a shift in emphasis from the writer as commodity producer to the writer as process manager. All writers ultimately retain responsibility for what they write, and many, through copyright laws, also retain direct ownership. For some, managing the entire effort of document production seems natural. Professional writers accustomed to the iterative process of writing, automatically devise workable schedules, formats, styles, change controls, and methods for archiving and printing information. The switch to production mode for such writers may ostensibly involve only a change in the device used to print or in the types of decisions made about the appearance of what is written.

For other writers, however, the transition may be more difficult, because many writers lack skills in budgeting funds, scheduling deliverables, and working with others who contribute to the finished product. Managers who wish to improve the project management skills of employee writers should share with writers the tools and strategies of project management, and should insist that writing projects be managed as other business ventures are—with attention to schedules, tracking, accountability, productivity, and progress.

### **PRODUCTION PLANNING**

Planned production invariably assists writers and those new to publishing in successfully completing a production run. Just as good planning in general helps writers to complete writing on time and with good quality, production planning helps those involved in production to meet deadlines that are often compressed because of inadequacies in other areas of the project. Because production is inevitably among the last items to be completed in a writing project, it is

frequently subject to such compression. The ability to adapt a production plan and to engage in creative problem solving are important skills.

### **Start Early**

As part of the information planning that occurs at the beginning of a writing project, detailed production planning creates a roadmap that writers and others can follow in producing the final product. Such a roadmap assists writers by freeing them from the responsibility of making decisions about a document's appearance or content during crucial stages in the writing process. A writer who knows that his or her document will be distributed to large databases on CD-ROM, for example, may forego special formatting for the document which would ultimately be removed by the database compositors. This may save hours of the writer's time that can be better spent in writing or research. Alternatively, production planning may just result in a better and more useful written product. Writers who know that their documents will be retrievable online may take special care to create adequate glossaries and indexes that can be useful in retrieving information, or they may add an informative abstract or key words to facilitate online searching.

### **Provide Concrete Details**

Production planning should include specific details about what a document will look like in final form, and how it will be produced. More (rather than fewer) details should be included, even if final plans are still in the making. One advantage to including specifics in a production plan is that they engender an early cost-consciousness and provide a foundation for controlling costs later in a project cycle. The example below illustrates how a detailed production plan saved money for the publishing department of XYZ Corporation. Notice that even before writing had begun on the policy manual, the publishing specialist had envisioned what the manual would look like, and had devised a two-tiered plan that allowed her to trade off costly and time-consuming options as the production schedule became more compressed.

#### Example: Production Planning at XYZ Corporation

Doris Hagan began planning the production of her policies and procedures manual the moment she was assigned the task of coordinating its writing. As a publishing specialist and lead writer for XYZ Corporation, Doris knew that providing other writers on the project with specific details about what the manual would look like and how it would be produced would

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save her valuable time, especially during the production phase of developing the manual. In addition, Doris had enough experience to know that getting everyone in the corporation to agree to the manual's appearance and costs ahead of time would ensure her success.

To do this, Doris created the following table of specifications to describe salient aspects of the finished publication. Thinking through these aspects forced her to make decisions, start to research costs early, and get the approvals of both her writing and management teams for producing and distributing the manual. To play it safe, Doris also included two alternatives for some of the controversial aspects of the manual, thereby providing herself with a backup plan should something go wrong once the project had begun.

<b>Specification</b>	<b>Alternative #1</b>	<b>Alternative #2</b>
page count	approximately 250 printed pages	approximately 200 screens if presented as online book
no color, printed	4,000 copies, printed @ \$2700	5,000 copies printed @ \$2,000
4 color, printed	additional \$800 for 4,000 copies	additional \$650 for 5,000 copies
no color, photocopied	4,000 copies @ \$500	5,000 copies @ \$600
paper type	\$100 per ream @ 40 lb. matte	\$125 per ream @ 60 lb. matte
text generation	desktop, writer-generated; no added costs; more time needed by writers	desktop, word processing department; costs of \$4.00 per page
artwork	desktop, writer-generated; no added costs; more writer time and training needed	professionally drawn and designed; costs of about \$100 per piece

Doris's ability to create a specific plan also positively affected the work and morale of those working on her project, and it ensured her success in avoiding problems in printing. The sample below shows how just a few of her well-made decisions thwarted problems before they could blossom.

<b>Planned Specification</b>	<b>Production Problem Avoided</b>
200-page manual, headings shaded by printer in PMS rubine red.	Estimated size contributes to keeping size down during writing. Printer-based color helps writer avoid special formatting for emphasis in headings.
Indexing at least to third index level.	Requirement placed on writer for specified level of indexing avoids need for additional indexing at production time.
All graphics prepared as <i>EPS (Encapsulated PostScript)</i> files. All images must be scanned to be compatible with <i>PostScript</i> production.	Specific directions about graphical file types help to avoid problems associated with incompatible graphic and image file formats.

**Be Alert to Growth Patterns and Allow for Change**

Like other projects, writing projects are subject to growth in scope and complexity—both of which can affect production planning. Even with the best production planning, writers may occasionally discover that the scope of the writing to be produced has grown or lessened, the strategy behind it changed, or the impetus propelling it forward has diminished. Writers may discover, for example, that the amount of time or money originally allocated to complete a project is inadequate, although promises have been made to deliver the writing. They may be asked to absorb some slippage or defray some costs in the production cycle. They may be required to ask others, such as printers, to assist in reducing costs or expediting delivery.

For these reasons, employees planning production need some acquaintance with publishing and printing terminology and processes. They need to understand how to negotiate production details once the production cycle has begun as well as to plan for it ahead of time. Managers also need to have some knowledge of areas associated with production, because, apart from salaries, this phase of the document process affects the costs of a writing project more than any other.

## **SELECTING A METHOD FOR PRINT-BASED PRODUCTION**

Despite technological advances, most writing is still produced for print-based media. The method of production that you select for printing will be derived from your audience, your budget, and the equipment available to you. In general, most in-house document production requires one of the following methods:

- **Word processing**—Special equipment designed for text processing on personal computers or other equipment is used in conjunction with software programs and laser printers to generate textual documents. Although some word processing software packages can produce basic tables and charts, few provide enhanced graphics capabilities or sophisticated page layout facilities.
- **Desktop publishing**—Page layout, graphics, and special formatting, in addition to text, are produced through software on a personal computer. Desktop publishing differs from word processing in its total document approach, which allows for integrated text, graphics, and high-quality formatting and printing capabilities within a single document.
- **Electronic publishing**—Complex document structure, large volumes of information, and multiple-document libraries can be produced, transmitted, and stored on high-capacity computer systems (generally, mainframe computers) through the use of special formatting software. Many electronic publishing systems require documents whose text is tagged to provide machine-readable



formatting instructions for a computer system. In addition, electronic publishing systems are often connected to high-speed, mainframe printers capable of printing up to 50 pages per minute.

Although most documents produced in modern organizations originate in word processing, some are also produced in final form by commercial printers. Documents likely to be produced by outside printers or production specialists tend to be those in which high-quality printing is needed. Generally, the quality of printed output is measured in dots per inch (DPI); the denser the print, the more dots per inch, the better the printing quality. Whereas most laser printers available in organizations are capable of 300 to 600 DPI, commercial phototypesetting produces 1,000 DPI or better.

How can writers and company production personnel decide when commercial printing is needed? For many, the decision whether to print or not to print is purely economic, and for many, the question is answered by whether the expense associated with commercial printing can be recovered, either by the product or service being sold or by the organization in general. Unfortunately, there is no uniform answer. Researchers, however, report that the trend is toward desktop and electronic publishing and away from wholesale vending of material to be printed (Wilson-Davies et al. 1987). This trend is born out by recent increases in equipment and software sales for desktop and electronic methods of production. Although it is not likely that documents such as annual reports will soon be routinely produced within organizations, it is possible that, as individuals and organizations provide more information electronically and as desktop laser printing improves, the need to print large quantities of commercially produced reports will diminish.

## **STORING AND UPDATING INFORMATION**

In this unit, you have already learned some of the newer terms associated with storing information in modern organizations. CD-ROM, videotex, audiotext as well as disk, diskette, and database are all methods for storing information once it is written and produced. In most modern offices, old-fashioned file cabinets have already been replaced by streamlined diskette packs for large volumes of information, even though most offices still retain some documents in paper form for various reasons.

Perhaps the greatest future challenge will be storing the information produced by the information workplace. Storage on disk or diskette works well for individuals but not for groups of people who must all access the same information, often at the same time. Databases work well for large organizations because they provide the necessary security and restricted access to information; however, they generally require much computing power, some hardware investment, regular maintenance and backup, and the ability to share what is in them.

For most small to medium-sized organizations, local area networks (LANs) can provide the storage and software management capabilities needed. When information is stored on a LAN, it is saved to specially designated areas of a computer network and administered by a LAN operator or administrator. Many users can access information stored on a LAN without disturbing one another. Often LAN users can also "dial up" to mainframe computer systems where even greater volumes of information are stored and can be transported. In addition, very recent technological innovations will soon make it possible for users to share information over vast international networks through fiber optic connections and existing telephone cables that will transmit text, audio, and video from organization to organization as well as into individual homes.

### **Making Storage Decisions**

For employees to decide how to store documents, they must understand how they and others in their organizations will use the documents in the future. Most documents written in modern business organizations are designed to be updated or reused.

In science and technology-related industries, almost all writing undergoes some change between the time when it is written and the time when it is declared obsolete. The changes are often marked with **change bars**, character or graphic marginalia that show which parts of a

document have changed. Frequency of change can be one of the most influential factors in deciding how to store documents as well as how to create and produce them.

Other factors that influence decisions about storage include:

- Ease of use and facility for extracting and transferring documents.
- The size of the documents or document to be stored. Large or multivolume documents, for example, may be stored on CD-ROM—which can store hundreds of gigabytes of information—or in online databases (rather than on diskette, where space is more limited).
- The need for security or restricted access to what is to be stored.
- The amount of storage space (measured both as computer-defined space and as physically measurable space).
- The amount of money available for storage and related equipment.
- Any legal or contractual considerations.

In addition, any system of storage should provide expansion capability so that, as information grows, the system can accommodate the growth. Every system should provide for easy search and retrieval of information. Many database storage systems also allow users to query the database in a variety of ways; for example, to request reports by document title or by the date when documents were last updated. Many also provide easy access to system editors or word processors, so that changes can be made efficiently and documents archived again easily within the database.

## **Initiating and Controlling Change**

Knowing when to initiate changes and how to control them is crucial. Just as organizational changes must be controlled to be managed properly, writing-related changes must be assessed and the benefits of making them weighed. Not all changes need to be made immediately, and some need not be made at all. For this reason, and because all changes have some associated cost, organizations need to adopt change control procedures that include criteria for deciding when changes should be made.

Change control criteria may reflect the policies and precedents of an organization, but they should also present thoughtful consideration of an audience's needs. Changes to documents that are made to correct errors (often referred to as *errata*), for example, should be expedited when they affect the safety of those reading the document. Pharmaceutical, medical, and scientific writings, for example, should publish only the most up-to-date and accurate information to physicians and consumers. Similarly, if a document's design thwarts readers who try to retrieve information from it, then a strong case may be made for redesigning the document. A parts diagram that is difficult or impossible to read, for example, should certainly be redesigned when it appears in a manual for teaching mechanics how to assemble a particular type of automobile.

Although many organizations adopt a numeric formula for deciding when a document should be changed (for example, when 10 percent of the document is no longer accurate), most change control criteria such as those on the following page also include subjective criteria. Employees involved in changing documents should be encouraged to devise and understand similar criteria, and to apply these criteria in making decisions about change.

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<b>Criteria for Change</b>	<b>How to Apply Criteria</b>
Document contains factual errors.	Investigate nature of errors. If more than 8 percent of total pages are affected, then redo. If the errors are life- or business-threatening, rate as top priority and change immediately.
Document contains typographical errors that might embarrass company.	Investigate nature of errors. If budget available, update. If errors involve misspelling of company or related names, redo document. Redo document to remove potentially offensive or inappropriate language and misspellings. Rate the type of error on scale of 1 to 10, with 10 being the least severe.
Document is not accessible online.	Find out which parts of the document are not accessible, and why. If a disk has been corrupted, redo the document. If the document's original design prohibits access, and redesign can be contained in less than 3 sections, redo it. If neither of these applies, see the writing manager for the project.
Warranty information is incorrect.	Redo the document immediately. Inform legal and marketing departments of the error.

In addition to change criteria, employees who work with changing documents should also be encouraged to keep a change log of recorded actions, issues, decisions, and responsibilities associated with each change. Some writers may keep such histories within each document that they write or update. Others may maintain a separate log, such as in the following example.

<b>Date</b>	<b>Description of Change</b>
September 28, 1992	Changed all references to "the client shall" to say "the client may consider." Made at request of legal dept. Document Change Symbol = @.
August 2, 1992	Redesigned cover and 6 pieces of art in first chapter to eliminate depiction of Apple Macintosh computer. Made at request of Apple contract liaison, John Jones. Document Change Symbol = >.

## **Disaster Recovery**

**Disaster recovery** is the term used by computer operators to refer to the need to respond to a loss of information stored in computer systems. In general, the term is used to refer to serious or large losses experienced by many people, rather than to the loss an individual might experience. **Disaster recovery plans**, vital to managers or employees who store data on computer systems, provide security and backup procedures so that information can be retrieved even after natural disasters.

Although the quality and format of such plans vary from organization to organization, they all share the common goal of information preservation. Traditionally, these plans are conceived and written by information systems personnel such as computer operators or those in an organization responsible for managing computer systems. Disaster recovery plans should be reviewed periodically by anyone with an interest in preserving an organization's information to ensure that the plans are viable. At a minimum, they may contain information such as the following:

- an agreed definition of *disaster*
- backup procedures for saving data to a different location
- a backup frequency chart telling how often backups occur
- an off-site storage location for essential operating or policy information
- backup security measures for ensuring the security of sensitive or restricted information

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## **REVIEW QUESTIONS**

1. What basic areas should be addressed in production planning?
2. What is the difference between word processing and desktop publishing?
3. What is electronic publishing and what is required to use it within a corporation?
4. What guidelines might managers establish to safeguard information if no corporate policies are in place for information security?
5. What is the difference between storing information on disk and on diskette?
6. What special skills may be needed by employees to use the current technology for document creation and storage?
7. What is a disaster recovery plan and what is the manager's role in establishing one?

## **INTEGRATING QUESTIONS**

1. Most businesses now expect employees to have some of the skills necessary for using document creation and archival technology. Assume that the employees in your corporation do not have such skills and devise a training program for them.
2. What should the role of the writer be in document production? Suggest two methods for organizing writing teams to ensure that both writing and production duties are accomplished.
3. To what extent are managers responsible for understanding printing and publishing technology and for implementing changes? List three reasons why some familiarity with this technology can benefit managers in accomplishing overall objectives.

## **SUGGESTED READING**

"IBM Commits More Than \$100 Million to Send Data Along 'Digital Highway.'" *Wall Street Journal* MarketPlace (16 September 1992): B1.

"Sony, IBM Unveil Efforts to Create Interactive Systems." *Washington Post* Business Section (17 September 1992): B10.