

A User View of Office Automation or The Integrated Workstation

by
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Abstract

Although handling information is a major part of our work, the information we need generally exists in many different places and even different forms. This makes it difficult and inefficient to search for the needed information, to verify that it is correct (or the latest version), to incorporate it in our work, and to transmit it to its recipient. Electronic technology can greatly ease the solution of these problems, and can help free us from the paper chase.

The importance of central databases will be discussed. These are only useful if they are kept up to date and easily accessible in an interactive (query) mode rather than in "monthly reports" that may be out of date and have to be searched by hand. The concepts of automatic data capture, database management and query languages will be introduced. These concepts, however, still need good communications and readily available work stations to be useful. It will be shown that a "personal computer" is the minimal necessary work station. These will rapidly become as ubiquitous as the telephone, and will provide easy access to databases, other users, larger computers and most office tools. This will lead naturally to vastly improved information flow and the reduction of "grunt labor". It will be shown how these concepts are equally valid for administrative, secretarial and scientific work.

1. The Paper Office

Our offices are still run by paper: paper for communications, paper for work-orders and purchases, and paper for computations. Despite the increasing use of computers, they are still, to a large extent, *centrally inaccessible*. Now that terminals and small (personal) computers are readily available, the time has come to grow out of the "central computer printout" mentality and make increasing use of the on-line distributed capabilities that have become a technical reality. The central computers have become a fact of life; in conjunction with the Personal Computer (PC) they can become a real asset.

Using computers for communications reduces time, reduces transcription errors and makes computers **directly available to users** instead of going through the intermediaries generally associated with central computer facilities.

2. Central Data Bases

It is valuable to any large organization to have a central information pool consisting of the state of its business, its finances, inventories, etc. Nowadays these are increasingly being kept in computer memories, and dignified by the appellation of *Data Bases*. The problems we face are how the data are to be entered, how they may be retrieved, and how they may be kept up to date. It is clear that collecting pieces of paper for transmittal to key-punch operators is inefficient; it guarantees time delays and transcription errors. Equally, the perusal of monthly reports represents a poor way of retrieving information required to answer specific questions.

3. Data Capture

Data should be entered into the computer as close to the source as possible. There is no *technical* reason why financial data, purchase orders, manpower utilization reports, etc., should not be entered on a keyboard rather than a typewriter. The information can always be printed out in any form desired, or sent to its destination electronically. Some form of automatic data capture is needed to ensure that the computer databases are accurate and up to date, in addition to the obvious saving of several steps in the current procedures. An approval chain can also be set up by computer, so that the information is only passed on when the appropriate person signifies his assent. Editing, or making changes, is equally easy to do provided that the requisite procedures are set up, and the privileges to read and write are judiciously allocated.

4. Data Retrieval

Retrieval should be immediate and on-line. This implies that the data be stored in an orderly way under control of a decent query language. The **computer's** fingers should do the walking, and the user should be able to go directly to the data needed with a minimum of effort and computer jargon. Great strides are being made in relational database systems that come close to meeting real requirements in this regard and require a minimum of time to learn. This is where a personal computer is very useful; it can originate the query to a much larger system, receive a selection of data for further manipulation, and print out at the user's desk an edited summary of the answers to his questions for further action. While the completely paperless office will undoubtedly remain a pipe dream for the foreseeable future, there is no question that a great reduction can be made in the useless and outdated information that presently clutters up our workplaces.

5. Editing and text work

The personal computer has the advantage over special purpose word processors that it is far more flexible. A wide variety of word processing programs is available, and many of these can also be tailored to the individual, whereas dedicated word processors are immutable. A user can select a very simple text formatter like **TEXTRA**, progress to more powerful systems like **VOLKSWRITER DE LUXE**, or the Wang-like **MULTIMATE** or even the clumsy but powerful **WORDSTAR**. Programs like **SAMNA WORD** can format multi-column text, do arithmetic and generate automatic tables of contents, **WORDIX** will hyphenate automatically. The choice is very wide, and the better programs can merge material taken from central or other databases via communications links. The PC can also format material for the very powerful programs like **TEX** that have several hundred fonts and mathematical symbols not available on *any* word processor with a mechanical printer.

6. Communications

Computer mail is much more convenient than US mail and much better than playing telephone tag. Received via a PC, it can quickly be turned into hard copy if desired, or forwarded to other users. An interesting use is for multi-authored manuscripts, which can be bounced back and forth many times in short order until all the authors reach agreement.

7. Computing

A modern PC is, in itself, a surprisingly powerful computing tool, better than the machines available in most University math labs thirty years ago. However, it is clearly not the equal of larger machines. With a PC linked on a network, however, a user should be able to call on a machine appropriate to his problem.

8. Graphics

A PC like the IBM-PC can generate charts and low resolution graphics suitable for many purposes. The Apple Macintosh and Lisa are better in this regard, and can easily produce a variety of graphic material. For some purposes these are not of sufficient resolution, and lack the more sophisticated capabilities required in a full-featured graphics shop. Very powerful workstations have been built that include such capabilities. Notable is the IRIS where quite complicated objects like the Space Shuttle can be represented in some detail, and individual portions rotated to examine clearances, sun illumination and the relative positions of portions of the payload with respect to the earth, sun and stars.

Sophisticated programs for generating directly almost any conceivable color graphics that can be produced by a well-equipped graphics department are now available on mini-computers. These can be generated directly from a terminal, or a PC used as a terminal, and manipulated rapidly to produce the desired final result instead of waiting for several manual iterations.

9. Conclusions

A personal computer can be an important office tool if connected into other office machines and properly integrated into **an office system**. It has a great deal of flexibility, and can often be tailored to suit the tastes, work habits and requirements of the user. Unlike dumb terminals, there is less tendency to saturate a central computer, since its free-standing capabilities are available after down-loading a selection of data. The PC also permits the sharing of many other facilities, like larger computing power, sophisticated graphics programs, laser printers and communications. It can provide rapid access to common data bases able to provide more up-to-date information than printed reports. Lastly, portable computers can access the same familiar office facilities from anywhere in the world where a telephone connection can be made.