

roll microfilm where very large files are involved in that access becomes cumbersome, requiring the mounting and remounting of tapes, and perhaps involving conflict among users seeking information from the same data base.

134. Currently the industry is seeking to develop techniques for marrying micro and video forms into one storage and retrieval system. The camera would transmit the image to a CRT screen. The system would attempt to harness the best of both video and fiche systems at substantially lower costs. The National Research Council has convened an informal committee to explore this general field to determine whether a development project should be embarked upon seeking solutions to problems being encountered among government agencies. In view of the current project in External Affairs the Department has been invited to participate in the work of this group.

135. Another important storage medium is computer-compatible tape or disk. The storage of full-text in machine-readable format provides perhaps the most flexible of the various techniques, since being in electronic digital form it can be used for presentation on a CRT terminal or it can be manipulated with understanding of its meaning. The major drawback of this technology is in the input process, which is usually more time-consuming or expensive than the photographic approach used for microform or video tapes. Expense can also escalate according to the amount of "on-line" storage facilities provided in the system.

Information Processing

136. In dealing with large amounts of information a method of managing the indexes, if not the material itself, is required. Techniques such as the Randriever exist, which require knowledge of the whereabouts of the file to be retrieved, or the item required. In order to provide such an address, or even to identify the existence of desired material in extremely large masses, some processing power is required. This can be provided clerically but heavy manpower demands are made and the indexes of actively growing files prove difficult to handle as the size increases and flexibility decreases. The trend is now towards using computers for this function. The demands placed upon the computer are for adequate core storage to hold the necessary programmes and enough disk/tape storage to hold the large volume of indexes/pointers or possibly even full text. If CRTs are used this places further demands on the capacity of the machine.

137. It is possible to take a number of approaches in supplying this machine power. A popular tendency is to use "mini" computers to provide the capacity needed at any stage of development, adding modules or new machines as required. The major disadvantage of this approach is that "software" development devolves on the system developer since very little exists for this genre of machine. Furthermore, the combination of equipment usually results in unique systems with no direct precedents and, therefore, some degree of pioneering. "Software" shortcomings can prove costly. Larger, general-purpose machines have available "software" and expandable capacity but generally result in more expensive systems, perhaps at times excess capability, and use more staff. Falling between these two extremes are 'medium' systems which can start out resembling "minis", but with the ability to expand to a large system. While software support is better than with "minis", it is still not up to that available for general-purpose machine support.