A FORM MANIPULATION SYSTEM

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Data base management usually implies very large data bases supported by a large centralised system providing services to a large number of users. There are other kinds of data management, however, where data base techniques can be applicable without implying large data bases or many users. In an office environment, for instance, clerks manage data. In most organisations they manage data on paper using telephones and mail for communication purposes. The availability of inexpensive microprocessors and networks provide the opportunity to transfer a great part of office data managemennt from paper to electronic media. The logical properties of data remain approximately the same whether managed or by computer, in a centralised or distributed fashion. Data base management techniques should be therefore potentially applicable for managing data in an office environment.

We have concentrated primarily on office procedures relating to paper forms for two reasons. First, because most well defined office procedures have been implemented using paper forms. Second, a paper form corresponds to structured text with certain value attributes. It is, therefore, a generalisation of both text and attribute value records. We have completed a system which fills, enters, files, finds, mails, prints and generally manipulates forms in an electronic manner. The system retains properties of manual systems relating to paper forms. For instance, there is a distinction between an original and a copy. Forms cannot be destroyed, they can only be sent to a disposal station. Forms can be located and traced in the system with respect to stations they have visited. A conscious effort has been made to provide an environment to users where they keep doing similar actions as on paper forms. The only difference is that the form is viewed on a screen and the desk is replaced by a terminal or personal computer. In this way, the users will hopefully not be alienated by having to switch their customary activities. The system serves as a tool to do the same things in a different manner.

Data on the forms is also available through another interface using data base commands. In this way data on the forms as opposed to the forms themselves can be processed further for the different needs of the organisation. The data base management system managing the data has a set of relational commands available to the user.

The system has been implemented on DEC PDP-11's. It can run on any PDP-11 from an LSI-11 to a PDP-11/70. Stations for the manipulation of forms can be either LSI-11 personal microcomputers with some disk space costing less than $10,000, or terminals connected to a larger PDP-11. Mailing of forms is effected through a larger PDP-11 which does archiving, printing and other housekeeping jobs.

We are currently building more automated tools in the system. For instance, mail in the system is currently being implemented by each user addressing a form to another user. We plan to incorporate a mail routing ability by which the system will be routing mail automatically based on the form's contents and the predefined routing information. Automated tools require careful analysis to make sure that potential problems in the behaviour of the system are avoided. For instance, ensuring that the automatic routing will not trap a form in the system forever. A series of models is being developed for capturing requirements of office procedures, analysing information flow and restructuring of office procedures. In addition, there is some work on hardware architectures which will facilitate the development of office form systems.

The goal is to construct a complete experimental environment which can be used for many purposes. First, to try out ideas in office automation. Second, to evaluate user responses with respect to office automation tools. Third, to investigate the interplay between office automation and data base management. Finally, to give our students a tool to learn and experiment with future uses of computers.