

Preface

With the proliferation of Personal Computers, considerable processing power is available at users' desks. Much work remains to be done, however, toward the goal of ensuring the effective use of these systems. The papers presented in this issue address areas of further research and describe the design principles behind some of the current systems.

The ease of use of a particular system is both a subjective judgment and a performance factor that is very real to its user. Branscomb and Thomas propose that ease of use be approached from a broader perspective than that commonly held. It is the authors' contention that systems designers must approach the design of the architecture of their systems with a sense of the usability implications of their design decisions. Included are guidelines for the development of systems that will meet the needs of today's users and be flexible enough to meet the needs of a changing future user community.

Generally, Personal Computers are installed in one of two environments: as isolated workstations or as participants with host systems, providing complementary services to meet the needs of their users. Goldstein, Heller, Moss, and Wladawsky-Berger describe an architecture for cooperative processing that has as its objective the optimization of service to the user through the sharing of processing and data base operations between the PC and a supporting host. The host is used for access to cross-organizational data, for massive data base accesses, and for high-volume input/output capability. The Personal Computer offers an environment designed for the non-data-processing professional, with consistent response time and local processing power. With cooperative processing users can optimize their use of both environments.

The PC XT/370 provides the user with System/370 capability in a desktop computer. In addition, it has

facilities that make it optimal for use in a cooperative processing environment. Kozuh, Livingston, and Spillman describe the evolution of the development of PC XT/370 and the design of its hardware and software architecture. The system was designed from a base of the PC XT and has been enhanced by the addition of microprocessors to support the System/370 instruction set. This approach has maintained compatibility with the basic PC XT, so that users can take advantage of enhancements to that product base.

With the geographic dispersion of PCs throughout organizations, a facility to provide for the tight coupling of personal computers offers significant advantages. Specifically, the system described by Chess provides for the interconnection of Personal Computers such that although all processing is performed at a master PC, keyboard input may be provided and display output viewed at any workstation. This system has a variety of applications in the support of PC users, in teaching, and in the demonstration of PC programs.

The architecture, the instruction set, and other system facilities can significantly affect the implementation of a very-large-scale-integration microsystem. Matick and Ling examine these factors and provide an understanding of the balance that must be achieved among the instruction set, the memory system, cache, and virtual memories to achieve optimal performance in the design of a microprocessor. This paper should be of considerable interest to designers of such systems. Users also will gain insight into system internals and design considerations.

Much of the information with which we deal in the traditional office environment is presented in non-coded form. The data processing systems with which we work, however, are primarily designed to work

with coded data. Somerville reviews previous techniques for the processing of noncoded data and describes an approach for the development of an image processing and presentation system using available hardware and software. Such a system may be used in the transmission, manipulation, and presentation of noncoded office correspondence.

The burgeoning use of personal computers creates a greater need for awareness of data security principles in the user community. Murray presents security considerations as applied to personal computers. The author provides suggestions for the protection of the computer itself, its data, and its application programs, as well as procedures for controlling access to host sites.

It goes without saying that the personal computer has had a vast impact on our personal and business lives. We hope that the insight provided by the papers presented in this issue will form the basis for the more efficient and effective use of such systems.

John Lacy
Editor