

Listed are synopses of recent papers and books that should be of interest to the readers of the *IBM Systems Journal*. Inquiries should be directed to the publications cited.

Suggested reading

A virtual machine emulator for performance evaluation, M. D. Canon, D. H. Fritz, J. H. Howard, T. D. Howell, M. F. Mitoma, and J. Rodriguez-Rosell (RES San Jose, CA), *Communications of the ACM* **23**, No. 2, 71-80 (February 1980). This is one of several papers selected from the Seventh Symposium on Operating Systems Principles (December 1979) to be published in *Communications of the ACM*. Discussed is an emulator that is an enhanced version of the IBM VM/370 Control Program incorporating timing simulation. With the addition of timing simulation to the already existing capability for machine function simulation, virtual machines can be effectively used to evaluate system performance. Such virtual prototyping supplements analytic formulas, queuing models, discrete simulation, and hardware prototyping as a performance evaluation and installation management tool. The implementation of the concept of timing simulation, the emulation environment, validation results, and applications of the emulator are discussed.

Computer-assisted logical database design, George U. Hubbard (IBM Palo Alto, CA), *Computer-aided Design* **11**, No. 3, 169-179 (May 1979). Good data base design is not easily obtained because of the tedium and time involved in sufficient analysis. Automating the design of the data base can alleviate these problems by supplying editing and diagnostic information and assisting in the structuring process. This paper discusses the design of DL/I hierarchical structures and then extends these concepts to relational structures. Interfaces between automated design procedures and a dictionary system are also suggested.

Interlocking shapes in art and engineering, William W. Chow (GPD Tucson, AZ), *Computer-aided Design* **12**, No. 1, 29-34 (January 1980). This paper reviews the art and science of interlocking shapes and the application of computers to the production of these designs. Original drawings composed by engineering students are included. New engineering applications of interlocking shapes are now possible with the help of computer graphics. In this design technique, the computer helps users overcome mathematical difficulties and serves as a learning tool.

The IBM System/38, Dale N. Reynolds and G. Glenn Henry (GSD Rochester, MN), *Datamation* **25**, No. 9, 141-143 (August 1979). The System/38 was developed as an altogether new system allowing the use of unique data processing concepts. This article summarily presents some of these new features, such as layered architecture, data structures, addressing schemes, and single level store, and the benefits resulting from them.

Putting together the new IBM mainframe, *Electronics* **52**, No. 23, 109-120 (November 1979). A set of three articles in this issue provides a view of the unique hardware and software design of the 4300s. *4341's infrastructure is new from the substrate up*, Humberto Cordero, Jr. (SPD Endicott, NY). This article discusses the hardware design, based on high-density semiconductor technology, improved

microcode control, and advanced data flow and buffering techniques. *Support processor analyzes errors caught by latches*, Theodore J. Frechette and Fred Tanner (SPD Endicott, NY). This article contains a presentation of several new maintenance concepts employed by the IBM 4341. A separate support processor using innovative microcode and a special type of latch design facilitates tracking down and analyzing problems on the 4300 computers. *Streamlined architecture achieves software compatibility*, Hartmut R. Schwermer (SPD Boeblingen, West Germany). The third article of this series presents the system software of the 4300 computers. There are two operating modes in the 4300 series. One mode is the System/370 mode; the other mode reconfigures 4300 architecture to enhance software performance and is called Extended Control Program Support: Virtual Storage Extended. This article discusses ECPS:VSE architecture.

Josephson computer technology: An IBM research project, Wilhelm Anacker (RES Yorktown Heights, NY), *IBM Journal of Research and Development* **24**, No. 2, 107-112 (March 1980). This special issue of the *IBM Journal of Research and Development* describes the status of IBM's research project on Josephson computer technology. This first paper traces the origins and history of Josephson technology as it led to the project and outlines the project's scope. The paper then provides an overview outline of the remaining papers presented in this issue.

Overview of Josephson technology logic and memory, Juri Matisoo (RES Yorktown Heights, NY), *IBM Journal of Research and Development* **24**, No. 2, 113-129 (March 1980). This paper serves as an introduction to the other logic and memory papers in this issue. Basic concepts of superconductivity and electron tunneling underlying the operation of Josephson devices are outlined and an overview of the literature on the subject is presented, with emphasis on work performed at the IBM research laboratories.

Management systems: The study and design of information systems, Burton Grad, Thomas B. Glans, David Holstein, William E. Meyers, and Richard N. Schmidt, The Dryden Press, Hinsdale, IL (1979). This is the second edition of a book that was first published in 1968. The purpose of this study is to present a detailed treatment of the first stage in the life cycle of a management system—its study and design. The book documents the rationale and procedures used by experienced practitioners and therefore focuses on methods rather than concepts. The new edition updates the material to reflect new terminology and technology.

Modern project management: foundations for quality and productivity, Claude W. Burrill and Leon W. Ellsworth, Burrill-Ellsworth Associates, Inc., Tenafly, NJ (1980). 554 pp. (ISBN 0-935310-00-2, \$39.00). This book is quite comprehensive in that it not only traces project activities from inception through the phases of development and finally to post-project review, but it also gives the reader a global perspective of the essential major business activities of which application development and project management are parts. Discussed, for example, is the planning process in general, which is then related to project management.

The book is divided into two parts. The authors first set a groundwork for chapters 1 through 20 by placing data processing projects in a perspective of their relationship to the needs of the business. They then adopt a tutorial approach to describe, explain, and discuss various topics relating to project methodology. Non-data processing analogies are used very effectively in this exposition. In the second part, appendices A through D, the authors adopt a handbook approach to provide lists, forms, policies, procedures, and other components of a formal, highly structured methodology.

Of special interest is the illuminating discussion on estimating and the authors' practical approach to this most elusive activity. The chapters on the theory and practice of project design, planning, and scheduling networks are probably the simplest ever written on this subject.

The superconducting computer, Juri Matisoo (RES Yorktown Heights, NY), *Scientific American* 242, No. 5, 50-66 (May 1980). This paper discusses a new electronic technology based on the Josephson junction. The paper introduces two physical phenomena on which the technology is based: superconductivity and electron tunneling. It then describes what a Josephson-junction computer would be like.