Whether the book gives proper credit to the generality and flexibility of numerical simulation methods based on the availability of all the modern tools of numerical analysis and programming is questionable in this reviewer's opinion. Whether the book will be of interest to those who are interested in simulation of dynamic systems without having to go through the details of learning about analog/hybrid computer hardware is also questionable.

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This book treats the difficult topic of "operating systems" in a somewhat novel manner—one which is not necessarily suggested by its title. The "pragmatic approach" amounts to basing the descriptions virtually entirely in the context of two very widely used operating systems: IBM's OS/MVT and IBM's TSS/360. As an expository framework, these two systems certainly provide a surfeit of material—there are literally stacks of it in a large number of machine rooms throughout the country. Katzan culled and organizes this material in a manner which surely demonstrates that it's been culled and organized, but less surely demonstrates any significant extraction of the essences of OS's. The material is not, however, without its good points even though, in most instances, they are hard to discern from the jargon jungle which seems to be de r?gle when speaking of operating systems.

The book is organized into three parts, and consists of eleven chapters. Part One ("Fundamentals of Operating System Technology") devotes five chapters to the basics of software processes and their resource requirements. Part Two ("Functional Characteristics of An Advanced Operating System") posits IBM's OS/MVT as the vehicle of discussion, and devotes three chapters to a discussion of that system's structure, use, and dynamic behavior. Part Three ("Functional Characteristics of a General-Purpose Time Sharing System") employs TSS/360 as the model for a time sharing system; there are three chapters dealing with TSS's general characteristics, operating environment, and internal organization. Study/discussion questions are provided for each part, and there is an extensive Index. Another handy feature is the presence, on the inside covers, of a "Glossary of Acronyms;" it makes reading the book much easier.

The exposition relies wholly on the IBM System/360 architecture and it is in this regard that many of the deficiencies of the book arise. Many of the "design decisions" in construction of a operating system are driven by the facilities provided by the architecture which the OS is to manage; Katzan effectively explains how the architecture (of System/360) affects certain operating system features, but fails to discuss how changes in the architecture could (or would) affect the design of the operating system. For example, the use of 4 b memory protection keys to guard 2048 byte blocks of memory impacts both the process loading/linking/binding operation and the means chosen to allocate and reallocate memory. For a machine with hardware base register address translation and bounds protection, these activities are performed in substantially different ways; but Katzan makes no mention of this.

Likewise, the discussion of subroutine calling structures (in the introductory material, p. 29), and the treatment of exception processing (the interrupt structure), are pertinent factors in operating system design philosophy and no alternatives to System/360 conventions are offered. A proper course in operating systems would, of course, attempt to delineate these issues by considering different sets of architectural groundrules.

On the positive side, there is a particularly cogent description of the physical organization of various storage devices. Chapter 5 ("Evolutionary Development of Operating System Technology") does a thorough job of tracing the development of several basic operating system ideas through three generations of machines. Chapter 7 ("System Utilization") does a reasonably good job of unraveling the intricacies of "JCL" and it's role in use of OS/MVT.

There are some noteworthy blunders, too. In the introductory architecture section there is a careful distinction between "centralized" and "distributed" crossbar switches, but the corresponding figures (pp. 41-42) do not carry the same terminology. The SAVE and RETURN macros are used in several figures (pp. 127-129) but are not adequately explained in the corresponding text. The definition of the metalinguistic sense of "[" and "]" (p. 180) indicates that they denote "optical material." And, on p. 230 there is a broad hint that much of the text may have been dictated: there it has "least lines" instead of "leased lines." There is a 360 percent circular definition of "System Residence Volume" on pp. 135, 138; and there is the term "commends" instead of "commands" in a display line on p. 174.

In general, however, the descriptions of OS/MVT and TSS/360 are accurate and concise. If the terminology seems overbearing at times that is not Katzan's fault, and in the vast majority of cases his description is considerably more coherent than that extant in the corresponding IBM system support material. In addition, the artwork is generally superb and is well keyed with the text. All of the main features of these two operating systems "come across" relatively easily, provided the reader's attention span is sufficient to support retention of the very large number of specialized terms.

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