An overview of the Pick Operating System

by RICHARD PICK
Pick Systems
Irvine, California

INTRODUCTION

Information management is the heart of the Pick Operating System. This easily used, multi-user operating system with virtual memory has an English-like retrieval language in which a data base manager, an extremely efficient programming language, and system utilities are all integral. Because of this structure and capabilities, Pick is actually more than a traditional operating system, it is an integrated decision support system. In addition to its use as a management decision tool, the Pick system has proved to be exceptionally efficient for applications development. As a result, the Pick approach has won converts from both professional and non-professional data processing ranks for nearly two decades. This software architecture remains technically very different from other operating systems with data storage and accessing concepts that are truly unique.

THE PICK ARCHITECTURE: A SOFTWARE MACHINE

The term *architecture* applies to software written free from hardware constraints in a virtual assembly language, or pseudo code. In mainframe and mini-computer implementations, the Pick architecture is interfaced to hardware at the micro-instruction level and much execution is at the firmware micro-instruction level. With microprocessor-based machines, the system is in software. This micro-instruction layer includes terminal I/O operations and a virtual memory manager that treats core memory as a scratchpad and addresses the entire disc. With assembly language executing in this high-level software, the Pick system provides a remarkable degree of transportability which contributes to its reputation for being machine, or hardware, independent. Some of the major system components incorporated in the Pick system's architectural construct are:

An advanced VIRTUAL MEMORY MANAGER
A versatile SYSTEM MONITOR
A unique FILE STRUCTURE
An efficient DICTIONARY SYSTEM
A sophisticated DATA BASE MANAGER
An easily used INQUIRY LANGUAGE, (ACCESS*)
An exceptionally powerful high-level PROGRAMMING language, (Pick/BASIC)
An efficient STORED PROCEDURE LANGUAGE INTERPRETER, (PROC)
A TEXT-PROCESSING PROGRAM with expanded capabilities, (EDITOR)
A flexible, productivity-enhancing TERMINAL CONTROL LANGUAGE, (TCL)

In the Pick Operating System, all these major system components and several additional system utilities are integral parts. This is not the case with most traditional operating systems in which many of these features are technically add-ons. Although this may be transparent to the user, such add-on constructs are inefficient.

VIRTUAL MEMORY MANAGER

Embedded in the quick of the system, the virtual memory manager allows data and programs to move in and out of main memory as needed, dynamically. Disc is addressed as if it were an extension of main memory. It allows the active processes to use only the portion of a program, or data, needed at any particular instant. With the Pick system, users need not concern themselves with the memory requirements of programs, files, or reports. In effect, main memory is as large as the available disc space.

SYSTEM MONITOR

The Pick system is a video display, or CRT, terminal-oriented multi-user system designed for interactive use to facilitate decision making from a shared data base. The system monitor provides the vital interrupt-driven multi-user scheduling required. It ensures system users inter-active access to data resources and it allows simultaneous performance of such processes as program compilation, system utility functions, multiple application program construction, and data base back-up without conflict.

FILE STRUCTURE

The Pick file structure is unquestionably unique. It features data strings of variable length in a structure that is considered mathematically "three dimensional." Although this concept may be difficult to grasp at first, the system is much easier to use than traditional structures, and a Pick system user can easily process data in a very real world environment.

THE DICTIONARY SYSTEM

For speed and ease-of-use, the Pick software incorporates a hierarchy of special files called "dictionaries." They are "road maps" for retrieving data from the various files using the inquiry language, ACCESS. They provide the mnemonic names for the various attributes (fields), describe their contents, and reveal how information is to be displayed when printed.

FILE DICTIONARIES

The Pick dictionaries contain file and attribute definition statements that describe the structure of the data files with which they are associated. They describe, on an attribute-by-attribute basis, the type of data within each, the conversion specifications, relationships between attributes, and similar information. The file dictionary's definitions assist substantially in the information retrieval process and are used with the English-like ACCESS inquiry language processor.

DATA BASE MANAGEMENT AND THE ACCESS LANGUAGE

The business orientation of the Pick system is most evident in the interactive inquiry processor and the high-level inquiry language, ACCESS, associated with it. A data base has been described as an accessible collection of separate information values and Pick, a data base management system, was designed to manage varied operational data, or information, in a coherent way using one set of standards. The Pick Operating System was created specifically to manage information practically. It was purposely written in a pseudo code with logic free from the constraints of hardware and traditional programming approaches. Classified as a relational system by many, it actually includes desirable features from all three traditional structures and is, in fact, something entirely new—ideally suited to data base management. A special purpose inquiry language, ACCESS, provides a programming tool to enter the data base and generate reports with exceptional speed. In the hands of non-programmers it can be used to easily generate simple inquiries from a visual display terminal on an ad hoc basis, and programmers and trained personnel can use it to generate extremely complex reports, with relative ease.

PICK/BASIC

Pick/BASIC is a high-level, general purpose programming tool. When combined with the non-procedural ACCESS inquiry language and the flexible Pick data structure, it enables programmers to bring new applications on-line in a remarkably short time. A new language, Pick/BASIC, is specifically tailored for data base management in a multi-user environment. BASIC was chosen because of universal appeal. It is an easy-to-use, flexible programming language adaptable to quickly solving specific business application needs.

PROC

A handy procedure language called PROC is provided to create a time-saving list of commands to ensure the proper execution of sequential processes. It permits the storage and execution of a lengthy series of commands or operations and the ability to customize data base input, inquiry, retrieval, and report generation.

EDITOR

The Pick Operating System's editor is used to examine and alter any attribute, item, or file.

TERMINAL CONTROL LANGUAGE (TCL)

The Pick Operating System is terminal oriented. Although hard-copy reports are generated, it is a multi-user interactive system activated through various video display terminals. As such, the Terminal Control Language, or TCL, plays a major role. With TCL, an unlimited number of user-defined procedures, and more than 200 system utilities, menus, and procedures can be initiated. TCL serves as a command processor where action is initiated and passed to other system modules.

As new faster and smaller computers appear on the scene almost monthly, the need for a machine-independent operating system becomes more and more necessary. The Pick system fulfills that requirement and will continue to do so in the coming decades.