

**1985
OFFICE
AUTOMATION
CONFERENCE
DIGEST**



OFFICE
AUTOMATION
CONFERENCE

GEORGIA WORLD CONGRESS CENTER
ATLANTA, GEORGIA
FEBRUARY 4-6, 1985

alfiprs

1985 Office Automation Conference Digest

February 4-6, 1985
Atlanta, Georgia

Conference Chairman: James F. Foley
Program Chairman: Dr. Sidney E. Harris
Digest Editor: John Goldthwaite

alfiprs
PRESS

Sponsored by
American Federation
of Information
Processing Societies

The ideas and opinions expressed herein are solely those of the authors and are not necessarily representative of or endorsed by the American Federation of Information Processing Societies.

Library of Congress Catalog Card Number 80-648747
ISBN 0-88283-042-2
ISSN 0272-4855

© 1985 by the American Federation of Information Processing Societies, Inc. Copying is permitted without payment of royalty provided that (1) each reproduction is done without alteration and (2) reference to these Proceedings and notice of copyright are included on the first page. The title and abstract may be used without further permission in computer-based and other information-service systems. Permission to republish other excerpts should be obtained from AFIPS Press.



OFFICE
AUTOMATION
CONFERENCE
GEORGIA WORLD CONGRESS CENTER
ATLANTA, GEORGIA
FEBRUARY 4-6, 1983



Acknowledgments

OAC Steering Committee

Conference Chairman
James F. Foley
LOMA, Inc.

Program Chairman
Sidney E. Harris
Georgia State University

Assistant to the Chair/Finance Chairman
Jennifer Rankin
LOMA, Inc.

Special Activities Chairman
Herbert P. Bruce
National Service Industries

Promotion Chairman
David Elliott
Digital Communications Associates, Inc.

Operations Chairman
Robert Reed
IBM Corporation

NCCC Liaison
Floyd Harris

AFIPS Liaison
Ann-Marie Bartels
Project Manager

OAC Program Committee

Program Chairman
Sidney E. Harris
Georgia State University

Vice Chairman
Bob Stirling
International Business Machines

Organizational Impacts
Cherian Thachenkary
Georgia State University

Office Workstations
Donovan Young
Georgia Institute of Technology

Ergonomics Of The Workplace
Theodore Stout
The Blake Corporation

Communications Technologies & Issues
Roy Bruce
The Coca-Cola Company

Productivity & Requirements Evaluation
David Conrath
University of Waterloo, Canada

Networking Applications
Tony Cash
AT&T Information Systems

Professional Development Seminars
Gayla McLean
BellSouth Services Company

Digest Editor
John Goldthwaite
Georgia Tech Research Institute



MESSAGE FROM THE CONFERENCE CHAIR

Welcome to Atlanta and to the 1985 Office Automation Conference. We are thankful that with your support the OAC has established itself in just six short years as the premier conference devoted to the exploding world of office automation.

During our early efforts to develop the theme and program for the 1985 OAC we took a critical look at office automation and its present and potential role in business. And we asked some hard questions. During one memorable brainstorming session we deliberately (and somewhat cynically) played devil's advocate and asked ourselves "Why, in these times of budget constraints and weekly technology conferences, would anyone want to attend OAC '85?"

As we compared yesterday's and today's workplace, we began to find the answers. In the seventies, advances in computer technology created an office technology explosion. Unsophisticated users were bewildered by an increasing array of tools. Technical solutions to business problems often meant merely automating processes that once were done manually.

But the proliferation of these new tools at our workplaces and our increasing sophistication as users has caused a fundamental shift in emphasis in the field of office automation. Office automation in 1985 means integrated solutions.

Hence our theme for OAC '85: "Today's Partnership: People and Technology." Among the new issues are improved productivity, the impact of office automation on the organization, strategic planning, training, multi-vendor compatibility and security. The new tools are powerful. The new dialog merges the perspectives of MIS, OA and telecommunications professionals. The new challenge is to successfully integrate people, work processes, technology and office facilities.

This theme is emphasized throughout the six program tracks: office workstations, ergonomics of the workplace, communications technologies and issues, organizational impacts, networking applications and productivity requirements and evaluations. The technical sessions stress state-of-the-art information processing solutions and the need to increase human and systems integration for increased productivity. All of the latest technology is displayed on the exhibit floors.

I want to express my sincere thanks and appreciation to the many people who have worked so hard over the past two years to make OAC '85 a success. The Conference Steering Committee and its subcommittees have devoted countless hours of their time toward the development of an exciting and informative conference. Expert guidance and support were provided by the AFIPS staff and the National Computer Conference Committee. Numerous other volunteers provided on-site help.

To all of these people and to you, our attendees, I say thank you. We are excited about OAC '85 and are glad you could join us.



James F. Foley
Senior Vice President
Operations and Systems Division
LOMA
Atlanta, Georgia



OFFICE
AUTOMATION
CONFERENCE

GEORGIA WORLD CONGRESS CENTER
ATLANTA, GEORGIA
FEBRUARY 4-6, 1985

afips

MESSAGE FROM THE PROGRAM CHAIR

Looking back five years ago at the 1980 OAC (the very first), it was fashionable and topical to talk about the impacts and changes information technology would have in the decade of the 1980s. One of the main problems organizations faced at that time was the lack of adequate information technology to meet their business automation needs. In fact, business automation was defined almost exclusively in terms of routine word and data processing applications. These technologies were certainly important to the organizations' support specialist, but they were not very useful to most managers and professionals.

Since then, we've witnessed a revolution in the sophistication of business automation hardware and software. The industry now encompasses personal computers, distributed processing, networking and telecommunication architectures, information centers and, more recently, intelligent buildings.

We've also refined and extended the basic concepts of end-user computing. We now think in terms of personal decision support, workgroup support, and organizational support. In fact, it is now routinely accepted that more and more managers and professionals will use computers in their day-to-day activities.

In addition, a growing number of top level managers now view information technology as a strategic business tool. Consequently the technology is now responsible for a wide array of new products and services: computerized banking/brokerage services, electronic legal/financial databases, computer-aided training and education, cellular mobile telephones, and intelligent building systems. Indeed, we are at a very exciting point in the industry evolution where business automation solutions are not just dreamed about, but are actually implemented—and successfully. The challenge today is to use the technology to achieve business and economic growth through sound strategic and tactical management.

The challenge to manage our resources and remain highly competitive only gives greater importance to this year's Conference Program and its theme: "Today's Partnership: People and Technology."

The Program is divided into forty-eight technical sessions in six conference tracks. It also has, for the second year, eleven Professional Development Seminars. The tracks are: Productivity and Requirements Evaluation, Communications Technologies and Issues, Networking Applications, Office Workstations, Ergonomics of the Workplace, and Organizational Impacts. For the first time, in the Professional Development Seminars, we are offering two hands-on sessions: Unix, and Getting Started with LOTUS 1-2-3.

We believe this Program is special and it was designed with you in mind. I hope you enjoy the Conference and your stay in Atlanta.



Sidney E. Harris
Director, Research & Program
Development
Georgia State University
Atlanta, Georgia



Table of Contents

Part I.	Office Workstations	1
	M1.1 UNIX—The Operating System for Office Workstations	
	Integrating Office Automation Systems and Strategy and Tieing-In with Corporate Strategy — by Howard Anderson	3
	UNIX and the Office — by Don Tapscott and Jonathan Chevreau	9
	T1.1 Computer Graphics & the Office Workstation	
	Graphics in Office Automation: Five Trends Shaping the Future — by Alan Paller	15
	T3.1 Project Management with Microcomputers	
	Project Management on Microcomputers Using a Fourth Generation Project Language — by Jack Figel	19
	T4.1 Home/Remote Office Workstations	
	A Personal and Remote Work Station — by P. Goyal and B. C. Desai	25
Part II.	Communications Technologies & Issues	33
	M2.2 Standards for Document Interchange	
	Document Interchange Format (DIF) — by Robert J. Gray and Gary Evans	35
	Multi-Vendor Information Interchange — by David G. Pistole	41
	T2.2 Progress Toward Multi-Vendor Integration	
	Document Interchange Systems — by Michael D. Zisman	51
	T4.2 Computer-Supported Cooperative Work	
	The Need for Collaboration Tools in Offices — by James H. Bair	59
	An Overview of XCP: A System for Supporting Coordinated Work — by Paul M. Cashman	69
	Computer-Supported Group Work: What are the Issues? — by Irene Greif	73
Part III.	Ergonomics of the Workplace	77

T1.3	The VDT Health Issue	
	State Legislation: A Threat to the Ergonomic Workplace	
	— by Charlotte LeGates	79
	“VDTs: Innocent Until Proven Guilty?”	
	— by Karen Nussbaum	83
T2.3	New ANSI Standards for Office Work	
	VDU Ergonomic Issues, Standards, and Directions	
	— by Gene Lynch	87
	Proposed American National Standards Institute (ANSI) Standards	
	for Visual Display Terminals and Their Workstations	
	— by Bruce A. Rupp	99
T3.3	The Economics & Ergonomics of Facility Management	
	The Economics of Furniture Adjustability	
	— by Rani Karen Lueder	105
	Office Automation and Facility Standards in the 80's	
	— by Jon B. Ryburg	113
	The Relationship Between Ergonomics and Office Productivity	
	— by M. Franz Schneider	123
W1.3	Battlefield or Corporate Asset: The Office	
	The War in the Office	
	— by Hy Bomberg	129
W3.3	Smart Buildings—Implications for Facility Management	
	“Smart Buildings” as Preferred Office Locations?	
	— by Tom Durkin	133
Part IV.	Productivity and Requirements Evaluation	139
M1.4	Executive and Managerial Productivity	
	Understanding Managerial and Professional Office Automation	
	Preferences	
	— by Vicki F. Baker and M. Lynne Markus	141
	The Potential Role of Office Automation in Decision Support	
	Systems: Some Empirical Evidence	
	— by Raymond McLeod, Jr. and Jack W. Jones	149
T2.4	Winning Implementation Strategies	
	Corporate Strategy for End-User Computing	
	— by Peter G. Sassone and A. Perry Schwartz	157
T4.4	In Search of Office Automation Excellence	
	Productivity Pragmatism	
	— by Gerald Hershey	165
	OA: Bridging the “Executive Gap”	
	— by V. W. Fearon	169
	Achievements of the Canadian Office Communications Systems	
	Program	
	— by Theodore Grusec	173

W1.4 Office Requirements Methodologies	
The Critical Task Method: A Method for Assessing User Needs in Unstructured Work Environments	
— by Harvey J. Brightman and Sidney E. Harris	179
Applying the Data Processing Tools of Structured Systems Analysis to an Office Automation Systems Study	
— by Mary-Elizabeth Downing Wallenius	187
Part V. Organizational Impacts	197
M1.5 How Does Office Automation Affect Your Organization?	
Office Automation Implementation and Operational Issues	
— by Edward J. Bartosik	199
Don't Hang Up! Or, Adopting the Intelligent Telephone 1	
— by George G. Manross and Ronald E. Rice	205
Organizational Adaptation: The Learning Problem	
— by James R. Taylor	211
M2.5 Office Automation Planning: Avoiding the Pitfalls	
Preparing Workers for the Age of Change	
— by Nancy B. Finn	215
Making Employee Involvement Work: Office Automation at Honeywell	
— by Susan Haider	219
Two Very Different Meanings to OA "Strategy"	
— by N. Dean Meyer	223
T1.5 How to Implement Office Automation and Succeed	
Conrail's Office System	
— by Thomas F. Eustice	227
Successful Office Automation: For The People, By The People	
— by William E. Foulkes and M. Louise Parizek	233
Office Automation at American Express	
— by Kenneth D. Meyers	243
T2.5 Measuring the Impact of Office Automation	
Organizational Design of Word Processing: From Typewriter to Integrated Office Systems	
— by Bonnie Johnson	249
Information Control Net: A Tool for Studying and Measuring the Impact of Office Systems	
— by Najah Naffah, Marcus Michel and Jean-Jacques Roubière	257
T4.5 Training and Staffing: Issues and Approaches	
Office Automation Training: An Agent for Change	
— by Ronald A. Munden	267
Executive ADP Training	
— by Thomas J. Richards	273
Training: Unleashing the Potential of Office Automation	
— by Laura L. Scharer	279

W1.5 Protecting Privacy & Security	
Protecting Security and Privacy in the Automated Office	
—by Gerald I. Isaacson	289
Legal Remedies for Computer Abuse	
—by Frederick W. Tokars and John C. Yates	293
W2.5 Office Automation: The Organization & Integration	
Office Automation: The Organization and Integration	
— by David W. Conrath	303
Part VI. Networking Applications	313
T2.6 Integration Architecture in the Intelligent Building	
“Smart Buildings for Intelligent People”	
— by Thomas B. Cross	315
Communications as a Resource Within the Intelligent Building	
— by Gordon J. Lorig, Jr.	323
T3.6 Local Area Networks, Benefits and Risks	
Local Area Networks, Benefits and Risks	
— by M. Fortgang and I. T. Frisch	329
T4.6 LAN Panel Debate	
The ARC Local Area Network: Design and Implementation of a	
Local Network	
— by Alan J. Malinger	333
W1.6 PBX/LAN Integration	
The New Face of OA: The PBX/LAN Dilemma	
— by W. Spencer Rice	341
W2.6 Integrating Multiple Vendors in the Automated Office	
Office Automation in an Open System	
— by Marshall D. Abrams	345
DISOSS—Third Party Focus for Multi-Vendor Interconnect in the	
Office Environment	
— By James G. Gilbert	351
Part VII. Professional Development Seminars	355
“People Power, the Key to the Partnership”	
— by R. Bruce Tuck and Peter S. Taylor	357
Planning: Your Insurance Policy for a Successful Automated	
Office	
— by Bonnie M. Polski	361
Creativity in the Workplace. Are You Creative Enough to Meet	
Tomorrow’s Challenges?	
— by Lorna Martin	365
Nonverbal Communication	
— by Lawrence J. Rifkind	369



OFFICE
AUTOMATION
CONFERENCE

GEORGIA WORLD CONGRESS CENTER
ATLANTA, GEORGIA
FEBRUARY 4-6, 1985

卷四

Part I

OFFICE WORKSTATIONS

This track focuses on the hardware and software applications and technologies of workstations in the office. The office today includes a variety of workstations ranging from word processors, personal computers, and integrated voice/data terminals to graphics, photocompositions and engineering design workstations. Associated with the wide array of devices are numerous office applications ranging from decision support to electronic filing and retrieval.

The challenge is to indentify the workstation concepts and applications that will be carried over into the next generation of workstations accepted in the office. The problem today is due to the fact that the typical office worker interacts with diverse systems and workstations, each having its own set of languages, procedures and data bases. Ideally, system and workstation design will evolve towards a common user interface language independent of the user's applications or the specific type of workstation used. This approach would eliminate the need to learn different languages, procedures and data base structures as the user's work requirements change.

This track will discuss and analyze new concepts that will make office workstations more flexible, general and powerful. In addition, the track will emphasize state-of-the-art applications, compatibility requirements, and future technology.



Donovan Young, Chair

Associate Professor
Industrial and Systems Engineering
Georgia Institute of Technology
Atlanta, Georgia



INTEGRATING OFFICE AUTOMATION SYSTEMS STRATEGY AND TIEING-IN WITH CORPORATE STRATEGY

Howard Anderson
Managing Director

The Yankee Group
Boston, Massachusetts

The Office Systems Environment: A New Challenge

System selection is becoming less of a purely technical issue -- and more of a people issue. User interfaces, user friendliness, integrated software packages and help facilities, all are increasingly part of the office vocabulary. The reason: the rapidly emerging new group of users, representative of the "mainstream" or white collar work force, including all levels of management and administrative employees. The Yankee Group estimates that as much as 80% of the total office organization will be OA users by the late Eighties. These "mainstream" users (office "professionals"), who would not have been considered potential OA users five years ago, will constitute the major OA market over the next three to five years.

The emerging people issues primarily are the result of initial attempts to match users operating in non-predictable, highly interruptive environments with logical, method-dependent, non-forgiving electronic tools. It did not take long for vendors and users alike to realize that people and machines do not approach task processing in the same way. The single most important human factor and major issue, between user and system, is ease of operation. However, despite this realization, it has taken many years, and numerous product iterations, to reach even the current, primitive state of user-machine interface.

Ease of Use vs. Ease of Operation

Ease of operation is, and will continue to be, the most popular and most misused criteria in OA. Although vendors and users are constantly defining what they mean by ease of operation, the Yankee Group believes it simply means asking the system for information and executing system commands in a way that is familiar to a non-technical person. Many vendors claim their systems are easy to operate, but few truly meet a rigorous test.

For example, Wang's systems are touted as some of the most user friendly systems today. Wang's approach to ease of operation was to introduce systems (OIS, VS, Alliance) that facilitate operation on both elementary and advanced levels, depending on the experience of the user.

In effect, users are not bound by the system functions. An operator can choose to bypass advanced features and manually process a document (e.g., pagination, hyphenations are not forced by the system; they are user requested). Wang felt that loss

of a little productivity for an inexperienced user beats no productivity for a frustrated user who is forced to understand the whole system to accomplish a minor task.

But there is more to this equation than meets the eye. Wang's heavily menu-oriented approach to the interface is tolerable to the advanced user only because of the high bandwidth (4Mbps) between the workstation and central processing unit, and an effective use of the intelligence in the terminal (an OIS terminal has 48K RAM in it; Alliance terminals 64K RAM), partially accounting for Wang's high prices for these items. This feature provides much better response times than other minicomputer vendors typically offer, and allows users to scroll a screen at a time or to move through several menus without too much frustration.

Digital Equipment Corporation (DEC), along with some other mini vendors, has partially alleviated this menu versus code key dilemma by allowing users to graduate from the menu environment at their own pace. This does complicate the interface, however, by giving a user several options in performing an operation.

In the recent past, competitors such as DEC, Data General, Prime, Honeywell, and Hewlett-Packard, utilized minicomputer architectures that poorly supported terminal intelligence; thus, their attempts to mimic the Wang interface have resulted in poor response times and/or highly limited terminal populations in heavy word processing applications. For this reason, their emerging workstation products are critical to their ability to compete with Wang head-to-head in the user interface arena.

Providing end-users with applications continues to be a problem. Most minicomputer vendors have responded to this issue by looking to the "system manager" to provide solutions (e.g., macro commands) for imbedding complex manipulation into a condensed code sequence (such as DEC, DG). Managers of these systems are given tools to design "packaged applications" for distribution to non-technical users.

Reliability and Back-up: A Growing Requirement

If ease of operation is the main "human-related" gating factor, reliability and system backup are the among most important buying criteria. Regardless of what type of OA system is installed, or how complex a company's future OA strategies might be, the sheer number of users affected by loss of system resources dictate the importance of backup at every segment of office architecture. This is a criteria that has too often been ignored by "non-technical" system buyers. Integrated streaming tapes and inexpensive modules with automatic "switch-over" in case of failure have remedied this to some extent.

Like ease of operation, system reliability and backup are particular to the requirements of the installed environment. In an OA integrated, large user environment, the Yankee Group sees reliability and backup as inherent functions of the system, whereby loss of all or portions of the system does not prohibit continued processing in the user environment. It means building into system architectures redundant facilities that contain self-diagnostics and automatic switch-over devices when errors occur. These system switch-overs should be totally transparent to the user. Examples of built-in redundancy features found on office systems include Computer Consoles Inc.'s "perpetual" processing system (CCI's Office Power software is quite slick, by the way) and Syntrex's "always up" Gemini system.

Justification of OA as a major long-term expenditure must support the corporate buying criteria established at the executive level. However, the collective reaction of the mainstream user, although not often considered a part of the "justification process," will, in the future, produce enough of a backlash, due to sheer numbers, to negate the carefully laid plans of upper management. OA is totally people dependent for ongoing success, and human factors must be a substantial part of the selection circle.

OA Architecture: The Five Segments

The Yankee Group believes the "systems approach" to the automated office in large organizations (Fortune 2,000 companies) will consist of five segments. Long-term strategic planning (first layer) must integrate OA system functionality representative of all five technical segments. Figure ES-1 illustrates the buying criteria within each segment.

Segment 1: The Communications Processor (also known as gateway) provides a communications interface between the work group and outside world. Intra-facility (off-network) and/or interfacility communications move through this segment. The gateway function can be provided in a variety of hardware environments, including a PBX, a communications processor such as IBM's 3705 family, or as integral to a utility processor.

Segment 2: The Utility Processor (also known as the Satellite Processor) provides local data base control, program storage and development, and large applications management and distribution to users on demand. Examples of utility processors include Data General's Eclipse series, Digital's VAX products, Wang's VS family, and IBM's 4300 and S/38 Systems.

Segment 3: The Advanced Peripheral provides printing, storage, scanning and other functions. Examples include laser printers, OCR, optical and disk storage, and facsimile machines.

Segment 4: The local network provides transparent communications between the pieces in the office. Examples include Wangnet, Xerox's Ethernet, and Datapoint's ARCnet. In addition to performing gateway functions, digital PBX's will play a large role here as well.

Segment 5: The user workstation provides the user link to other office segments, as well as full processing power at each desk. Most representative of this segment are the evolving high powered, multi-processing DTC systems such as DG's Desktop Generation, DEC's Pro 350, and Honeywell's Micro 6/10.

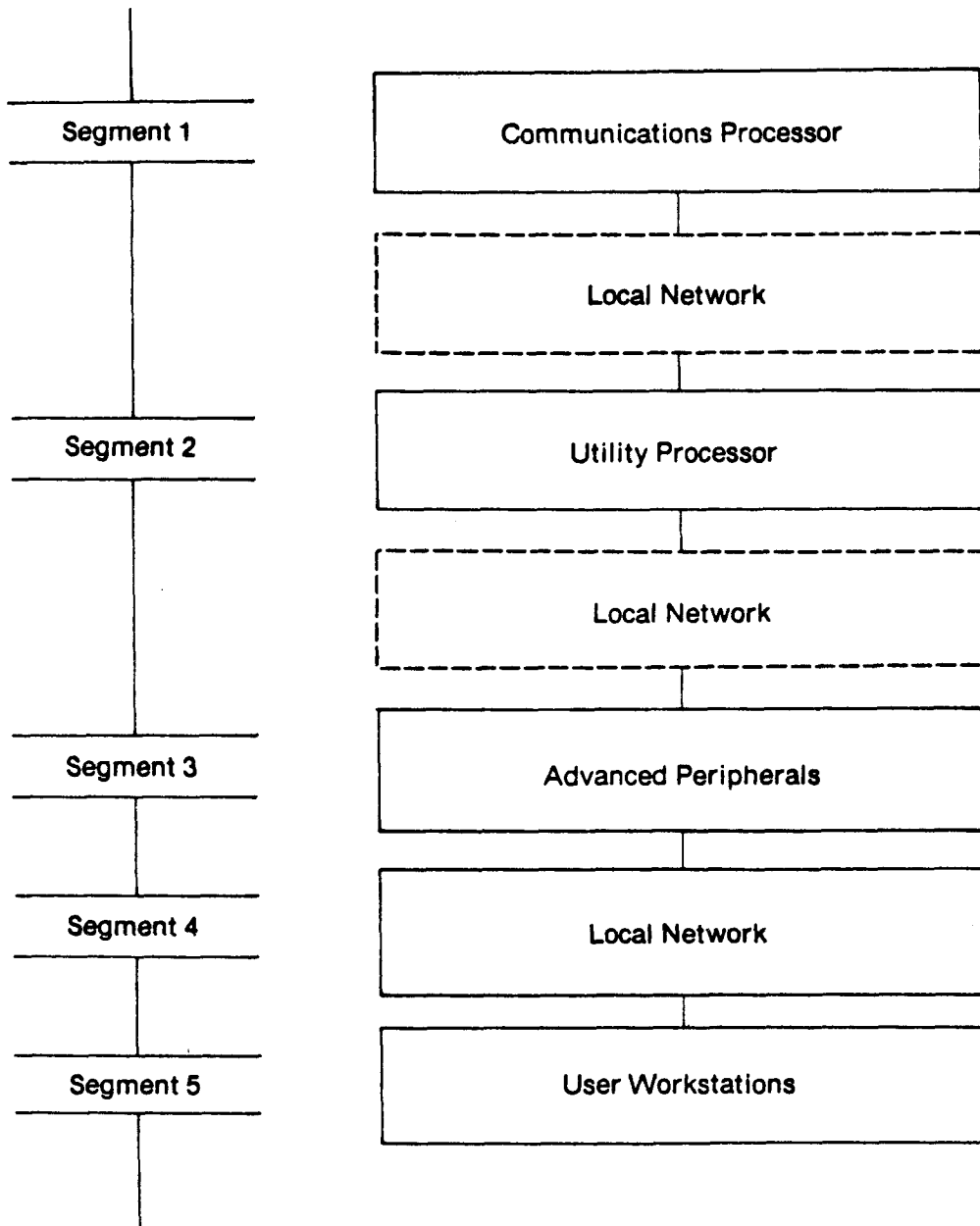
Niches in the Five Segments

"Office environments" can be both remote and/or centrally located, and are distinguished not by size, but by commonly shared applications and task processing requirements. The Yankee Group believes it is both possible and logical to address specialized needs with multiple vendor solutions, if those solutions are implemented within the boundaries of the five segment OA architecture.

The five segments of OA represent a logical "break" point where multivendor OA solutions can be taken as complete systems within the five segments. For example, two different utility processors could be monitoring and generating applications support for two distinct office environments. Both processors could be accessing data from the host mainframe.

While keeping the five segments within a single vendor environment enables a single conversion point (e.g., the communications processor or utility/satellite processor), where information can move into or out of the corporate network transparently, this does not preclude a carefully planned niche solution. Acknowledging this possibility, a growing number of vendors are attempting to circumscribe Wang's influence in the word processing environment in Fortune 1000 companies by providing text format code conversion facilities. Among these vendors are Data General, Sperry and NBI. The Yankee Group expects the majority of the minicomputer community to take this approach, one that does not require that they displace Wang's superior word processing in order to tap the huge professional and managerial market.

**FIGURE ES-1
FIVE SEGMENTS OF OFFICE AUTOMATION**



Source: the Yankee Group

Opportunities/Strategies at the Work Group Level

This also implies that workstation vendors such as Apple, Xerox, NBI, and CPT have an opportunity to participate at the work group or departmental level. However, these vendors will only be able to do this within the context of plug compatibility. Users who prefer the Lisa to the IBM PC/XT, or NBI to DEC word processing, must not have to isolate themselves to make these choices. Thus, an intra-site bridge facility at minimum, and preferably a communications processing facility, are critical to the prospects of these companies.

Even implementations within the full five segment context do not require corporate-wide standardization. Many user departments or divisions have very little contact or little need to edit documents created on the other's system. Data consolidation at the corporate level is still vital, but this is, at most, a matter of emulating SNA and other IBM protocols. The emerging headaches that IBM's "compound document" communications architecture (DIA/DCA -- see IBM profile) implies are not required in this situation. As an example, a large user with several "complete office environments" (those requiring all five segments) might use DEC OA at some, Wang at the majority, and IBM at others -- all connected to an IBM SNA network with IBM hosts.

This solution gives users the flexibility to solve their individual application needs, while enabling a corporate structure to bring everything together. Work groups (employees in one office environment) can be composed of whole departments or portions of a department and include both management and administrative members.

Issues for Strategic Planners

Strategic planners and implementors preparing for the OA of the 80's are faced with dramatic product line shifts and an overabundance of futures as promised by vendors. Much emphasis has been given to OA technical issues from the vendor's perspective, but minimum discussion has been devoted to the increasingly complex operational and organizational decisions that must be considered by managers charged with implementing a totally integrated office automation concept. Where do vendors stand in relation to the integrated functionality, reliability and ease of use required by mainstream users? Issues that present new challenges to users include:

- how to define and understand the mainstream environment and the unique human factor requirements of the new OA user.
- how to define and isolate technical criteria (e.g., Comms, DBMS), and to assign weighted values (e.g., of performance, functionality, price, etc.) to immediate need requirements (individual OA office environments) versus long-term strategic planning.
- how to link data and resources of the various multiple vendor office environments into a fully integrated OA network.
- how to develop a procedure that clearly defines the corporate direction and OA requirements, provides the basis for system evaluation and selection and serves as the benchmark for contract provisions and negotiations.

This report emphasizes the user interface issue associated with implementation of OA into the "mainstream." Vendors are evaluated on how their products meet the technical criteria of the five segments of OA, and on how vendors intend to interface non-technical users with their systems.