Micros At Big Firms

Users Rate Microcomputer Usage in the Corporate Environment

■ CORPORATE ATTITUDES TOWARD MICROS

Corporate employees, as everyone knows, have embraced personal computing with a passion, and the trend is expected to accelerate. But for the corporations, and especially for their dp departments, the little machines still seem to raise more questions than they answer. What, exactly, are micros accomplishing today? What might they accomplish tomorrow, and how will organizations get there from here? And what role do dp managers expect to play as their companies make fundamental changes in the way they handle information?

For answers to these and other questions, Data Decisions recently surveyed dp managers at a thousand corporate and institutional installations. The results overturn some perceptions on the use of personal computers in big companies and on the attitudes of the professionals who dictate their use.

The installations surveyed represent a cross section of American business; the top three categories were manufacturing, financial/insurance, and transportation/utility. The average number of employees at these sites was over 1,900, and all own or lease computer equipment with equivalent monthly dp rental charges in excess of $50,000. (For more detail on how the survey was conducted, see Methodology on last page).

The questions were designed to find out how and where personal computers are being used in large installations and to explore the attitude of the dp manager toward their use. The survey went out to dp managers at 2,000 organizations. Over 50% responded, often with lengthy comments and other indications that this is indeed a critical topic. The respondents were opinionated and interested. They were also knowledgeable; even for the most difficult questions concerning current usage patterns, over 80% of the participants responded. Their answers provide some startling insights into what is important in the corporate use of PCs.

The attitude of the data processing organization has a major influence on the use of personal computers in large corporations. While there is some indication from their comments that certain dp managers are merely accepting the inevitable, in most cases the attitude is overwhelmingly positive. A solid 59% of the dp managers reported that they were favorably disposed to the use of personal computers by non-dp personnel. An additional 34% were "somewhat favorable": 4% were somewhat unfavorably disposed, and only 2% had strong objections. This favorable attitude is fortunate since 82% of the managers reported some personal computers in use at their locations.

Participants were asked to disregard their own attitudes and list what they saw as the advantages and disadvantages of PC use. The most significant benefit, cited by 44% of the respondents, was improved management or professional productivity. One way dp managers expect micros to address this problem is by taking over a "backlog of small but useful applications needs that cannot be addressed by data processing professionals, because the volume of applications is too great." Another manager felt that the micro's chief value lay in its "ability to be interactive and experiment" in cases where the user can't define the exact boundaries of the job. Computer literacy was also cited as an avenue through which productivity could be improved, underscoring the almost universal attitude of dp managers that computers will play a vital role in all aspects of corporate operation in the years ahead. "The personal computer will familiarize users with computer concepts," suggested a dp manager who strongly supports using personal computers.

Some comments on computer literacy suggested that dp managers were not altogether sorry to see users experience the problems that come with computers. One respondent noted that "users would get more familiar with data processing problems, frustrations, capabilities, etc., which in itself will help to promote better feelings and better understanding of data processing." Programming was an area of particular sensitivity. Working out their own applications, according to one manager, "makes users aware that all applications are not simple.

A second major benefit is felt to be a reduction in the dp workload, both from a programming and an operations perspective. Twenty-nine percent of the dp managers felt that the growth of personal computer usage would reduce the workload of the dp department. However, they had few concrete examples of exactly how this reduction would take place. One manager reported that "certain editing tasks now performed on the mainframe" could be offloaded suggesting that personal computers might serve as local transaction editors.

☐ Concrete Ideas On Cost Cuts

In the area of programming services, the ideas on how costs might be reduced were more concrete. One manager expected micros to "assist with development of those applications that don't require access to mainframe data—sales forecasts, budgets, and maybe some modeling." Where dp development resources are significantly overextended, dp managers suggested that personal computers could help by absorbing most local applications.

Dp managers are also conscious of the advantages of personal systems for ad hoc applications. "They are easy to

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use where there are limited amounts of data involved," one manager reports, "so the results usually come quicker." In all, 28% of the managers saw quick access to needed information as a potential benefit. Having their own systems will give users "quicker, more personalized results." The use of spreadsheet packages to answer "what if" questions was a frequent favorite application.

The favorable attitude toward personal computers is mirrored by a general expectation that their use will ease the burdens of the dp manager in the long term. Fifty-nine percent of those surveyed felt this to be true, the same percentage that favored the use of personal computers in their corporations. An almost equal number, 60%, however, felt that their jobs would be made more difficult in the short term, primarily because of user unfamiliarity with the program and data controls that form the core of most dp department procedures.

Data security and control of sensitive information ranked as the top problem anticipated by the dp managers, with 40% expecting difficulties in these areas. "It's a security risk," one said bluntly. "Failure to audit their data or test their results will result in bad numbers," predicted another manager who expected short-term problems. A third manager, who reported being only "somewhat favorable" to personal computer use in the company and who expected this use to complicate the dp manager's job even in the long term, suggested that "their use will cause a serious loss of control over a valuable corporate asset—data."

Inconsistency of data and of the reports produced from it worries 19% of the respondents. "Confusion due to duplicate data is going to be a problem," one manager explained. The reason for this confusion? Lack of organized dataflow and audit trails. "PCs can lead to mass managerial confusion, because no one knows where the numbers came from." Dp managers also fear a certain amount of "number merchandising." As one put it, "We're going to see a proliferation of different interpretations of the same data."

Waste and cost issues were the third major area of concern, with 18% of those surveyed believing that the user was likely to waste money on the wrong purchase or misuse the equipment once it was installed. "Users tend to say 'just make it work' without a commitment to learn and understand—they want to be button pushers versus data processors," went one comment. The lack of data processing savvy is expected to result in a simplistic approach to the systems: "they'll use the device as an expensive adding machine," or "it will become a toy rather than a tool."

Related to the issue of waste is the issue of duplication of effort. Review committees to evaluate and approve individual departmental applications were not much in evidence, and once equipment was in place, this lack was felt to lead to redundant development. "The disadvantage is that everyone will try to do their own programming instead of performing the jobs they were hired to do. Duplication of effort will result," said one respondent, and 17% of the managers agreed.

☐ Buying: A Delicate Balance

The purchase of a personal computer in a large corporation can reflect a delicate balance of influences. Users may feel that the dp organization wants to retain control over all corporate computer resources and resent dp input into what they see as a local purchase decision. Corporate management, concerned about the possibility of purchasing inferior or unsatisfactory equipment, may encourage users to seek professional advice from the internal data processing staff. "The capability of personal computers are oversold by the media," explained one manager.

Most managers are aware of both the responsibility to advise the user and of the natural resistance to having purchase policy dictated. While 70% of those surveyed felt that dp managers should "participate in the decision along with the manager of the acquiring department," only 20% felt that the manager should mandate which systems could be acquired. Only 9% felt that their role in the decision process was unnecessary; 8% believed that an active effort to promote the dp department as a voluntary contact point was required, and 1% felt that the dp organization should offer advice or information only if asked (see Figure 1).

Figure 1

ROLE OF DP DEPARTMENT IN PURCHASE BY USER DEPARTMENTS (%)

ROLE	CURRENT[1]	EXPECTED IN ONE YEAR[1]	IDEAL[2]
Mandate which system to buy	18	19	20
Participate in decision	48	57	70
No official voice but promote dp department as source of information/advice	16	11	8
No official voice; offer information/advice only when asked	9	3	1
No role	3	1	*
No answer	6	9	1

[1]Base: other departments are using PCs.
[2]Base: all repondents
*Less than 0.5%

Results were less rosy when the "ideal" was compared with the current role and the role expected within one year. Progress toward the ultimate goal of participation can be measured by a shift in role from the unofficial "influence," which conjures up images of meetings in cafeterias and smoke-filled rooms, to a formal joint responsibility. Within one year, three out of four managers expect to take an active role, but currently nearly one in ten limits involvement merely to answering questions if asked.

Where the dp manager has input to the decision process, that input usually takes the form of guidelines. Seventy-three percent of those surveyed provide a list of recommended makes/models, and the same percentage offer selection guidelines for users. Slightly over half (56%) offer guidance on the languages the systems should support. This response is significant because it may constitute ac-

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ceptance of a user programming role by a majority of dp managers and, perhaps, contradict the assumption that end users are to be relegated to package programs such as word processors and spreadsheets.

What factors do the dp managers consider most important in the selection of micros? Figure 2 shows what proportion of the dp managers rated each factor very important and what the average score was for each.

Figure 2

IMPORTANCE OF SELECTION FACTORS

SELECTION FACTOR	% RATING FACTOR AS VERY IMPORTANT	AVERAGE SCORE (1-5)
Available software packages for current applications	65	4.57
Ease of use	56	4.48
Compatibility with existing mainframe, mini, or micro computers	56	4.37
Availability of large number of software packages	53	4.35
Vendor reliability/reputation	48	4.30
Quality of service available	44	4.24
Expansion/upgrade capability	34	4.07
Quality of training available from vendor/seller	25	3.72
Compatibility with existing PC peripherals	23	3.66
Current use of same model by others in company	21	3.62
Cost of system	17	3.54
Ability to get service from another vendor already on site	13	3.14
Amount of processor memory	12	3.55
Mass storage available	12	3.43

Analysis of the responses suggests that dp managers' primary concern is that the system selected be suited to the initial application. Sofware support for it (the most important factor) and ease of system use (the second) would combine to provide the user with an easy transition. The next level of concern involves expansion/upgrade capability for both hardware and software and the so-called "management issues"—compatibility (by only a slim margin of 54% to 44% the majority of managers feel that the result of a selection process will be a single vendor to serve all user needs), vendor reputation, service, and training. Cost and technical features, such as memory size and disk capacity, are considered the least important factors.

In summary, the dp managers's attitude toward the decision process is often refreshingly nontechnical. As one respondent put it, "Get them something they can use now so the system will cost-justify, be sure it can be adapted to other applications, then worry about traditional dp factors."

The actual role played by the dp managers seems to fall short of the goal of being a full participant in the purchase decision. Many managers were not even aware of which employees used personal computers at their installations. Only 25% felt they knew where all personal computers were being used; 33% could account for most of the systems, 21% for some. Three precent said there are PCs at their sites, but they don't know where or how they are being used; 8% were not sure whether systems were in use or not, and 13% were sure that none were.

One reason for this lack of knowledge may be related to the issue of budget purchase authority. The dp department in a large organization is unlikely to be the direct source of funds for the purchase of personal computers. Forty-three percent of the managers at sites where other departments use personal computers say they are always paid for out of the user department's budget; another 24% indicate that this is usually the case.

Although this undoubtedly influences how much say the dp department has in the purchase of personal computers by user departments, when it does play an advisory role, its influence is appreciable. Figure 3 shows how dp managers perceive their comparative influence.

Figure 3

INFLUENCE IN DECIDING WHICH PCS ARE ACQUIRED BY NON-DP DEPARTMENTS (%)

	INFLUENCE			
DECISION MAKER	GREAT DEAL	FAIR AMOUNT	LITTLE OR NONE	NO ANSWER
Data processing department	47	29	17	7
Manager of the individual department	36	39	18	7
Individual user(s)	26	38	26	10
Central purchasing department	6	14	69	11

The acceptance of dp input into the decision process is not the only place where reality trails expectations. Dp managers were asked to identify the areas where the dp organizations *should* provide user services, and then those

Figure 4

USER SERVICES PROVIDED BY THE DP DEPARTMENT (%)

SERVICE AREA	SUPPORT NOW[1]	EXPECT TO SUPPORT YEAR FROM NOW[1]	SHOULD SUPPORT[2]
Training and consulting	63	69	88
Identifying application packages	59	61	69
Providing central data access	44	74	90
Bringing up new applications	30	39	40
Hardware maintenance	24	30	44
None of the above/no answer	22	16	3

[1]Base: other departments are using PCs.
[2]Base: all respondents

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they service currrently and those they expect to support within a year. The views shown in Figure 4 indicate the role dp organizations feel they should play in the after-purchase support of personal computers and offer a glimpse of the dp managers's views on general policies in the use of PCs.

☐ Fall Short of Goals

Dp managers fall short of their goals in all areas, but nowhere is the difference more dramatic than in central database support. Interaction between personal computers and the installation's mainframe or minicomputer is clearly regarded as the wave of the future, with 9 out of 10 dp managers advocating that the department help PC users access central databases. Currently, however, only 44% of the managers at sites where non-dp departments use PCs claim they are able to provide this service. On the other hand, 74% expect to do so within a year.

The very high score given to the issues of central data access also reflects the dp managers' views on the future role of personal computers. A clear separation of functions is expected, with the PCs providing remote processing services against a centrally maintained and supplied database. A PC may thus replace an intelligent terminal, providing remote access but also offloading some processing functions.

This relationship is confirmed by the managers' perceptions of the effects of personal computer selections on the use of intelligent terminals. When asked how often they recommended personal computers in an application where an intelligent terminal would have been recommended two years ago, 21% reported having done so frequently and 41% occasionally. Only 28% rarely or never did so.

The replacement of intelligent terminals raises issues of protocols and compatibility at the connection level. Some dp managers felt that insufficient attention was paid to the problem, and they foresee a heavy penalty for this failure. "Incompatible equipment," reports one dp manager, "will stymie eventually tying everything together in a network." Another is more specific: "There's a real danger if you don't control the protocol used. We happen to be an SNA shop!"

Uncertainties about the role of the dp organization do not seem to be affecting the rate at which dp managers in large companies expect their use of personal computers to expand. When asked what trends in usage they anticipate, 72% of the respondents predicted internal dp department use would increase, while 88% thought other departments' use would rise.

The fact that dp managers are more likely to foresee growth in PC applications outside their own departments than within does not mean that PCs are considered unsuitable for the dp organization. When they were asked to provide a profile of the current use of personal computers within their corporations, 91% of the dp managers at installations where PCs are currently in use reported use by the dp department. This was the highest percentage of any corporate department.

Figure 5 shows the extent to which personal computers have moved from use as specialist tools into the mainstream of the business. When the managers at sites using PCs were asked whether and how many personal computers were used in specified departments, the response demonstrated a significant growth in nontechnical areas. However, the numbers also show that though computers are moving into the executive suites they are not moving out of the lab.

Figure 5

USE OF PCS IN SPECIFIC DEPARTMENTS

DEPARTMENT	% REPORTING PC USE	AVERAGE NUMBER IN USE
Data Processing	91	5
Accounting	67	4
Research	44	9
Marketing	36	3
Manufacturing	27	5
Personnel	26	3
Sales	21	7
All Other	46	8

If the use of personal computers can be classified by department, it can also be classified by the job level of users (Figure 6). One key question in the growth of personal computer use is the extent to which the systems are being applied directly to high-level decision support. Penetration of the higher management levels by PCs is, in part, a tribute to the effectiveness of recent software designed for management use. While clerical use of systems is by no means unknown, management support applications now dominate. Both outside and within the dp organization, the PC is clearly a management tool.

Figure 6

PC USE BY JOB LEVEL (%)

JOB LEVEL	DP DEPT.	NON-DP DEPTS.
Middle Management	63	67
Clerical	38	47
Upper Management	24	22
Professional, Other	21	20

Are the uses to which personal computers are put satisfying the expectations of the dp manager? The managers had expected PCs to improve productivity, reduce mainframe workload, and provide faster access to data. What specifically is being done with the systems, and what is expected within the next year?

As shown in Figure 7, use of personal computers is expected to grow in all areas except the catchall undefined category. The most dramatic growth areas are all related to the substitution of personal computer power for mainframe power, and the highest growth rate is expected in the area of offloading small programs and related data from the main computer.

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Figure 7

CURRENT VS. ANTICIPATED USE (%)

	USES OF PERSONAL COMPUTERS			
	DP		NON-DP	
FUNCTIONS	NOW	IN ONE YEAR	NOW	IN ONE YEAR
New applications not suitable for mainframe	41	54	73	82
Word processing	39	53	55	71
Production of graphics	26	48	36	65
Offload current applications	24	54	30	69
New applications that would have gone on mainframe	22	36	51	63
Bring outside timesharing under in-house control	5	16	21	33
Other	17	15	14	13

If this prediction is correlated with the fact that the majority of personal computer users are expected to be management personnel, it indicates an expected increase in the demand for management decision support applications. The fact that so much is expected of personal computers in the area of replacing programs currently run on mainframes may explain the willingness of dp managers to recommend which programming language should be selected by end users.

Word processing and graphics production, applicable to both management and clerical users, are also expected to show significant growth in both data processing departments and user areas. Replacement of outside timesharing services, while not impressive in total expectations, nevertheless shows a very high growth rate. Since this area represents a direct cash outflow to a corporation, it could provide cost justification to fund the further expansion of personal computer use. Comparison of current usage with that expected within a year does not suggest major shifts in applications; the attitude is "the same things, but more of them."

☐ Problems Creating Standards

The expected rapid growth in PC use has many dp managers worried about standardization. "There is a potential lack of equipment standards," one manager suggested. "We'll have a proliferation of micro vendors in a company and dp will have to support them all," explained another. However, while a bare majority (54%) of the respondents thought their companies should standardize on a single make of personal computer, a substantial (44%) want to acquire more than one make in order to take advantage of different vendors' strengths.

Competition among vendors has been intense, especially since the introduction of the IBM Personal Computer. A survey of the dp managers on the equipment currently in place both within the dp organization and in other departments provided not only an indication of brand preference among the very large corporations, but also showed the extent to which standardization is currently in effect (see Figure 8). Non-dp departments are clearly less committed to a single vendor. While the IBM PC is used by more than twice as many dp departments as any other brand, it has a much narrower lead among non-dp departments. Dp departments were also less likely to experiment with new systems. The DEC computer was more than twice as common in non-dp departments.

Figure 8

PC BRANDS IN USE: PRINCIPAL MENTIONS (%)

	FREQUENCY REPORTED	
MANUFACTURER	WITHIN DP DEPT.	IN OTHER DEPTS.
IBM	55	57
Apple	25	46
Radio Shack	10	23
Digital Equip. (DEC)	4	10
Hewlett-Packard	5	9
Commodore	2	7
Osborne	4	6
Wang	3	5
Texas Instruments	2	4
Xerox	2	3
Victor	1	3
Altos	1	2
Heath/Zenith	1	2

It is difficult to interpret these differences. If the non-dp use of micros represents an earlier trend in purchase, when little control was exercised, the diversity could be construed as the result of uncoordinated purchasing.

Another possible reason for the number of vendors is the failure to integrate personal computers with other systems. In the average dp department using PCs, 58% of the machines are used only as standalone systems; in other departments the number is even higher—79%. These high percentages almost belie the fact that a full 90% of the dp managers rated providing access to centralized data as an objective of their organization. Perhaps providing central data access is a philosophical goal rather than a practical one; only 7% of the dp managers felt that providing users with assistance in networking or communications was a reasonable goal for the dp organization.

The survey of large corporations clearly shows a dramatic increase in the use of personal computers and indicates that the major beneficiaries of the systems will be management and professional personnel. The expected surge is already being watched by the software suppliers, and the sudden increase in all-purpose executive packages that combine word processing, database, spreadsheet, and other applications is one result.

The effects of the growth in corporate America's personal computer use are overwhelmingly perceived to be positive—increasing productivity and providing users with faster access to results. But in the short term, major problems in employing these little powerhouses may occur. Some are a natural result of a sudden increase in the perceived benefits of the systems, spurring an explosion in purchas-

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ing without providing time to establish a framework for their selection and acquistion. One dp manager ruefully compared the task of guiding personal computer selection to that of "directing an avalanche."

Some of the frustrations felt by dp managers are reflected in their comments and in the majority view that personal computers in the hands of end users will make their jobs more difficult in the short term. Many dp managers view the user community as lacking in computer knowledge (probably true), somewhat hostile toward the dp organization (almost certainly true), and therefore inclined to go it alone, given the chance. This latter fear seems groundless in the large businesses—there is simply too much at stake and everyone realizes it. While one dp manager is concerned lest the "hotshots attempt to make micros do what we are doing well on a larger system," the majority seeem to realize that the user managers have no time to become a dp department, even if they had the inclination.

Unfortunately, lack of familiarity with even the most fundamental concepts of data processing can be as damaging to the decision process as deliberate obstruction of corporate data processing policy. This fact makes the centralized control of PC purchases vital if a cohesive cost-effective corporate information policy is to have any hope of long-term success. While administrative controls may be a partial answer to the immediate problem, the dp managers seem to agree that the best answer is strong dp support for a rational policy of selection and use.

☐ Central Control of Data

It appears that the greatest challenge faced by the dp organization, and therefore by the large corporation, is the provision of central data access through mainframe-microcomputer networks. Lack of central control and inconsistent data were rated as serious problems, and 90% of all dp managers felt that central data maintenance and supply should be a key part of the dp department support policy for small computers. Yet, according to these same managers, standalone systems outnumber networked systems by over two to one, a wide margin.

Will the manager of the future use personal computers to digest and display the kinds of high-level information required for supporting major corporate decisions, or will that manager become more and more isolated by a mass of unconfirmed and uncorrelated data? As one dp manager put it, "How many different monthly sales figures can possibly be correct? Only one, obviously. But that's not how many we are going to have."

The personal computer revolution, like other computer revolutions before it, will be assimilated into the back office as well as the boardroom. By providing offerings in the microcomputer area, large system vendors such as IBM and DEC tend to tie together the user's information-management components. The success of the "you got the big one from me, now get the small one from me" strategy is obvious in the growth of the IBM PC from its introduction in 1981 to an estimated annual production of 600,000 units only two years later. That success is already changing the attitudes of other vendors, and even software companies are hurrying to provide offerings that integrate mainframes and micros into a package so tight it is difficult for the user to know where the information is and which system is handling it. If today's average non-dp user in a major corporation is uncertain about the alternatives, the trend toward product integration in the market is so well publicized that it will be hard for such a person to remain so.

The dp manager, for all the suspicions about the attitude and level of expertise of the user, is a professional at information management and is prepared to admit that the small computer has a large place in the corporation. As one manager put it, "Because of the complexity of our 'groups' of programmers, our standards, our procedural red tape, small jobs sometimes become bogged down. Faster turnaround could be helpful to many departments and to the company as a whole." With luck in the short term and with the proper planning and strategic foundations for the future, the personal computer seems assured of a major place in America's biggest businesses.

■ METHODOLOGY

The object of this survey, which was designed by Data Decisions and conducted by Beta Research Corporation, Syosset, N.Y., was to collect information on the use of personal computers in an institutional or corporate environment.

The universe for the survey consists of installations that have purchased or leased computer equipment with equivalent monthly rental fees that exceed $50,000. These installations were identified using the database maintained by Computer Intelligence Corp., La Jolla, Calif., a sister company of Data Decisions. At the time the sample was drawn, the universe consisted of 3,226 sites (7% of all U.S. sites in the entire Computer Intelligence database).

A random sample of 2,000 sites was selected on an nth name basis. On April 22, 1983, questionnaires were mailed to the data processing manager or MIS director at each site. A $1 incentive and postage-paid return envelope were included in the mailing. On May 18, a follow-up mailing was made to all nonrespondents. A total of 898 mail returns were received. During the weeks of June 20 and June 27, 1983, telephone interviews were conducted with 103 nonrespondents, bringing the total number of responses to 1,001, for an overall response rate of 50%.

The organizations surveyed represent a good cross section of U.S. dp sites:

Manufacturing	25%
Financial/insurance	18
Transportation/util.	8
Retail/wholesale	7
State/local govt.	7
College/universities	6
Non-mfg. business	4
Communication	3

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Federal govt.	3
Medical	3
School district	2
Professional	1
Other	13

● **END**