HOW TO TRAIN A TERMINAL USER TO BE AN EFFECTIVE PC USER

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SCOPE OF THIS PAPER

This paper addresses the transition from a terminal to microcomputer-based workstation environment for the user community in a county government. The paper will focus on the training needs of these users and how these needs have been addressed by our training department.

BACKGROUND/ENVIRONMENT

When I joined Solano County MIS in March of 1984, the bulk of the processing work was performed on Hewlett-Packard 26XX series terminals connected to our then single HP 3000 series 68.

Today the County has over 400 terminals connected to three HP 3000 series 70's. In addition, we now have 75 HP 150 Touchscreen and 30 HP Vectra microcomputers.

Along with a growth in the sheer volume of devices attached to the 3000's, there has been a shift away from terminals to PC workstations.

When new management arrived in 1983, there came the addition of the first series Hewlett-Packard Series 68 and a dramatic growth in the number of on-line systems written and purchased for use on the 68. Financial systems, case tracking systems, client services systems. And all were to be accessed using terminals.

GROWTH OF THE TERMINAL INSTALLED BASE

As applications systems were completed and installed on the 3000/68, terminals were purchased and installed in the user departments. The user was given a terminal operation manual and told to now perform the job they had done manually for years using their new terminal.

You can imagine how smoothly the transition went. Department management often used the "big stick" approach to force the use of these terminals and the users learned only enough to perform their immediate tasks and nothing more. These expensive computer resources were vastly under-utilized.

In fairness, the customer support staff at that time consisted of a single staffer transferred from a data entry position. She was responsible for unpacking, delivering and installing all terminals and printers. She was also responsible for help desk coverage and what little training that could be provided to users on a one-on-one basis.

The position of Customer Services Manager was created and I was hired to fill the slot in 1985. I have since built the Customer Services Department to a staff of four. The installation, help desk and training functions are each now full-time equivalent jobs. For over two years, Customer Services has conducted a regularly scheduled program of classes in all areas of information processing. However, four years after systems and terminals started proliferating, we are still playing "catch-up", trying to locate and train all those first terminal users who never received adequate training and continue to use their terminals in a sub-optimal manner.

When our MIS Department outgrew our single facility, we had to acquire an additional building. I was able to negotiate for a separate Training Center in the new building. We installed four 2392A, four 2628A terminals, a letter quality and a line printer.

Creation of the Training Center was central to establishing a quality training program for the County. It enabled me to train a large group of students at one time in a controlled atmosphere with no distractions. A dedicated training facility is a must if you can pry the resources loose!

TRAINING ISSUES: TERMINALS

In order to assist our users in becoming more proficient in the use of their terminals, I developed and our department offered, at no charge, a regular schedule of classes in what I refer to in Figure 1 (page A1) as Level 1 courses:

Beginning HP DeskManager, 4 hours
Advanced HP Deskmanager, 4 hours

covering the following major topics:

keyboard operation

logon/security procedures

basic troubleshooting

how to find information in hardware and software manuals

using HP Deskmanager

Additionally, we offered training courses in specific HP 3000-based applications including:

Beginning HP Word/3000, 18 hours in 3 sessions

Advanced HP Word/3000, 6 hours

HP Listkeeper, 4 hours

Data Entry, 18 hours in 3 sessions

Opticalc, 12 hours in 2 sessions

GROWING NEED FOR MICROCOMPUTERS

My background before joining the County was in the private sector as a PC and multiuser PC systems integrator. One of my first lobbying efforts at Solano County was to show the need for microcomputers. I was surprised that with the sizeable investment in computing resources, there were only a handful of PC's scattered around the County and no plan to incorporate microcomputers in to the overall office automation plan.

My efforts concentrated on the performance improvements which could be made by distributing some of the processing out to microcomputers and off of the HP 3000. Several existing performance and environmental factors supported my claims:

The response time on our single HP 3000/68 was increasing daily as we approached 200 users, many of them using HP Word 3000.

Disc storage space was getting scarce as HP Word 3000 and HP Listkeeper users created, but never purged documents and files.

The number of transaction-intensive 3000-based applications being written for and installed on the 3000 was increasing and further degrading response time.

Users were becoming more sophisticated as to the availability of office automation applications available on the 3000 (I'd like to think that this was a result of our increased training effort) and were using these applications with greater frequency.

Users were becoming more sophisticated in their use of the office automation applications and created "custom" applications with these products which strained processing and storage resources. Some examples:

The Sheriff's Department developed a fingerprint identification system using HP Listkeeper.

The District Attorney's office used HP Listkeeper as a case tracking system.

The Customer Services department developed a case calendaring system for Superior Court using HP Word/3000 to create the documents and HP Deskmanager to distribute them.

The increasing use of office automation applications: HP Word/3000, Opticalc, HP Draw and EasyChart put additional strain on the overworked 3000 CPU and response time for these products became almost unacceptable.

Additional response time and downtime problems were increasing as remote users attempted to run HP Word 3000 over point-to-point data communications equipment.

I realized many of these problems could be resolved or ameliorated by moving many office automation applications off of the 3000 and on to microcomputer.

TRANSITION PATH: TERMINAL TO HP 150 TOUCHSCREEN MICROCOMPUTER

We decided to make our MIS managers the "test market" for the PC experiment and purchased the first HP 150 Touchscreen microcomputers to replace existing HP 2628A terminals for the 5 MIS Managers. The transition was not without its rough points but, basically, I was surprised that the managers all rapidly became PC "converts". Even our MIS Director, a card-carrying mainframe/minicomputer "techie" since the days of the Series III and before, became a champion of the Touchscreen PC.

A primary reason that we selected the HP 150 Touchscreen over other true IBM compatibles was the Touchscreen's HP Word 3000 terminal emulation capability. At Solano County, we have many departments with heavy dedicated word processing requirements. County offices are also geographically disperse and there are extensive requirements to share documents between departments with remote offices. HP Word/3000 solved the logistics problem but failed to perform efficiently and reliably over the data communications network. Microwave channels drifted, multiplexers overflowed, modems failed, data circuits died and users complained.

In fairness, HP never intended HP Word/3000 to operate over data communications equipment so we were the ones "stretching" the technology to serve our own requirements.

In addition to continuing to run HP Word 3000 on the Touchscreens, we installed HP Word/150, Advancelink, Lotus 1-2-3 and RBase 5000 PC software and worked increasingly in the stand-alone PC mode.

TRAINING ISSUES: TERMINAL TO TOUCHSCREEN PC

As a test case, the MIS manager group was a complete success. We all adapted readily to the working on the Touchscreens with our PC applications. It seemed that every day, someone would come into my office with another Lotus macro to share.

No formal training classes were given to the MIS managers as we were initially the only staff with Touchscreens and were still in the learning phase. As training manager, I was encouraged by this example and assumed that our enthusiasm for the new technology and willingness to "self-teach" would be shared by our users as they, too, received new Touchscreen PC's.

The motivation was certainly there. Many users had publicly voiced the desire to have independence from MIS, to control their own computing and be free from MIS CPU charges and inconvenient batch processing schedules. They would surely "take the micro and run" and have no need of our training classes.

As the 1985-86 budgets were approved, Touchscreen microcomputers were purchased in volume and installed in departments where on-line performance was the worst and the need to work in stand-alone PC mode the greatest.

Unfortunately, the average non-MIS department user did not take to the Touchscreens as readily and enthusiastically as the MIS managers had. Many continued to use only the terminal portion of the Touchscreen to run HP Word and the other 3000-based terminal applications they had been running on their old 26XX terminals. The 10MB 9153 disc drives served only as a convenient base to place the Touchscreen terminals on. Even users who had used terminals extensively and had received formal terminal training were confused. Calls for assistance with the new PC's increased.

One of the primary functions of my Customer Services Department is to staff the help desk, a phone line for user assistance with computer-related problems. We monitor the types of calls for assistance received by application type and we could see that the calls relating to the new Touchscreen's were representing an increasing proportion of the calls received. These calls were enlightening. Some examples:

> User; "I'm working in HP Word." Help desk staffer: "HP Word on the 3000 or on the microcomputer?" Caller; "I don't know."
>
> "I lost some Lotus 1-2-3 files." "Can you have Operations restore them from tape for me?"
>
> "The manual says I have two disc drives but I only see one!"

Obviously, my assumption that non-MIS users would self-train on the Touchscreen and operate more efficiently (and autonomously) was incorrect. The Customer Services staff met to assess this new need and develop new training classes to meet the need. I refer to these classes as Level 2 (see Figure 1, page A1). These courses included:

> **HP 150 Microcomputer**, 4 hours

covering the following topics/areas:

> online (to the HP 3000) versus stand alone operation of the microcomputer
>
> information transfer between HP 150 and HP 3000
>
> working with diskettes
>
> installing software
>
> information retrieval
>
> use of the P.A.M. (Personal Applications Manager) facility
>
> **Beginning Lotus 1-2-3**, 6 hours
>
> **Advanced Lotus 1-2-3**, 6 hours
>
> **Beginning HP Word/PC**, 18 hours in 3 sessions
>
> **Advanced HP Word/PC**, 6 hours

We also negotiated for the resources to upgrade the Training Center equipment. We replaced the four 2392A terminals with Touchscreen microcomputers (on-line to the HP 3000) equipped with 2225A Thinkjet printers.

Note, also that we make attendance at the HP 150 microcomputer class a prerequisite to attending either of the applications classes.

TRANSITION PATH: HP 150 TOUCHSCREEN MICROCOMPUTER TO HP VECTRA MICROCOMPUTER

As our HP 150 Touchscreen microcomputer base grew, we, in Customer Services grew to love many of the features unique to this microcomputer.

As a CP/M, then DOS "purist", I initially regarded the Touchscreen/PAM features as novelties which would remain largely unused by most users. As a trainer, I grew to love the feature's simplicity and ease of use for the first-time microcomputer user and, yes, my DOS skills did become a bit rusty during the period when a Touchscreen graced my desk but I, too used and loved them!

Our users complained loud and frequently about the Touchscreen's lack of compatibility with the IBM PC and its clones; but, as the one responsible for installing, distributing and controlling the whereabouts of the County's microcomputer software, I was thankful for the non-standard MS-DOS format on the indestructible 3.5" diskettes. Also, in that Touchscreen environment, we did not spend hours on the phone troubleshooting a problem only to find that the root cause of the problem was a user-installed bulletin board provided utility!

Needless to say, standardizing on microcomputer software packages and providing regular training classes for this software was much easier given the limitations in software initially available for the Touchscreen.

I was able to standardize on HP Word/150 (then PC), Lotus 1-2-3 and RBase 5000 as the basic packages for microcomputer applications within the County. Even now, many departments still use their Touchscreens only for word processing and to access HP Desk and other terminal-based applications.

But technology advanced and as the price for the HP Vectra "AT" dropped below that of a similarly configured Touchscreen in the Fall of 1987, we made a decision to fill all new requests for microcomputers with a one of two standard configuration Vectra's:

the ES model 21 with monochrome monitor for "standard" use to replace the 640KB, Touchscreen/9153

the ES-12 model 42 with 2MB extended memory, 80287 co-processor, color monitor and mouse for users requiring large spreadsheets, graphics and as a future bridge to the New Wave or OS/2 environments

Both Vectra models were ordered with a 3.5" disc drive in addition to the standard 5.25" flexible drive. This was done to facilitate transfer of files created on the 3.5" media used by the Touchscreen microcomputer.

TRAINING ISSUES: TOUCHSCREEN MICROCOMPUTER TO VECTRA MICROCOMPUTER

Once again, we began the transition by replacing the MIS manager's Touchscreens with Vectra ES-12's. Once again, the managers were enthusiastic as spreadsheets could expand in size and recalculate faster, as graphics loaded and displayed faster and as print buffers carved out of the extra 2MB of memory allowed a 10 page document to print to the Quietjet while another program was running. But there were problems.

Where was the familiar Touchscreen? (learn to use the mouse). Where is a full-function PAM screen? "You mean I have to type out a DOS command to do copy and backup?" (learn to install these commands on the Vectra's PAM program).

Even though the Touchscreen and Vectra were both microcomputers manufactured by the same company, many issues unique to the Vectra started to surface:

How to we perform the daily tasks like copy, backup and format? We used to just touch a box on the Touchscreen PAM screen.

How do we transfer files created on the Touchscreen to the Vectra?

How do we access HP Word 3000 documents?

Which word processing package should we use?

How do we move documents created on the Vectra using WordPerfect to HP Desk and mail or store them in HP Library?

We, in the Customer Services department could see that this would be an even more difficult transition for our users than the move from terminal to Touchscreen and we broke the project down into major tasks:

Standardize the Vectra's config and autoexec files and PAM screens to "automate" many of the common utility functions such as copy, backup and format. Yes, we were recreating the Touchscreen environment!

Identify the training needs unique to the Vectra, plan and schedule classes based on these needs.

Obtain four ES model 21 microcomputers to upgrade the Training Center.

We realized that we would need a training course on the Vectra, separate from the training course on the Touchscreen. We also recognized the need to provide a separate course on using DOS.

As of the current time, we offer the following courses for Vectra users. These are referred to as Level 4 courses on Figure 1, page A1.

Vectra Microcomputer, 4 hours

Beginning DOS, 4 hours

Intermediate DOS, 4 hours

Advanced DOS, 4 hours

These courses cover the following major topics:

Operation of computer hardware and interfaces

Working with diskettes

Software installation

Setup of applications in PAM

File management: storage, retrieval copy and backup

Hard disc directory management

MS-DOS commands

Creating and modifying autoexec, config and batch files using EDLIN

Working as a terminal using the HP terminal program

Additionally, those receiving a Vectra as their first workstation will generally also attend the HP Deskmanager course.
We plan to combine the Vectra Microcomputer and Beginning DOS classes into a single one-day course. We have found that there is generally a lag between the time users take the Vectra and DOS classes and without a basic review of DOS, users have had difficulty working with the Vectra.

The following application software courses are currently offered on the Vectra:

Beginning Lotus 1-2-3, 6 hours

Intermediate Lotus 1-2-3, 4 hours

Advanced Lotus 1-2-3, 4 hours

Beginning HP Word/PC, 18 hours/3 sessions

Advanced HP Word/PC, 6 hours/1 session

As the demand increases, we plan to offer courses in WordPerfect and RBase 5000.

TRANSITION PATH: MICROCOMPUTERS FROM STAND-ALONE AND POINT-TO-POINT CONNECTIVITY TO LOCAL AREA NETWORKING (LAN)

As part of our planning for FY 88-89, we have requested funding for a 12 node HP Starlan 10 network. As before, our plan is to install this LAN at MIS and research the training requirements by learning the system and developing a training plan based upon our experience.

Currently, the County Counsel department is the only user department to have requested a LAN (an 18 node Starlan with a bridge to the HP 3000) for this budget year but I know that the requirement for LANS will increase as the number of installed microcomputers grows.

Already, we have identified some potential areas for concern for the transition to LAN:

Will primary support for the management of the LAN be at the user department or MIS Customer Services level? If the support comes from Customer Services, how will we charge the user? If the support is at the department level, how will this person be selected, trained and compensated? In speaking with my colleagues at other California counties, it appears that support of a LAN of this size warrants close to a full-time position.

Which applications will be run "shared" or networked versus stand-alone?

How will data backup be accomplished? Who will be responsible?

How will peripherals be shared? Will a microcomputer server or HP 3000 using Resource Share be used?

Some of these training issues have been identified as Level 4 requirements on Figure 1, page A1.

As this topic of transition to LANS is really outside the area of concentration of my paper, I will not spend further time on it now. The topic is critical, however, and we will be devoting considerable resources to it in the coming year.

APPENDIX FIGURES

TRAINING REQUIREMENTS: TERMINAL TO PC (Figure 1)

Figure 1 on Page A1 graphically represents the training requirements necessary to support the current and anticipated workstation configurations at Solano County.

The training topic areas on this graph are cumulative; all prior level topics must be incorporated into training for the highest level of training required. For example, the user receiving a terminal as his or her first workstation, need only take Level 1 courses. The user receiving a Vectra PC as a first workstation must take all level 1,2 and 3 courses.

Level 1 courses include:

Beginning HP DeskManager, 4 hours

Advanced HP DeskManager, 4 hours

HP Listkeeper, 4 hours

Data Entry, 18 hours in 3 sessions

Opticalc, 6 hours

Level 2 courses include:

HP 150 Touchscreen Microcomputer, 4 hours

Beginning Lotus 1-2-3, 6 hours

Intermediate Lotus 1-2-3, 4 hours

Advanced Lotus 1-2-3, 4 hours

Beginning HP Word/PC, 18 hours in 3 sessions

Advanced HP Word/PC, 6 hours

Level 3 courses include:

HP Vectra Microcomputer, 4 hours

Beginning DOS, 4 hours

Intermediate DOS, 4 hours

Advanced DOS, 4 hours

Level 4 courses include (proposed):

LAN Management

Specific courses in working with networked versions of microcomputer software such as RBase System 5 multiuser

WORKSTATION TRANSITION PATH (Figure 2)

Figure 2 on Page A2 shows the transition path of workstations at Solano County.

This path is chronologic, showing our workstation transition over time from terminal to LAN. As workstation hardware has evolved and become more powerful (and less expensive from a price/performance standpoint), we have purchased the newer model and incorporated it into our installed base.

This path is also applicable on a task-complexity and user sophistication basis. As the user's tasks to be performed become more complex, and as that user becomes more sophisticated in his or her knowledge of workstation capability, the workstation needed to support those tasks becomes more sophisticated.

From a training standpoint, there are several implications:

We must maintain an ongoing training program for all levels of courses because all types of workstations are in use within the County.

County staff move within departments and must be trained on the workstations in use within their current departments.

Departments are constantly upgrading to new workstation technology and their staffs must be trained in the use of the new workstations.

Since our MIS Department is a chargeback agency, purchasing and then leasing workstations and peripherals to County departments, we keep these devices circulating through the departments on a "task/technology" matching basis. When a department outgrows a terminal and requires a microcomputer, we select the appropriate microcomputer and move the terminal to a department requiring its capabilities. In this way, we can maximize the "field time" of these devices, control inventory, minimize new purchases and lower the overall computer hardware costs to the County.

There are many other economies of scale we derive from centralized computer hardware management but those are outside the scope of this paper.

SUMMARY

Training the terminal user to be an effective PC user requires several actions:

Workstation hardware must be standardized to leverage the training effort over large groups of students. Standardization will also provide for a lower overall training bill for the organization as staff can move between departments and likely find the same (or similar) workstations and software in use there.

A Training Center must be established and maintained to provide for the ongoing education of the organization's staff.

The concept of an ongoing training program must be "sold" (and continually resold) to senior management. The training manager is the only one in the position to know and sell the cost benefit (to the organization) of maintaining a quality training program.

As new workstation technology is brought into the organization, before it is widely distributed to the non-technical users, it must first be adopted by those responsible for training. The training staff must assess training requirements for the new technology and develop and offer applicable courses to the users at the same time as the new workstations are distributed to the users.

The Training Program must provide standardized courses on a regular basis to accommodate the schedules of staff to be trained. These courses must be offered at no or low cost in order to encourage attendance. We have found that it is wise, however, to charge a "no-show" fee in order to ensure full classes and maximize training resources.

Calls for assistance from the help desk or help line must be periodically reviewed in order to determine if existing training courses should be modified or combined or if new courses need to be developed.

A student/course database should be established in order to provide statistics on the training effort. These statistics can be used to show such trends as:

Period to period changes: How many sections of a particular course have been given over the previous year. How many students have been trained?

Which training courses are no longer desired/required?

Which courses need to be offered more frequently?

Which students frequently repeat the same course (is the student a slow learner or is the course ineffective?).

Which departments have never received formal training?

Which students are broadly trained and might be candidates for department level support contacts or future Customer Services staff.

Training the terminal user to be an effective PC user is an ongoing effort. The resources devoted to this training effort must increase as the technical complexity and capability of PC's increases. The training staff must be "detectives" and actively seek out user training needs. Finally, the training manager must maintain a quality training program and continually "sell" the program to users and management.

MAJOR TOPICS COVERED:

TRAINING REQUIREMENTS - TERMINAL TO PC

LEVEL 4 - LAN
- LAN MANAGEMENT
- SERVER BACKUP
- PERIPHERAL SHARING

LEVEL 3 - VECTRA PC
- SOFTWARE TRANSFER
- P.A.M.
- DIRECTORIES
- MS-DOS

LEVEL 2 - HP150 PC
- P.A.M
- STORAGE/BACKUP
- RETRIEVAL
- INSTALL S/W
- DISKETTES

LEVEL 1 - TERMINAL
- HPDESK BEG/ADV
- MANUALS
- BASIC TROUBLESHOOTING
- LOGON/SECURITY
- KEYBOARD OPERATION

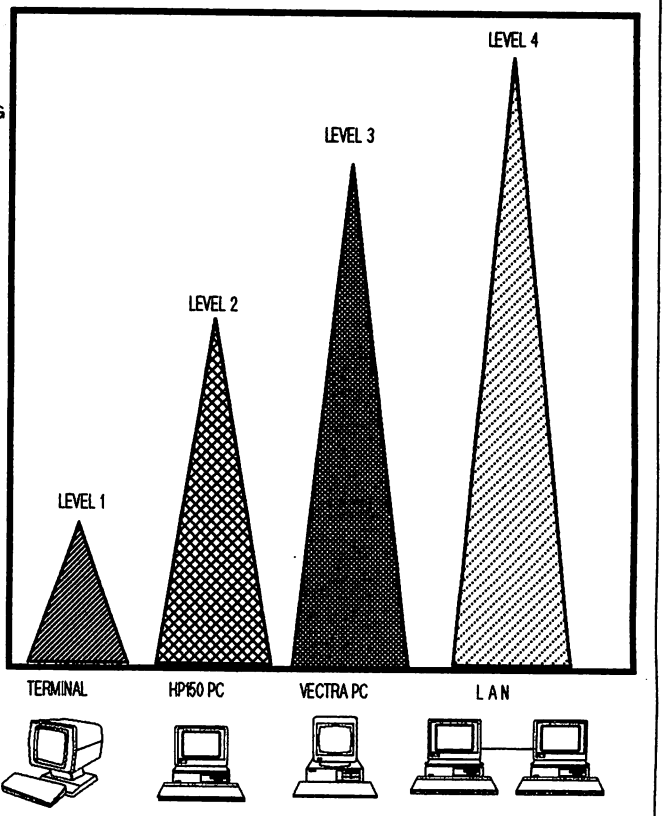
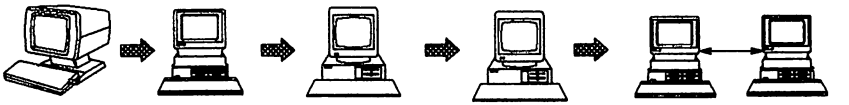


FIGURE 1

WORKSTATION TRANSITION PATH



TERMINAL	HP150 PC	HP VECTRA ES/MOD 21	HP VECTRA ES-12/MOD 42 2 MB EXTENDED MEMORY	L A N
TASKS:	**TASKS:**	**TASKS:**	**TASKS:**	**TASKS:**
DATA ENTRY	TERMINAL TASKS PLUS:	ALL TERMINAL TASKS EXCEPT HPWORD 3000	ALL TERMINAL TASKS EXCEPT HPWORD 3000	ALL TERMINAL TASKS EXCEPT HPWORD 3000
CLETS	STAND ALONE:	STAND ALONE:	ALL STAND ALONE TASKS FOR VECTRA ES/MOD 21	ALL STAND ALONE MICRO TASKS
ON LINE INQUIRY HP DESK	WORD PROCESSING	WORD PROCESSING HPWORD PC WORD PERFECT	LARGE LOTUS 1-2-3 SPREADSHEETS	SHARE DEPARTMENTAL BASED INFORMATION
WORD PROCESSING (HPWORD 3000)	W/CONVERSION TO/FROM HPWORD 3000	LOTUS 1-2-3	DESK TOP PUBLISHING	SHARE LOCAL PERIPHERALS: PRINTERS PLOTTERS
HP3000 APPLICATION PROGRAMS	LOTUS 1-2-3	RBASE 5000	HP NEW WAVE OR OS/2 OPERATING ENVIRONMENT	CD ROM
	RBASE 5000	APPLICATION SOFTWARE AVAILABLE IN STANDARD PC-DOS FORMAT	CD ROM	
	HP150 SOFTWARE			

FIGURE 2