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AUTHOR Simmons, Dexter D.
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ABSTRACT

Conversion of a University of Oregon bowling center into a computer laboratory by the college union is discussed. Located in a renovated former bowling center, the Erb Memorial Union Computer Lounge is a self-supporting campus computer laboratory. User fees are charged for on-site computer rentals, laser printing, color plotting, and typesetting services. To achieve the goal to provide state-of-the-art computer rentals for students, faculty, and staff, a local area network has been used to share software, printers, campus mainframes, and lab management control. Descriptions are provided of the main lab, the control desk, and additional equipment. Information is provided on hardware such as Sixteen Apple Macintosh Plus's, 10 Kaypro PC 10's, and three Apple 2e's. It is noted that demand has pushed the computer lounge to the limit of its computer access capacity. The result is that users are forced to sign a waiting list or make reservations far in advance. Additions to existing equipment has enabled the computer lounge to grow from a user base of 3,000-plus students to 4,000-plus students. Included is the computer lounge budget showing 2 school years. (SW)

Converting bowling balls into Apples and Macs

Dexter D. Simmons

College unions around the country are trading in the thunder of bowling balls and pins for the quiet hum of computers.

It's mainly a matter of timing. The demand for microcomputer services has increased at a time when bowling centers are declining in popularity. On some campuses, the decision to convert bowling lanes into computer lounges can generate more revenue.

Microcomputer labs, like some bowling centers, can produce enough income to be self-supporting. The current heavy demand by students, faculty, and staff for computer services opens the door for a new union enterprise. On the income side, user fees can be charged according to the amount of time spent on the computer or according to the number of pages printed. On the expense side, user-support personnel can be work-study students or volunteer-interns enrolled in computer-related programs. Campus-based computer technicians can even help with hardware repair and maintenance.

But there's another very practical reason why computer labs and lounges are going in where bowling lanes used to be: subflooring. Computer lab flooring requires space to lay cables for computer networks, and the honeycomb structure of bowling lane beds provides ideal floor ducts for these network cables. Salvaging the bowling lane subflooring for computer cables can save considerable remodeling costs.

The University of Oregon's Erb Memorial Union has turned one of its two bowling centers into a computer laboratory, a self-supporting service that has had to expand to meet the demands of its campus users.

This successful venture started in the spring of 1985, when the Erb Memorial Union Student Board of Directors recommended that the EMU administration renovate the original bowling center for use as a microcomputer center. A renovation budget of $99,999, plus an equipment budget of $75,000 were funded by the Oregon State Board of Higher Education building reserve sinking fund. The renovation budget was purposely set below $100,000 to keep the project free of the delays inherent in the state capital construction process. In the spring of 1986, the eight bowling pinsetters, bowling lanes and approaches, scoring and seating facilities, and miscellaneous hardware were sold, adding another $20,000 to the equipment budget.

Opened in June of 1986, the Erb Memorial Union Computer Lounge is a self-supporting campus computer laboratory, located in a renovated former bowling center. User fees are charged for computer rentals (on-site only), laser printing, color plotting, and typesetting services. Figure 1 shows the Computer Lounge budget for last school year and this one.

The goal of the Computer Lounge is to provide state-of-the-art, on-site computer rentals for students, faculty, and staff. To achieve this goal, management has relied on a local area network (LAN) for the sharing of software, printers, campus mainframes, and lab management control. The ultimate objective is to network all of the nodes (computer terminals, printers, and peripherals) into one control center.

The main lab area and the publishing room of the Computer Lounge are monitored from the control desk by student lab attendants (see Figure 2). A back storeroom (not shown on Figure 2) is used for computer and printer technical maintenance, re-inking of printer ribbons, miscellaneous supplies, and employee meeting space.

The main lab

A wide range of hardware is available for rental in the main lab of the Computer Lounge. Sixteen Apple Macintosh Plus's (Macs), 10 Kaypro PC 10's, and three Apple 2e's are set up in homogeneous clusters of three and four computer stations. Each computer station cluster is networked to a near letter quality printer, via a switch-box system.

The Kaypro PC 10's are IBM-XT compatible microcomputers, capable of interfacing with virtually all IBM-compatible software and hardware peripherals and enhancements. The Kaypro systems are popular with the business-oriented students, fac-

ulty, and staff who require a powerful word processor or data management system with little graphics capability. A 20 megabyte hard disk accompanies a 360K floppy disk drive, with 640K of internal memory in each PC 10. Five of the 10 Kaypro's in the main lab are hard wired to the university Gandalf Switch network, controlling the university mainframes (DEC10 and IBM4341). The three clusters (three or four machines per cluster) of Kaypro's are networked to EPSON FX-286 printers, using COMPUTER INTERFACE SYSTEMS automatic switch boxes. At least 18 software packages are stored on each PC 10 hard disk, providing word processing, spreadsheets, database, telecommunications, utilities, programming languages, and games:

- Perfect Writer
- MS Word
- Word Perfect
- Word Star
- Word Proof
- GW-Basic
- PC-Forth
- Lotus 1, 2, 3
- Symphony
- Framework
- Thinktank
- dBase III+
- Files and Folders
- NFL Challenge
- XLisp
- Kermit
- MS "C"
- Public Domain Games

A user friendly Kaypro "master menu" controls the selection of these software programs. Disk operating system command codes provide write- and copy-protection for software packages. Demand has increased for the Kaypro systems during the last six months, creating a need for two additional PC10's. This has been achieved via grant funding sources.

In the main lab, the Computer Lounge offers 16 Mac-Plus microcomputers in four work station clusters (four Macs per cluster). Each Mac is networked to an Apple hard disk 20, using Appletalk hardware and Macserve software. Two Mac host computers are connected directly to a 20 megabyte hard disk. Each Mac host is then cabled to seven other Mac node computers. Each cluster of Macs is networked to an Imagewriter II printer, via a Scooter switch box. The Macserve system software is user friendly and capable of efficiently handling a software-shared Mac network.

The Apple Macintosh is the most popular microcomputer on the University of Oregon campus. The overwhelming popularity ratio of the Mac, when compared to the IBM compatibles, is estimated to be 4-to-1. This can largely be attributed to the graphics capabilities and the overall flexibility of the Mac system architecture. For instance, students and faculty are fascinated with the ability to combine word processing with draw

Figure 1
EMU Computer Lounge

	1986–87 Budget	1987–88 Proposed Budget	$ Change Increase (Decrease)	Percent of Change to Last Year
Income:				
Student Term Passes	$38,750.00	$37,500.00	($1,250.00)	−3.23%
Faculty/Staff Term Passes	$4,650.00	$6,300.00	$1,650.00	35.48%
Daily Use	$7,500.00	$15,000.00	$7,500.00	100.00%
Mini Classes	$450.00	$200.00	($250.00)	−55.56%
Summer	$5,802.00	$1,500.00	($4,302.00)	−74.15%
Other (Printing, Paper)	$388.00	$12,000.00	$11,612.00	2992.78%
Cash over/short				
Total Income	$57,540.00	$72,500.00	$14,960.00	26.00%
Expense:				
Salaries & Wages	$8,646.00	$10,640.00	$1,994.00	23.06%
Work Study	$4,000.00	$7,000.00	$3,000.00	75.00%
Student Wages	$8,301.00	$16,000.00	$7,699.00	92.75%
Custodial	$8,000.00	$5,600.00	($2,400.00)	−30.00%
Payroll Assessments	$7,130.00	$8,076.00	$946.00	13.27%
Total Payroll	$36,077.00	$47,316.00	$11,239.00	31.15%
Telephone	$1,680.00	$1,744.00	$64.00	3.81%
Postage	$80.00	$80.00	$0.00	0.00%
Office Supplies	$200.00	$200.00	$0.00	0.00%
Printing & Duplicating	$800.00	$800.00	$0.00	0.00%
Advertising	$2,000.00	$2,000.00	$0.00	0.00%
Misc.	$200.00	$200.00	$0.00	0.00%
Total Administrative	$4,960.00	$5,024.00	$64.00	1.29%
Printing Supplies	$3,000.00	$5,000.00	$2,000.00	66.67%
Maint. & Repair	$1,000.00	$1,000.00	$0.00	0.00%
Utilities	$6,400.00	$4,800.00	($1,600.00)	−25.00%
New Equipment	$400.00	$1,000.00	$600.00	150.00%
Equipment Reserve*	$4,800.00	$9,089.00	$4,289.00	89.35%
Building Reserve	$480.00	$838.00	$358.00	74.58%
Total Other	$16,080.00	$21,727.00	$5,647.00	35.12%
Total All Expense	$57,117.00	$74,067.00	$16,950.00	29.68%
Net	$423.00	($1,567.00)	($1,990.00)	−470.45%

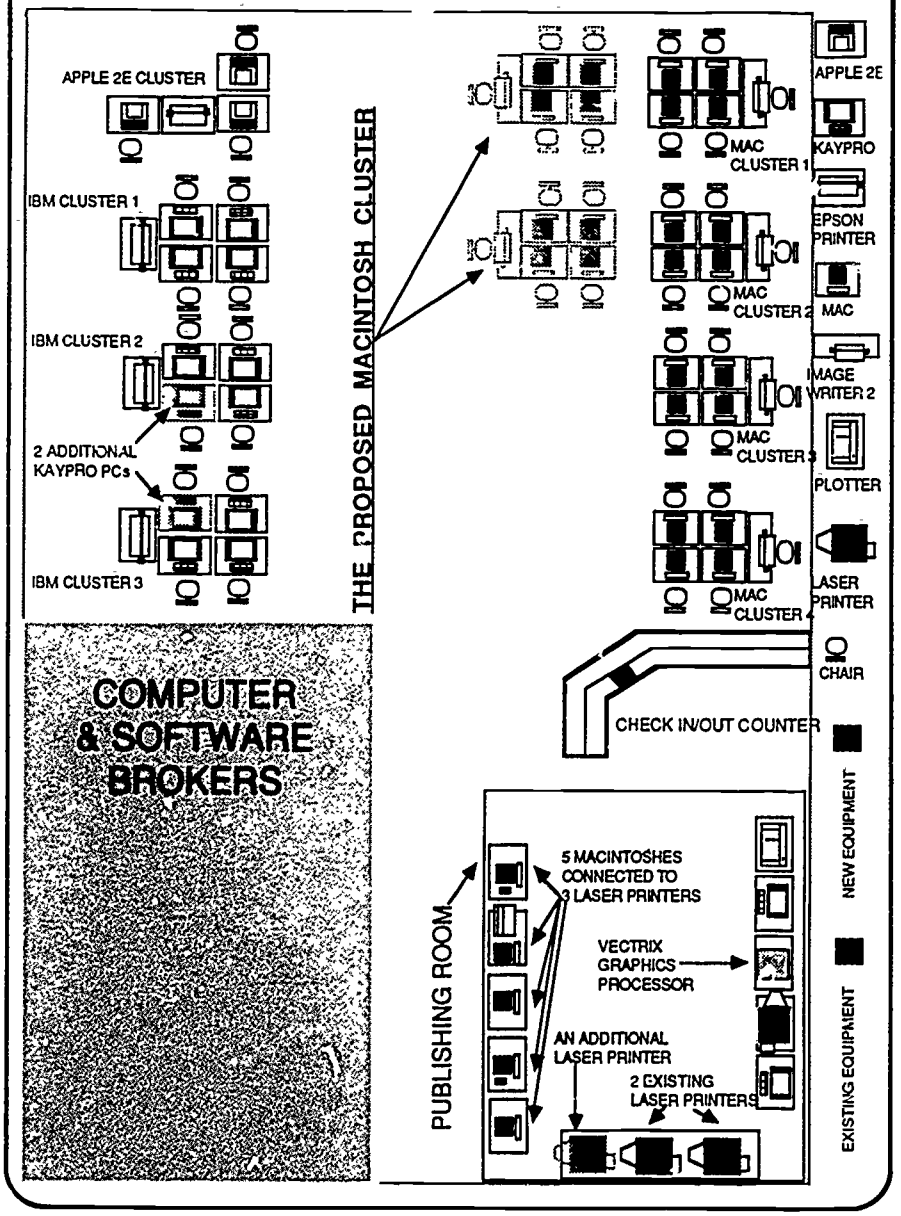
**Equipment Reserve depreciation schedule on computer equipment is 10 years.*

and paint (bit-mapped) graphic images. Moreover, hundreds of software programs are available to integrate the different software capabilities of the Mac. Presently, 30 Mac-compatible software packages are available for use in the Computer Lounge:

- MacWrite
- PageMaker
- MacSpell+
- LightSpeed Pascal
- MS Basic
- MacProject
- MS Multiplan
- Jazz
- Excel
- MacPaint
- MacDraw
- MacDraft
- Slide Show Magician
- Mc pic #1
- Mc pic #2
- Art a la Mac #1
- Art a la Mac #2
- MS Chart
- Full Paint
- Mac 3D
- MS File
- Fontastic
- Music Works
- Plot Start
- Switcher
- Silicon Press
- Thunderscan
- Video Works
- Public Domain Games
- MacKermit

The tremendous demand for Macs has created a need for additional Mac stations in the Computer Lounge. Although our objective was to double our supply in the main lab from 16 to 32 Macs, using the same or a similar network configuration, grant funding from student incidental fees will allow us to add only eight Mac stations.

Figure 2
Proposed Additions to the EMU Computer Lounge



The publishing room

The Computer Lounge publishing room is equipped with four Macs, one Apple 2e, and two Kaypro PC10's, all networked to two Apple Laserwriter Plus's, an HP Laserjet+, and an HP 7475A Plotter. The network configuration in the publishing room is a combination of our Appletalk Macserve system and DataSpec switch boxes. This setup allows the greatest amount of flexibility in interfacing computers with desktop publishing printers. For instance, a student is given the option of combining laser-printed documents with color-plotted graphics, regardless of the type of computer used to perform the word processing and graphics software functions. Since student demand for laser quality printing and color graphics has increased during the last year, the Computer Lounge is adding another Apple Laserwriter and a Vectrix Graphics Processor to the publishing room configuration. This has also been achieved by grant funding sources.

The control desk

The Computer Lounge has implemented a state-of-the-art bar code reader system using a Mac, a hard disk 20 (purchased before the faster, more compatible SCSI disks became available), the Appletalk network, Mac Barcode software, Omnis 3+ software (database) and the Scanstar-Mac wand reader. A Computer Lounge data-base management program was designed and written using a team of students, campus Computing Center consultants, and student union staff. Basically, the program allows Computer Lounge staff to check customers in and out of the facility by reading the 39 bar code on their campus photo IDs. The program records transactions by each user ID, subtotaling all transactions by dollars, hour, day, year in school, and department affiliation. The next logical step in future months is to network this system to the cash register. In the meantime, the transactions are tabulated in the bar code system and rung separately into the cash register. A duplicate coding subprogram created for both the Omnis bar code reader and the Sharp cash register has protected the accounts receivables.

This database system has allowed student managers the flexibility to create mailing lists of different campus market segments. More than 2,700 people (of an estimated 16,000 on campus, or 15.5 percent of the student body) are currently using the facility at some time or other, according to the data base. This demand has pushed the Computer Lounge to the limit of its computer access capacity. The result is that users are forced to sign a waiting list or make reservations far in advance. A short-term solution to create a greater supply of computer access was to extend the closing hours of the Computer Lounge from 11 p.m. to 2 a.m. Sunday through Thursday. Using this type of hours-extension strategy along with the addition of the 10 new computer stations, the Computer Lounge will expand its present user capacity from 3,000 to more than 4,000 users.

The new additions

The Erb Memorial Union Computer Lounge has secured funding to satisfy an immediate need for additional equipment. Student demand was overrunning the supply of Macs, PC compatibles, and printers causing waiting lines and frustration. Apple Macintosh demand in particular was nearly 50 percent greater than Computer Lounge supply.

On July 15, 1987, when the Student Incidental Fee Committee awarded $30,000 for the purchase of new computer equipment, the prospects for increased student access to microcomputers at the University was greatly improved, as was the quality of the educational experience. Students face enough day-to-day stress in competing for grades, without having to compete for access to word processors and laser printers. Additions to existing equipment have enabled the Erb Memorial Union Computer Lounge to grow from a user base of 3,000-plus students to 4,000-plus students. Should the growth in student demand eventually overrun the proposed supply additions, then the Computer Lounge will once again strive to provide a greater supply of equipment and computer access with whatever means available.

"This demand has pushed the Computer Lounge to the limit of its computer access capacity. The result is that users are forced to sign a waiting list or make reservations far in advance."

Dexter D. Simmons managed the Erb Memorial Union's Recreation Center at the University of Oregon from January 1984 through July 1987. In addition to the normal duties of a recreation center manager, Simmons voluntarily managed the Computer Lounge project for a 30-month period, from the planning stages through the first year of management.

This summer Simmons received a master's degree in interdisciplinary studies, which he earned by attending classes part-time while working at the University of Oregon. He holds a bachelor's degree in education from the University of Rhode Island.

Simmons is now the regional marketing director for The Village at Smugglers' Notch, a resort in the Green Mountains of Vermont.