

**The Development of a College/University
Microcomputer Purchasing Program:
A Conceptual Model**

by

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The authors of this paper provide a conceptual model of a computer purchasing program. This model should assist appropriate personnel in the establishment of a prototype that will best meet the needs of their campus community. The process of developing such a system includes defining such resources as equipment, personnel, facilities, and finance and marketing.

Some processes include surveying potential clients, setting software and hardware standards, selecting vendors, purchasing inventory, installing and distributing inventory, doing orientation, training, and user support and providing servicing and maintenance.

The model is a blueprint of activities that flow in both a parallel and serial time line. It shows the interdependence and interrelationship of the various elements. From this general schema, individuals may develop a prototype program.

INTRODUCTION

The purpose of this investigation is to present a conceptual model for a campus computer purchasing program that can be used by universities and colleges. Establishing a computer purchasing program is becoming increasingly important. Because of technological advances and changes in the education process, there is a greater need for all students and faculty to have access to this technology. Therefore, higher educational institutions must respond to the changing environment and the needs of the campus community. Establishing a computer purchasing program will contribute to extending the quality of academic achievement and provide an excellent recruitment tool for attracting students.

The scope of this project is broad. This report is designed as a generic blueprint of a computer purchasing program that can be used by most colleges and universities.

In this report, we will present a conceptual model of a computer purchasing program that can be adapted by most colleges and universities. Within the presentation, we address the following issues:

1. Financial (venture) considerations
2. Human resource requirements
3. Maintenance options
4. Hardware and software standards

PROCEDURES

We did a review that included institution interviews, first year student survey, literature searches. This presentation is focused primarily on information obtained from these resources.

We began by searching for colleges and universities that have established computer purchasing programs on their campuses. The initial search was conducted through the 1992 Directory of Computing Facilities in Higher Education by Charles H. Warlick. This Directory has information on purchasing programs which include total dollar sales by type of system. At first, we confined ourselves with institutions in North and South Carolina. We then had to expand our search to include institutions throughout the country. Once this list was completed, we proceeded by conducting telephone interviews with persons responsible for establishing and/or maintaining the institution's program. Some of our telephone interviews lead to on site interviews.

The questions we asked were designed to provide information regarding successes, as well as unexpected problems, with a computer purchasing program. We asked specific questions concerning the institutions program structure, maintenance for the systems, and financial and human resource policies. From the interviews, we were able to determine key pieces of information about computer purchasing programs.

To provide us with essential information concerning the student body, we developed a survey questionnaire for the first year class at Winthrop (see Appendix). Our main intent was to determine the student interest level in a computer purchasing program. Interviews were conducted with The Office of Assessment at Winthrop University to develop the questionnaire. The questionnaire was sent out just prior to the Fall semester of 1992 to 787 first year students enrolled at Winthrop University.

The responses to the questionnaire were entered into a database. From this database, we were able to determine key pieces of information about the incoming first year class. Some of the key issues that we were concerned with were: where the student will live while in school, what the student will be majoring in, what is the student interest level in buying a computer through the program, how much they are willing to contribute as a down payment, how quickly will they are willing to pay off the balance, and what platform would they purchase.

After the questionnaire was mailed, we requested a national database search from the campus library. This search was made through Dialog and included databases from ERIC, Microcomputer Index, Computer Database, and Magazine Index. The search was based on key words and phrases. The key words were *education, microcomputers, sales, computers, colleges and universities*. Less than 10 articles relating to University microcomputer sales were found. Relevant articles were selected and abstracts obtained for potential use. Most of the articles reviewed the effects that university sales had on retail sales five years ago or more.

RESULTS

The results from the first year student survey furnish information about student ideas concerning a computer purchasing program. The survey shows that 72% of the first year students would definitely or probably participate in a computer purchasing program. DOS based systems would be purchased by 73% while Macintosh would be purchased by 27% of the first year students. Approximately 40% of the students surveyed indicated that they expect the price of a computer to be between \$1000 - \$1500. Thirty nine percent would be willing to pay of the balance of the loan in two years.

THE CONCEPTUAL MODEL(see Figures 1a &1b).

- EVENT 1** *REVIEW/ADAPT MODEL*
Adapt the model to specific institution.
- EVENT 2** *DETERMINE MARKET SEGMENT TO SURVEY*
Determine the segment of the campus community that will be surveyed. This survey will help in determining how much of the campus community will participate in this program.
- EVENT 3** *DETERMINE SURVEY QUESTIONS*
The survey questions should be structured in such as way as to provide key information pertaining to your particular institution. It may be necessary to determine what the students will be majoring in and what platform they will purchase.
- EVENT 4** *CONDUCT & ANALYZE MARKET SURVEY*
Carry out the survey of the determined campus market.
Analyze the market survey to help estimate sales.
- EVENT 5** *DECIDE SCOPE OF OPERATIONS*
From the analysis of the market survey, determine the appropriate size and scope of the computer purchasing program.
- EVENT 6A** *DEVELOP DIRECTOR'S JOB SPECS & SKILLS INVENTORY*
Define the responsibilities of the sales director.
- EVENT 6B** *DEVELOP ADVERTISING PLAN*
Determine the most effective way to inform the campus community of the computer purchasing program.
- EVENT 6C** *DETERMINE PART-TIME STAFFING REQUIREMENTS*
Using the results of the market survey, determine additional staffing requirements. This additional personnel could be made up of student employees, work-studies or interns.
- EVENT 6D** *REVIEW FIXTURES, EQUIPMENT, SPACE AND STORAGE NEEDS*
- EVENT 7A** *PREPARE PERSONNEL DESCRIPTION*
Define the specific qualifications that the sales director must have.
- EVENT 7B** *OBTAIN QUOTES FOR FIXTURES*
After estimating the operations space, calculate the fixtures that will be needed. Secure vendors quotes for these fixtures.
- EVENT 8A** *DETERMINE WAGE SCALE*
Define the salary range for the sales director.
- EVENT 8B** *DEVELOP FACILITIES PLAN*
This may come in the form of office areas, a store or both. Estimate space for the workers to talk with customers. There should also be office space for the coordinator. It will also be necessary to determine the physical space needed to receive and temporarily store computer orders.

- EVENT 8C** *DEVELOP FIXED ASSETS PLAN*
Determine the fixed assets that will be needed. This will include office furniture and accessories and the cost for each.
- EVENT 9** *ESTIMATE EXPENSES & INCOME*
From the information gained in the previous steps, determine how much money will be needed to cover expenses and how much money can be expected in income.
- EVENT 10** *PREPARE BUSINESS PLAN*
The Business Plan will evaluate the projected business operations of the program. The Business Plan will cover a broad area and will be used for the institution approval process.
- EVENT 11** *INSTITUTION APPROVAL*
Receive approval from the University/College to begin a computer purchasing program.
- EVENT 12A** *COMMITTEE ESTABLISH & RECOMMENDS GENERIC APPLICATION STANDARD*
It is beneficial for the various academic departments to be involved with recommending software application standards. Each academic area will have individual ideas to contribute that will be helpful in selecting software applications. This committee will need to address standards for word processing, spread sheets, data bases, communications, presentations and graphics.
- EVENT 12B** *OBTAIN VENTURE CAPITAL*
Determine the source that will provide the necessary start up money for the program. This step will most likely require the involvement of the institutions financial department. There may be possible involvement of the institutions Foundation as well as outside sources (corporate and banking).
- EVENT 13A** *SELECT APPLICATION SOFTWARE*
Committee recommendations will assist the director in effectively choosing software standards for the program.
- EVENT 13B** *SELECT OPERATING SYSTEMS*
The operating systems that should be offered for sale will vary among institutions and may include offering a variety of platforms.
- EVENT 13C** *DEVELOP DIRECTOR ORIENTATION PROCEDURES*
Design orientation procedures for the incoming sales director. The director should be informed of the institutions purpose of the program as well as the model used in developing the program.
- EVENT 13D** *START RECRUITMENT PROGRAM*
Begin institution proceeding for recruiting the sales director.
- EVENT 13E** *ESTABLISH PROCEDURES TO RENOVATE SPACE*
This will include any remodeling, painting as well as special wiring for demos.
- EVENT 13F** *ORDER FIXTURES & EQUIPMENT*
- EVENT 14A** *SELECT HARDWARE OPTIONS*
Specific options (models, parts, etc) must be selected to be offered for sale in the program. This step should include selecting several different models which should give the customers an acceptable range to choose from. The "acceptable range" should depend on the specific institution. Once this has been determined, limit the purchases to the acceptable range.

- EVENT 14B** ***HIRE FULL TIME DIRECTOR***
In the majority of cases, the institution will require a full time director/coordinator. If the institution is small or expects sales to be low, they may want to consider hiring a part time director/coordinator instead.
- EVENT 14C** ***DO INTERIOR FINISHING***
Using the interior finishing plan, perform the necessary renovations on the operations space.
- EVENT 15A** ***ESTABLISH CLIENT CONTRACT TERMS***
If the institution is planning to help the student finance his or her computer purchase, contract terms must be established. Included in this step is how much of a down payment must be made by the customer and how soon they must pay the balance due.
- EVENT 15B** ***ESTABLISH SUPPORT AREAS OF PROGRAM***
How the program will impact other administrative areas of the University? As the contract terms are established, impact areas will be discovered.
- EVENT 15C** ***ESTABLISH PRODUCT PRICING***
Determine a price range for the systems. The range should be able to include inexpensive systems and reasonably priced, high performance systems.
- EVENT 15D** ***DIRECTOR ORIENTATION***
Carry out the orientation procedures developed for the sales director.
- EVENT 16A** ***CREATE CLIENT CONTRACT, CREDIT PLANS, ETC.***
Create the individual contracts and credit plans, and official check-in sheet to be used when the orders arrive, etc.
- EVENT 16B** ***SOLICIT BIDS FROM VENDORS***
Solicit bids for micro computer vendors along with bids from software vendors.
- EVENT 16C** ***DEVELOP PROGRAM TO TRAIN PART TIME EMPLOYEES***
- EVENT 16D** ***INSTALL FIXTURES AND EQUIPMENT***
- EVENT 17A** ***SELECT VENDORS***
The coordinator will determine what vendors best fit the criteria and agenda of the institution.
- EVENT 17B** ***ESTABLISH SERVICE MAINTENANCE PROCEDURES***
In conjunction with choosing a vendor, outside servicing options, must be established. The brand of computer you will choose to sale will determine who will perform the maintenance.
- EVENT 17C** ***START RECRUITMENT PROGRAM FOR PART TIME EMPLOYEES***
- EVENT 18A** ***PURCHASE AND RECEIPT OF DEMOS***
Once the vendors have been chosen, the coordinator will need to determine the demo model(s) that should be on hand for the sales operations.
- EVENT 18B** ***PROMOTIONAL MATERIAL ARRANGEMENT FOR PRODUCTION***
Promotion materials include any brochures or pamphlets that will be used to promote and advertise the program.

- EVENT 18C** *HIRE PART TIME PERSONNEL*
Support personnel may include student employees or work study students.
- EVENT 19A** *INSTALL DEMOS*
- EVENT 19B** *TRAIN PART-TIME PERSONNEL*
- EVENT 20** *IMPLEMENT ADVERTISING PLAN*
Begin promoting the program.
- EVENT 21** *GRAND OPENING*

The following Figures (1a & 1b) are what we call our Poor Man's PERT. That is, they were not generated from any packaged software program. We used Freelance Graphics[®] by Lotus and Lotus 1-2-3[®] to generate the subsequent table of time estimates. The following "loose" interpretations hold for our model.

An **event** represents a specified program accomplishment. Events are sequenced in both parallel and sequential manner. Parallel events may be processed independently and simultaneously. In a serial pattern, prior events must be performed before the next event in line.

Time estimates are made for each event/activity of the network. They are **optimistic, most likely, and pessimistic**. They were used to calculate a time estimate (t) that reflects the uncertainty in the "activities". In the table, we proceeded to sum the longest "t" of any parallel set of events. This would give us approximation of the total program duration. While not accurate in itself, it will provide a measure of dynamic control of the program.

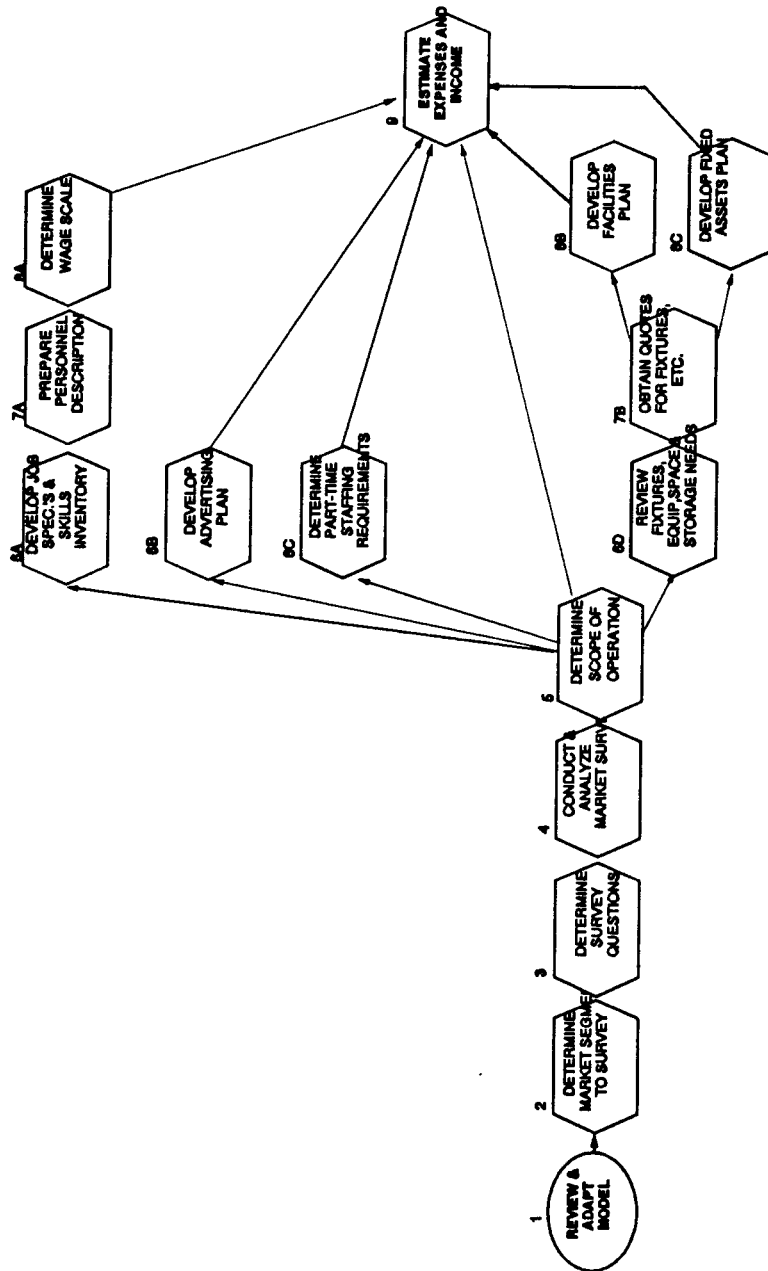


Figure 1a: PERT Model

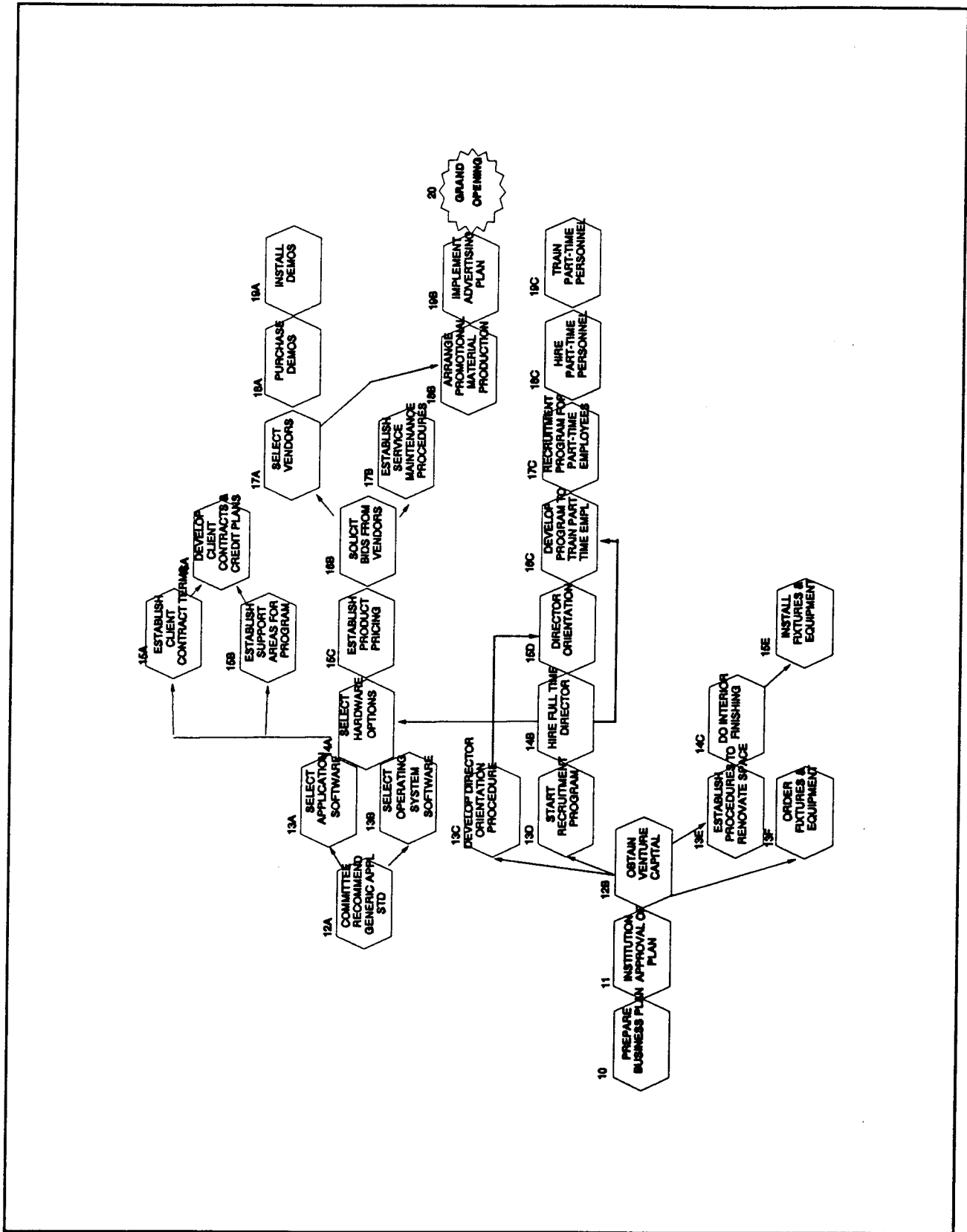


Figure 1b: PERT Model

The following table is a list of time (weeks) schedules for the PERT events. The letter a is optimistic time, b is pessimistic time, and m is most likely time. The value for t (estimated time) is calculated from the formula $T=(a+4m+b)/6$. All values are expressed in weeks. L.E. is the longest event time for a 'set' of parallel Events.

#	EVENT	a	b	m	T	L.E. TIME
1	REVIEW/ADAPT MODEL	2.0	6.0	3.0	3.3	3.3
2	DETERMINE MARKET SEGMENT TO SURVEY	1.0	2.0	1.0	1.2	1.2
3	DETERMINE SURVEY QUESTIONS	1.0	2.0	1.5	1.5	1.5
4	CONDUCT & ANALYZE MARKET SURVEY	4.0	8.0	5.0	5.3	5.3
5	DECIDE SCOPE OF OPERATIONS	2.0	4.0	3.0	3.0	3.0
6A	DEVELOP DIRECTOR'S JOB SPECS & SKILLS INVENTORY	2.0	3.0	2.0	2.2	
6B	DEVELOP ADVERTISING PLAN	2.0	3.0	2.5	2.5	2.5
6C	DETERMINE PART-TIME STAFFING REQUIREMENTS	1.0	2.0	2.0	1.8	
6D	REVIEW FIXTURES, EQUIP, SPACE & STORAGE NEEDS	1.0	2.0	2.0	1.8	
7A	PREPARE PERSONNEL DESCRIPTION	2.0	3.0	2.0	2.2	
7B	OBTAIN QUOTES FOR FIXTURES	4.0	8.0	7.0	6.7	6.7
8A	DETERMINE WAGE SCALE	1.0	2.0	1.5	1.5	
8B	DEVELOP FACILITIES PLAN	2.0	5.0	3.0	3.2	3.2
8C	DEVELOP FIXED ASSETS PLAN	1.0	3.0	2.0	2.0	
9	ESTIMATE EXPENSES & INCOME	2.0	4.0	3.5	3.3	3.3
10	PREPARE BUSINESS PLAN	2.0	4.0	3.5	3.3	3.3
11	INSITTUTIONAL APPROVAL OF PLAN	6.0	8.0	7.0	7.0	7.0

#	EVENT	a	b	m	T	L.E. TIME
12A	COMMITTEE ESTABLISH & RECOMMENDS GENERIC APPLICATION STANDARDS	2.0	4.0	3.5	3.3	
12B	OBTAIN VENTURE CAPITAL	8.0	12.0	12.0	11.3	11.3
13A	SELECT APPLICATIONS SOFTWARE	1.0	3.0	2.0	2.0	
13B	SELECT OPERATING SYSTEMS	1.0	3.0	2.0	2.0	
13C	DEVELOP DIRECTOR ORIENTATION PROCEDURES	1.0	3.0	2.0	2.0	
13D	START RECRUITMENT PROGRAM	4.0	6.0	5.5	5.3	5.3
13E	ESTABLISH PROCEDURES TO RENOVATE SPACE	2.0	4.0	3.0	3.0	
13F	ORDER FIXTURES & EQUIPMENT	1.0	2.0	1.0	1.2	
14A	SELECT HARDWARE OPTIONS	1.0	2.0	1.0	1.2	
14B	HIRE FULL TIME DIRECTOR	1.0	2.0	1.0	1.2	
14C	DO INTERIOR FINISHING	2.0	7.0	5.0	4.8	4.8
15A	ESTABLISH CLIENT CONTRACT TERMS	2.0	4.0	3.5	3.3	3.3
15B	ESTABLISH SUPPORT AREAS FOR PROGRAM	2.0	4.0	3.0	3.0	
15C	ESTABLISH PRODUCT PRICING	1.0	2.0	2.0	1.8	
15D	DIRECTOR ORIENTATION	1.0	1.0	1.0	1.0	
16A	CREATE CLIENT CONTRACT AND CREDIT PLAN	1.0	2.0	2.0	1.8	
16B	SOLICIT BIDS FROM VENDORS	4.0	8.0	7.0	6.7	6.7
16C	DEVELOP PROGRAM TO TRAIN PART-TIME EMPLOYEES	1.0	3.0	1.5	1.7	
16D	INSTALL FIXTURES AND EQUIPMENT	1.0	3.0	2.0	2.0	
17A	SELECT VENDORS	1.0	2.0	1.0	1.2	
17B	ESTABLISH SERVICE MAINTENANCE PROCEDURES	1.0	4.0	3.0	2.8	
17C	START RECRUITMENT PROGRAM FOR PART-TIME EMPLOYEES	2.0	4.0	3.0	3.0	3.0
18A	PURCHASE & RECEIPT OF DEMOS	3.0	6.0	4.0	4.2	
18B	PROMOTIONAL MATERIAL ARRANGEMENT & PRODUCTION	3.0	6.0	5.5	5.2	5.2
18C	HIRE PART TIME PERSONNEL	2.0	3.0	2.0	2.2	

#	EVENT	a	b	m	T	L.E. TIME
19a	INSTALL DEMOS	1.0	3.0	1.5	1.7	1.7
19b	TRAIN PART-TIME PERSONNEL	1.0	3.0	1.0	1.3	
20	IMPLEMENT ADVERTISING PLAN	1.0	1.0	1.0	1.0	1.0
21	GRAND OPENING	0.5	1.0	0.5	0.6	0.6
	TOTAL WEEKS FOR LONGEST EVENTS OF EACH CATEGORY					83.2

DISCUSSION

Some general conclusions from our work are:

1. It is possible that only a portion of the money needed to start a computer purchasing program will be available. Therefore, the institution must consider the possibility of initiating a program on a limited basis.
2. It is consistently underestimated how much effort and time must be dedicated to start and maintain a program of this type. Therefore, most institutions will require a full time director. There is a unique case where students are desired for an essential position, and that is customer education and training.
3. Although there may be room for on-site maintenance in the future, it is important to outsource the maintenance in the early stages of the program.
4. Before the program is initiated, the institution must select hardware and software standards that will be widely used in many different academic areas. The institution must determine standards for operation systems and applications software such as word processing, spread sheet, data base, communication, and graphics.

We will elaborate on these and other points in more detail at our presentation. We hope for suggestions, comments, and recommendations.

APPENDIX

FIRST YEAR STUDENT SURVEY

Demographic Information

1. Your sex : Male Female
2. Your age: _____
3. Your classification:
First year Senior
Sophomore Graduate student
Junior Other
4. Which of the following best describes your roommates while at college?
Parents Spouse or Children Other
Peers I live alone
5. Which best describes your place of residence?
House off campus A fraternity house Other
Apartment off campus A sorority house
Winthrop residence hall On Campus Apartment

Computing Information

1. Do you currently own a personal computer? yes no
2. Do you plan to bring a personal computer with you to Winthrop?
yes no undecided
3. Do you plan to purchase a personal computer while you are a student at Winthrop?
yes no undecided

4. If you wanted to purchase a personal computer, how much would you expect to pay?
- less than \$1000
 - \$1000 - \$1500
 - \$1500 - \$2000
 - \$2000 - \$2500
 - \$2500 - \$3000
 - More than \$3000
5. If a plan were to be made available through Winthrop whereby students could purchase computers at educational discounts and then pay for them in installments that were included in each semester's tuition and fees payment, would you be likely to purchase a computer?
- Almost definitely yes
 - Probably yes
 - Probably not (go to item 10 below)
 - Almost definitely not (go to item 10 below)
6. If you wanted to purchase a personal computer, how much money would you be willing to contribute as a down payment?
- Less than \$250
 - \$250 - \$500
 - \$500 - \$750
 - \$750 - \$1000
 - More than \$1000
 - I would pay the total price at the time of purchase.
7. Would you be willing to pay the balance owed in:
- 1 year
 - 2 years
 - 3 years
 - 4 years
 - I would pay the total price at the time of purchase.
8. How much would you be willing to pay each semester as a payment on a computer?
- less than \$100
 - \$100 - \$200
 - \$200 - \$300
 - \$300 - \$400
 - more than \$400

BIBLIOGRAPHY

- Archibald, Russell D., and Villoria, Richard L., Network-Based Management Systems (PERT/CPM). New York, John Wiley & Sons, Inc., 1967.
- Kinley, Patricia, "Report May Curb Computer Sales Through Universities," Computer & Software News, February 1988, Vol. 6 #5, p. 1.
- "Large Colleges Doing a Booming Business," Computer & Software News, February 1988, Vol. 6 #5, p. 1.
- Miller, Robert W., Schedule, Cost, and Profit Control with PERT. New York, McGraw-Hill Book Company, 1963.
- "NEC Sells Direct to College Students," Computer & Software News, April 1987, Vol. 5 #17, p. 39.
- Reisman, Averil, "Ann Arbor Dealers Stunned As University Moves 2,700 PCs," Computer & Software News, October 1988, Vol. 6 #43, p. 1.
- Scott, Robert, "ABCD to Scout Impact of University Sales," Computer & Software News, May 1988, Vol.6 #18, p. 3.
- Warlick, Charles H., 1991 Directory of Computing Facilities in Higher Education, The University of Texas at Austin Computation Center, 1991.

BIBLIOGRAPHY

- Archibald, Russell D., and Villoria, Richard L., Network-Based Management Systems (PERT/CPM). New York, John Wiley & Sons, Inc., 1967.
- Kinley, Patricia, "Report May Curb Computer Sales Through Universities," Computer & Software News, February 1988, Vol. 6 #5, p. 1.
- "Large Colleges Doing a Booming Business," Computer & Software News, February 1988, Vol. 6 #5, p. 1.
- Miller, Robert W., Schedule, Cost, and Profit Control with PERT. New York, McGraw-Hill Book Company, 1963.
- "NEC Sells Direct to College Students," Computer & Software News, April 1987, Vol. 5 #17, p. 39.
- Reisman, Averil, "Ann Arbor Dealers Stunned As University Moves 2,700 PCs," Computer & Software News, October 1988, Vol. 6 #43, p. 1.
- Scott, Robert, "ABCD to Scout Impact of University Sales," Computer & Software News, May 1988, Vol.6 #18, p. 3.
- Warlick, Charles H., 1991 Directory of Computing Facilities in Higher Education. The University of Texas at Austin Computation Center, 1991.