1986

# A Five Year Plan for Excellence

Mikhail J. Atallah
*Purdue University*, mja@cs.purdue.edu

Douglas E. Comer
*Purdue University*, comer@cs.purdue.edu

Herbert E. Dunsmore
*Purdue University*, dunsmore@cs.purdue.edu

Greg N. Frederickson
*Purdue University*, gnf@cs.purdue.edu

John R. Rice
*Purdue University*, jrr@cs.purdue.edu

Report Number:
86-651

# A FIVE YEAR PLAN FOR EXCELLENCE

Mikhail Atallah
Douglas Comer
H.E. Dunsmore
Greg Frederickson
John Rice

CSD-TR-651
Summer 1986

# A FIVE YEAR PLAN FOR EXCELLENCE

Mikhail Atallah
Douglas Comer
H. E. Dunsmore
Greg Frederickson
John Rice

CSD-TR 651
Summer 1986

## Abstract

This plan, developed in the winter of 1985/86, is a follow-up to the previous plan [Denning, et.al., 1981]. The top priority goal is to increase the quality of the department measured in terms of its research and educational programs. The primary mechanism is to increase the quality of the faculty by providing a superior academic environment to attract and retain superior faculty. Modest growth in the size of the faculty is foreseen along with a substantial decrease in the number of undergraduate majors and a substantial increase in the number of Ph.D. students. Tables are given summarizing the projection for personnel, departmental finances, students and staff. An appendix summarizes the goals and achievements of the previous plan.

# A FIVE YEAR PLAN FOR EXCELLENCE
# DEPARTMENT OF COMPUTER SCIENCES

CONTENTS

1. EXECUTIVE SUMMARY
2. THE FACULTY
3. THE EDUCATIONAL PROGRAM
   - 3.1 Undergraduate
   - 3.2 Service
   - 3.3 Graduate
4. THE RESEARCH PROGRAM
5. THE FACILITIES
   - 5.1 Educational Computing and Laboratories
   - 5.2 Research and Administrative Computing
   - 5.3 Space
6. ADMINISTRATION AND STAFF SUPPORT
   - 6.1 Department Administration
   - 6.2 Facilities and Laboratory Operations
7. QUANTITATIVE DATA AND PLANS
   - 7.1 Assumptions of the Plan
   - 7.2 Tabular Data:
     - Table 1: Personnel
     - Table 2: Faculty Evolution
     - Table 3: Financial
     - Table 4: Students
     - Table 5: Space

APPENDIX: Goals and Achievements of the 1981 Plan for Excellence

## 1. EXECUTIVE SUMMARY

This plan was developed in the winter of 1985/86 by a cross section of the Computer Science faculty to provide a guide for the future of the department. It is hoped that the University administration will also approve it as a guide just as it did the previous plan [Denning et.al., 1981].

The top priority goal is to increase the quality of the department as measured by its research and educational programs. The emphasis will be on getting better, not bigger. The key components of the plan in seven areas are as follows:

**Faculty.** We will create a superior academic environment to attract and retain a superior faculty. Eight specific steps are proposed, the most significant are to provide superior research facilities, a much better teaching environment plus more and better Ph.D. students.

**Education.** We will have significantly smaller class sizes along with a moderate increase in the number of courses at the advanced undergraduate and advanced graduate levels. The experimental and laboratory components of the educational program will be increased substantially.

**Research.** The level of research funding will approximately triple, going from $1.2 million/year to $3.5-4.0 million/year. Seven factors are cited which contribute to this growth; the most important are (a) our young faculty will be much better supported as it matures, (b) the overall quality of the faculty will improve and (c) several large projects and/or centers will be established.

**Administration/Staff.** The administrative staff will be increased to reflect the recent rapid growth of the department both in numbers of people and in laboratory/experimental facilities. Key additions will be an Associate Department Head and several people on the technical staff.

**Computing Facilities.** Dramatic improvements in the cost/performance ratio make it plausible to plan for about 50 VAX 11/780 equivalents in the department, plus a variety of specialized equipment.

**Space.** The projected needs are substantially larger than existing space even though the department currently has "in reserve" about 4,000 $ft^2$ of lab space (being used as classrooms) and about 10 offices (being loaned to Mathematics or used for visiting scholars). The projected deficit in space at the end of the 5 year plan is about 12-15,000 $ft^2$ of laboratory space and 12-15 offices.

**Budget.** This plan can be accomplished with a steady increase above inflation of $200,000/year in the Department's operating budget. At that point the Department's resources and responsibilities will have moved into the normal range as measured by such things as student/faculty ratio, cost per credit hour, cost per major, etc. Note that the research support budget is expected to grow

much faster at a rate of about $500,000/year. These funds will help indirectly to finance a number of the planned improvements.

The next five sections describe the components of this plan in more detail. Section 7 presents tabular data on plans or projections of personnel, faculty evolution, finances and budget, students, and space. The Appendix presents a summary of the goals and achievements of the 1981 Plan for Excellence. The 1985/86 goals of this plan were met rather well except for two items: there were serious shortfalls in funds for S&E (operation of computing facilities) and space for research labs.

## 2. THE FACULTY

The current faculty consists of about 33 full time equivalents (FTEs) and its structure is summarized in Table 2 of Section 7. The faculty is quite young which suggests there will be considerable change both in people and in their fields of interest. Growth to about 38-40 FTE faculty is planned.

The Plan's principal point is to create a superior academic environment which will attract and retain superior faculty. The following specific mechanisms are identified:

A. *Provide excellent research facilities.* High quality, state-of-the-art general computing services will be provided as well as a variety of specialized interesting facilities (e.g., parallel machines, sophisticated graphics, specialized workstations). Ample space for laboratories must be available.

B. *Attract more and better Ph.D. students.* New energy is to be put into this.

C. *Provide competitive salaries.* Current salaries are generally average for high quality schools, but not more. The lower cost of living at Purdue helps some, but is not a strong attraction for younger faculty.

D. *Provide competitive teaching environment.* The department must continue evolving from the high teaching loads traditional in mathematics to those typical of engineering and experimental science departments. More assistance (both staff and student) will be provided to support the teaching program.

E. *Emphasize special areas of excellence.* The department is already strong in some areas (theory, scientific computing, software engineering, systems) and these strengths will be the foundations of future quality enhancements. Adding an area of strength will involve a committment to 3-4 excellent people.

F. *Hire a superstar distinguished professor.* The department is very short of senior researchers and this goal has top priority. The competition is fierce, but we must try hard.

G. *Maintain a vigorous visitor/colloquium program.*

H. *Maintain a congenial/cooperative atmosphere.*

The facilities and student aspects of these mechanisms are discussed in Sections 3 and 5. Other mechanisms require mostly money (salaries, colloquium program) while the rest require a judicious combination of effort, organization, money, cooperation and

perseverance.

## 3. THE EDUCATIONAL PROGRAM

### 3.1 Undergraduate

The number of undergraduate majors is expected to decline substantially, to about 750 majors from the current 1,000+. Table 4 gives a projection for the next five years. This reduction will be very beneficial for both the faculty and students. Currently, some class sizes are far too large and the variety of undergraduate offerings is too limited. The combination of 30% fewer majors and 15% more faculty provides the opportunity to raise significantly the quality of the undergraduate program. Even so, care will be needed to provide high quality within the resources expected to accrue.

Curriculum evolution is constant in Computer Science. We must be vigilant to maintain an up-to-date program while not proliferating courses unnecessarily. Thus the number of undergraduate courses will remain relatively small, but there may be major reorganizations of the undergraduate program.

More specific plans for the undergraduate program are:

A. Reorganize the degree requirements to provide a better "core" and more flexibility with a minimum number of courses.

B. Introduce new laboratory courses or laboratories for existing courses as follows:

| | |
|---|---|
| 1986/87: | Graphics (new course) |
| 1987/88: | Artificial Intelligence (new course) |
| | CS 404 (Software Engineering) |
| later: | CS 330 (Second course for majors) |
| | CS 430 (Third course for majors) |
| | Systems Programming (new course) |

The three new courses will be the only additions to the undergraduate program. The facilities implication of these courses are discussed in Section 4.

C. Introduce an honors program. We conjecture that this can be done with a modest expenditure of resources, a specific implementation plan is to be developed.

D. Increase the number of undergraduate assistants from 32 to 40. This helps the department and provides more suitable work for undergraduate majors.

### 3.2 Undergraduate Service Courses.

The plan is to maintain the current commitment of resources. These courses will continue to be taught primarily by visitors and instructors because the projected increases in faculty are barely sufficient for the planned improvements in the undergraduate and

graduate programs.

### 3.3 Graduate Majors.

The number of graduate students is to increase from 125 to 180. All the increase will be in Ph.D. students. This requires a substantial enhancement in the graduate course offerings, especially for 600-level and seminar courses. These have been held down in the past because of the lack of faculty.

A vigorous program to attract high quality graduate students will be devised. Current efforts in this area are much too small.

More specific plans for the graduate program are:

A. Increase the numbers of supported positions as follows:

| | |
|---|---|
| Fellowships: | from 4 to 10 |
| Research Assts: | from 18 to 50 |
| Teaching Assts: | from 60 to 70 |
| Staff Assts: | from 6 to 12 |
| Total Supported: | from 95 to 160 |

The total supported includes some supported outside the department (e.g., fellowships and assistants in other departments).

B. Increase the course offerings as follows:

| | |
|---|---|
| 500-level, regular courses: | offer 2 more per year |
| 600-level, regular courses: | offer 4 more per year |
| Special 590, 690 courses: | offer 10 more per year |

Note that the laboratory facilities needed for the undergraduate program will also be used in the graduate program.

## 4. THE RESEARCH PROGRAM

The research program will grow dramatically in the next five years. There are several factors that will contribute to this growth:

(i) The faculty will be more senior, more established, and consequently, better funded.

(ii) The quality of the faculty will improve.

(iii) Some big projects and centers will be established.

(iv) Research in Computer Science is becoming more experimental in nature and thus larger in size.

(v) The number of faculty will increase.

(vi) More academic year support will be available to support a larger research program.

(vii) More effort will be put into identifying sources of funding, both in government and industry.

The current level of research support in Computer Science is $1.7 million (this is actual expenditures from July 1, 1985 to June 30, 1986). The above factors will increase this level by about $2.5 million up to $4.0 - 4.5 million.

The increase in the research program depends on many individual efforts. The department as a whole will concentrate on establishing large scale projects or centers that have high national visibility and provide substantial support for the students, faculty, staff and facilities. Promising areas for such projects and centers are: parallel computations, software engineering, systems and networking, and interdisciplinary research. We must be alert for new opportunities that arise in this fast changing field.

The financial information summarized in Table 3 of Section 7 shows the increased level of research support and its effects on the operation and purchase of computing facilities.

## 5. THE FACILITIES

### 5.1 Educational Computing and Laboratories

The departmental computing is logically divided into educational, administrative and research. Educational computing is, in turn, divided into three categories:

A. *General computing provided by PUCC.* These facilities have traditionally been grossly overloaded and this has prevented faculty on many occasions from teaching appropriate material. We strongly support a large increase in the computing power provided for general support of courses.

B. *Laboratory computing provided by PUCC.* Several laboratories have dedicated equipment with hardware support provided by PUCC and software/supervisory support provided by the Computer Sciences Department. Much better computing service is provided to the students in these labs and we plan to expand this approach.

C. *Laboratory computing provided by CS.* Some laboratories with specialized equipment and systems are operated entirely by the Computer Sciences Department.

The laboratory space is provided by the Computer Sciences Department. The current educational laboratories are:

CS110: two labs equipped with 22 IBM PC/AT's each

| | |
|---|---|
| CS230: | one lab with 22 terminals supported by a dedicated dual processor VAX 11/780 |
| CS503/536: | one lab equipped with a network of LSI 11's supported by a VAX 11/785 |

The laboratories planned for the near future are:

| | |
|---|---|
| Graphics: | one lab equipped with workstations supporting 12-15 graphics terminals |
| Artificial Intelligence: | one lab equipped with workstations providing 10-12 AI stations. |

In the longer term we plan on:

| | |
|---|---|
| CS330/430: | one lab for core CS courses |
| Various: | one lab with powerful UNIX workstations |

We anticipate that equipment cost (list price) for one laboratory is about $150,000-$300,000 (depending on the type). The PUCC maintenance and operating costs per year are probably about 10% of the equipment cost and the extra costs to the Computer Sciences Department for supervision and support is about $25,000/year per laboratory.

### 5.2 Research and Administrative Computing Facilities

The goal is to have one VAX 11/780 equivalent per faculty, plus adequate support for secretarial, administrative and facilities staff. This means about 50 VAX 11/780 equivalents. A resource allocations system will be installed to insure that the services provided match the priorities of the department. The bulk of the funding for this is to come from research grants and much of the increased capacity will be in the form of workstations. The installed computing capacity in the spring of 1986 is over 20 VAX 11/780 equivalents, but it is unevenly distributed. The general research and administrative computers are grossly overloaded while some machines are lightly used. Note that the special nature of some machines means that their "power" is not easily made available to the department as a whole and, indeed, some are dedicated to specific research projects.

The user community for research and administration computing will consist of about 160 people in 1991 (40 faculty, 60 Ph.D. students, 20 staff, 12 secretaries and 25 M.S. students). The general characteristics for the facilities planned are as follows:

| | |
|---|---|
| Gross computing power: | 50 VAX 11/780 equivalents. |

| | |
|---|---|
| User stations: | High quality color (20), lower quality color (20), high quality (bit mapped) (50), lower quality (70). |
| I/O devices: | Access to all varieties of black and white paper printers, phototypsetters, color printers, wide bed printers, video displays and copiers |
| Networks: | Access to all major national and international networks and all important campus facilities. |

Note that the CS computing facility currently has about 100 user stations (mostly simple terminals) for about 120 users. Only graduate students involved in research projects are (and will be) given access to these facilities.

It is interesting to note that the biggest difference between this plan and the previous one is in the projected computing power needs. This is a reflection on the dynamic changes underlying the computing profession. Even the current plan only provides what will be considered "ordinary" facilities by 1991.

### 5.3 Space

The department's space needs are divided into three somewhat independent categories: teaching laboratories, research laboratories, and offices. We discuss these categories in this order, the order of increasing concern.

The new Computer Science Building was planned for eleven teaching laboratories. In the first year of occupancy these are used as follows:

| Equipment | Course |
|---|---|
| **In Use:** | |
| Personal Computers (two): | CS110 |
| Graphics: | CS435 |
| Terminals: | CS230 |
| Terminals: | General graduate student use |
| Terminals/Microcomputers: | CS503 and CS536 |
| **In Reserve:** | |
| Seminars/Occasional Use | |
| Classrooms (four) | |

The four classrooms are currently assigned to Schedules and Space with the understanding that they will be converted to laboratories as needed.

The anticipated five new laboratory courses will require two or three new laboratories depending on the course enrollments and versatility of the equipment selected.

The new Computer Science Building contains 4,700 $ft^2$ of research laboratory space and 2,050 $ft^2$ of computer room space. This is a large increase over the previous situation (1,300 and 840 $ft^2$, respectively), but far short of the 20,000 $ft^2$ projected need in the earlier plan. In the first year, 3,200 $ft^2$ of the research lab space and 1,200 $ft^2$ of the computer room space was in active use. It is expected that all the research lab space will be in active use before the end of the second year. Some more space can be obtained by "squeezing" people tighter, but it is clear that this space will be gone by the end of 1987.

There are three factors that will contribute to the need for additional research lab space: (1) computer science research is becoming increasingly experimental in nature, (2) the research faculty will increase some (perhaps 15%), and (3) the research faculty is maturing and will be involved in larger projects. Our analysis of the future suggests that the previous estimate of 20,000 $ft^2$ of required research lab and computer room space is still a reasonable one. This is less than 20% of the corresponding space of the Chemistry or Biological Sciences Departments at Purdue.

Office space is the major shortcoming of the new Computer Science Building. The original plan was for a faculty of 40, but it did not adequately foresee the growth in support staff for facilities, research projects, visitors, centers, and administration. The office space for graduate teaching and research assistants is adequate for the number the department had in the 1983-85 period. However, we plan on a substantial increase in research assistants in the next five years. The result is that all the office space will be gone by the end of 1986. After that a substantial squeeze for offices will begin.

The five rooms now in reserve will provide some of the research lab, educational lab and office space needed. These rooms have about 4,400 $ft^2$ and it is clear that they cannot come close to providing for two or three teaching labs, 18 offices and 13,000 $ft^2$ of research laboratories. In view of the long lead time for acquiring space, planning must begin now on how to meet these needs. Quantitative projections of space needs are given in Table 5.

## 6. ADMINISTRATIVE AND STAFF SUPPORT

### 6.1 Departmental Administration

The department has grown substantially over the years without acquiring adequate support for administrative and staff operations. Some of these duties have fallen upon the faculty and some are not being done. Tasks that need better support include industrial relations, recruiting graduate students, managing educational labs, and departmental administration. Using faculty for these tasks detracts from our plan to provide a superior departmental environment.

### 6.2 Facilities and Laboratory Operations

The superior environment that we desire must include an excellent support staff for the computing and experimental facilities. Furthermore, we must start providing general support for the teaching laboratories and for the laborious software preparations for many

regular courses. The main burden for supporting research experimental facilities will fall upon the research projects, but there are still many general support tasks that must be provided. Our budget projections assure that the staff additions listed below to support research labs will be paid from research grants.

Thus, over the next five years, we plan that the department add the following:

* Associate Department Head (perhaps rotating for a 2-3 year period).
* Assistant Department Head (responsible for industrial relations, publicity, government relations, development).
* Three secretaries (beyond any dedicated to research projects, centers, etc.).
* Three Programmers (one for educational services, two for general research/administrative support).
* Two Technicians (one for educational services-labs, one for general support).
* Five graduate assistants (two for educational services, two for general support, one for research lab support).
* Ten undergraduate assistants (five for educational services, three for general support, two for research lab support).

These additions are included in the personnel projection of Table 1.

## 7. QUANTITATIVE DATA AND PLAN

### 7.1 Assumptions of the Plan

This plan is based on four assumptions, three of these are outside the department's control:

1. *Department Budget.* The Computer Sciences Department's budget will increase about $200,000 per year (in constant dollars) over the next five years. These increases are in addition to normal raises, inflationary increases in supplies, etc. This is the level of increase that was agreed to in 1981 when the previous plan was presented and discussed.
2. *Undergraduate Enrollments.* A substantial decrease in undergraduate enrollments will occur, dropping the number to 750 or fewer. This seems rather plausible in view of the demographics and a return to normalcy of interest in Computer Science.
3. *Research Funding.* The level of federal research will double (in constant dollars) and the level of industrial support will triple. The result will be an increase of about $2+ million/year in external research funding (from $1.7 million to $4.2 million).

The fourth assumption is, given the above developments, that the department and administration will make the commitment to the goal of increasing the quality of the department and its faculty.

### 7.2 Tabular Data

The plan is presented quantitatively in five tables: Personnel, Faculty Evolution, Finances and Budgets, Students, and Space. In each table, actual values are given for the 1981-82 and 1985-86 years along with planned values for the 1986-87 and 1990-91 years. Table 2, Faculty Evolution, also gives each year from 1985-86 to 1992-93.

Further historical data is given in the Appendix which presents an analysis of the status and progress of the 1981 Plan for Excellence.

**Table 1: Personnel.** Graduate Teaching Assistants also includes graduate assistants for computing facilities. Staff includes administrative and computing facilities. About 25% of the staff and secretaries and all of the Graduate Research Assistants are to be supported by grants and contracts. Values are full-time equivalents (FTEs).

| | Actual | | Planned | |
|---|---|---|---|---|
| | 1981-82 | 1985-86 | 1986-87 | 1990-91 |
| Faculty | 22 | 32 | 33 | 37 |
| Counselors and Instructors | 2 | 4.5 | 5 | 5 |
| Grad Teaching Assistants | 17 | 34 | 36 | 39 |
| Undergrad Teaching Assistants | 0 | 8 | 8 | 10 |
| Staff | 3 | 7 | 8 | 14 |
| Secretaries and Clerical | 3 | 7 | 8 | 14 |
| Graduate Research Assistants | 11 | 9.5 | 11 | 25 |

**Table 2: Faculty Evolution.** The distribution of faculty in the three ranks is given based on average assumptions about future promotions, resignations, and new positions. Only people more than 50% in Computer Sciences are considered. All vacancies due to resignations are assumed to be filled at the same rank. During the six year period 1986-1992 it is estimated that over 20 positions will be filled in order to increase the faculty by five.

| | Rank | | | |
|---|---|---|---|---|
| Year | Assistant | Associate | Full | Total |
| 1981-82 | 11 | 8 | 6 | 25 |
| — | | | | |
| 1985-86 | 16 | 10 | 6 | 32 |
| 1986-87 | 15 | 10 | 8 | 33 |
| 1987-88 | 15 | 11 | 8 | 34 |
| 1988-89 | 15 | 13 | 7 | 35 |
| 1989-90 | 14 | 13 | 9 | 36 |
| 1990-91 | 14 | 12 | 11 | 37 |
| 1991-92 | 12 | 13 | 13 | 38 |
| 1992-93 | 11 | 11 | 16 | 38 |

**Table 3: Financial.** Amounts shown are in $1000 units and are university budgets with the exception of capital. Capital obtained by grants includes ordinary grants and contracts, gifts and discounts. The facilities budget includes both maintenance and operating supplies. Constant dollars are assumed from 1985-86 on.

| | Actual | | Planned | |
|---|---|---|---|---|
| | 1981-82 | 1985-86 | 1986-87 | 1990-91 |
| Salary & Wages | 1111 | 2270 | 2430 | 2950 |
| Supplies & Expenses | 26 | 60 | 65 | 85 |
| Facilities | 15 | 125 | 170 | 410 |
| Miscellaneous | 22 | 26 | 28 | 35 |
| Capital items | | | | |
| Research grants | 58 | 792 | 800 | 1000 |
| Education grants | 0 | 40 | 50 | 200 |
| Subtotal | 58 | 832 | 850 | 1200 |
| Recurring dept. budget | 37 | 175 | 175 | 200 |
| Non-recurring Purdue funds | 250 | 125 | 100 | 200 |
| Total | 345 | 1133 | 1125 | 1600 |
| Total budget (University funds) | | | | |
| Current dollars | 1211 | 2656 | 2980 | 4260 |
| 1985-86 dollars | 1620 | 2656 | 2867 | 3680 |

**Table 4: Students.** Undergraduate student majors are given by semester and graduate by year. Degrees granted are averages over three years. Data is for the fall of each year.

| | Actual | | Projected | |
|---|---|---|---|---|
| | 1981-82 | 1985-86 | 1986-87 | 1990-91 |
| **Undergraduate Majors** | | | | |
| Semester 1 | 507 | 320 | 290 | 240 |
| 2 | 27 | 22 | 22 | 18 |
| 3 | 205 | 199 | 205 | 155 |
| 4 | 35 | 28 | 30 | 22 |
| 5 | 138 | 154 | 135 | 115 |
| 6 | 30 | 36 | 32 | 26 |
| 7 | 81 | 155 | 160 | 115 |
| 8 | 50 | 96 | 100 | 70 |
| Total | 1073 | 1010 | 974 | 761 |
| B.S. degrees | 97 | 171 | 180 | 140 |
| **Graduate Majors** | | | | |
| Year 1 | 25 | 47 | 45 | 50 |
| 2 | 54 | 40 | 45 | 50 |
| 3 | 26 | 18 | 22 | 35 |
| 4+ | 36 | 19 | 20 | 45 |
| Total | 141 | 124 | 132 | 180 |
| M.S. degrees | 54 | 53 | 50 | 50 |
| Ph.D.degrees | 5 | 6 | 6 | 12 |

**Table 5: Space.** Department space is given in terms of assignable square feet, except for offices. Offices are broken down by type of occupant (some types have multiple occupants). These data do not include offices for counselors. The data given for 1986-87 and 1990-91 are estimates.

**OFFICES**

| | Faculty | Secretary | Staff | Grad. Students | Total |
|---|---|---|---|---|---|
| 1981-82 | 30 | 4 | 1 | 21 | 56 |
| 1985-86 | 39 | 7 | 8 | 35 | 89 |
| 1986-87 | 40 | 7 | 8 | 36 | 91 |
| 1990-91 | 45 | 8 | 11 | 45 | 109 |

**OTHER SPACE**

| | Labs | Machine Rooms | Conferences Rooms | Terminal Rooms |
|---|---|---|---|---|
| 1981-82 | 300 | 280 | 158 | 474 |
| 1985-86 | 4715 | 2059 | 824 | 1100 |
| 1986-87 | 4715 | 2059 | 824 | 1100 |
| 1990-91 | 16000 | 4000 | 824 | 700 |

## APPENDIX ONE

PLAN FOR EXCELLENCE
DEPARTMENT OF COMPUTER SCIENCES
PURDUE UNIVERSITY

*Analysis of Status and Progress*
John Rice, November 1983
(Updated August 1986 for 1986-87 year)

Peter Denning, John Rice, Larry Snyder, and Paul Young prepared the department's *Plan for Excellence* in the summer of 1981. This Plan and its goals were agreed to in principle (but not as to specific details) by the Dean and Provost that summer. This analysis is to determine the progress that has been made so far and to assess the current status of this Plan.

The method used here is completely quantitative. There are many specific quantitative goals stated in the Plan for the years 1986-87 and 1989-90. Corresponding values have been obtained for 1981-82 and then linear interpolation used to produce year by year milestones. In some instances (e.g., supplies and equipment maintenance), we have derived numbers from the Plan which were not explicitly given there. The financial goals of the Plan were expressly given in constant dollar terms, these (except for capital items) have been adjusted for inflation as follows:

| | |
|---|---|
| 1981 to 1982 | 8% |
| 1982 to 1983 | 6% |
| 1983 to 1984 | 5% |
| 1984 to 1985 | 4% |
| thereafter | 0% |

Thus these numbers are in constant 1985 dollars after 1985.

The analysis is reduced to simple tables of the following variables:

*PERSONNEL*

| | |
|---|---|
| Faculty FTE | Grad. Teaching Asst. FTE |
| Secretarial | Other professional staff |

*FINANCIAL*

| | |
|---|---|
| Salary and Wages Budget | Supplies and Expenses Budget |
| Capital Budget | Capital Equipment Installed |
| Misc Budget | |

*OFFICES*

Faculty GTA Secretarial Staff

*SPACE* (excluding offices)

Labs Machine rooms Conference rooms Terminals

Numbers from the Plan and the original 1981-82 situation are starred, the other Plan numbers are obtained by linear interpolation. Actual values for years 1981-1987 are also given following the slash after Plan numbers.

**Table 1: PERSONNEL**
Entries are "Plan"/"Actual".
Counselors and instructors are not included

| | FACULTY FTE | GTA FTE | SEC'Y | STAFF |
|---|---|---|---|---|
| 1981-82 | 22* | 17* | 3* | 3* |
| 82-83 | 24/22.4 | 22/24 | 5/6 | 5/3 |
| 83-84 | 26/24 | 26/23 | 7/5.5 | 6/4 |
| 84-85 | 28/28 | 31/32.5 | 8/6 | 7/4 |
| 85-86 | 30/27 | 35/34 | 9/7 | 9/7 |
| 86-87 | 32* | 40* | 10* | 11* |
| 87-88 | 35 | 40 | 12 | 11 |
| 88-89 | 37 | 40 | 13 | 12 |
| 89-90 | 40* | 40* | 15* | 12* |

**Table 2: FINANCIAL** (amounts are $1000)
Amounts are those budgeted at the beginning of the year except for capital which are year end figures.

| | Salary&Wages Budget(Note 1) | Supplies&Expenses Budget(Note 2) | Capital Equip. Installed(Note 3) | Capital (Note 4) | Misc. Budget |
|---|---|---|---|---|---|
| 1981-82 | 1,111* | 100*/51 | 654 | 345*=37+250+58 | 22* |
| 1982-83 | 1,393/1,238 | 148/155 | 1,071/1,035 | 401/381 (98+0+283) | 26/25 |
| 1983-84 | 1,668/1,454 | 212/135 | 1,490/1,449 | 457/414 (10+210+154) | 31/25 |
| 1984-85 | 1,967/1,898 | 288/185 | 1,908/1,963 | 513/514 (50+112+352) | 35/25 |
| 1985-86 | 2,270/2,057 | 338/195 | 2,326/2,477 | 569/996 (125+72+799) | 40/25 |
| 1986-87 | 2,495*/2300 | 384*/225 | 2,744/3,494 | 625/ | 43/25 |
| 1987-88 | 2,682 | 429 | 3,162 | 681 | 45 |
| 1988-89 | 2,807 | 474 | 3580 | 737 | 47 |
| 1989-90 | 2,994* | 529* | 4000* | 800* | 49 |

Note 1. Amounts include transfers from School of Sciences funds for 1984-85.

Note 2. Supplies and expenses Plan consists of consumables which are adjusted for inflation and faculty growth, plus equipment maintenance which is 10% of equipment installed. Starting in 1985-86, the actual S&E of the department is reduced by the maintenance costs of items used exclusively for teaching (these items are also excluded from the capital equipment installed).

Note 3. Installed capital equipment does not recognize depreciation or obsolesence. Actual values are perhaps one third to one half less than the amounts shown.

Note 4. Capital expenditures consists of three parts (separated by +'s) and do not include items used exclusively for teaching:

recurring department budget

+ non-recurring university purchases

+ gifts and purchases from grants

**Table 3: OFFICES**

These data do not include offices for counselors.

| | FACULTY | SEC'Y | STAFF | GRAD STUDENTS |
|---|---|---|---|---|
| 1981-82 | 30* | 4* | 1* | 21* |
| 82-83 | 31/29 | 5/4 | 3/4 | 23/34 |
| 83-84 | 32/28 | 7/4 | 4/7 | 25/22 |
| 84-85 | 33/31 | 8/5 | 6/4 | 26/20 |
| 85-86 | 34/39 | 9/7 | 8/8 | 27/35 |
| 86-87 | 35*/40 | 10*/7 | 9*/8 | 28*/36 |
| 87-88 | 38 | 12 | 10 | 29 |
| 88-89 | 41 | 13 | 11 | 30 |
| 89-90 | 43* | 15* | 12* | 30* |

Note 1. The numbers for 1985-86 include the new CS building plus part of the 4th floor of the Math Science. The graduate student offices beginning in 1985-86 are measured in units of 120-150 sq.ft. offices holding 3 students each.

**Table 4: SPACE-EXCLUDING OFFICES** (in square feet)

| | LABS | MACHINE ROOMS | CONFERENCE ROOMS | TERMINALS |
|---|---|---|---|---|
| 1981-82 | 300* | 280* | 158* | 474* |
| 82-83 | 3900/600 | 1224/576 | 206/158 | 500/474 |
| 83-84 | 7500/816 | 2168/838 | 254/158 | 525/616 |
| 84-85 | 11,100/1300 | 3112/838 | 302/158 | 550/616 |
| 85-86 | 14,700/4715 | 4056/2059 | 350/824 | 575/1100 |
| 86-87 | 18,000*/4,715 | 5,000*/2,059 | 400*/824 | 600*/1,100 |
| 87-88 | 19,000 | 6,000 | 430 | 630 |
| 88-89 | 21,000 | 7,000 | 470 | 670 |
| 89-90 | 22,500* | 8,000* | 500* | 700* |

Note 1. The machine room space includes PUCC space in 1981-85.

Note 2. The numbers for 1985-86 include the new building for CS plus the following from the 4th floor of Math Science: Machine: 158, Terminals: 316.