REPORT OF THE SUBCOMMITTEE ON

ADMINISTRATIVE COMPUTING

Report of the Subcommittee on Administrative Computing

Goals and Implementation

Introduction

The Administration Subcommittee of the Planning Board was given the responsibility for fact-finding and preparation of recommendations relating to administrative computing for Rice University's Five-Year Plan for Information Systems. The charge to the subcommittee includes, but is not limited to, topics which have significant impact on the educational and research programs of the university. These topics include administration of grants, word processing, budget monitoring, institutional planning, grading assignments, management of administrative subdivisions such as departments and colleges, and the administration of the library.

Over the past two-and-one-half years the subcommittee, with considerable help from many interested members of the Rice community, has investigated the current and evolving situation in administrative computing, consulted with a broad representation of Rice users, and discussed with vendors and selected experts existing and potential solutions to our requirements. The subcommittee has prepared a strategic plan for administrative computing at Rice and makes recommendations for implementation.

Summary and Recommendations

Strategic Plan Recommendations

1. That Rice University provide an environment in which faculty and students will be supported in their research and education by modern and efficient administrative computing whenever possible.

2. That within the program to improve computing a high priority be given to enhancing electronic information transfers of administrative data, in order to improve the efficiency and productivity of staff and faculty currently frustrated by disjointed systems. This should include information transfers between administrative databases and faculty, department staff and other administrative users who require the information to do their job efficiently (including external communications for administrative offices that need

it) as well as information transfers of library-related databases (bibliographic or full text retrieval), whether these databases reside on campus or elsewhere.

3. That a directory of databases be developed and maintained for general use on campus.

4. That administrative computing standards be developed for word processing, spreadsheets, databases and networking and that minimum standards for administrative computing capabilities be established and met for all departments. These standards should encourage the use of electronic mail within university administrative units and thus reduce paper records. A program to develop standardized electronic forms available to all systems users (by calling-up screens) is seen as an integral part of this recommendation.

5. That administrative computing resources be coordinated, and that campus standards be observed whenever multiple users are dependent on the availability of the information produced or stored.

6. That the quality of the work product be emphasized, whenever possible, for administrative computing, in all of its many forms. Quality is here defined as the ability efficiently to meet the needs of the end-user, in support of the goals of the institution.

Implementation Recommendations

a. Near-term

The following recommendations specify near-term implementations that will improve administrative computing at Rice.

1. That during the spring semester of 1990 the university complete the evaluation and selection of a financial software system. The financial system selection must address the requirements of financial, payroll, budgeting and personnel computing. The immediate benefits will include on-line access by some, if not initially all, appropriate offices to their current expenditures, budget status, personnel position allocations and salary information. A modern system will allow management inquiries to be made without Herculean manual efforts by staff already fully occupied with normal business. The

elimination of duplicated effort to produce similar basic data required by the several offices will increase productivity in these offices.

2. That, if a human resources/payroll package is not included in the basic financial system, the university purchase a human resources/payroll package from the principal vendor, or another vendor whose product can be fully integrated with the financial system and database chosen. This is a very important element in the production of information (vs. data) for managing schools, departments and offices across the university. It is critically important to the success of the university's integrated information system.

3. That the university purchase a computing platform that can accommodate the systems recommended in 1 and 2. It is desirable that this platform accommodate also the library's OPAC (NOTIS) software which runs in an IBM environment. An integrated and user-accessible administrative information system has been the aim of the Administrative Subcommittee for three years. The subcommittee's goals can be achieved by either acquiring a very large single machine that accommodates all the various administrative software and through which all users can access the data they need to do what is expected of them or by acquiring a platform of networked machines using a common architecture and a relatively painless process for moving between software systems and databases.

4. That the first phase of administrative computing improvements (the financial system) be operational by July 1, 1991. This will entail replacing the Burroughs machine and providing a modern fund accounting system, including the general ledger system. The financial system will be the source from which many of the other administrative systems receive information and will be the receiver of data that produce management information. The financial system is the foundation for much of what follows.

5. That appropriate support staff be hired to implement the first-phase improvements. An appropriate support staff is essential to the successful development of the new systems: without it this program will falter. Currently, Rice does not have staff support appropriate to the completion of the program.

6. That the subcommittee's mid-term recommendations (below) be implemented immediately after an appropriate financial

system is installed, and that planning continue for implementing the subcommittee's longer-term recommendations (below) to meet the five year schedule.

b. Mid-term Recommendations

The following mid-term recommendations specify implementations that should immediately follow the installation of an appropriate financial system.

1. That academic and administrative offices of the university be provided electronic access to appropriate information and data held in the financial and human resources systems. It is expected that decision making (for purchasing, managing budgets of departments and grants, etc.) will improve when campus-wide users have such electronic access, that a significant paper-reduction program can be instituted, and that users will be able to download data into spreadsheets developed for their specific needs. Productivity will increase considerably across the entire campus when data are easily transportable from one database to another.

2. That integrated budget- and endowment-management packages be purchased or developed if these needs are not satisfied by the near-term improvements. Without an integrated budget package (with the financial, personnel and payroll systems), the management of departments, schools and divisions becomes much more difficult. A robust endowment-management package can provide timely analytical and historical information important for sound treasury decisions.

3. That supplemental administrative packages be purchased or developed for sponsored research and grant administration, and that these packages be made available to the appropriate departments and principal investigators by electronic means. Grant submissions and correspondence should be passed between principal investigator, department, dean, and the sponsored research office via electronic means for efficiency. Current grant administration information needs to be available to the financial systems staff, the budget office as well as the deans and provost.

4. That electronic transfers be developed for department-to-department fund- or fee-transactions, including Library- and facility-use fees, Physical Plant, Administrative Stores, Book Store, Chemistry Store, Computing Information Services, Research Support Shops, and Faculty Club charges.

Electronic document transfers will make possible reductions of workloads (and perhaps manpower) at the receiving end, where these data are currently entered in the financial system - an area in which, at present, there is substantial duplication of effort.

5. That electronic document transfer capabilities be developed for initiating personnel actions, grant submissions, space utilization reports, budget preparations and like administrative functions. This is another area in which there is, at present, substantial duplication of effort. Electronic document transfers can reduce workloads at the receiving end.

6. That current class schedules, the institutional and major event calendars, room usages, space management records, employee directories and similar general information be made available to the campus community through easily accessed electronic means. This has been one of the most requested improvements. The university calendar, room assignments and similar information affect nearly everyone on campus. Electronic access to this information by the Rice community will decrease the frustrations and outrage now commonly associated with the scheduling of events, lectures, and classes. If up-to-date scheduling information can be obtained electronically, many hours of work will be saved by deans' staff and the space records office.

7. That academic and administrative buildings that are presently not connected to, or wired for, campus networking be equipped with appropriate local networks, gateways, and file servers that will integrate them with the campus network. Electronic networks within each building have become a necessity for multi-user departments sharing printers and other devices for word processing and data files. To reduce unnecessary campus-wide network traffic, buildings are isolated for internal normal business but can be given gateway access to the campus (and global) network. This network-efficient architecture becomes necessary as the number of users increases and access is offered to central databases.

8. That greatly improved data transfer capabilities be developed for the remaining non-integrated administrative systems (student records, admissions, financial aid, student advising, alumni records, and the library). Record and data transfers between these and other university offices are substantial. Until these offices and their systems are

integrated with the new system for administrative computing - in a cluster or in a compatible network - they will need to be able to pass data from their current machines to the new systems. This will require developing appropriate software. The benefits achieved will be increased efficiency and ease of (normally labor intensive) reconciliation of data.

9. That staff and faculty who need to use the Rice administrative computing systems be provided with periodic training. This program is essential to the overall plan and will produce immediate improvements in productivity.

10. That computing support staff needed to operate and maintain the acquired systems be hired on an appropriate schedule. This is important for the success of the developing systems. Without the necessary professional support staff these programs will falter, and therefore this investment must be a part of the whole in order for Rice to achieve the anticipated benefits.

11. That the Office of Administrative Computing continue to define standards for university supported software; that these standards continue to be responsive to the user's particular requirements; that they be based on technically sound architectures; and that the objective be a coherent system. Costly duplication of software packages can be avoided with accepted standards. Site licensing for the standard can provide further university-wide savings.

c. Longer-term Recommendations

From the outset, the subcommittee for administrative computing recommended the eventual integration of administrative computing wherever possible and expressed the desire to move toward a seamless (or less than painful) environment. The recommendations cited above address that desire. However, there remains the formidable problem of integrating student records (admissions, registrar, financial aid and advising functions) and alumni and development records. The integration of these programs with the new administrative system appears to be quite possible in the later stages of implementation, albeit not without considerable further study and, in some cases, product development by vendors. The integration of the library into the administrative computing scheme needs further study.

To avoid pursuing an ever receding software-development horizon that promises everything for everyone, the subcommittee recommends moving in a timely fashion to meet pressing needs in administrative computing and relying on further product development in the rapidly changing environment. Although this plans entails some risks, proceeding with the purchase and development of what is currently available will lead to substantial gains that will affect all administrative offices. Further delay, on the other hand, will have the predictable cost of continued faculty and staff inefficiency and overall poor quality of management. The current problems convincingly demonstrate the need for immediate action, followed by mid-term programs and continuing planning to meet the longer-term goals.

Discussion

Strategic Planning

During this phase of its operations, the subcommittee's task was to establish what computing capabilities Rice should have in place in five years and to provide the justification for seeking this level of capability. The subcommittee was asked to develop a "best effort" first plan, and in doing so it focussed on the functional requirements of administrative computing in the development of a strategic plan, leaving recommendations for implementation for the second phase (see below).

After initial discussions, the subcommittee held a number of hearings and gathered information. Discussions were held with several groups having related administrative needs, and two general public meetings were held. An Appendix contains the names of those invited and those who attended the sessions.

The subcommittee sent to each invited guest a copy of the charge to the Computer Planning Board, the charge to the subcommittee, and a set of questions. These questions were used to establish the framework for the hearings and, hopefully, to act as a stimulus for discussion in the group sessions. The discussions were lively and informative and clearly revealed certain pressing needs. Of the list of questions below, the first six were posed to all groups; the seventh was posed only to groups 1, 2, 6 and in the public sessions.

Questions of Interest to the Subcommittee

1. What does administrative computing mean to you?

2. What are your most pressing needs in administrative computing?

3. What efficiencies or improvements in quality might come with added capabilities?

4. What less pressing, but desirable, administrative computing needs do you have? And, their justifications?

5. If the goal of Rice University is to become one of the top ranking universities in the nation, in both education and research activities, what kind of administrative computing environment would you think is appropriate to have in place in five years to help achieve this goal?

6. In the context of this goal, what are the specific benefits that justify the environment you propose?

7. What priority do you and your colleagues put on the above administrative computing needs? How does this compare to the priorities you place on educational and research computing needs?

Findings

With regard to computing capabilities, Rice University has had a history of individual groups, departments, offices, centers, institutes and schools competing separately to acquire what they need without much evidence of concern for how that affects the remainder of the university. This modus operandi has produced isolation and frustration for the administrative computer user. In an environment where traditionally it is thought there should be a continual attempt to encourage and improve the free and easy flow of information, Rice faculty, staff and even students are frustrated by the inability to communicate and perform basic administrative tasks efficiently.

If one adds to this internally competitive environment the conservative philosophy and policy of maintaining a "lean" administration, it becomes evident why Rice is so very inefficient and ineffective in the performance of some aspects of its administrative tasks. In terms of administrative computing capabilities that are beneficial to a broadly based user group, Rice does not even maintain a "mean" standing, in the mathematical sense.

Throughout the hearings we were told of duplications of effort to get basic student or administrative information, of the inability to access needed information to advise students, to review accounts, to communicate, to do the job at hand efficiently. Currently, Rice University's fragmented administrative computing services waste staff time and energy by making each office reproduce similar records. Basic information needed by faculty, departments, schools, security staff, college masters and secretaries, Food Services, Development, Alumni, and others may be available in the Registrar's Prime system, but because it is not networked to them they each must duplicate files of their own. All of our invited guests mentioned their need to have current and preferably on-line access to either budget or financial information on grants or projects stored in the Comptroller's database.

The subcommittee heard evidence of some academic departments "having" while others "have not." Even word processing was not uniformly available across the campus. The degree of sophistication in administrative computing among the SEs and the Academs is quite different.

An Addendum to this report characterizes administrative computing as it is currently and then as it should be in the near future.

After considerable discussion of functional needs within offices and departments, between administrative units, between administrative activities and educational activities, between administrative activities and research activities, and how that relates to the goals of the university, the subcommittee came to several conclusions:

1. There are staggering inefficiencies that could be corrected over time through cooperative coordination of resources and the development of standards for administrative computing. The most pressing need is administrative-unit-to-administrative-unit information transfers and support.

2. The establishment of minimum standards for office computing capability are necessary. Administrative staff in many departments could become much more productive and the quality of their output improved through enhanced computing capabilities. Productivity gains should be directed to further faculty support when possible.

3. Resource persons are needed to train administrative staff in departments and offices in computer use, to keep departments

informed about what is available to them, to help them intelligently to specify equipment and software purchases, and to advise departments on how to meet their requirements and achieve their goals.

4. A directory of databases and a thorough understanding of who needs what information is needed so that future systems will be developed with multiple user groups considered.

5. Decision making in nearly all offices would be greatly enhanced if better and more timely information were available.

6. The public image of Rice University suffers because of archaic approaches to the handling of administrative tasks and responsibilities.

7. Rice University is not providing the administrative support to faculty that other quality institutions do. Faculty are burdened with administrative inefficiencies in the oversight of their grants and department funds, the advising and recruiting of their students, the training of their staff, and campus communications.

8. During the next five years there will be important changes in computing techniques in education and research, and administrative needs have to be related to, and in tune with, these projected changes.

9. If Rice University is going to attract and recruit the faculty it needs to make the next step toward establishing itself as a truly great university, it will have to create an environment in which faculty find it as easy to perform their work here as at the universities competing for them. Enhanced administrative computer support will promote more efficient use of faculty time, e.g., for research and instruction.

Addendum

The subcommittee received advice from the invited guests (see Appendix), from visitors at the public sessions and from the members themselves, who shared their own experiences and frustrations with the current status of administrative computing at Rice. The following are statements of present conditions followed by what the situation and capabilities should be in 1993:

Accounting - Today basic accounting information, such as the status of department operating accounts, research grants and other funds, is dated from two to six weeks when received. It is difficult to manage accounts when the information is old by the time it is received. The accounting entries close around the twenty-fifth of the month. The printouts are available around the tenth of the following month so, for example, accounting entries made on the 26th of January may not be seen by the department administrator or principal investigator until the 10th of March when the February status report is distributed. Many entries are keystroked twice before being entered into the Burroughs financial computer. Twenty thousand Physical Plant work order charges per year are computerized in the Physical Plant, but because they do not "speak the same language" these items are manually input again by the Comptroller's staff. Although accounts payable and payroll are now on-line for their individual tasks within the Comptroller's office, others are not. Managers and administrators responsible for million dollar operations are financially blind for a period of two to four weeks each month unless they duplicate an accounting system for their own operation. So, that is what they do -- duplicate the accounting. Principal investigators (PIs) do the same thing. The time and effort spent by staff and faculty to track financial data between status reports is tremendous.

Because the accounting information, as presented, is considered to be incomprehensible by many of the staff and faculty who read it, they continually ask that the double entry system not be used for their status reports. Others ask that payroll information be separated for reasons of confidentiality.

In 1995 basic accounting information should be current and available to those who need it on-line (with security and confidentiality assured). PIs, department chairs, managers, administrators, deans, vice presidents, the provost and the president (or his/her staff) should be able to read the financial accounts they are held responsible for shepherding. Accounting transactions should be keystroked once and copied or passed forward for review/approval electronically. Systems should be networked when major transfers of information are standard practice. There should also be means for fast review or retrieval of information currently held on old paper printouts (by means of using computers, microfiche, optical disks, or some other efficient technology).

By 1995 the university should offer mini-courses in fund accounting for staff and faculty unaccustomed to accounting standards and provide the expenditure records in some simplified form for the general reader, when requested. Salary information should be separated when requested.

General Information Used by Many - Currently the University Cashier is on the Prime computer along with Financial Aid, the Registrar, Admissions, Student Advising and the Faculty Club. The Faculty Club uses the Prime's billing capabilities. The others use both the accounting and student records capabilities of the system. Admissions and the Registrar also use the Prime's word processing capabilities which can be merged with the student records. Student records are isolated and not available on-line to faculty, masters and resident associates. Food and Housing, Campus Police and most colleges and many academic departments develop their own lists and records because they cannot easily transfer this information to their computers (for ID cards, building access, meal plans, college room assignments and student advising).

The Burroughs, holding financial information, is isolated from all but the Comptroller's accountants.

Personnel records are kept on the National Advanced Systems 9000-II, the ICSA machine in the Mudd Building. This system does not "speak" directly to the Burroughs, where payroll information resides. Reconciliation of salary and benefit expenditures is most difficult today. Currently if someone terminates employment only the Personnel office and payroll gets the information. Security, the library, the gym, the Cashier and maybe others need the information immediately to settle the accounts, fees and fines they carry on their books. Personnel needs to be able to provide Affirmative Action reports to federal agencies in a timely way for Rice to continue receiving federal research funding. Because payroll and personnel records (both needed for many reports) reside on separate systems this is made difficult.

Today "hot" checks can be held simultaneously in the bookstore, at the Cashier's, in Sammy's and Athletics. There is no automated hold put on further acceptance of insufficient funds checks. Most auxiliary enterprises can be stung one after another. Such basic business information cannot be easily transmitted throughout the university because of the variety of systems and lack of system connectivity.

In 1995 the university should have multi-user information available in a database form and provide accessibility to those who need it. One "universal" file should be kept for student, faculty and staff names, ID numbers, addresses, department or college affiliations and current status (full-time, part-time, suspended, on leave, terminated -- whatever). When changes are made the new information should be downloaded automatically into the specialized databases used for other purposes. Student records should be available to advisors, but secure otherwise. Personnel and payroll records should be integrated and easily reconcilable. Charges, fees and fines outstanding should be flagged in the Personnel and student records databases. All administrative units and business enterprises should be electronically connected to a database that could be accessed to determine an individual's status (faculty, student or staff), his/her current eligibility for participation in discount programs, parking privileges, library and gym use, and if any of these have been suspended because of recent change of status or abuse of privileges, such as writing "hot" checks or not paying registration fees, housing or board fees, or parking fines.

Budget Process - In the past the budget was manually written, corrected, sent forward for more manual input by the deans or administrators, sent forward again for more manual input by the Provost or Vice Presidents and President -- then sent to the Comptroller for final manual input into the financial computer and budget letters written (manually). Only during the past <u>two</u> years were the budget letters written on a word processor. For the first time in Rice history, for fiscal year 1989, several (not all) budget schedules have been put on Lotus 123 and Excel spreadsheets for departments to use.

By 1995 the entire budget process should be automated (with security and confidentiality assured). Rather than being a simply awful process it should become awfully simple. Current salary information should be passed to the department with the templates for constructing new budgets. The department's finished product should be transmitted to the next higher level electronically for additions and corrections. The "footing" of totals should be passed to divisional spreadsheets and the campus totals electronically added to make the university budget. The President's approved budgets should be electronically passed to the Comptroller for implementation. The process could and should become nearly paperless.

Student Records & Advising Students - The Prime minicomputer holds student records today. Although it is on-line for the Dean of Admissions and Records, the Registrar, Admissions, Financial Aid, the Cashier and the Student Advising office, it is a very slow and overloaded system with substantial inefficiencies. At times some of these offices simply cannot use the system because of the impact on others meeting deadlines. (That means, for example, that Admissions stops doing word processing and making other inquiries when the Registrar is registering students, or the Registrar and Admissions limit or stop most computer inquiries, report generation and word processing when the Cashier is posting credits to student records for a few days at the beginning of each semester.) The subcommittee heard complaints from the Cashier, the Registrar and the Student Advising office stating that they frequently waited one to two minutes between the system accepting data entries. (A modest upgrade which will improve response time somewhat has been approved recently.)

The information on the Prime is not readily available to faculty-at-large, faculty advisors, administrators of programs, departments, and schools. They may request transcripts and pick them up later. They may request specific reports for majors or lists of students by some category, but these are subject to the time available to the Registrar (personally) for writing a report program. The subcommittee heard several faculty advisors, department chairs, one master and a resident associate state that they had created duplicate academic records for majors and advisees because they needed to look at the information, analyze it and produce statistical data not available from the Registrar's office in a format useful to them. The selections for scholastic honors and scholarships that require specific characteristics, courses and grades are particularly difficult and time consuming. Faculty asked for on-line read-only student records capabilities, for simple graphic representations of a student grades, and for statistical tools to evaluate selected subsets of students (i.e., specific majors, athletes, freshmen, students with GPAs above or below some point, graduating seniors, etc).

Registration has become a long and drawn out process with many complaints, due primarily to the extremely slow computer system.

In 1995 advisors, faculty and administrators "with a need to know" should be able to easily read student records, perform some relatively simple statistical analyses of sets and

subsets of student records, and see graphic representations of these records using on-line terminals in their department offices or colleges. By 1995 registration should be done electronically (along with all appropriate approvals by advisors).

Sponsored Research - Sponsored research accounts for 25% of the university's annual budget. It represents a very significant portion of the university's activity and is the basis for much of the university's reputation for scholarship. Tracking the financial aspects of research accounts, determining which post doc or graduate student is or has been funded by a grant, checking that only agency or donor approved expenditures are made, and that billings are sent in a timely fashion is very difficult and imprecise today. Information transfers between departments and Sponsored Research are done manually. The office needs to be able to report to faculty, internal and external offices and agencies the type of research that is done on campus and by whom. The office must provide research space utilization information to the Comptroller for the indirect cost formula negotiations, based on the current status each year. All this is done manually.

In 1995 the administrator of the office of Sponsored Research should be able to send and receive grant proposals electronically from faculty as well as funding agencies. He/she should be able to have access to current financial information and have on-line access to a database for each grant and contract. This information should be available to deans, department chairs and other administrators on a "need to know" basis, as well. Information should be readily available to interested university parties about who is doing what kind of research or has done some work in specific areas of research. This very important office should be automated to serve our faculty in a way that provides them every practical advantage possible in the development of proposals for funding research and managing their funded programs.

Recruiting Faculty - The subcommittee was told that the degree of administrative support provided faculty at Rice University is considerably less than at schools with which we wish to compete. When faculty time is inefficiently used or considerable effort (relative to other universities) is required to grade, advise, write proposals, manage grants, schedule classes or communicate at Rice then the issue begins to take on greater significance. If the Rice image is one of "horse and buggy" administrative support systems, and some have suggested that, then this may have considerable impact on

recruiting faculty who are interested in doing research and teaching in positive and supportive environments.

In 1995 Rice University should be in a position to provide an environment where faculty will be supported in their research and educational activities through modern and efficient administrative computing. By 1995 the reputation (and image) of Rice should be one of progressive improvements and support for advancing faculty research.

Recruiting Graduate Students - The Graduate Office coordinates graduate student recruitments with the offering departments. This is not automated and has many inefficiencies built into the system.

By 1995 the Graduate Programs Office should have on-line databases to track offers by departments, promises made (and by whom), acceptances and refusals, stipend commitments, and funding support for each graduate student. This information should be available to academic departments and academic administrative offices on-line, also. The Graduate Programs Office, the dean's office, or the academic department should be able to initiate updated information when appropriate, and communicate easily with highly-sought prospective students.

Tracking Graduates - The subcommittee was told that Rice University does not systematically maintain records on all graduates. Several accrediting agencies require tracking the success of graduates of the university.

For this reason and for the obvious reason of substantiating the success (or evaluating the failure) of programs, by 1995, the university should have standards for record keeping and maintain appropriate records on graduates.

Scheduling Classes/Courses/Major Events - Today it is very difficult for faculty and academic department staff to plan for or schedule regular courses, special seminars, colloquia or guest lecturers. The Registrar's office currently sets classroom schedules and assigns rooms for special events. It is nearly impossible for faculty and staff to "see" the schedule and work with the times and spaces available, although the information exists on a PC in the Registrar's office.

In 1995 anyone wishing to "see" the university's classroom and reserved public spaces schedule should be able to access from department offices an electronic database of the current

schedule, review this information and make a request for space use. An electronic calendar of events should be available for all interested faculty, staff and students (including information about the location, time, fees and speaker/artist).

Space Utilization - Space is a valued asset; its utilization necessarily must be evaluated periodically. Nearly every administrative unit (centers, institutes, departments, deaneries, and university administrator's offices) require information on how space is used and by whom. Today the gathering of this information has been frustrated by inaccurate records and building drawings. Building occupants have changed room numbers, walls, entire suites and the Physical Plant has not been sufficiently staffed to maintain updated drawings. To add to the situation, space records have been gathered and maintained three different ways: space measured as architects do, as the state of Texas requested through the Coordinating Board, and as the federal government requires for various reports. (These measurements can be quite different, e.g., the state includes the private gardens of the master houses and president, and enclosed courts as part of the gross areas of the building. The federal government does not.) Tied directly to utilization is the indirect cost allocation.

The space survey has been entered into a database, however, because of mislabeled drawings the reconciliation of utilization has been slow.

By 1995 Rice should have an updated and continually current database that can provide administrative offices their space utilization for use and evaluation. The Physical Plant should maintain current building drawings which should be the basis for the database. Standards for measuring space should be established so that duplication of measuring efforts are not necessary to produce the various reports required by federal and state agencies.

Computer Office Equipment - There exists at Rice a large variety of office computing equipment. Much of it is "stand alone" equipment by design or because of its incompatibility or the electronic isolation of the department. Standards need to be set for administrative computing and some control placed on purchases that do not support the generally accepted direction for administrative computing developed by the Computer Planning Board or Vice President for Information Systems. Another factor that was raised in one of the subcommittee

sessions was that several federal agencies now consider PCs to be general office equipment to be supplied by the institution. This will change the ability of PIs to fund basic administrative microcomputers at Rice in some cases. For this reason and others mentioned, it is necessary that Rice, in time, develop a program that will provide basic administrative computing equipment for all administrative offices.

By 1995 standards for administrative computing should be in place, including what basic equipment offices should be supplied.

Word Processing - Today there exists a vast array of capabilities from department to department. The science and engineering faculty, generally, have considerably more administrative support than do the humanities and social sciences, music, and architecture faculty and, specifically, much more and better word processing available to them. Some of this may be supported by grant funding; however, even basic department office equipment availability seems to be much better in SE departments. Departments are doing word processing on many kinds of systems. Communication between systems is frequently possible within the department or groups of faculty in SE departments. This is less frequently the case in social sciences and even less frequent in humanities departments.

By the beginning of FY91 all academic and administrative departments should have basic word processing and text transfer capabilities (to any other academic or administrative department). Standards should be established for word processing, text transfers and university correspondence (over a university network). All department offices should have or exceed minimal word processing and networking capabilities.

Library - Today, the library enjoys a healthy, stable computer environment with its on-line public access catalog, NOTIS, which operates on an IBM 4361 Group V mainframe. In addition to the catalog, which provides title access at the book level, the system has sophisticated subsystems in accounting, ordering (including electronic ordering), journal check-ins, circulation, and cataloging including the electronic transfer of bibliographic records from outside databases. The bibliographic database is accessible on and off campus through the network or via telephone and modem. The software vendor has an active R&D program and continues to offer enhancements and new capabilities to the package, and the library will add these as they become available. In addition the library serves as a gateway to over 1000 external databases (OCLC,

Dialog, BRS, etc.) through dedicated terminals. There are also local databases on CD-ROMs, which require dedicated terminals and only permit single user access. Finally, it should be noted that the library is beginning to develop consortia programs on networking, locally mounted databases, and shared electronic products through the Houston Area Research Library Consortium (HARLiC) whose members include Texas A&M, the University of Houston, and the Houston Academy of Medicine-Texas Medical Center Library (HAM-TMC).

In years I and II of this program the library should add two additional drives ($20,000) to its mainframe in order to accommodate the ever expanding bibliographic database as well as enhancements announced by the vendor. Also during year I the library should develop and implement a local area network ($40,000) for its CD-ROM products which would permit simultaneous, multi-user access; such access should be through the NOTIS system. In year II the building should install a local area network for library and non-library departments. Software for mounting locally commercial databases should be purchased and the databases, identified and purchased -- perhaps in a library consortia arrangement. If the university's new mainframe is an IBM 3090, the library's NOTIS should migrate to the larger machine. If the mainframe is by another vendor, then the library will have to upgrade its current machine to an IBM 4381 or its equivalent at that time. The Appendix contains a detailed five year plan for Fondren Library.

Electronic Mail - Today electronic mail (E-Mail) is not uniformly available on campus. Individuals and departments with network connections, generally, have E-Mail. Those without such networking capabilities do not.

Many of the invited guests of the subcommittee suggested that a Rice E-Mail system would enhance campus communications and improve the chances that general information is available to departments. Additionally, it was pointed out that Rice already supports certain regional, national and international network connections (BitNet, ARPA Net, CS Net, NSF Net, and our own SesquiNet) that are not available to all departments now.

In 1995 all university offices should have electronic mail capabilities. By then, anyone requiring network connection to the several systems supported by the university should find it easy to get an account and mail box for university related work.

Calendar of Events - A frequent complaint heard by the subcommittee was the lack of a central university calendar of events. University Relations does one; Athletics does one; the student center does one; the music school does one; and others do them! What was requested was a centrally administered electronic calendar of all university events (that was updated and maintained by some administrative office).

In 1995 there should be a calendar of all university events supported and accessible to all departments and colleges via a university network.

Building Maintenance - The current state of building systems documentation is wanting. Recently an expensive mistake was made causing a laser to be damaged because of poor building system record keeping and documentation. Faculty and department administrators have requested improvements in this area. The "As Built" drawings of the campus buildings are not kept current (for lack of staff and the priority of other work). This is an example of "lean" administrative support that has the potential of causing great harm to instrumentation, research programs, building systems and individuals. A suggestion was made to use the CAD/CAM system currently in Architecture for updating the "As Built" drawings. (Of course, some staff support would also be necessary.)

In 1995 the university should have an ongoing building system updating program that provides accurate documentation for all building utility and special systems. This should include the production of graphics computer aided current drawings after all changes.

Attitudes - "Rice University has gotten along all right all this time. It was OK in the past so it must be OK for the future."
"Lean and mean administration is the best way to run a university" (regardless of the unseen costs).
"Do only what you absolutely must to get by administratively. Put the dollars where they really count (?) "
"There is little reason to share information. Others don't need what I have anyway."
"Don't worry about fancy improvements, we'll get along, we always have."

By 1995 Rice must free itself from the attitudes that will keep it second rate.

Implementation

a. General

In view of the inefficiencies of the current systems and procedures, the final selection of an administrative software system should not be delayed. The implementation and installation of new systems require from six months to a year. To meet the users' expectation of integration of information across the campus, it is felt that the financial system should be built on a database system. A security system that protects data and limits access to appropriate users must be built into the database. DB2® and ORACLE® are the leading candidates.

After concentrated study and site visits, the subcommittee concluded that several software packages are available that have the potential to be responsive to many, if not all, of our expressed needs. The systems currently of most interest are products of Information Associates (IA), American Management Systems, Inc. (AMS), Systems and Computer Technology Corporation (SCT), and Academic Institutions Management Systems (AIMS). The subcommittee intends, during Spring semester 1990, to complete the study of these products and make a final recommendation.

It is important that the platform (machine), if not large enough initially, be capable of expansion, so that the remaining administrative software requirements can eventually be included. The remaining software packages include student records, alumni and development records, budget (if not included in the initial purchase), and endowment/portfolio management.

After the acquisition of modern financial and human resources systems there remains the critical problem of integrating administrative functions by electronic means to meet goals stated above.

The consensus of the subcommittee is that the installation of new financial and human resources systems on a robust database (during the near-term phase) is the foundation from which an administrative system can be built. To achieve the principal goal of giving faculty and staff appropriate access to information (that allows them to meet their administrative responsibilities efficiently), it is necessary to develop the system linkages and data transfer capabilities recommended.

The range of funding requirements corresponding to mid-term recommendations has not been fully explored.

The longer-term recommendations are listed above and need no further elaboration here.

b. Selection Process

Since January 1989 the subcommittee has reviewed the administrative systems software products currently available. In this study, very able consulting assistance was provided by Andersen Consulting (Arthur Andersen & Company) who provided sufficient information to reduce the field of choice to a few vendors. The subcommittee divided itself into several groups to study various aspects of the products, and these groups were allowed to expand their membership by inviting others who could provide expertise and help in the research. Groups were established to investigate the financial systems (led by Nic Messana, Comptroller), student records (led by Jim Williamson, Registrar), human resources (led by Bob Dawson, Assistant Director of Personnel), a technical group (various aspects, led by Francisco Porras, Director of Administrative Computing, and Priscilla Huston, Director of Computing Information Services), and development/alumni records (led by Pat Kambhu, Department Administrator for Development).

Andersen Consulting produced a study that reduced the potential vendors to three, based on requirements by Rice users. They suggested that IA, AMS and SCT be looked at carefully. The subcommittee concentrated initially on IA and AMS, because they appeared to have the majority of market shares, they appeared to be the most experienced, and they appeared to be fiscally stronger on first review. Francisco Porras aranged trips for representatives of the subcommittee groups to selected sites. The following schools were visited to see products in use: UT Health Science Center in Houston, Northwestern University, Saint Louis University, Pepperdine University, Baylor University, Mount Holyoke College, Amherst College, and the University of Cincinnati.

The subcommittee's early expectation was to find in IA or AMS a single vendor set of products that would satisfy all Rice administrative user needs in a technologically modern and forward-looking fashion. The subcommittee and groups invited IA and AMS to campus for day-long product presentations, and later SCT was invited to a shorter presentation for an expanded financial group.

No extant vendor product set was found to be entirely responsive to all the needs of all the Rice users. In addition,

the IA financial product presented what is understood by the financial group to be a serious weakness in its chart of accounts. Unfortunately, both the IA and AMS products are not as technologically modern or forward-looking as desired; however, the AMS financial system is felt (by the financial group) to be a good product. Only when database capabilities are added to some of the vendors' packages is a solution revealed for present and anticipated administrative requirements. SCT's Banner system sits on top of ORACLE and IA and AMS's system can be used with IBM's DB2.

c. The Critical Problem and the Proposed Solution

The subcommittee realizes that the critical problem in administrative computing at Rice is the current Burroughs-based financial system - an antiquated system that cannot meet the growing needs of the university. It has been determined that the financial system should be replaced as quickly as possible even if other administrative requirements are not met immediately. The subcommittee includes in this critical replacement the interrelated requirements of a personnel/payroll system, budgeting and endowment management. Several sub-systems must be as integrated as possible from the outset: personnel, payroll, budget, endowment management and the financial system.

To solve this critical problem, the subcommittee recommends the purchase and installation of a financial system (with personnel/payroll, budgeting and endowment/portfolio management capabilities, if available) by July 1, 1991. It is commonly understood that the student records system on the PR1ME, the development system on the Wang and the Library's system on an IBM are currently performing adequately, and there is little pressure from these users to move them to a new system immediately. This situation allows Rice to move quickly in response to the most pressing need and plan further for the timely transition of the remaining administrative users to the new integrated system. Furthermore, as the new products will be sitting on a database product of considerable flexibility, the packages for development, student records and anything else not acquired initially may not be bound to the same vendor or product line. In some cases systems may be integrated only through the database because further integration is unnecessary or unwarranted.

d. Appropriate Platform

The subcommittee's technical group reported that to implement any new administrative system Rice will have to purchase a new computing platform since the NAS AS9000-II has neither current capacity to handle the new packages or CICS (a necessary transaction processing component of the operating system). CICS support is no longer available on the AS9000-II. The subcommittee recommends the initial purchase of a machine sufficient to accommodate the financial system, personnel/ payroll, budgeting and endowment management. It is, however, of the utmost importance that this machine, its operating system, and the database be readily expandable to accept the remaining administrative users when they are scheduled for system integration.

The technical group developed a list of machines with operating system costs. The machines selected were based on the group's understanding of the number of anticipated simultaneous users, what they perceived to be the ultimate package requirements, and the operating system requirements implied by the former. The machine costs ranged from $600,000 to $7,800,000; the machines are rated from 3.5 to 40.4 MIPS. (The table follows this section.) This information has been most helpful to the subcommittee for budget response purposes. It is evident from the study that administrative computing needs can be adequately met with machines in the $1 million to $2.6 million range.

The subcommittee understands that the choice of an appropriate machine may not hinge entirely on administrative computing needs. The IBM machines suggested by the technical group ranged from the 4381 series to the 3090-280J, a very large double processor machine capable of handling all administrative needs and much of the acknowledged research needs on campus. The subcommittee recognizes the advantages of combining resources on a shared machine when it is not disruptive of the administrative users and is beneficial to other university users. In the interest of the greatest common good, the administrative subcommittee will cooperate accordingly, if sharing a machine is determined to be the best solution for all. However, the consensus of the subcommittee was that to satisfy the principal needs of administrative computing only it is not necessary to acquire the top-end machines defined by the technical group. A few members of the subcommittee felt strongly that the first phase of the administrative computing needs could be met using a PR1ME 6350, the least costly machine recommended by the technical group. Others thought that a VAX 6000 system could offer suitable capabilities and be expanded as necessary. The chair of the subcommittee reserves some hesitation about sharing even a

double processor machine with the researchers on campus since research machines are likely to be replaced two to three times faster than administrative machines. This factor can have several negative consequences. If the administrative system is changed frequently, there will be disruptions, but if research users need a newer platform (typically in four to eight years) that is incompatible with the administrative system's architecture the administrative users may have to keep and support a machine much larger than needed. Administrative users need some assurance that such hidden costs would not arise.

e. Budget

The budget required for the administrative system has not been finalized. It is, however, possible to define budget ranges for many of the near-term cost elements. The following are list prices:

	FY90	FY91	FY92	FY93	Total
Software					
Information Associates					
Financial system	54,600	163,800			218,400
Human Resources					0
IBM DB2		217,800			217,800
Maintenance					
IA		23,400	37,300	41,100	101.800
IBM DB2		53,000	60,900	70,000	183,900
	54,600	458,000	98,200	111,100	721,000
AMS					
Financial system	121,250	397,750			519,000
Human resources		410,000			410,000
IBM DB2			202,000		202,000
Maintenance					
AMS	112,000	128,000	148,000	388,000	
IBM DB2		53,000	61,000	70,000	184,000
	121,250	1,174,750	189,000	218,000	1,703,000
SCT					
Financial system	41,250	157,750			199,000
Human resources		135,000			135,000
ORACLE database		194,000			194,000
Maintenance					
Banner		45,000	52,000	60,000	157,000
ORACLE		5,000	6,000	7,000	18,000
	41,250	536,750	58,000	67,000	703,000
Hardware range					
Adequate machines					
VAX 6000 series		1,000,000			1,000,000
System software		30,000			30,000
Maintenance			54,000	54,000	108,000
		1,030,000	54,000	54,000	1,138,000
IBM 4381 series		2,000,000			2,000,000
System software		630,000			630,000
Maintenance			53,000	53,000	106,000
		2,630,000	53,000	53,000	2,736,000

Shared machines

IBM 3090-280J	7,000,000			7,000,000
System software	834,000			834,000
Maintenance		177,000	177,000	354,000
	7,834,000	177,000	177,000	8,188,000

At this writing, full configurations for communications hardware have not been calculated. The technical group will be asked to develop these costs. Their results will be dependent upon the selection of the platform. The cost of terminal hardware also remains to be completed. This will depend on a careful evaluation of how many users will be on-line at the completion of phase one's implementation. That in turn will depend upon the financial software vendor and package, and the particular availability of that vendor's complementary packages for budgeting, endowment management, etc. After consideration of the task of implementing the software packages on any of the suggested platforms, it was estimated that six technically competent people would be required. It has been recommended that three be assigned to oversee installing the operating systems and three (with accounting, personnel and other functional experience) be assigned to ensure a minimum inconvenience in the transition and implementation. The subcommittee feels that six people would also be the right number to initiate the near-term recommendations. A conservative estimate is that another six people may be required to adequately develop, and then maintain and support, the fully developed administrative computing systems.

While the final choice of hardware and software cannot be specified at this time, it is apparent that over the next five years the university will need to make significant additional investments in administrative computing. The needs are as follows:

* Computing hardware capable of running the full range of administrative applications and storing the necessary data will cost about $2,000,000 over the next five years.

* In order to meet the minimum service levels specified in this report, the university will need to spend about $1,000,000 in the near term on software applications for the financial and human resources system. In addition, the systems for development, alumni, student records, and the library will require an investment of $700,000 over the next five years.

* The annual budget for computer maintenance and software for these systems will be about $300,000.

* Finally, the support staff will have to be increased by 12 to service these systems and ensure adequate training and documentation. Users will need this additional support to make effective and reliable use of the administrative computing systems. The annual cost of this addition in support staff is estimated at $600,000, including fringe benefits.

APPENDICES

1. Strategic Plan

Invited Speakers by Session

Invited	Department	Attended	or Represented by
Group 1: Science & Engineering, October 16, 1987			
Bill Bonner, Chair	Physics	v	
Hardy Bourland, Asst. Dean	Engineering		v
George Busby, Dept. Adm.	Chemistry		
Stan Dodds, Professor	Physics		
Alemka Kisic, Dept. Adm.	Biochemistry	v	
Bart Sinclair, Professor	Elect & Comp Engr	v	
Ken Smith, Exec. Director	Rice Quantum Inst		v
Wayne Smith, Dept. Adm	Space Physics & Astr		v
Mason Tomson, Professor	Environ. Sci & Engr	v	
Group 2: Humanities, Social Sciences, Music, Architecture & Jones School, October 23			
Joseph Cooper, Dean	Social Sciences		Jackie Ehlers, AA
Chandler Davidson, Chair	Sociology	Chad Gordon, Prof.	
Jackie Ehlers, Exec. Dir.	RIPA	v	
Bill Howell, Professor	Psychology		David Lane
Allen Matusow, Dean	Humanities		Linda Quaidy, Ex Asst.
Deborah Nelson, Chair	French & Italian	v	
Hally B. Poindexter, Chair	HP&HS		
Gary Smith, Asst. Dean	Music	v	
Duane Windsor, Assoc. Dean	Jones School		Wil Uecker, Assoc. Dean
Gordon Wittenberg, Prof.	Architecture		v
Group 3: Student Services, October 30, 1987			
Patti Ciampi, Cashier	Comptroller		v
Keith Cooper, Res. Assoc.	Brown College	v	
Kevin Gass, Pres.	Student Assoc.	George Contreras, VP	

Walter Isle, Chair	Masters Committee		Rod McIntosh, Master
Marion Hicks, Director	Food & Housing	v	
David Hunt, Director	Financial Aid		Nell Sandefer, Asst. Dir.
Pat Martin, Director	Student Aff. & Act.	v	
Ron Moss, Director	Admissions	v	
Mary Voswinkel, Chief	Campus Police	v	
Babs Willis, Col. Secr.	Will Rice College	v	

Invited	Department	Attended or Represented by

Group 4: Services, November 6, 1987

Ralph Holibaugh, Assoc. UL	Library		Kay Flowers, Asst U L
Carter Hughes, Manager	Faculty Club		
Tom Moffett, Bus. Mgr.	Physical Plant	v	
Tom Peeler, A/P Mgr.	Comptroller	v	
Rober Rawlings, Mgr.	Rice Campus Store	v	
Joyce Rubash, Director	Food Services	v	

Group 5: External Activities & Athletics, November 13, 1987

Sully Alsobrook, Director	Development		Pat Kambhu, Dept. Adm.
Susan Baker, Director	Alumni	v	
John Boles, Mgr Editor	Journal of So. History		Mary Dix, Editor
Linda Crist, Staff Editor	Jeff Davis Papers		Mary Dix, Editor
Bobby May, Assoc AD Athletics		v	
Mary McIntire, Dean	Continuing Studies	v	
Bill McNally, Mgr.	Printing Center	v	
Bill Noblitt, Director	University Relations		v

Group 6: Management Information, November 20, 1987

Stephen Baker, Professor	Physics	v

Robert Dawson, Asst. Dir. Personnel v
Arthur Few, Professor Space Physics & Astr John Freeman, Professor
Louis Griffin, Director Sponsored Research v
C. M. Hudspeth, Trustee Board of Governors v
Linda Driskill, Professor English
Carl MacDowell, Pres. Asst. President's Office
Nic Messana, Comptroller Comptroller v
Albert Napier, Professor Jones School
Jim Williamson, Registrar Registrar v

2. Implementation Plan Supplemental Reports

Reports on Systems Implementation at Fondren Library - A Five Year Plan.

The following reports are available from Neill Binford:

Technical group report
Porras report
Messana report
Andersen report