

## Using Information Technology to Achieve the Strategic Goals of Rutgers, The State University of New Jersey



*“All too often, computing plans are focused on technology itself, rather than on how technology enables faculty and students to achieve some of the key instructional or research goals of the institution. If it is to have a strong chance of succeeding, the plan cannot be distinct from or tangential to the overall academic mission of the university--indeed, the plan must flow from an understanding of the mission...”*

Hawkins, Brian L. (Ed.). "Organizing and Managing Information Resources on Campus." McKinney, Texas: Academic Computing Publications, 1989, p. 231.

Submitted by:

### **Information Technology Strategic Planning Committee**

Michael V. McKay, Vice President for Information Technology,  
Steven M. Director, Professor, Human Resource Management, co-chairs

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## Executive Summary

Information technology (IT) is a key strategic asset of the university as we move forward into the 21<sup>st</sup> century. This asset is vital to the advancement of the university's mission and is an essential component in its ability to attract the most competitive students, researchers, faculty, and staff in the years to come. This is evidenced by the rapidly increasing use of high performance computing, classroom learning environments, online learning systems and need for integrated, pervasive IT environments by the entire university community. These capabilities are now an expectation, rather than the exception. Rutgers is currently not well positioned to use its IT resources to achieve its goals.

Higher education, particularly at Rutgers, is undergoing a transformation. While learning and research were performed largely as solitary activities in the past, they are now thought to be most effective when done collaboratively and interdisciplinarily. Here at Rutgers this transformation is occurring slowly, perhaps too slowly. Faculty increasingly want students to engage more with their course and research materials, their teachers, each other, and the institution as a whole. Inadequate facilities and support services are limiting the contributions faculty, staff, and students make to the university and their ability to benefit from their Rutgers experience.

This plan provides a vision for applying IT resources to the work and life experiences of students, faculty, and staff. This vision focuses IT resources so that the Rutgers community feels connected and learns from each other during their time at the university. It also provides the means to continue lifelong contributions and connections to the Rutgers community.

A simple statement of the vision says that:

Rutgers University will use information technology effectively and efficiently to facilitate achieving the university's mission of: providing for the instructional needs of New Jersey's citizens through undergraduate, graduate, and continuing education programs; conducting the cutting-edge research that contributes to the medical, environmental, social and cultural well-being of the state, as well as aiding the economy and the state's businesses and industries; and performing public service in support of the needs of the citizens of the state and its local, county, and state governments.

In practice this means that all students, faculty, and staff will have access to information appropriate to their role at Rutgers. This information would be delivered through a reliable network, available anywhere and anytime.

We have a long way to go to achieve this vision. This strategic plan looks at goals for the next three to five years. It is detailed enough to ensure that the complete spectrum of IT areas are covered and yet broad enough to allow flexibility. We recognize that these suggestions are being presented at a time when the university faces unusually severe budget constraints. Even within this budget context it will be important to act quickly on some of these recommendations and to

begin planning for the implementation of others as additional resources become available. It is essential to assure that IT and related non-IT resources are used as efficiently and effectively as possible. Hopefully no later than during the fall 2006 semester Rutgers should create an IT governance structure involving key senior administrators. A recommended composition and operating structure for this governance system is described in the section of this report pertaining to strategic goal 1.

Implementing a more effective governance structure is the first priority for improving IT services at Rutgers. Creating this structure will itself require few, if any, additional resources and is essential for assuring the efficient use of the resources that are available.

The IT Strategic Planning Committee has suggested the first set of programmatic priorities so that the university can move forward quickly. These priorities are:

**Tools for teaching and learning** – IT is transforming learning from an activity that had only been done in classrooms and libraries to one that can be done in any space in which IT services are deployed and supported. Students, using cell phones and laptop computers, routinely make calls and access information from the student center or coffee shop. The university should provide a significantly improved learning environment by leveraging IT and making resources available. This can be done in carefully designed distributed learning spaces such as classrooms, instructional computing labs, and online by using selected software such as course management systems, simulations, games, and specific science/mathematics tools.

**Centrally supported research infrastructure** – Research computing at Rutgers should provide the backbone for our competitiveness. Virtually all research at Rutgers uses some aspect of computing, from advanced high performance computing, to Internet2, to storage of confidential information, to usage of large datasets. The university should advance IT-supported research through creation of centrally-managed “co-location” facilities, establishment of an IT support group for research, development of a more effective pre- and post- award system for grants, and investigation of identity management, data repositories, middleware, and grid computing.

**Integrated central and supplemental administrative systems** – Based on research conducted as part of the strategic planning process, it is clear that students expect to register, view grades, and pay bills online; and to have online communities where they can connect with faculty and staff to enhance teaching and learning. Faculty and staff expect integrated central and supplemental administrative financial and other systems. All populations also want more wireless locations and a user-friendly, reliable, “single-click login system” to access the Rutgers’ universe of services. Although Rutgers is moving in the right direction with the myRutgers portal and the Sakai collaborative software, much more needs to be done in the financial systems areas.

**The Rutgers data, video, and voice network** – The Rutgers network was reconfigured and upgraded as part of the RUNet 2000 project, which ended in 2002. The fiber, wiring, and network routers installed as part of this project are reaching their end of life, and plans must be made for a significant capital investment in this area. In addition, as the network is the most critical IT resource available to the Rutgers community, it must maintain a high level of

performance and meet the expanding demands that will be placed on it. This will require investments to increase reliability, to protect against power failures, and to increase the level of network support. Moving forward, Rutgers should look at “network convergence,” an approach that integrates voice and video into the IP-based data network. This permits users to get email, participate in videoconferencing, and make and receive telephone calls anywhere.

We are hopeful that the IT governance committee will begin to look specifically at these areas as soon as it is formed. IT is as much a strategic asset to the university as its buildings and campuses, its curricula, its research, and its faculty and students. IT enables our faculty to teach more effectively; our students to acquire new knowledge and skills more effectively; and enables our scientists and researchers to open up new frontiers of knowledge. IT provides the underlying infrastructure that links student learning and life and enables Rutgers to be managed more effectively, improving the quality of our decision making. In short, we must embrace this strategic asset to the best of our ability, to achieve the excellence to which we strive.

In the beginning, there was no network—just a few faculty working on computers at their desks and a mainframe computer for some very basic administrative functions.

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Then came Rutgers’ connection to the Department of Defense’s network, ARPANet, which was shared among a group of researchers.

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Some years later came BuschNet, the university’s first named network.

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We wired a few residence halls; we installed lots of different telephone systems; we put some administrative applications online.

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Then there was RUNet 2000, a project to create the university’s first data, video, and voice network.

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Now, all of the residence halls are wired, and some of the classrooms. There is wireless networking in some places; a few more administrative applications are online; and our faculty and students, the “Net Generation,” are clamoring for more. More information online and accessible from anywhere at anytime.

## Information Technology at Rutgers is at a crossroads

In 1961, with regard to the U.S. space program, President John F. Kennedy stated:

I believe we possess all the resources and talents necessary. But the facts of the matter are that we have never made the national decisions or marshaled the national resources required for such leadership. We have never specified long-range goals on an urgent time schedule, or managed our resources and our time so as to insure their fulfillment.

This is true of Information Technology (IT) at Rutgers. While we have made great strides, technology's full potential as a university-wide education, research, productivity, and life-enhancing tool has yet to be realized. We all believe that IT will pave a path that guides Rutgers' future. But the direction of the path has been uncharted. Until now.

Thanks to the input of many members of the Rutgers community, Rutgers' Information Technology Strategic Planning Committee is ready to lay the foundation for the future. Based on what you've told us, what we've learned is occurring at top tier public research universities, and with the support of the university's senior leaders, we have identified the direction that IT should take as we approach the crossroads. This direction is best described by Rutgers' IT strategic goals:

- An IT governance structure will be developed involving the university's senior administrators, faculty, staff, and students, to ensure there is appropriate planning for IT expenditures throughout the university and that IT decisions reflect the priorities of the university community.
- Faculty and students, engaging in teaching and learning, will have IT tools comparable to those at the top public AAU institutions.
- The university will centrally support a distributed research computing infrastructure to help it achieve its goal of entering the top ranks of public research universities.
- Integrated systems will be developed to enhance decisionmaking, community building, and service at all levels of the university.
- A secure, robust, and reliable IT infrastructure will be developed and maintained as the underpinning to all of the above described efforts.

The value of these goals is in how they relate to campus, unit, and departmental missions, how they focus your thoughts about deploying and using technology, and finally, how they define your information technology requirements for the future. If they are on target, they will spur the next level of planning in which goals and measurable programmatic objectives are defined.

On the following pages, we take a closer look at each of the five strategic goals and outline what it will take to achieve them. And in case technology jargon is unfamiliar to you, a technology glossary can be found in Attachment A.

## Introduction

Something is happening to the academy—outside the consciousness of the majority of its members. A new academy is forming that acknowledges the changes manifested in the Net Generation, uses the power of technology to enable deeper learning, demonstrates the interplay of culture and technology, and changes the nature of interaction among the members.

Some within the academy are aware of these trends, but view them with trepidation because they represent a fundamental change in well-established assumptions regarding how faculty teach and how students learn, not to mention how the academy governs itself. Not engaging in thoughtful self-examination, however, may pose the greater threat.

*~ Barone, Carol (2005), The New Academy. In Oblinger, D.G. and Oblinger, J.L. eds. Educating the Net Generation. EDUCAUSE e-Book. Available at <http://www.educause.edu/TheNewAcademy/6068>.*

The university has seen tremendous growth and change over the years, and we will continue to grow and change how we learn, do research, manage our activities, communicate with others and engage in entertainment. IT has been a catalyst to and an integral part of these changes. Technology has changed the way people access information and interact with one another.

Rutgers must plan for the future and ensure that the university's IT resources make the greatest possible contribution to our goals of excellence in research, teaching, and public service. IT at Rutgers should be capable of supporting the university's strategic goals:

- Improve the quality of Rutgers' academic programs, especially in areas where there are comparative advantages and opportunities.
- Enhance the effectiveness of student services, the livability of our residence halls, and the attractiveness and accessibility of our campuses.
- Increase Rutgers' resources to the level of peer AAU public universities. (i.e. increase NIH and NSF grants and giving) and manage those resources more strategically and efficiently.
- Improve Rutgers' service to, and reputation among, all the relevant internal and external constituencies.
- Continue to develop an administration that will provide leadership for achieving Rutgers' strategic goals. (i.e., by hiring staff, at all levels, with a service orientation).



## Charge to the committee

The Rutgers Information Technology Strategic Planning (ITSP) process was initiated in February, 2005 when University President Richard McCormick charged Vice President for Information Technology (IT), Michael V. McKay, and Professor of Human Resource Management, Steven M. Director, with creating a committee (ITSPC) to study the use of IT in supporting Rutgers' strategic goals. Specifically, they were charged to:

- Develop and align IT strategy to support:
  - Improvements in the quality of academic programs
  - Enhancements in the effectiveness of student services
  - An environment appropriate for a leading AAU public university
  - Improvements in Rutgers' services for internal and external constituents
  - The continued development of a service oriented administration
- Develop recommendation for integrating IT into the university planning and budgeting process.
- Establish measurable IT objectives to support the university's strategy. Ensure that the objectives of the plan are realistic. Identify significant obstacles and risks to the attainment of the goals and make realistic recommendations for overcoming them.
- Establish procedures to implement, assess, and modify the strategy as needed. The IT strategic plan (a "living document") will guide an evolving IT strategy.

Five (5) sub-committees were created to examine all areas of IT use at the university:

- IT governance
- IT and teaching and learning
- IT and research
- IT and business/enterprise services
- IT and university life/public outreach

Committee members were selected through consultation with Rutgers' provosts and deans. Committee chairs formed a leadership team with Vice President McKay and Professor Director. Details of committee and sub-committee membership can be found in Attachment B.

The ITSP leadership team met regularly to align activities of the groups. Each sub-committee met at least monthly to examine the current state of IT vis-à-vis their area, areas of deficiency, and future strategic goals to better align IT with the university's overall strategic goals. Sub-committees gathered data from students, faculty, and staff through focus groups and surveys during spring and fall semester 2005 and spoke with key IT leaders from several universities to learn more about their IT strategic planning and goals. Previous Rutgers IT planning documents as well as external higher education reports were also reviewed (see Attachment C).

## Overarching principles

The principles listed below are key statements of direction related to IT and its ability to help the university achieve its strategic goals. They were developed early in the strategic planning process and guided all planning efforts.

These principles do not address specific IT goals, but rather outline a philosophy under which the university should think about IT.

- All faculty, staff and students will have information accessibility via a stable and robust networking and computing infrastructure as appropriate to each individual or local unit of the university.
- Support for all users of technology will be appropriate for their individual and local unit needs, yet systematically deployed by the university as a whole to maximize delivery to and minimize complexity and inconvenience for the user.
- Each faculty member will be able to make full and effective use of technology in instruction and research through an individually appropriate use of training, computers and computer support, and shared information technology resources.
- Courses and programs that are delivered electronically, or have technology-integrated components, will be improved and expanded due to the availability of appropriate technology-equipped classroom facilities, instructional technologies, and support to faculty and students.
- Administrative support for the academic mission will be enhanced by employing IT to enhance business process effectiveness and efficiency.

## General technology trends

It is important to note global IT trends during this process, since they can and will shape the experiences of the entire Rutgers community.

- **Ubiquitous computing.** Technology increasingly provides access from almost anywhere to the Internet, creating a virtual conduit for the individual to connect to a wide range of just-in-time information.
- **Rapid connectivity.** High-speed networks, remote access, and wireless increasingly provide seamless access. More than 55% of our peers include renewal of the IT capital plant (wiring, electronics, etc.) as part of their current funding model.
- **Increasing freedom with mobile devices.** Increasingly, people are choosing portable devices for their everyday needs, which, through converged networks, will help them realize unprecedented mobility in information and network access.
- **24x7 service expectations.** Individuals anticipate service and support assistance to be 24 hours a day, seven days a week. One third of our peers operate IT help desks 24x7.
- **Electronic commerce.** Consumers expect the convenience of products and services to be available via secure online purchase and transaction systems.

## Benchmarks

As part of the overall strategic planning process, we looked at data collected by the Educause organization about IT. We used these data to compare Rutgers with our peers:

- Indiana University
- Iowa State University
- Michigan State University
- The Ohio State University
- Purdue University
- Texas A&M University
- University of California, Berkeley
- University of California, San Diego
- University of Florida
- University of Illinois, Urbana-Champaign
- University of Maryland
- University of Michigan-Ann Arbor
- University of Minnesota
- University of North Carolina, Chapel Hill
- University of Texas at Austin
- University of Virginia
- University of Washington
- University of Wisconsin-Madison

These data are included throughout the plan.

## IT-related challenges

At Rutgers, as at many other universities, there is a great deal of ambiguity about the appropriate roles for the central information technology organization and its counterparts in departments, colleges, and campuses. For example, the tendency to distribute responsibilities for planning, budgeting, and architectural decisions to autonomous local units is often in tension with the desire for coordinated budgeting and planning, common databases and procedures, and overall system compatibility and security. Since these ambiguities are significant impediments to the progress to which we are all committed, Rutgers must resolve them and foster more creative collaborations among its diverse IT units.

In addition to the central/distributed ambiguity, there are many other challenges that we face as a university as we think about IT:

**Challenge 1: Executive commitment and leadership.** To effect the changes necessary to better utilize IT to help the university achieve its strategic goals, there must be a commitment from all members of the university community to share information, standardize data and data gathering, and optimize business practices. This includes individuals at all levels of responsibility, including executive leadership and faculty.

**Challenge 2: Strategies for IT investment.** Campus/college/department budgets are being reduced, but demands for technology are exploding. All units need significantly more support than they now have. In order to attract and retain the best researchers, teachers, students, and administrative staff, the university must offer a modern computing environment. Rutgers needs

strategies to invest in new technologies either by reallocating existing resources, creating efficiencies, or developing additional resources. IT financial support must become an institutional priority.

**Challenge 3: Classroom prioritization and course management system consistency.** Faculty, students, and staff are increasingly integrating instructional technology resources into all aspects of teaching and learning. However, university and campus responsibilities for instructional technology and academic computing are unclear; existing services are not well coordinated and are often difficult to locate and access; and resources are unevenly distributed. Classroom use is prioritized by class size, not by technology need. Students and faculty are often asked to use multiple course management systems. Decisions must be made about how to address these issues.

**Challenge 4: Enterprise services and supplemental systems.** Most campus departments want improved systems for managing their operations, but campus/department responsibilities for developing and maintaining administrative systems are not clear. Units often duplicate data available in central systems because it is difficult to access in a manner that is useful to them. As new enterprise systems are investigated, they must take into account the many and diverse issues of departments to avoid the unnecessary proliferation of new and different supplemental systems throughout the university.

**Challenge 5: Training faculty, staff, and students to use IT effectively.** In order to ensure acceptance of new technologies, faculty, staff, and students need to become comfortable using systems and have confidence in them. A thorough and comprehensive training program, including “hands on” training and ample user documentation, will provide the users with a high degree of acceptance.

**Challenge 6: Standardization.** Standards are not in place to encourage faculty, staff, and other researchers to adopt consistent hardware, software, basic configuration settings, and services which leads to an increase in IT staff support costs and does not allow the university to leverage its considerable purchasing power. Developing an IT governance structure should help move toward a higher degree of standardization.

## **Strategic Goal 1:**

**An IT governance structure will be developed, involving the university's senior administrators, faculty, staff, and students, to ensure there is appropriate planning for IT expenditures throughout the university and that IT decisions reflect the priorities of the university community.**

In higher education, how decisions are made about institutional priorities, strategies, goals, and major resource allocations, and who is accountable for these decisions, are functions of institutional governance. For IT, an institution's senior leaders, including but not limited to the chief information officer (CIO), need to be involved in the determination of how best to use IT to generate value for the institution. An IT governance structure, therefore, is key for institution-wide long-term and short-term prioritization of and search for funding for IT-related projects.

## **Recommendation 1:**

**Establish a mechanism for IT governance throughout the university.**

*Implementation strategy 1: Invite the VP for Information Technology (CIO) to sit on the President's Cabinet.*

Proposed leadership: University President

To ensure that the case for IT is presented in a forum where it receives executive scrutiny and is subject to the highest level of university planning, we recommend that the CIO be added to the President's Cabinet. This recommendation is based on statements appearing in several Educause reports. For example, a 2005 Educause Executive Briefing states, "The campus IT leader can be most effective if she or he has a seat on the executive cabinet or council." Educause has also found that 50% of CIOs sit on the President's Cabinet. Furthermore, 22% of our peers have the CIO reporting directly to the President; 50% have the CIO reporting to the highest ranking academic officer; and 17% have the CIO reporting to the highest ranking administrative officer. The remaining 11% have joint appointments. Currently, the Rutgers CIO reports to the Senior Vice President for Administration and Chief Financial Officer.

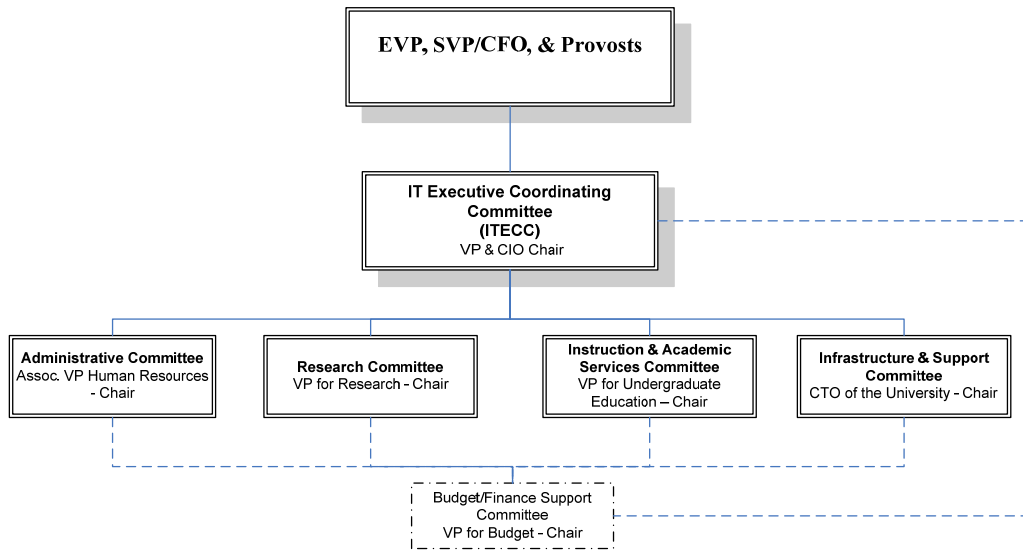
*Implementation strategy 2: Establish a university-wide IT governance and planning structure.*

Proposed leadership: Executive VP for Academic Affairs, Senior VP for Administration and chief financial officer, Provosts

Recognizing the importance of IT to fulfillment of the research, teaching, and service missions of the university, we propose the immediate establishment of an IT governance and planning structure. This structure will provide for the involvement of senior administrators and the university community in decisions about IT policies and priorities. The involvement of senior leaders on the relevant committees as committee chairs is necessary to ensure that the activities and initiatives put forth by this structure are recognized as having the backing of the university

community and the endorsement of the institution’s senior administration. Such a structure might look like the following:

## IT Governance



### **IT Executive Coordinating Committee (ITECC):**

**Chair:** CIO. In models presented by visiting CIOs from other universities, the CIOs had strong leadership roles in coordinating their advisory committees. We recommend that the CIO/chair of this committee present the strategic vision of the coordinating committee to the President's cabinet and bring their decisions back to the committee for deliberation and action.

**Membership:** The four subcommittee chairs, the four subcommittee vice-chairs, the VP for Budgeting (representing the University Budget Committee), a representative of the New Brunswick Council of Deans, and senior administrators (with knowledge of campus priorities and budgets) from Camden and Newark (one each) to be appointed by the Camden and Newark Provosts.

**Reporting Relationship:** The ITECC reports directly to the Executive VP for Academic Affairs, Senior VP for Administration and Chief Financial Officer, and the Newark and Camden Provosts. A joint meeting between these individuals and the ITECC is recommended at least twice per year.

**Charge:** To set strategic direction for IT and to make recommendations regarding prioritizing of IT spending and university IT policies, and the yearly submission of a proposed rolling 5-year budget for IT spending, including both expenditures by the Office of Information Technology (OIT) and units outside the OIT. The committee will also take upon itself the task of examining areas that need attention within IT throughout the university, possibly then delegating responsibility for initial proposals to one of the subcommittees described below.

The CIO would have the responsibility of ensuring that (1) all important IT issues, both central and distributed, are part of the charge of at least one of the subcommittees; (2) there is coordination of the agenda and staff support for all subcommittees and the executive committee; (3) the President, the Executive VP for Academic Affairs, Senior VP for Administration and Chief Financial Officer, and the Provosts are kept informed of committee activity; (4) all committee elements are provided necessary technical and budgetary expertise and comparative data (the budget/financial subcommittee should be established to aid in this task); (5) communication procedures are established so that ideas and proposed actions are shared among and between subcommittees; (6) there is regular communication with decanal units and directorates so that their needs are considered by the committee.

Subcommittees: Four subcommittees reporting to the ITECC would be established, each with a Chair and a Vice-Chair and subject area specialists. Membership on these committees would be decided by consultation among the Executive VP for Academic Affairs, Senior VP for Administration and Chief Financial Officer, and the Newark and Camden Provosts with input from deans and center directors, the OIT, the University Librarian, and appropriate university bodies, such as the University Senate, Faculty Councils, and student groups. Selection of members will be based on interest and experience in IT issues with the aim of representing the institutional constituencies (administrators, faculty, staff, and students). It will not be possible to have representatives of all units on each subcommittee.

The four proposed subcommittees are: (1) Administrative, (2) Research, (3) Instruction and Academic Services, and (4) Infrastructure and Support. These committees will develop IT plans and policies, prioritize IT projects within their specific functional areas, and make recommendations to the ITECC.

**Administrative Committee:**

Chair: Associate VP for Human Resources

Vice-Chair: Faculty or staff member representing distributed administrative activities.

Some issues that this committee is expected to discuss and make recommendations about are: Enterprise/supplemental systems in all business (e.g., financial, human resources, grant accounting) and student areas. We recommend that the current IT Project Governance Committee (ITPGC) be integrated into the Administrative Committee.

**Research Committee:**

Chair: VP for Research

Vice-Chair: Faculty member

Some issues that this committee is expected to discuss and make recommendations about are: IT infrastructure for research, central and unit-based resources, library services for research.

**Instruction and Academic Services Committee:**

Chair: VP for Undergraduate Education  
Vice-Chair: Faculty member

Some issues that this committee is expected to discuss and make recommendations about are: enhanced classrooms, wireless deployments, on-line courses, learning technologies, course management systems, on-line resources and libraries, public computer labs, instructional microcomputer labs, department computer labs, specialized software for instruction, IT training, support services for faculty and students, and accountability for the student computing fee.

**Infrastructure and Support Committee:**

Chair: Chief Technology Officer (CTO) of the University  
Vice-Chair: Faculty or staff member from outside OIT

Some issues that this committee is expected to discuss and make recommendations about are: Cyberinfrastructure; networking (wired and wireless, voice and video); security, privacy, and data integrity; desktop computers; system management; and infrastructure for distributed data applications. Because some of these areas require substantially different expertise, we anticipate that it will be appropriate to set up further subcommittees to deal with some of the specific issues.

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In addition to the four main subcommittees discussed above, we recommend the formation of an additional committee, whose role is to provide support for the other committees.

**Budget/Finance Support Committee:**

Chair: VP for Budgeting  
Vice-Chair: Associate Provost, dean, or faculty member

This committee will provide support to the ITECC and its committees on the issues of budget and financing of IT projects, investments, and services including alternative models and strategies.

**Benefits of this Committee Structure:**

- IT policies and projects will be decided based on the needs and goals of the university, not just the needs and goals of the OIT.
- Decisions about IT projects will be made with an holistic view of the university in mind, since the committee members provide a broad representation of the university, including both academic and administrative constituencies on all three campuses.
- The Committee structure involves key administrators with knowledge of budgets and finance at all levels of the planning and prioritization process. Thus, the final recommendations of the ITECC are made with knowledge and awareness of budgets and funding and with a high level of university backing and support.
- By having the full backing of a representative IT advisory structure, the CIO and ITECC will be in a much better position to build a business case for the funding of IT projects.



**Recommendation 2:  
Establish adequate and trackable funding mechanisms for information technology throughout the university.**

Although IT is a pervasive part of the university and the total dollars spent on IT are substantial, it does not appear to be a key part of general university planning. Rutgers lags behind our peers with regard to central IT funding (29% below the mean) and does not have a funding model for renewal of the capital plant (evergreening) as is the case at 55% of our peers. At Rutgers, because of the reliance on onetime funding and the uncertainty in budgets beyond the current year, there is little opportunity to plan for future IT expenditures, such as replacement of each of the different components of the technology infrastructure (hardware, software, wiring). Current budgeting does not include either ongoing operational costs or new implementations. One result of the difficulty in planning for IT expenditures at Rutgers is that standardization of hardware, software, services, and support practices has been difficult to achieve, despite the fact that standardization can allow more efficient use of resources and the ability to achieve economies of scale.

Assessing the state of IT funding expenditures and planning for future expenditures should be one of the key tasks of the ITECC, since the university spends more than \$73 million on IT at this time. Without oversight and coordination, we believe that expenditures are not being made as cost effectively as possible.

At this time, the university has no mechanism in place to identify all IT expenditures, including hardware, software, support staff, etc. Many of these funds are expended through departments and units, with 31% of the direct expenditures occurring on Quick Purchase Orders, which require no coordination or oversight. Based on conservative estimates, the university has averaged about \$30 million in direct IT expenditures over the last three fiscal years, with 40% occurring through the central OIT organization and 60% in departments and units as indicated in the table below:

**FY05**

|                                  | IT graded staff | Direct IT expenditures <sup>1</sup> | Other OIT-related expenditures <sup>2</sup> | Total <sup>3</sup> |
|----------------------------------|-----------------|-------------------------------------|---------------------------------------------|--------------------|
| OIT                              | \$18.9M         | \$11.9M                             | \$7.4M                                      | \$38.2M            |
| Departments/Units                | \$17.1M         | \$18.1M                             | NA <sup>4</sup>                             | >\$35.2M           |
| Capital/Plant Funds <sup>5</sup> | NA              | NA                                  | NA                                          | NA                 |

1. Based on Accounting IT object codes and including hardware, software, computer supplies, telephones, external Internet connections, and maintenance contracts.
2. Includes all other IT expenditures that are not identifiable via object codes: professional services/consulting, hourly IT staff, non-IT graded staff, IT memberships, IT training.
3. Includes IT expenditures across all accounts: state, non-state, auxiliary, grants, endowments.
4. Data indicated as NA were unavailable as of the time of the printing of this report.
5. Under the current accounting structure, it is not possible to identify capital/plant fund expenditures related to IT. This number could be significant given new construction and projects like RIAS and RUNet.

In addition, the university spends about \$36 million on IT-graded staff positions as noted in the table below:

|                       | FY04 | FY05 |
|-----------------------|------|------|
| OIT                   | 247  | 263  |
| Departments and units | 234  | 272  |

It should be noted that the increase in OIT staff has occurred at a much slower pace than in departments/units. This is having the unfortunate result of lessening IT coordination even more than in previous years.

***Implementation strategy 1: One-time capital funding of services, projects, or initiatives should not be appropriated unless there is a commitment to adequately fund ongoing training, operations, and support of these services.***

Proposed leadership: VPs for IT and Budgeting

The university has a history of relying on one-time allocations to provide operational support of essential services. This practice must be replaced by one that fully addresses the resources required to support ongoing training, operation, and management. An IT system that is not adequately supported is of little value to the university. One-time capital expenses that address specific needs are inadequate unless complemented by resources for ongoing operations. Funding decisions should be based primarily on the ability to provide resources for ongoing operations and secondarily on the one-time expenses required to initiate a program.

The Committee makes the following recommendations in the area of budget and funding models:

- The ITECC should make recommendations regarding prioritizing of IT spending and university IT policies, and the yearly submission of a proposed rolling 5 year budget for IT spending, including both expenditures by the OIT and units outside the OIT.
- A replacement cycle needs to be established for each of the different components of the technology infrastructure (hardware, software, wiring).
- Budgeting needs to include ongoing operational costs as well as new implementations. The cost of staff to support technology must not be underestimated, and should be an essential consideration for any new implementation strategy.
- Prior to making IT investments, university leaders need to assess, evaluate, and then mandate university-wide changes in the business and academic processes that will be required in conjunction with the IT investment. Conversely, those making changes in business and academic processes should consider the IT implications of their actions.
- Standardization of hardware, software, and support practices should be a priority, allowing more efficient use of resources and the ability to achieve economies of scale.
- Charges for IT services should reflect actual costs and not include surcharges to fund other university initiatives, since this distorts the economics of IT decision making. Currently, this does not seem to be the case in university charges for phone systems.

**Strategic Goal 2:  
Faculty and students, engaging in teaching and learning,  
will have IT tools comparable to those at the top public  
AAU institutions.**

IT is transforming learning from an activity that had only been done in classrooms and libraries to one that can be done in any space in which IT services are deployed and effectively supported. Cell phones and laptop computers have untethered communication. Students routinely make calls and access information from the student center or coffee shop. The university can provide a significantly improved learning environment by leveraging IT and making resources available in carefully designed distributed learning spaces and using carefully selected software.

**Recommendation 1: Responsibility for instructional support should rest with a specific group on each campus.**

Proposed leadership: VP for Undergraduate Education and Provosts

There should be a single person responsible for all aspects of instructional IT support on each campus. Where services do not report to that person, the units responsible for those services must designate specific individuals responsible for the quality of their support for instructional spaces and activities. Their responsibilities should include, but not be limited to, IT support of all learning spaces, instructional computer labs, online services such as course management systems, and faculty training and support (e.g. instructional design). Each campus' support group must be appropriately sized and organized to respond to the multi-faceted and geographically distributed needs of the user community. For example, support for IT-enhanced instructional environments in New Brunswick could be coordinated by the Office of Instructional and Research Technology (OIRT), in Camden by Instructional Design and Technology, and in Newark by the Office of Academic Technology (OAT).

**Recommendation 2: Teaching and learning spaces, both formal and informal, both face-to-face and online, both classroom-style and hands-on facilities, will include a baseline set of IT resources to enhance faculty-student interaction and improve learning.**

We recommend that responsibility for all aspects of teaching and learning, including IT, lie with academic officers of the university including the VP for Undergraduate Education, VP of Research and Graduate and Professional Education, and the Provosts of Rutgers-Newark and Camden, in concert with the ITECC. This requires, and we recommend, that budgets for resources that support instruction, including those derived from student fees, should be controlled by these officers and the ITECC and that they should allocate portions of these budgets to organizations that provide essential services (e.g., Center for Advancement of Teaching (CAT), Facilities, OAT, OIT).

***Implementation strategy 1: All new buildings should include learning spaces that meet standards established by the Instruction and Academic Service Committee of the ITECC. All lecture hall and recitation spaces in existing buildings should be upgraded to meet standards.***

Proposed leadership: VP for Undergraduate Education and Provosts

The importance of establishing and maintaining effective learning spaces cannot be overemphasized. The committee recommends that all rooms be equipped with an acceptable level of IT capability but recognizes that equipping all rooms identically would be an unwise use of resources. It also knows, from first hand experience, that instruction will gravitate to the lowest common IT denominator and instructors will plan their lectures and recitations to only use resources they are guaranteed to have available over multiple semesters. We recommend that standards for IT support be multi-tiered <sup>1</sup>; reviewed and analyzed annually based on user feedback and usage statistics; and advertised to the university community. In addition, adequate resources should be available for the maintenance, upgrading, and security of classroom environments including staffing for classroom support. Faculty should be involved in the design of the classroom environment, working with a single coordinating entity at the university.

Standards should include the following:

- A networked classroom environment should be developed that allows all materials to be delivered to the classroom over the network, and provides all necessary equipment in the classroom.
- Classrooms should be equipped to allow a portion of the blackboard and the projector screen to be used simultaneously.
- Classrooms should be designed with multiple lighting controls and dimmers.
- Classrooms intended to accommodate the use of video should be designed to include two high definition projectors or one projector with a split image.
- Classrooms should be equipped with more flexible seating arrangements, such as moveable tables rather than fixed seats.

***Implementation strategy 2: IT resources should only be deployed in spaces if the supporting physical infrastructure is properly maintained.***

Proposed leadership: VPs of Undergraduate Education and Provosts

The physical infrastructure in several enhanced classrooms has made it impossible to provide effective IT support. Leaking ceilings, broken projector screens, blackboards that are damaged or that can't be raised or lowered, ineffective lighting, and inadequate networking, to name a few, have made it impossible to supply the services needed to support effective teaching and learning. Our strategic plan for IT assumes the supporting physical infrastructure is in place and maintained. Resources need to be made available to maintain the physical infrastructure – these

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<sup>1</sup> Some rooms should have leading edge equipment, others should be middle of the road, and some should only meet minimum requirements.

cannot be one-time capital expenses but must be budgets that support ongoing operations and maintenance. If the physical infrastructure is not maintained, IT resources will fail and should not be deployed.

***Implementation strategy 3: Scheduling of classes should be dependent on the IT resources required for instruction and availability of these services in lecture and recitation rooms.***

Proposed leadership: VP of Undergraduate Education and Provosts

Today, courses are scheduled primarily based on enrollments and with minimal attention to the IT needs of the class. The committee recognizes that this problem can be reduced or eliminated by providing a greater number of full-capability enhanced rooms and this document recommends these upgrades be made. We also feel that the scheduling of classes should address the specific IT support needed for lecture and recitation (e.g., laptop projection, audio capability, Internet, wireless, etc.).

***Implementation strategy 4: The Instruction and Academic Service Committee of the ITECC's responsibilities should include planning for computer labs and hands-on instructional computing facilities.***

Proposed leadership: VP for Undergraduate Education and Provosts

Computer prices have fallen precipitously over the last ten years. Students now routinely bring workstations or laptops running basic software (and usually looking for printers) with them to school and, as a consequence, usage patterns have changed. The general purpose public computing labs in New Brunswick/Piscataway are experiencing a greater number of user sessions but of a shorter duration. Compared to ten years ago, the total number of machine-hours used by students is down in NB/P while Newark and Camden show no such decrease. Over the same period, the demand for hands-on instruction has increased. To date, most instructional computing labs have been squeezed into available space. Going forward, these rooms will play an increasing role in the delivery of instruction and they need to be sized and designed for their intended purpose<sup>2</sup>. Evaluation of usage and decisions about the size and number of labs should be campus specific.

***Implementation strategy 5: The university should establish a plan to increase the number and coverage of its online material and courses so that by 2010 it is on par with its AAU peers.***

Proposed leadership: VP for Undergraduate Education and Provosts

We realize that curricular recommendations are not formally within the purview of this subcommittee but feel strongly that exposure to and use of online materials and courses are essential to a student's university experience in the 21<sup>st</sup> century. It is clear that the use of IT for instruction and in the classroom is increasing, that online materials are becoming an essential

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<sup>2</sup> New offerings in SCILS need a lab size of 40, the Sociology and other departments in Camden are in need of a lab size of 60, and RBS has a standard class size larger than the existing instructional labs.

component of the university's educational mission, and that students expect such materials to be effectively incorporated into the university's educational offerings.

Over the next five to ten years most education will be done using a "blended" approach to IT-based instruction. Face-to-face lectures and recitations will continue to be an important part of a student's education but online material will augment these more traditional forms. Many organizations, both large and small, already rely on this blended model for staff development and training. Graduates will live and work in a society that expects them to be comfortable with online materials and the university would be remiss if it did not expose its students to a pedagogically sound learning environment that effectively incorporates online material.

Our peer institutions have taken the lead in supporting technological fluency for their students in many creative ways (e.g., requiring students to purchase laptops or an iPod or requiring courses to have some online component). Rutgers lags behind our peers in the development and delivery of online material and courses and without a significant commitment to closing this gap will fall further behind. For example, four years ago, about two thirds of the State of the University Address given by President Graham Spanier at Penn State was devoted to IT issues. Speaking on the issue of Distance Education and Resident Instruction he said,

The formerly religiously separate domains of distance education and resident instruction are converging. I believe this to be among the most significant unacknowledged trends in higher education. It creates some exciting prospects for educators. Learning can occur online or in campus classrooms or through a combination of these two approaches. .... I am not one who believes that modern information technologies will displace the primacy of resident instruction in institutions such as ours, but I believe that the current rigid distinctions between distance education, commuter, and residential students will be increasingly blurred.

The Undergraduate Education Task Force is notably silent on the issue of online materials and courses that support the undergraduate curriculum. In contrast, our peers have identified online material and courses as a key component of their plans for the futures. Institutions like the University of Washington and Pennsylvania State University offer hundreds of online courses to thousands of students each semester and provide them with the opportunity to complete dozens of academic degrees completely online. Further, they report that their online materials and offerings have had a direct and positive impact on traditional face-to-face instruction.

If the university does not match the commitment and resolve of its peers and increase the level of technological fluency in its curriculum, it will fall even further behind when it comes to effective use of online materials in support of undergraduate education.

We recommend that the university charge the Instruction and Academic Service Committee of the ITECC, chaired by the VP of Undergraduate Education, to

- a) perform a thorough in-depth evaluation of online material and courses delivered at Rutgers and its 61 AAU peers and
- b) prepare, implement, and monitor a plan that will increase the Universities online materials and offerings to be on a par with its AAU peers by 2010.

There are several university organizations that have the expertise in and experience with online resources that can assist in such an evaluation including but not limited to the CAT, the Division of Continuous Education and Outreach, Instructional Design and Technology, the OAT, the OIRT, and the Task Force on Undergraduate Education.

**Recommendation 3: The university should provide an adequate budget and sufficient staff to operate one or more well-supported course management system (CMS) environments covering all campuses, departments, and units.**

Proposed leadership: VP for Undergraduate Education and Provosts

There is a strong consensus that CMSs have not received adequate central support, although some support exists for WebCT in New Brunswick/Piscataway and Camden. In response to this lack of support, the Newark campus and the Division of Continuous Education (DCEO) have deployed Blackboard and eCollege, respectively. Both have user bases that are satisfied with the services provided and only willing to consider changing if the new service is as good as or better than what they currently have. A single central system that is effectively supported and operated could have several advantages. Faculty could seamlessly teach in any university department without learning a new environment, materials could be easily shared among all faculty members and instructors, and student taking courses anywhere in the university would have the same interface to their course material.

We are not in the majority in offering multiple CMSs. About 40% of our peers support a single commercial product course management system. Another 33% support both homegrown and commercial course management systems. Only 6% support more than one commercial system.

We recommend that the university provide an adequate budget and sufficient staff to deploy a well-supported CMS environment<sup>3</sup> covering all campuses, departments, and units with a budget that ramps up to steady state over a three year period. Further we recommend support and training be distributed by campus and under the academic leadership of each campus and that a 24x7 helpdesk be supported for faculty and students.

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<sup>3</sup> The committee has not reached a consensus as to whether to recommend one or more than one CMS but it does agree that the choice is not between one, or more than one environment, but rather between a well-supported or poorly supported environment.

**Recommendation 4: Equipment and personnel budgets should be expanded to support the development of the Rutgers Digital Archive and expansion of databases, full text, and media materials.**

Proposed leadership: University Librarian

The Rutgers Libraries are developing a strategic plan that will make a significant commitment to enhancing the teaching and learning environment at Rutgers through the acquisition, creation, and delivery of digital resources. The Libraries will expand acquisition of digital media and text resources, convert existing materials for online delivery to the classroom and integration into course management systems as well as preservation, and provide services for converting unique university resources to digital format and making them durably accessible. The constellation of Rutgers resources to be made available over the university network includes such unique resources as faculty lectures, artistic performances from the Mason Gross School of the Arts, and media from the Institute of Jazz Studies.

**Recommendation 5: The Instruction and Academic Service Committee of the ITECC's responsibilities should include the establishment and evolution of standards for usage monitoring.**

Proposed leadership: VP for Undergraduate Education

Effective usage monitoring of environments is as important as establishing their "true costs." Without knowledge of the amount and type of usage, it is impossible to assess performance and cost effectiveness of deployed services. Online tools should be deployed only if their usage will be carefully monitored and analyzed. To encourage effective and efficient working and sharing relationships across similar resources, we recommend that standards for monitoring and reporting of resource usage be developed, that usage and outcomes related to each IT service be thoroughly monitored and annually reported, and that course surveys be expanded to collect information about use of IT systems and services.



**Strategic Goal 3:  
The university will centrally support a distributed research computing infrastructure to help it achieve its goal of entering the top ranks of public research universities.**

Research computing at Rutgers provides the backbone for competitiveness. Virtually all research at Rutgers uses some aspect of computing, from word processing to advanced high performance computing, from local area networks to Internet2, from storage of confidential information to usage of large datasets. Due to the distributed nature of research at Rutgers, it is logical that computing to support research be distributed, also. However, supporting researchers and the research network, providing standards, and coordinating efforts should be accomplished by a well-trained and organized central unit.

**Recommendation 1: Ensure that the university's research computing infrastructure and its staffing are adequate for future research needs.**

*Implementation strategy 1: Upgrade the university's legacy network to current standards*

This strategy will be discussed in more detail in Strategic Goal 5.

*Implementation strategy 2: Establish a small, centrally available research computing cluster for testing and training.*

Proposed leadership: VP for Research

High Performance Computing (HPC) is a general term used to describe supercomputing across various technologies such as cluster computers, massively parallel processing computers, and grid computing. Rutgers has a varied history of employing these technologies. According to a survey of Rutgers HPC clusters conducted by the Office of Instructional and Research Technology, there are currently more than 35 clusters in operation by 17 groups. The efficient use, promotion, and support of HPC at Rutgers is very important for continuing progress and competitiveness in research and academics. To further develop and improve HPC at Rutgers, training, on-site consulting, and matching funding must be made available.

*Implementation strategy 3: Improve intradepartmental, interdepartmental, and extra-university network connections. Develop policy for funding upgrades to network connections.*

Proposed leadership: VP for Research

Intradepartmental networks: The trend in high performance computing at the university level has shifted from multi-user environments on multiprocessor machines (e.g., SUN E10000) to laboratory and departmental-based computational clusters and desktops. The computational resources on these distributed systems need to be consolidated through high performance networks at a minimum bandwidth of 1 GBit/sec for file transfer between computational clusters and desktops,

shared data storage, and archival devices. Where networks are not capable of this level of performance, they should be upgraded.

Interdepartmental networks: The recent pronounced shift in Federal funding from single investigator, single discipline research to multi-investigator, multidisciplinary research has led to increased collaboration between university research groups from different departments (e.g., the School of Engineering and Department of Chemistry). This, in turn, has led to the need for faster network connections between their computers (desktops and servers) for efficient sharing of data and software. A minimum of 1 Gbit/sec bandwidth is needed between departmental networks to achieve the same level of network performance as for intradepartmental networks. Where networks are not capable of this level of performance, they should be upgraded.

Extra-university networks: Research collaborations between Rutgers departments and other institutions (for example UMDNJ) as well as access to the National Supercomputing Centers (such as NCSA, Pittsburgh and San Diego) requires high network bandwidth connections with the Internet for data transfer and database access. The merger of Internet2 and the National Lambda Rail represents the next generation of transcontinental network system providing 10 Gbit/sec to universities on dark fiber. Future development of the Rutgers network must make provision for the Rutgers community to take advantage of these networks, as needed for research and teaching at the university.

***Implementation strategy 4: Establish staffed co-location facility(ies) (data center) for computing equipment used for research.***

Proposed leadership: VPs for Research and IT

A basic requirement of any IT project is the physical space to store computational, storage, and networking hardware. This space must provide reliable environmental and power conditions with backup systems to ensure continuous 24x7 service. Secondary space should be available to support servers for applications with critical uptime or availability requirements.

***Implementation strategy 5: Provide university funding for research hardware and software and their support.***

Proposed leadership: VP for Research

Shared services. IT projects may require the identification, acquisition, installation and configuration of server hardware. Solutions for common system management tasks such as secure access (e.g. one time password access), archiving, and disaster recovery should be provided completely by the university. Included in this should be a sufficiently sized data storage facility. Support from university sources, including grant overhead or indirect cost return, should be available for all of these ongoing services, as they are key pieces of the research infrastructure. To be competitive, the university must provide these core requirements at no cost to researchers.

Support for project-specific IT expenditures. For other research IT expenditures, the ITECC will work with faculty to determine the most effective way of accomplishing this goal. We recommend providing a fixed percent of matching, to replace the current system of ad hoc negotiations. For example, at least 50% of the cost of the other IT requirements could be borne by the university up

to \$240,000 through indirect cost return with the remaining 50% borne by the grant. In addition, the university should aggressively pursue strategic discount arrangements with hardware and software vendors to minimize the cost of acquisition and maintenance of key/common hardware and software products for IT projects.

***Implementation strategy 6: Provide training opportunities in research computing for faculty, staff, and students.***

Proposed leadership: VPs for Human Resources, IT Research

In a research setting, the IT required is often not available for purchase from vendors, or may require significant effort to integrate. Individual faculty members and their students often lack the expertise required to develop such experimental technologies. Professionally staffed IT training could serve as a bridge between researchers and the experimental IT they need for their research.

***Implementation strategy 7: Provide research support staff to assist faculty in adopting new information technologies, and to support core middleware services.***

Proposed leadership: VPs for Research and Information Technology

Researchers are often unaware of the possibilities created by new developments in IT. Even when they are aware of the technologies, lack of background expertise creates barriers to utilizing them. This is unfortunate, since rapid adoption of new technologies could provide a significant competitive edge in research. For a strategic plan in IT to be effective, the university needs to anticipate future needs, in addition to addressing current ones. For example, virtually all IT projects involve collaboration among geographically distant groups. The university should maintain expertise and provide facile solutions for constructing network collaborative environments. As part of this, Rutgers will need to support middleware services required for multi-institutional research projects. This includes services such as identification, authentication, authorization, and directory and security services.

**Recommendation 2: Automate and streamline the process of grant identification and administration.**

***Implementation strategy 1: Deploy a centralized grants administration system that will link with federal agencies and the university's other business systems.***

Proposed leadership: VP for Research

The Office of Research and Sponsored Programs has been using Coeus as its grants management tool and database of record since 2003, primarily for pre-award functions. A number of Coeus features are designed to help support the post-award process and Coeus is available to the post-award staff. In addition, a new web-based version of Coeus is due out soon that will support electronic proposal creation and submission to federal and other granting agencies. Rutgers currently has a successful experience with the Coeus system that merits further development for both pre-and post-award use.

**Recommendation 3: Establish a repository for significant intellectual property created by Rutgers faculty and students.**

Proposed leadership: University Librarian

The maintenance of the significant intellectual property of the Rutgers community, particularly the unique information created by Rutgers faculty and graduate students and by university publishers, is envisioned as being addressed by the Libraries through the development of a Rutgers digital archive or institutional repository. A somewhat newer role, the Rutgers Digital Archive is part of an effort of research libraries to capture and preserve the intellectual output of their universities and make this available as part of a federation of systems. The creation of the Rutgers Digital Archive is part of the changing system of scholarship and scholarly communication. Activities of the archive/repository will include the creation, storage and preservation, description, access, and display of content, and digital rights management.

The Rutgers Digital Archive will benefit teaching and research by providing an underlying cyberinfrastructure to support data sets, lab notes, publications, grant reports and other significant products and byproducts of the research process in a durable, sustainable manner. An important goal of the Rutgers Digital Archive, as developed and hosted by the Libraries, is to provide a digital infrastructure for Rutgers faculty research projects that enables researchers to find and re-use original research products and that meets or exceeds the requirements of granting agencies for sustainable and ubiquitous access to funded research results.

**Strategic Goal 4:  
Integrated systems will be developed to enhance  
administrative decisionmaking, community-building, and  
service at all levels of the university.**

It is essential that our stakeholders have access to reliable, accurate and consistent information anytime from anywhere to be able to make informed choices about their academic programs, careers, financial obligations, participation in university programs, and other educational interests. Currently, the university lacks the necessary functionality, interoperability, and proactive planning (i.e., portability, online systems, data warehousing, and support) to raise all campuses to a standard level of service and to position itself as a national leader in the higher education student services market.

**Recommendation 1: Implement integrated systems including those for  
students, human resources, procurement, payroll, contracts/grants  
and other financial systems.**

The ability to gain secure and timely access to systems and data in order to make improved decisions will allow the institution to move forward in obtaining, receiving, and better utilizing resources. Accurate and reliable data should be the basis of a more global view of the university and would provide decisionmakers with a consistent and dependable means of obtaining information. In addition, based on surveys, student focus groups, and dialogues with “university experts,” it is clear that students expect to register, view grades, and pay bills online; to have online communities where students, faculty and staff can connect with each other for teaching and learning, ad hoc work teams, employee communications, continuing education; and more. They also want more wireless locations and a user-friendly, reliable “single click login system” to access the universe of services.

*Implementation strategy 1: Empower the university community with the necessary tools to facilitate access to “integrated and near time” data in a quick, easy and timely fashion.*

Core systems

Proposed leadership: University Controller

Rutgers is faced with a choice between different strategies for the future of its core financial administrative systems: an ERP approach using Oracle or another vendor-supplied software to provide integrated administrative systems or the ‘Best of Breed Approach’. The Best of Breed Approach employs diverse solutions that can be relatively easily integrated with existing financial systems and new financial administrative systems. The university is currently exploring the implementation of the Oracle General Ledger system but the final implementation timeline and costs are still being evaluated. When the planning phase has been completed, this can be used as a benchmark or estimate for implementation of additional modules.

Supplemental systems

Proposed leadership: VP for IT

We must also identify and develop standardized solutions that will provide the university community with supplemental capabilities to access and manipulate financial, student, and administrative near-time data existing in central systems. Components of such systems include: a data warehouse, tools, training, and staff support needed to manipulate data, and a central repository of all core university data and reporting for student, administrative and financial data; electronic work flows, expediting transactions in all administrative systems resulting in information readily available to the university community; and, through a defined process, verification of a user's identity in a secure yet fluid manner. These solutions, which are part of an integrated core/supplemental system, should be coordinated through the ITECC.

**Recommendation 2: Improve visibility and service by establishing the university's web presence for both general access and access with login.**

The university has found difficulty communicating its outward facing website to the general public, while at the same time providing targeted services to current students, faculty, staff, alumni, retirees, and community outreach projects. In many ways, these are opposing objectives with different needs. Thus, it is recommended that the website will feature both generalized access and individualized access. These categories should provide the ability to provide generalized information available to the public and login for individualized information and services.

***Implementation strategy 1: Establish the myRutgers portal as the primary interface to individualized online services to the university community.***

Proposed leadership: VPs for Student Affairs and Human Resources

Currently, targeted services are delivered through multiple channels and departmental websites causing confusion and user difficulty. Establishing the myRutgers portal as the vehicle for accessing targeted services and information by individuals would assist in clearing up this confusion. Today the myRutgers portal is a secondary delivery mechanism rather than the primary. As a comparison, all but two of our peers have implemented or are in the process of implementing portals.

The benefits of such a portal include: services that are targeted to the individual and organized through a consistent interface which the user manages; less need to hunt through websites or try to remember where to find a service; and a unified approach to electronic service delivery to enable more leveraging and enhancing of services. It will also foster more collaboration and synergies among services and organizations; more unified and seamless service delivery; and a common approach for lifetime electronic interaction with constituents.

***Implementation strategy 2: Create and maintain an easy-to-use, up-to-date web-based presence for the university and its units.***

Proposed leadership: VP for University Relations

Only a few short years ago, it may have been enough if a university web page simply identified a University, their logo and their admission offices. The needs of prospective and current students, faculty, and staff have risen far beyond that scope. IT not only plays a key role in both the decision to attend or work at an institution, but also the quality of the experience at that institution. Indeed, the 21<sup>st</sup> century vision of IT in the academic setting is shifting from the administrator's perspective to the user's perspective. The best and most imaginative use of IT comes from settings where the systems are completely customer driven. Additionally, there has been a strong emphasis on providing mobile access and services to students, faculty, and staff. Offices require more up-to-date web pages and more dynamic capabilities, but often lack the technical expertise or funding to keep sites maintained or as useful as a resource.

To accomplish this critical strategy, Rutgers must place a renewed emphasis on its web presence and provide free or low-cost tools to achieve this goal. An open-source content management system can be set up centrally that allows easy to use templates for both regular and mobile portions of websites, as well as dynamic and date-sensitive linking of pertinent information. The content management system should be made available as a no charge "opt-in" option for departments who have limited technical or staffing capability. The content management system could be scalable as it becomes more widely used.

**Recommendation 3: Administrative data should be considered an institutional resource.**

Proposed leadership: Executive VP for Academic Affairs, Senior VP for Administration and Chief Financial Officer

As a general planning and governance issue, we strongly recommend that administrative data be considered an institutional resource, to be shared among all appropriate users (recognizing issues of confidentiality and privacy), and not the property of the office responsible for maintaining it. Otherwise, departments and units will continue to try to maintain their own versions of the data they need to conduct their business, resulting in a large waste of university resources.

**Strategic Goal 5:**  
**A secure, robust, and reliable IT infrastructure will be developed and maintained as the underpinning for all of the above described efforts.**

IT infrastructures include networks, applications, and security frameworks and their associated service quality components. These infrastructures are the underpinning for all electronic applications at the university, and, as such, must be robust, reliable, secure, and well-maintained.

**Recommendation 1: Continue development of a secure, redundant, university-wide, converged data, video, voice network that provides access to data, applications, and services for students, faculty, and staff that meets their respective needs.**

A centralized network is a key strategic resource and a “strategic differentiator” in higher education. Consequently, this institution must continue to maintain, enhance and evolve the network infrastructure as new technologies emerge. Over time, more applications and services must be incorporated over the increasingly capable network to allow us to provide a reliable, available, secure, adaptable, fault-tolerant and high-performance data communication network to the university community.

***Implementation strategy 1: Upgrade legacy networks to current standards.***

Proposed leadership: VP for IT

The RUNet 2000 project succeeded in bringing a new network to most buildings at the university. The Camden and Newark campuses are almost totally wired and a great deal of progress has been made in providing connectivity to all key buildings in the New Brunswick/Piscataway area. The core of the network, in particular, is especially robust, is capable of handling a significant amount of expansion, and will not need to be replaced for at least five years. There are, however, a number of key buildings that are not connected to the network or that have sub-standard internal wiring and electronics. These buildings should be connected and internally re-wired to provide the same level of connectivity to all faculty and staff working on university property.

***Implementation strategy 2: Plan for continued development of Rutgers Internet connections, both internal and external, to keep pace with the demand for online digital information.***

Proposed leadership: VP for IT

Rutgers needs to plan for continued development of the network, both internal and external. We are seeing a rapid expansion in use within Rutgers. Driven by increasing use of bandwidth-intensive applications such as video, and by projects that must manipulate massive amounts of data, we are seeing order of magnitude increases in the speed of national networks such as Internet2, as well as new efforts such as the National Lambda Rail. Rutgers must position itself to take advantage of these advances, as required by the needs of the Rutgers community. This is going to require continuing investment in the network within Rutgers, as well as continued improvements in the bandwidth of our external connection. In ongoing development of our



network architecture, we will need to pay attention to the requirements of certain applications for low latency, and to needs for certain projects to have access to specialized networks or services, e.g. agency- or project-specific networks provisioned over National Lambda Rail.

***Implementation strategy 3: Develop a comprehensive plan to improve voice service that is based on a transparent, surcharge-free funding model.***

Proposed leadership: VP for IT

Investigations conducted as part of this planning process suggest that there are serious issues with the current university voice systems. Many departments need services that are either not practical or too expensive to get via Centrex. Thus there has been a proliferation of departmental voice systems. But that situation has its own problems with costs, convenience, availability of features, maintenance, and the ability to handle billing. The situation is better in Camden because they have recently purchased a campus-wide PBX system. Newark is currently considering such a system.

Thus we believe that the university needs to develop a comprehensive plan to improve voice service in New Brunswick/Piscataway, and in Newark if the campus doesn't implement its own solution. This system needs to support all the standard features such as voice mail, auto attendant, caller ID, speaker phone, call forwarding, hold, intercom, and vacation messages. To the extent feasible, it should also include improvements such as speed dial, music on hold, voice, and FAX to email, and different ring styles.

As part of this plan, the university must develop an effective funding model that includes resources for maintenance and capital investments that meet the current and future directions of voice services in the market. The model must avoid artificially increasing costs in order to subsidize unrelated services. Such "taxes" can cause inappropriate decisions. For example, at least some of the pressure to buy departmental phone systems is a result of artificially high charges for phone lines. While there are other reasons to want departmental phone systems, the university has almost certainly spent more money on such systems than it would have had costs been allocated more transparently.

***Implementation strategy 4: Begin support for convergence of voice, video and data networking for students, faculty, and staff.***

Proposed leadership: VP for IT

The national university community is moving to integrate voice and video into the IP-based data network. This provides advantages such as access to services from all locations, improved support of portable devices, and "point of presence computing" – an approach that permits users to get email, participate in videoconferencing, and make and receive telephone calls anywhere by connecting with university-provided directory services. Convergence also reduces the need for maintaining separate cable plants for voice and video, and permits cost savings in some areas, particularly long-distance and international phone calls.

Rutgers should plan for and begin converging its networks to a single integrated voice/video/data network. If not already, then certainly in a few years, the network will become the most important and critical IT resource made available to residential and non-residential students, faculty, and

staff. It must maintain a high level of performance and meet the expanding demands that will be placed on it. This will require investments in the network to increase reliability, to protect against power failures and other environmental problems, and to increase the level of network support (e.g., 24x7 support services).

For this reason we suggest a two-pronged approach to convergence, including both long term and short term strategies:

- The ITECC should develop a transition strategy to a converged network, including changes to the network and network support that are needed to ensure success.
- Short term activities that support voice and video over the data network should take place. This will encourage individuals or departments to use technologies consistent with our long term directions of implementing a converged network, and will serve as a pilot for broader implementation.

Examples of some steps are listed below:

- Develop directory and gateway services permitting Rutgers to be part of Internet2 voice activities.
- Develop a supported approach to Voice over IP, for individuals or units that wish to pilot such a service.
- Develop plans to provide RU-tv and other video services via the data network. Making video available via the data network could greatly improve usability of video for research and instruction and make it available on the Camden and Newark campuses.

***Implementation strategy 5: Wireless deployment should be expanded, print stations should be located adjacent to wireless spaces, and a fee-for-print-services should be established.***

Proposed leadership: VP for IT

We believe that a university-wide plan for wireless deployment must be undertaken and supported for residential and non-residential students, faculty, staff. This plan should not only address wireless issues but also print capabilities. Technological trends make it clear that resources will become geographically distributed and not localized. Print stations should be deployed adjacent to wireless-capable public areas in a manner similar to how copying machines are deployed. Compared to our peers, Rutgers ranks in the bottom half in wireless deployment in classrooms, libraries, public labs, and student unions.

***Implementation strategy 6: Expand video capabilities throughout the university.***

Proposed leadership: VP for IT

The effective deployment of video technologies provides a basis for the way the university conducts its research, instructional, and administrative business. The use of video in research and instruction is expanding rapidly in both capability and future promise. It is particularly critical to Rutgers because of the distributed nature of its three main campuses and its numerous off-campus

facilities. Rutgers' video conferencing and streaming capabilities need to be upgraded to keep pace with its peer institutions some of which have been developing digital TV, video on demand, and related capabilities. A video conferencing server (i.e., a Multipoint Control Unit (MCU)) integrated with existing RUNet infrastructure could provide both high-quality video conferencing and services to departmental video conferencing units.

Rutgers needs to attain and maintain support for this important method of communication. Currently, video services are provided by multiple units throughout the university with different standards and approaches. We recommend that all central video services be provided by a single university-wide unit and that departments provide their own local support, in conjunction with this unit.

**Recommendation 2: Continue to maintain the distributed security model that requires both central computing services and business units to follow the same security framework.**

Because of the increasing importance of security, privacy, and data integrity, we recommend that the Infrastructure and Support Committee of the ITECC pay particular attention to these areas, with the assistance of a technical architecture committee for security, privacy, and data integrity. It is important that the university provide adequate resources and skilled staff to support the current distributed computing services and data security models. We must also continue to develop, refine, and monitor information security policies, procedures, and university wide standards for systems and networks.

***Implementation strategy 1: The university and all units must develop and implement disaster recovery and business resumption plans.***

Proposed Leadership: VP for IT

Planning for business continuity in the aftermath of a disaster is a complex task. Preparation for, response to, and recovery from a disaster affecting the administrative functions of the university or a unit requires the cooperative efforts of many organizations in partnership with the functional areas. All units should have a documented disaster recovery plan that details steps to perform in case of a major or minor disaster. These plans identify important IT services and how these services will continue in the event of various disaster scenarios. Outlining system backup procedures, including location of off-site storage facilities, is also an important part of any disaster recovery plan. Similarly, university communication in the event of a disaster must be addressed. The planning underway for providing an emergency website and communication mechanism is a good first step.

***Implementation strategy 2: Provide a cohesive, centrally managed identity management architecture that supports the evolution of system processes and services.***

Proposed Leadership: VPs for Undergraduate Education, Human Resources, and IT

Rutgers should establish a university wide identity management system capable of managing and identifying each individual/entity based upon the wide variety of roles utilized at this institution

for students, faculty, staff, and the rest of the university community. This system must also have a centrally managed infrastructure to authenticate people or servers seeking access to services and/or data.

**Recommendation 3: The Infrastructure and Support Committee of the ITECC should develop recommended approaches for system management and support.**

Proposed Leadership: CTO

- We recommend that OIT work with the Infrastructure and Support Committee of the ITECC to build communities of practice for technical staff around appropriate topics, e.g., desktop management and server administration. In particular, the Committee recommends the creation of a framework for developing technical architecture, involving a set of working groups that have both OIT and distributed staff.
- We recommend that OIT, working together with the new governance structure, develop ways for central IT staff to work more closely both with technical staff in units and with unit leadership, such as deans, directors, and key faculty members.
- We recommend investing in infrastructure for building distributed data applications. This includes areas such as services to provide secure access to data for distributed applications, identity management, authentication, and distributed security. It is critical that all departments and units that need central data are able to obtain it. Otherwise, they will continue to maintain their own duplicate databases, an extremely wasteful approach that is now the norm.

**Recommendation 4: A university-wide software collection development program should be implemented for instruction and research.**

Proposed Leadership: VPs for Undergraduate Education and Research

Software needs to be available to users on their desktop or laptop computers and not only in computer labs. We recommend that a university-wide software collection be developed and that that software be made available to users on any machine, including student owned machines. In addition, as vendors' licensing and pricing policies change, the university must evolve distribution and delivery mechanisms that efficiently and effectively manage these varied pricing and licensing options. Rutgers units should combine their buying power to improve general availability of software that meets instructional and research goals and provide evolving alternatives to deal with licensing and pricing. Budget support for a university-wide software collection could be obtained from a combination of funds from central, decanal, and departmental budgets, as well as student fees.

## Translating strategies into actions

This Strategic Plan is provided as a framework and guide for the strategies and priorities to be established by the ITECC and by units across the university. The divisions of the university, and the colleges and schools, will be encouraged to review and update their individual strategic plans in light of the priorities, initiatives, and action steps put forth in this Plan.

Accomplishing the goals of this ambitious Plan will require that:

- there be broad-based commitment to its aims and strategies by institutional leaders, faculty, and staff;
- specific responsibilities and timetables be assigned for implementing the initiatives and steps;
- strategies for resource allocations be established in support of Plan initiatives, and
- standards and a process for measuring progress be established.

With these requirements in mind, we propose to implement the Plan in alignment with the university's all-funds budgeting process as follows:

***Achieving Community Commitment.*** This Strategic Plan was developed through an intentionally broad consultative process. It is a community product representing our shared goals and our best judgment of the strategies needed to achieve them. It was drafted initially by a representative task force, which held frequent and in-depth discussions of goals and strategies. The draft is now being made available to all students, faculty, and staff, and will be modified in response to these discussions. The final version will be presented to the Executive VP for Academic Affairs, Senior VP for Administration and Chief Financial Officer for their review and endorsement.

***Implementation Assignments and Timetables.*** Each of the action steps will be assigned to a particular individual or group who will be responsible for overseeing its implementation and reporting regularly on progress. Those individuals charged with oversight will be asked to identify needed resources and to propose an implementation plan and a timetable for action. Where possible, the implementation plans will identify specific measures for monitoring progress towards the stated goal.

***Resource Allocations.*** Resource allocations are beyond the purview of this committee. Senior university administrators, based on the recommendations of the ITECC, must make decisions about the relative importance of IT as compared to other university expenditures, and act accordingly.

***Measuring Progress.*** Progress toward the goals of this plan will be reported regularly by the ITECC to the Executive VP for Academic Affairs, Senior VP for Administration and Chief Financial Officer, and the university community. Continued funding for projects will be requested only if progress has been made toward their goals.

## Attachment A: Glossary of Terms

|         |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AAU     | American Association of Universities          | The AAU currently consists of sixty American universities and two Canadian universities. The association serves its members in two major ways. It assists members in developing national policy positions on issues that relate to academic research and graduate and professional education. It also provides them with a forum for discussing a broad range of other institutional issues, such as undergraduate education. |
| --      | All funds budgeting                           | At Rutgers, all budgeting is done through EVP Furmanski's office on an annual cycle. This new budgeting process will be strategically based, with funding directed to academic initiatives of the highest priorities.                                                                                                                                                                                                         |
| Bb      | Blackboard                                    | Course management system.                                                                                                                                                                                                                                                                                                                                                                                                     |
| Centrex | Central Office Exchange Service               | A type of PBX service in which switching occurs at a local telephone station instead of on the university premises. Typically, the telephone company owns and manages all the communications equipment necessary to implement the PBX and then sells various services to the university.                                                                                                                                      |
| --      | Coeus                                         | A grants management system created at MIT to assist offices of sponsored programs, departments, and laboratories in proposal development and pre- and post-award grants management                                                                                                                                                                                                                                            |
| --      | Converged network                             | Integration of voice and video into the IP-based network                                                                                                                                                                                                                                                                                                                                                                      |
| CIO     | Chief Information Officer                     | Individual responsible for providing university-wide IT strategic planning and technical leadership of instructional, research, and administrative computing, telecommunications, and both central and distributed information technology usage.                                                                                                                                                                              |
| CMS     | Course management system                      | System of software that facilitates teaching and learning.                                                                                                                                                                                                                                                                                                                                                                    |
| CTO     | Chief Technology Officer                      | Chief technology advisor to CIO, Executive VP for Academic Affairs, Senior VP for Administration and Chief Financial Officer.                                                                                                                                                                                                                                                                                                 |
| --      | Dark fiber                                    | Refers to unused fiber-optic cable. Often, more lines than needed are laid down in order to curb costs of having to do it again. The dark strands can be leased to others who want to establish optical connections among their own locations.                                                                                                                                                                                |
| DCEO    | Division of Continuous Education and Outreach | Office at Rutgers that provides services such as off-campus courses, online courses, academic video services, and summer and winter session courses.                                                                                                                                                                                                                                                                          |
| --      | eCollege                                      | Company that provides the course management systems, eCourse and eCompanion.                                                                                                                                                                                                                                                                                                                                                  |
| --      | Educause                                      | Nonprofit association with a mission to advance higher education by promoting the intelligent use of IT                                                                                                                                                                                                                                                                                                                       |

|       |                                                         |                                                                                                                                                                                                                                                                                                                                                                 |
|-------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ERP   | Enterprise Resource Planning                            | ERP systems attempt to integrate all departments and functions across an organization onto a single computer system that can serve all of the organizations' particular needs.                                                                                                                                                                                  |
| EVP   | Executive Vice President                                | At Rutgers, the EVP for Academic Affairs is Philip Furmanski. He reports directly to President McCormick.                                                                                                                                                                                                                                                       |
| HPC   | High performance computing                              | General term used to describe supercomputing across various technologies such as cluster computers, massively parallel processing computers, and grid computing.                                                                                                                                                                                                |
| I2    | Internet2                                               | A consortium of 207 universities and 48 affiliate members including museums, libraries, and non-profit corporations that work together with industry and government to develop the next generation of network applications and technologies that can take advantage of significantly higher bandwidth than today's Internet.                                    |
| IP    | Internet Protocol                                       | An IP address is a unique number that devices such as routers, computers, servers, and some telephones use in order to identify and communicate with each other on a network utilizing the Internet Protocol standard.                                                                                                                                          |
| IT    | Information Technology                                  | Any equipment or interconnected system or subsystem of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information. The term information technology includes computers, servers, telecommunications, software, and services. |
| ITECC | Information Technology Executive Coordinating Committee | Used at Rutgers to describe a proposed IT governance structure.                                                                                                                                                                                                                                                                                                 |
| ITPGC | Information Technology Project Governance Committee     | Used at Rutgers to refer to a committee charged to establish priorities for allocating central administrative computing resources. If this strategic plan is adopted, the ITPGC will be folded into the ITECC.                                                                                                                                                  |
| --    | Middleware                                              | Software designed to integrate separate software and/or hardware systems. Middleware provides the communication between the separate systems.                                                                                                                                                                                                                   |
| MIT   | Massachusetts Institute of Technology                   | --                                                                                                                                                                                                                                                                                                                                                              |
| NLR   | National Lambda Rail                                    | A major initiative of U.S. research universities and private sector technology companies to provide a national scale infrastructure for research and experimentation in networking technologies and applications. NLR aims to catalyze innovative research and development into next generation network technologies, protocols, services, and applications.    |

|        |                                                                      |                                                                                                                                                                                                                   |
|--------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NCSA   | National Center for Supercomputing Applications                      | Located at the University of Illinois, NCSA enables the advancement of scientific discovery and the state-of-the-art in engineering and other research activities that depend on advanced computing technologies. |
| NIH    | National Institutes of Health                                        | The primary Federal agency for conducting and supporting medical research.                                                                                                                                        |
| NSF    | National Science Foundation                                          | An independent federal agency created "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense..."                                            |
| OIRT   | Office of Instructional and Research Technology                      | Office within OIT that provides IT services in support of instruction and research.                                                                                                                               |
| OIT    | Office of Information Technology                                     | Rutgers' central IT organization.                                                                                                                                                                                 |
| --     | Oracle                                                               | Company that provides, among other things, ERP systems. The Rutgers RIAS Purchasing system is based on Oracle technology.                                                                                         |
| PBX    | Private Branch Exchange                                              | A private telephone network used within an enterprise. Users of the PBX share a certain number of outside lines for making telephone calls external to the PBX.                                                   |
| RBS    | Rutgers Business School                                              | --                                                                                                                                                                                                                |
| RIAS   | Rutgers Integrated Administrative System                             | Rutgers' ERP system.                                                                                                                                                                                              |
| --     | Sakai                                                                | A community source software development effort to design, build and deploy a new collaboration and learning environment for higher education. Rutgers began pilot testing Sakai in 2005.                          |
| SCILS  | School of Communication, Information, and Library Studies at Rutgers | --                                                                                                                                                                                                                |
| UMD NJ | University of Medicine and Dentistry of New Jersey                   | --                                                                                                                                                                                                                |
| VP IT  | Vice President for Information Technology                            | aka CIO                                                                                                                                                                                                           |
|        | WebCT                                                                | Course management system.                                                                                                                                                                                         |



## Attachment B: Committee Membership

### Leadership team

|                 |              |                                           |
|-----------------|--------------|-------------------------------------------|
| <b>McKay</b>    | <b>Mike</b>  | Office of Information Technology (OIT)    |
| <b>Director</b> | <b>Steve</b> | School of Mgmt and Labor Relations (SMLR) |
| Brown           | Marcia       | Provost's Office – Newark (through 11/05) |
| Falk            | Rick         | Mathematics– NB/P                         |
| Knight          | Doyle        | Mech.& Aerospace Engineering– NB/P        |
| McCrea          | Doug         | Rutgers College (beginning 12/05)         |
| Rivera          | Rosa         | Business Services Camden                  |
| Smith           | Don          | Computer Science – NB/P                   |
| Ginder          | Bernice      | OIT                                       |
| Hedrick         | Chuck        | OIT                                       |
| Mundrane        | Michael      | OIT                                       |
| Sanders         | Joe          | OIT                                       |
| Stein           | Gayle        | OIT                                       |
| Williams        | Dorothy      | OIT                                       |

### Teaching and Learning subcommittee

|              |            |                                           |
|--------------|------------|-------------------------------------------|
| <b>Smith</b> | <b>Don</b> | Computer Science – NB/P                   |
| Dahle        | Greg       | Student representative                    |
| Delaney      | Joseph     | Center for Advancement of Teaching – NB/P |
| Gigliotti    | Gary A.    | Center for Advancement of Teaching – NB/P |
| Golden       | Gary       | Rutgers Univ. Libraries (RUL) Camden      |
| Ludescher    | Richard D. | Food Science – NB/P                       |
| Novak        | Richard J. | Division of Continuous Ed. & Outreach     |
| O'Donnell    | Angela     | Graduate School of Education – NB/P       |
| Oppenheim    | Rosa B     | Business School – Newark                  |
| Rowe         | Betsy      | Office of Academic Technology – Newark    |
| Taylor       | Shawn      | Rutgers Learning Center – NB/P            |
| Vosseler     | Thomas J.  | Faculty of Arts and Sciences (FAS)/NB     |
| Wood         | Robert E.  | Sociology – NB/P                          |

### Research subcommittee

|               |              |                                             |
|---------------|--------------|---------------------------------------------|
| <b>Knight</b> | <b>Doyle</b> | Mech. & Aerospace Engineering – NB/P        |
| Berman        | Helen        | Chemistry – NB/P                            |
| Davis         | Diane        | Inst. for Health, Health Care Policy – NB/P |
| Dilalo        | Gregory      | Cook College – NB/P                         |
| Hanson        | Stephen      | Psychology – NB/P                           |
| Kantor        | Paul         | Information Science – NB/P                  |
| Kotliar       | Gabriel      | Physics – NB/P                              |
| Levy          | Ron          | Chemistry – NB/P                            |
| Morrison      | Camie        | Grant & Contract Accounting – Camden        |
| Mullins       | Lynn         | RUL – Newark                                |
| Pai           | Dinesh       | Computer Science – NB/P                     |
| Stenchikov    | Georgiy      | Environmental Science – NB/P                |

**Public Service and Life subcommittee**

|               |                 |                                                 |
|---------------|-----------------|-------------------------------------------------|
| <b>Brown</b>  | <b>Marcia</b>   | Provost’s Office - Newark (chair through 11/05) |
| <b>McCrea</b> | <b>Douglass</b> | Rutgers College – NB/P (chair beginning 12/05)  |
| Daisy         | Mary B.         | Provost’s Office - Camden                       |
| Freidrich     | Gustav          | School of Comm., Info., and Library Studies     |
| Hill          | Diane           | Campus Information Services (CIS) - Newark      |
| Holloman      | Darryl          | FAS - Newark                                    |
| Logue         | Marie           | Rutgers College – NB/P                          |
| Lu            | Haitian         | Student representative                          |
| Pitts         | Delia           | Office of Student Affairs – NB/P                |
| Weismantel    | Matthew         | CIS – NB/P                                      |

**Business Service/Enterprise Systems subcommittee**

|               |             |                                  |
|---------------|-------------|----------------------------------|
| <b>Rivera</b> | <b>Rosa</b> | Business Services - Camden       |
| Brancato      | Patricia    | Human Resources                  |
| DiPaolo       | Steve       | University Controller            |
| Drumheller    | Jim         | Human Resources                  |
| Fensterheim   | Devin       | Student representative           |
| Knight-Cole   | Carolyn     | Human Resources                  |
| Lige          | Judy        | Mathematics – NB/P               |
| Martin        | Ann         | FAS - NB                         |
| Rash          | Jean        | Financial Aid                    |
| Rimal         | Sanjana     | Business Services - Newark       |
| Rose          | Brian       | Office of Student Affairs – NB/P |
| Ryan          | Tom         | Law School - Camden              |
| Stein         | Tim         | University Controller’s Office   |
| Torres        | Aida        | Provost’s Office - Newark        |
| Woodward      | Donald      | School of Pharmacy – NB/P        |

**Governance subcommittee**

|             |             |                                     |
|-------------|-------------|-------------------------------------|
| <b>Falk</b> | <b>Rick</b> | Mathematics – NB/P                  |
| Boyle       | Jeanne      | RUL                                 |
| Crown       | Warren      | Graduate School of Education – NB/P |
| Hedrick     | Charles     | OIT                                 |
| Hirsh       | Haym        | Computer Science – NB/P             |
| Kennedy     | Les         | School of Criminal Justice - Newark |
| Martancik   | Carol       | Human Resources                     |
| Rabinowitz  | Sam         | School of Business - Camden         |
| Russell     | Sandy       | Human Resources                     |
| Szymanski   | Heidi       | Budget Office – NB/P                |

**Other OIT staff**

|            |          |                    |
|------------|----------|--------------------|
| Botticelli | Marie    | OIT                |
| Gerdes     | Robert   | OIT                |
| Gordon     | Colleen  | OIT                |
| Grzelak    | Tom      | OIT                |
| Gwalthney  | David    | OIT                |
| Harth      | Cheryl   | OIT                |
| Krisanits  | Lorraine | OIT (retired 2/06) |
| Sisco      | Pam      | OIT                |
| Work       | Galen    | OIT                |

## **Attachment C: Previous Planning Documents**

### **Rutgers Reports**

- Campus Autonomy Planning. June 19, 2003
- Strategic Plan for RUCS. September 11, 2002.
- Administrative Use of Email Lists. October 28, 1997.
- Committee on Computing and Information Planning Report. Spring, 1992
- Instructional Computing Initiative initial planning document. September, 1993.
- RUNet 2000 Phase 1 and 2 planning documents. 1996-2002.
- Committee on Computing and Information Planning Report. 1991.

### **ECAR (Educause Center for Applied Research) reports:**

- An Architecture for Evolving IT Customer Service, July 2005, Research Bulletin.
- Network Funding Models: Cornell University, U. of California at San Diego, and U. of Wisconsin - Madison, ECAR Case Study 1, 2005.
- Developing an Institutional Perspective on the Information Technology Function: The Case of Cornell University, ECAR Case Study 8, 2004.
- Information Technology Funding in Higher Education, Research Study Vol 7, 2004.
- Using an IT Governance Structure to Achieve Alignment at the University of Cincinnati, ECAR Case Study 4 2004.
- Information Technology Alignment in Higher Education, Research Study vol.3, 2004.
- Enterprise-wide System Implementation at Multi Campus Institutions, Research Bulletin, February 2005.
- Information Technology Networking in Higher Education: Campus Commodity and Competitive Differentiator, Research Study 2005.
- “A Different Kind of ERP” Extending and Renewing Legacy Systems Enterprise Resource Planning Systems in Higher Education Enterprise Systems at Three University Systems: California State, U. System of Georgia and U. of Wisconsin System.
- Federating Identity Management: Standards, Technologies and Industry Trends  
The Promise and Performance of Enterprise Systems in Higher Ed  
Total Cost of Ownership: A Strategic Tool for ERP Planning and Implementation.

### **Key Interviews with CIOs**

Fred Siff, VP and CIO, University of Cincinnati (April 7, 2005)

Marilyn McMillan, CIO, NYU (April 12, 2005)

Jim Davis, Associate Vice Chancellor IT UCLA (April 15, 2005).

### **IT Strategic Plans from more than 50 institutions**