# Information Technology Support for Activities Examined as Part of the 2008 Middle States Commission Accreditation at Rutgers, The State University of New Jersey

Report prepared for the Rutgers Middle States Accreditation Self Study team by the Office of Information Technology (OIT).  Submitted February 19, 2007; edited version of March 5, 2007.

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## *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.[1]*

Information technology (IT) is a key strategic asset of the university as we move forward into the 21st 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 the need for integrated, pervasive IT environments by the entire university community.

The principles listed below are statements of direction related to IT and its ability to help the university achieve its strategic goals:

- All faculty, staff and students should 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 should 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 should 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, should be improved and expanded due to the availability of appropriate technology-equipped classroom facilities, instructional technologies, and support for faculty and students.

- Administrative support for the academic mission should be enhanced by employing IT to enhance business process effectiveness and efficiency.

This document includes information necessary for understanding how IT is used at Rutgers to support the standards set by the Middle States Commission on Higher Education. It should be viewed as illustrative, but not necessarily comprehensive. The report also contains information about activities suggested by the 1998 review committee, as well as comparisons of IT availability and use at peer institutions.[2]

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[1]*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.*

[2]*Peer institutions include: Indiana U., Iowa State U., Michigan State U., Purdue U., Texas A&M U., U. California-Berkeley, U. California-San Diego, U. Florida, U. Illinois-Urbana-Champaign, U. Iowa, U. Maryland, U. Michigan-Ann Arbor, U. Minnesota, U. North Carolina-Chapel Hill, U. Texas-Austin, U. Virginia, U. Washington, U. Wisconsin-Madison. Comparative data from the 2005 Educause Core Data Survey.*

## *Major IT activities that have occurred since the 1998 Middle States accreditation process*

Rutgers has made major strides in using its strengths in IT to address some of the concerns expressed by the 1998 accreditation team. The IT portion of their final report is contained in Attachment A.

The report spoke about the central IT organization that existed at that time, Rutgers University Computing Services (RUCS). This organization provided central administrative, telecommunications, and security services, as well as campus-based support services. Its executive director was Michael V. McKay, who was appointed to this position in 1999. During his tenure, Rutgers was able to address many of the issues raised during the 1998 Middle States accreditation process.

At that time, the committee was concerned about several different IT areas, including:

1. Funding for RUNet2000, the new data, video, and voice network being built at Rutgers. The ongoing cost of operating and maintaining the network.
2. The ability of the university's legacy administrative systems to support new business practices.
3. Support for the expanded instructional computing capabilities.
   a. Coordination for development of instructional applications. No single point of coordination, leadership, and accountability currently exists.
   b. Funding for innovation in instructional technologies.
   c. Diffusion of innovation and good practices throughout the university, particularly in the area of instructional technology.
   d. The speed with which Rutgers is articulating a mission and goals for distance education, especially in the area of professional education.

Committee suggestions included:

1. Attention to the people side of technology initiatives through training and faculty and staff development to maximize effectiveness and support academic priorities such as learner-centered instructions.
2. Planning for a replacement, upgrade, and ongoing operation strategy for the RUNet 2000 network.
3. Careful priority setting and investment strategies to create new instructional applications.
4. Development of a university-wide information technology advisory council and more formal mechanisms for linking other technology committees and task forces to this university-wide council.

Much has been done in the past ten years to address these concerns.  In 1997, the Rutgers Board of Governors endorsed a multi-year plan (Attachment B) for administrative computing that called for expanded use of web technology to leverage existing business systems. To this end, numerous new web applications were released over the past ten years aimed at improving services for current and prospective students, faculty, staff, and administrators. The conversion of administrative systems to

address Year 2000 issues was also accomplished during this timeframe as was the creation of the Rutgers Integrated Administrative System, being developed in stages with the procurement system rolled out as the first module. A list of current, web-based administrative services and their utilization can be found in Attachment C.

The $100 million RUNet 2000 project successfully connected most buildings to a high speed, robust, and reliable network. All residence halls and classroom buildings were wired as were many other facilities.  While, there are still a number of buildings that are not connected, the majority of them are either small, remote locations that require a very high marginal cost per additional user or are used for warehousing, farming, or other activities that do not require a network. This began a transformation in the manner in which faculty and students communicate—a transformation that is still occurring today. A summary of the outcome of the RUNet 2000 project can be found in Attachment D. The costs of upgrading and maintaining the network, often referred to as network evergreening, has been addressed through an ad hoc, one time funding model. The sustainability of the network is in question if this funding model continues.

During the past ten years, the organizational structure of IT has evolved.  Today the Office of Information Technology under the leadership of a vice president for information technology, with responsibilities for administrative systems, campus computing, telecommunications, and a new area, instructional and research technology, reports to the senior vice president for administration and chief financial officer.  As part of the new mission for the vice president for information technology, coordination of some of the efforts of the distributed computing organizations at the university with what was happening in the central organization began, including better coordination of IT hardware and software procurement. This process is ongoing.

It should be noted that significant funding has been provided by the university's central administration for projects of strategic importance to Rutgers, including the multi-year plan for creation of web-based administrative services and funding to create the Rutgers network. Budgetary exigencies have not allowed for a multi-year plan for funding instructional technology, a key recommendation of the 1998 Middle States evaluation.

## *IT and 2008 Middle States Commission on Higher Education standards: Institutional context*

## Standard 1: Mission and Goals

*The institution's mission clearly defines its purpose within the context of higher education and indicates who the institution serves and what it intends to accomplish. The institution's stated goals, consistent with the aspirations and expectations of higher education, clearly specify how the institution will fulfill its mission. The mission and goals are developed and recognized by the institution with the participation of its members and its governing body and are used to develop and shape its programs and practices and to evaluate its effectiveness.*

**Context:**
…Goals should be sufficiently flexible for the institution to be able to respond to internal and external opportunities and changes, including emerging academic disciplines, changes within disciplines, and the use of new instructional methods and technologies.

**Rutgers:**
In 2004, the Office of Instructional and Research Technology (OIRT) was created (Attachment E) to assist faculty in using IT in their teaching and research in as effective a way as is occurring at peer institutions, where central support is the norm.

Before OIRT was established, research computing was the domain of individual departments, with little cost sharing and coordination. The establishment of OIRT was an attempt to make Rutgers more like its peers in this area. In 2006, the National Science Foundation sponsored a workshop on "Effective Approaches to Campus Research Computing Cyberinfrastructure," attended by Rutgers and representatives from eleven of our peers. The workshop afforded the opportunity for universities to detail their research computing support models, the majority of which had well-organized research computing units that worked for or closely with traditional central IT services. The number of staff was typically 10-25 (Rutgers has two full time staff and a part time student working in this area) and in some cases, as high as 50. The focus of these campus-wide research computing units is mainly upon providing co-location facilities, secure server administration, and high performance computing grid and cluster resources.

Chief information officers from Purdue, MIT, Georgetown, USC and Arizona State discussed critical needs for building centralized research computing support:

- researchers require assistance with increasing needs and complexity of tools and procedures.

- centralized research computing provides efficient facilities, effective systems management, and manageable security.

- growth opportunities and initiatives for resources and staff emerge from researchers who are brought together by their participation in a central resource.

The University of Wisconsin-Madison has a distributed research computing effort very similar to that found at Rutgers. At a recent National Science Foundation workshop, a presentation by University of Wisconsin IT staff described their distributed computing model and its weaknesses

relative to campus cyberinfrastructure. Their model has contributed to the situation where most departments operate their own datacenters with varying degrees of systems expertise and managerial skill. Duplicate efforts, inability to maintain facilities in the long term, etc. contribute to a tremendous scale of inefficiency. Many of the services University of Wisconsin staff provide are fully auxiliary-supported. This has hindered their ability to build a relationship with researchers (i.e., needing to ask for up front funding). The institution considers its model to be inconsistent with campus cyberinfrastructure goals and is actively developing central research computing resources similar to those described at other institutions. Rutgers has developed a proposal for an auxiliary research programming group, as a first step, but based on what was found at University of Wisconsin and other universities is aware that much more will be needed.

Nevertheless, with the establishment of OIRT, Rutgers has been able to significantly increase faculty support for use of instructional technologies, which have moved from being experimental technologies used by a small number of leading - edge faculty to a standard feature in instruction. Before OIRT, support units on individual campuses made independent decisions about which software to make available and to support, a situation that is likely to change as technology needs increase.

Course management systems (CMS) form the backbone for many instructional technology-based activities. These systems typically have the following advantages:

- Access to much of the material from home, something particularly important to students in professional programs and others who are not resident on campus.

- Improved communication with faculty and other course members: Some Rutgers faculty report that in large classes students who are reluctant to speak in class will interact electronically.

- Ability to more easily provide detailed feedback, both through graded homework and through easier ability to pass multiple drafts of assignments between students and faculty.

- Ability to review material outside of class.

- Opportunity to include many instructional tools, such as podcasts, Library eReserve materials, simulations, blogs, wikis, and ePortfolios in one place.

Currently, about 1,800 courses are using CMS systems (about 19% of all Rutgers courses) with enrollments totaling nearly 75,000 (about 37% of total enrollment). Use is seen in virtually all disciplines at the university. This does not include some of the local systems that departments may be using, such as the home grown system used by Camden Law School for example.

The first centrally-supported CMS at Rutgers was WebCT. It was made available during the Spring semester of 1998, with 91 courses. By the Spring of 2006, usage had grown to 547 courses with 12,812 active users. WebCT has been available to the entire university, but is used primarily on the New Brunswick/Piscataway and Camden campuses. Systems support is supplied by OIRT. Faculty support is provided by campus-based organizations: the Center for Advancement of Teaching (CAT) on the New Brunswick/Piscataway campus and Instructional Design and Technology (IDT)

on the Camden campus. Rutgers will be decommissioning WebCT during FY08 due, in part, to the significant cost of upgrading the system and the unlikelihood of its availability in the future (Blackboard, another CMS system, recently purchased WebCT).

The Newark Campus is currently using Blackboard, supported by OIT-Newark and the Office of Academic Technology (OAT). Although initially purchased for use by the Business School, in the Fall of 2004, it was made available to the entire Newark Campus. During the first semester, it was used by 184 courses and 3,000 students. The Blackboard implementation received strong support from the Newark Provost, and was accompanied by faculty support resources.

eCourse, available through the Rutgers Division of Continuous Education and Outreach, was initially intended to support fully online courses. A companion system, eCompanion, was made available for on-campus courses on all three campuses.

During the Fall of 2005, OIRT ran a pilot of a new course management system, Sakai. Sakai is an anytime, anywhere online collaboration system that can be used to support courses, research projects, committees, and any other group or individual looking for a place to store materials, have online discussions, announce new activities, and keep track of activities and assignments. It is currently being supported by OIRT, CAT, and IDT.

Sakai is an open source system, in which many institutions are involved in development (founding members include U. California-Berkeley, MIT, Indiana U., and Stanford U). It is unique among CMSs in that it can be customized it to fit an individual institution's needs. More than with any other platform, it can be altered to work with existing Rutgers administrative and computing systems, potentially easing the administrative tasks of managing a course's web site. Beyond administrative details, unique instructional tools can be developed or added to Sakai to support individual disciplines — without the need to wait for a corporation to work the tool into their existing product on their own timeline.

While customization is useful, the most important feature of Sakai is its ability to support collaboration. It supports research groups, is used for committee work, and allows students to innovate and engage in their own education. Sakai turns the traditional course web site on its head, allowing the students to be as involved in the creation of the course web site as the faculty are (at the faculty's discretion). This is where a real transformation of teaching and learning can take place. The 400-student lecture can be shaken from its movie-theater style presentation mode to a dynamic community of small groups. The students themselves can create the web pages, discussion boards, document sharing areas, and online chats.

By supporting Blackboard, eCompanion/eCourse, Sakai, and WebCT, Rutgers is in the minority within its peer group, which includes Indiana, Ohio State, Purdue, UCLA and others (see Attachment F for a complete list), in supporting multiple CMSs (5% of institutions); 53% support a single commercial CMS and 16% support a homegrown CMS. Comparative, normalized course data about CMS use at Rutgers in FY06 can be found in the table below:

| | **Number of courses** | | | | | |
| | **Blackboard** | **eCompanion** | **eCourse** | **Sakai** | **WebCT** | **Total** |
|---|---|---|---|---|---|---|
| Camden | 0 | 13 | 1 | 61 | 37 | 112 |
| Newark | 709 | 16 | 14 | 0 | 2 | 741 |
| New Brunswick/ Piscataway | 95 | 204 | 25 | 436 | 159 | 919 |
| TOTALS | 804 | 233 | 40 | 497 | 198 | 1,772 |

The total number of courses using a CMS represents about 19% of all Rutgers courses.

In September, 2005, the University Senate recommended that the university move in the direction of supporting one CMS. It stated that both faculty who are knowledgeable about CMS' and those not currently using course management systems should be involved in the selection process, and both should be given the opportunity to specify the features they would deem necessary for any CMS that they would be likely to use. President McCormick concurred.

Regardless of the number of CMSs an institution has, faculty support is critical. Faculty are experts in their disciplines, not necessarily in the application of technology to teaching. Instructional designers, who work directly with faculty to assist in applying technology to teaching, are therefore, crucial if technology is going to move from early adopters to the rest of the population.

For central faculty support, we estimate that there is 1 FTE on the Camden campus, 2 FTE on the Newark campus, and 2.5 FTE on the New Brunswick/Piscataway campus. This is in addition to systems staff used to support Blackboard (1), WebCT (1.5 FTE), and Sakai (2.5 FTE). Based on the number of faculty and courses, the New Brunswick/Piscataway campus should have about 10 FTEs devoted to faculty support to be equivalent to the current support level in Camden and Newark. Even with this number of staff, Rutgers would be behind its peers where between 12 and 20 staff work in the central organization. However, as discussed below under Standard 11, this disparity is offset by decentralized distribution of IT staff among units on all three campuses.

In addition to collaboration systems, both instruction and research require specialized software. Rutgers supplies site licensed software for the community, both for individual, Rutgers-related activities and for use in the OIT computer labs. The software is selected based on a combination of purchase patterns and the expressed needs of faculty and students. A new, systematic "software collection development program" is helping to address the needs for purchasing software for the institution in an all-funds budgeting environment. Through this system, Rutgers has been able to purchase a mathematics software program, Maple, which, because of its availability in the computer labs, is readily available to students. A similar situation can be seen for Mathematica (mathematics software), Chem Draw, a chemistry drawing program and RefWorks (bibliographic software).

In FY01 (the earliest year for which data is available), 66 different software products were sold or downloaded under university-funded site licenses, primarily for faculty and staff. In FY06, more than 150 software products were site licensed. Purchasing and downloading of this software was made easier at the time through the development of an online "software portal."

Providing site licensed software has had one additional and significant instructional benefit – students and faculty now have ready access to standardized, discipline specific software allowing for increased use in courses.

## Standard 2: Planning, Resource Allocation, and Institutional Renewal

*An institution conducts ongoing planning and resource allocation based on its mission and goals, develops objectives to achieve them, and utilizes the results of its assessment activities for institutional renewal. Implementation and subsequent evaluation of the success of the strategic plan and resource allocation support the development and change necessary to improve and to maintain institutional quality.*

**Context:**
Institutions often have a variety of plans, including not only an institutional (strategic) plan but also …[a] technology plan.

**Rutgers:**
At Rutgers, as at 84% of its peers, an Information Technology (IT) strategic plan has been developed to guide the institution in its use of IT (finalized in 2006 – can be found as Attachment G). Thanks to the input of many members of the Rutgers community, and through an extensive strategic planning process, Rutgers identified the direction that IT should take to most effectively use IT to help the institution achieve its goals. The IT strategic goals are summarized below:

- 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.

In addition to stand alone Information Technology (IT) plans, IT is included in the university's strategic plan at 64% of our peers. This has been the case in the past at Rutgers, and IT support is clearly enunciated in the university's "Transforming Undergraduate Education" report, which states that:

> *We are particularly intrigued by the role that IT can play in creating learning environments that best support our undergraduate mission. IT can help in managing large classes (such as by providing course-support technology, supplying instructors with student-photo rosters, etc.), in supporting commuters (such as by providing Internet access to services to avoid in-person visits, facilitating use of the campus bus system through whereismybus.com, etc.), in helping students make course decisions*

*(such as making teacher evaluations, syllabi, and other resources available online), and so on. We look forward to the recommendations of the Information Technology Strategic Planning Committee's subcommittee on instruction, which is explicitly assessing the roles that IT can play in Rutgers' educational mission. We also strongly believe that the university's Advisory Committee on Instructional Computing process was exemplary in how it used faculty to assess IT funding priorities, and we encourage the university to use this process as a model for faculty participation in other administrative decision-making. The Information Technology Strategic Planning Committee's subcommittee on governance is considering structural and procedural mechanisms that can support broad participation by the university community in decisions concerning IT and its impact on our university's missions, and we thus look forward to their recommendations as well*

## Standard 3: Institutional Resources

*The human, financial, technical, physical facilities and other resources necessary to achieve an institution's mission and goals are available and accessible. In the context of the institution's mission, the effective and efficient uses of the institution's resources are analyzed as part of ongoing outcomes assessment.*

**Context 1:**
The effective use of institutional resources, internal and external, is crucial to institutional performance. While for some institutions, a significant portion of available resources is generated and monitored at the system level, institutional management of resource acquisition and utilization significantly contributes to the effectiveness of planning, goals achievement, mission success, and institutional integrity. Institutional support resources including financial, facilities, equipment and supplies, technology, research and instructional support and staffing, and other assets should be an integral and proportional part of all institutional planning, allocation, and assessment activities.

**Rutgers 1:**
Funding for central IT services at Rutgers comes from a variety of revenue, including university funds (63%), student computing fee funds (15%), and fee-for-service funds (21%). At peer institutions, the averages are 51%, 3%, and 32% respectively. Additional funding sources at peer institutions but not at Rutgers includes: capital appropriations, fee-for-service to external clients, and computer store sales. Approximately the same amount of funds supports distributed services as supports central services.

Much of the student computing fee funding is used to support student computing labs and hands-on computing classrooms; use data follows:

| | Number of centrally-supported student computing labs | | | | | | Number of centrally-supported hands-on computing classrooms | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # of labs | | % use | | Total seats | | # of classrooms | | % use | | Total seats | |
| | '98 | '06 | '98 | '06 | '98 | '06 | '98 | '06 | '98 | '06 | '98 | '06 |
| Camden | 8 | 13 | 40 | 85 | 170 | 205 | 1 | 5 | 20 | 70 | 36 | 149 |
| Newark | 13 | 14 | NA | NA | 289 | 291 | 5 | 6 | 42 | 55 | 143 | 155 |
| New Brunswick/ Piscataway | 16 | 15 | NA | 85 | 941 | 869 | NA | 13 | NA | 85 | NA | 364 |

Other student computing fee funds, as well as university funds, are used to support smart/enhanced classrooms. These rooms generally contain IT equipment and network connections that permit faculty to use technology while they are teaching, and not just as supplementary material. Rutgers has been working diligently to try to outfit, upgrade, and maintain as many of these rooms as possible; data about the use and technology in classrooms follows:

| | Number of centrally-supported smart/enhanced classrooms | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | % smart of total classrooms | | % use | | % wired | | % wireless | | Laptop carts | | Audio capture | | Audio & video capture | |
| | '98 | '06 | '98 | '06 | '98 | '06 | '98 | '06 | '98 | '06 | '98 | '06 | '98 | '06 |
| Camden (52 total classrooms) | NA | 100 | NA | 100 | NA | 100 | NA | 50 | NA | 3 | NA | 0 | NA | 5 |
| Newark (100 total classrooms) | NA | 100 | NA | 90 | NA | 100 | NA | 100 | NA | 0 | NA | 3 | NA | 3 |
| New Brunswick/ Piscataway (288 total classrooms) | NA | 45 | 67 | 67 | NA | 100 | 0 | 46 | 0 | 0 | 24 | 60 | 0 | 0 |
| Mean of peers | NA | NA | NA | NA | NA | 92 | NA | 54 | NA | NA | NA | NA | NA | NA |

Infrastructure improvements are necessary, but use of the infrastructures is highly dependent on individuals who can support them and assist faculty and students in their use. Because of this, central IT funding has been moved from non-salary budgets to the hiring of part-time staff to assist faculty and others who want or need assistance. This has left less funding for purchasing new software, equipment and testing new information technologies, a trend which, if it continues, will affect the university's ability to move forward in adopting new technologies.

A major change can be seen when comparing the salary and non-salary budgets of the central organization over the past 10 years. In 1998, 66% of the state central funding was used for salaries; today, that number is 71%. The reduction in non-salary monies has had a great impact on the central organization's ability to replace equipment, provide training for technical staff and invest in new technologies.

**Context 2:**
An accredited institution is expected to possess or demonstrate an educational and other equipment acquisition and replacement process and plan, including provision for current and future technology, as appropriate to the educational programs and support services, and evidence of implementation.

**Rutgers 2:**

The four year, $100 million RUNet 2000 project began in 1999. Its goal was to:

- Expand university's external telecommunications infrastructure to interconnect 500 buildings
- Upgrade network to permit high-speed data transport, interactive video transmitting, and improved voice applications
- Install wiring and electronics in the interiors of 260 campus buildings to support data, video, voice, and multimedia
- Begin operation of private university-wide video network
- Connect Rutgers with other educational institutions across the state and nation.

The project resulted in a significant upgrade of the Rutgers network, as shown below:

|  | 1998 | 2006 |
| --- | --- | --- |
| Bandwidth to the Internet | 18 Mbps | 622 Mbps |
| Bandwidth to Internet2 (research network) | NA | 622 Mbps |
| Fiber optic backbone (miles) | 40 | 100 |
| Interconnected buildings | 275 | 320 |
| Faculty/staff connected to RUNet | 5,500 | 10,000 |
| Residential students connected to RUNet | 5,000 | 14,600 |
| Devices connected to RUNet | 18,000 | 53,000 |

Funding for the project came from a number of sources, including state monies, federal grants, and student and university funds. It was, however, one time funding—funding for evergreening was not included and has not been provided since the completion of the project, a common situation at 42% of Rutgers' peers. As much of the network equipment installed as part of RUNet 2000 is reaching the end of its useful life, funds must be found in order for the network to continue to operate reliably. Since most academic and administrative work is done today across the network, this need is crucial.

The university and state have provided one time funding for other types of IT equipment, also. The Equipment Leasing Fund (ELF) provided $5,675,400 for IT, Libraries and Networking purchases in 2000 and the Higher Education Facilities Trust (HEFT) provided $1,125,000. Again, maintenance funding has not been made available, even though included as part of each proposal. To address this issue, the central computing organization has used some of its non-salary dollars, which are then unavailable for new service development.

Small pilot projects were initiated in other networking areas. The Rutgers telephone system is a collection of different voice systems, including traditional Centrex systems and PBX systems, and

pilot voice over IP installations. Centrally-supported wireless networking has also been made available in many locations on all campuses.  There are a total of 349 access points, with 138 on the Camden campus, 27 in Newark, and 184 on the New Brunswick/Piscataway campus. Videoconferencing installations, including interactive video classrooms, videoconference meeting rooms, video over IP, and web-based desktop videoconferencing are also available in selected areas at the university.

## Standard 4: Leadership and Governance

*The institution's system of governance clearly defines the roles of institutional constituencies in policy development and decision-making. The governance structure includes an active governing body with sufficient autonomy to assure institutional integrity and to fulfill its responsibilities of policy and resource development, consistent with the mission of the institution.*

**Context:**
Middle States accreditation standards do not address IT in this area.

**Rutgers:**
Although Middle States accreditation standards do not address IT in this area, policy development involving or affecting IT occurs frequently. OIT has attempted to ensure that faculty are involved in the IT planning and decisionmaking at all levels of the institution, and has also attempted to participate in these types of activities at the university level.

OIT staff have been involved with major presidential initiatives in the last few years, including the transformation of undergraduate education, the capital campaign, the new visual identity system, the university Senate and three of its committees (including the executive committee), and the Committee on Efficiency and Entrepreneurship. During the last 10 years, one of the most significant presidential initiatives was directly aimed at improving the institution's ability to provide high quality instructional, research, and administrative services for all members of the Rutgers community. This $100 million project, RUNet 2000, brought the Rutgers network up to the same level as our peers at that time. All residence halls were wired for data, video, and voice access, all major classroom facilities were also wired, as were a number of other buildings across the Rutgers campuses.

With the expansion of RUNet, and the increasing number of devices connected to it, came the need for improving network and desktop security. In 2000, at the recommendation of the Rutgers Board of Governors and to ensure that IT security issues were being appropriately addressed, the Information Protection and Security division was created within OIT. This group is responsible for managing the information assurance program in an academic environment, developing policies, and establishing goals and objectives to maintain a secure information environment. Critical areas include security awareness, computing incident response, regulatory compliance, vulnerability scanning, and overall best practices for secure computing. As is the case at 32% of our peers, Rutgers requires end-user authentication for network access.

## Standard 5: Administration

*The institution's administrative structure and services facilitate learning and research/scholarship, foster quality improvement, and support the institution's organization and governance.*

**Context:**
The administrative structure typically includes a chief executive officer and other administrators such as a chief academic officer and a chief financial officer. As an administrative structure they collectively participate in guiding the institution to achieve its goals. As individuals, each provides oversight for the various administrative services of the institution, which may include academic programs, finance and operations, student services, research and planning, instructional technology, public relations and others. In some institutions, the chief executive officer and other members of the executive structure also may have responsibility for fundraising activities.

**Rutgers:**
In 2005, recognizing the need to coordinate central IT activities with those in the academic departments and administrative units, Rutgers appointed Michael V. McKay as Vice President for Information Technology (Attachment H). His responsibilities include oversight of the central IT organization, development of an effective instructional and research technology support structure, and coordination of IT activities throughout the university (Attachment I). The first two responsibilities are occurring at this time; the last should be the focus in the future, to ensure that effective and efficient IT support exists in all units of the university.

As is the case at the majority of our peers, the highest level technology officer at Rutgers is a vice president, who reports to the administrative VP. At 47% of our peers, this position reports to the academic VP. Due to the complexity of Rutgers, the current structure is the most effective.

## Standard 6: Integrity

*In the conduct of its programs and activities involving the public and the constituencies it serves, the institution demonstrates adherence to ethical standards and its own stated policies, providing support for academic and intellectual freedom.*

Although the Middle States accreditation standards do not specifically address integrity issues surrounding IT, it is important to let the committee know about steps taken in the area of IT and integrity.

In 1997, the Rutgers "Acceptable Use Policy for Computing and Information Technology Resources" was developed. It states that members of the Rutgers community are expected to:

- Use only those computing and information technology resources for which you have authorization.

- Use computing and information technology resources only for their intended purpose.

- Protect the access and integrity of computing and information technology resources.

- Abide by applicable laws and university policies and respect the copyrights and intellectual property rights of others, including the legal use of copyrighted software.

- Respect the privacy and personal rights of others.

A complete copy of the policy can be found in Attachment J.

## Standard 7: Institutional Assessment

*The institution has developed and implemented an assessment process that evaluates its overall effectiveness in achieving its mission and goals and its compliance with accreditation standards.*

**Context:**
Institutions often have a variety of plans, such as a strategic plan, academic plan, financial plan, enrollment plan, capital facilities master plan, and technology plan. Just as such plans should be interrelated to ensure that they work synergistically to advance the institution, assessments should also be interrelated. At many institutions, effective institutional planning begins with academic planning, which in turn drives the other plans. If the academic plan calls for a new academic program, for example, the technology plan should ensure faculty and students in the new program will be able to use appropriate instructional technologies. Assessments of the technology plan should evaluate not just whether instructional technologies have been put in place but also how effectively those technologies have helped students to achieve the program's key learning outcomes.

**Rutgers:**
The major planning activity occurring at Rutgers recently is the transformation of undergraduate education in New Brunswick/Piscataway and the work of committees focusing on its implementation. To ensure that each area was taking full advantage of IT, and that IT was considered during the planning process, OIT staff held positions on six of the 15 committees, including: early implementation; overall and campus programming; residential colleges; Office of the Vice President for Student Affairs: organization, services, technology, management; student facilities, policies, and programming; and faculty engagement. Other IT staff at the university also served on implementation committees, sharing their expertise in the same manner as the OIT staff.

A major technology impact of the transformation will be the changes that are necessary within administrative computing services to accommodate the new structure, while continuing to support the existing structure for as long as it is still needed. This activity is not trivial, as currently, every Rutgers college, school, etc., has different policies and systems in place.

## *Educational Effectiveness*

## Standard 8: Student Admissions and Retention

*The institution seeks to admit students whose interests, goals, and abilities are congruent with its mission and seeks to retain them through the pursuit of the students' educational goals.*

**Context:**
Middle States accreditation standards do not address IT in this area.

**Rutgers:**
Although Middle States accreditation standards do not address IT in this area, enrollment management activities rely heavily on IT—for administrative support, communication, and

marketing. Administrative systems maintained by OIT, such as the financial aid system, undergraduate and graduate admissions system, tuition/fee payment system, and web registration are actively used in admissions activities; schedule of classes, housing, student health, electronic transcripts, degree audit, and course synopsis systems are used to support retention activities.

## Standard 9: Student Support Services

*The institution provides student support services reasonably necessary to enable each student to achieve the institution's goals for students.*

**Context:**
. . . the following, although not required, may facilitate the institution's own analysis relative to this accreditation standard: analysis of support services available to students, including any distinctions among physical sites or modes of delivery and the particular support services those sites/modes require (instructional technology support, library/learning resources support, etc.);

**Rutgers:**
The Office of Information Technology provides university-wide leadership in information technology and quality information technology services in support of the university's strategic goals. It accomplishes this by:

- Providing IT services that improve the quality of Rutgers' academic programs and administrative services.

- Designing, developing, operating, and maintaining secure IT infrastructures that support research, teaching and learning, outreach, student services, and administration.

- Promoting IT planning and fostering cooperation within and between academic and administrative departments throughout the university.

- Continuing to develop staff members who will provide IT leadership in support of the achievement of Rutgers' strategic goals.

OIT accomplishes its mission in a fiscally sound manner, striving to meet the increasing IT needs of Rutgers students, faculty, and staff.

IT student support services are essential; students at Rutgers have varying degrees of technological sophistication and, therefore, need different amounts and types of support. The backbone for all student support is the OIT help desk system, consisting of email, telephone, and face-to-face assistance provided on each of Rutgers' three main campuses. This system has grown significantly over the last ten years, due, in part, to the expanded number of students with computers and the expansion of residential networking (ResNet) in student residence halls. Help desk availability and utilization varies among the campuses as the data below indicates:

| Campus | FT staffing | Student staffing | Help desk queries (past) | Help desk queries (present) | Number of hours open per week |
|---|---|---|---|---|---|
| Camden | 1.7 | 6.9 | 4,202 (1998) | 7,576 | 68 |
| Newark | 2.5 | 22 | 660 (1998) | 65,201 | 57 (closed Sat & Sun) |
| New Brunswick/ Piscataway | 5 | 40 | 17,487 (2000) | 113,014 | 75 |
| Range of peer institutions | -- | -- | -- | -- | 45-168 (24x7) |

To accommodate the increased need to track progress made in satisfying help desk queries, a sophisticated online system was created. A large number of part-time students working at the help desks ensure that queries are answered in a timely fashion.

Other support services available to students are described in the table below:

| | FY 2000 | FY 2006 | Notes |
|---|---|---|---|
| Email | 96 million messages | 1.6 billion messages | These emails represent all email traffic going through OIT central systems on all campuses for all users – a 1,600% increase over the last six years. Breakdowns are not easily available at this time, it is estimated that 70-75% of the email messages can be attributed to students, who are using this tool for communication among themselves and between themselves and the faculty. These numbers do not include email sent by students using services from other university systems. |
| NetIDs | about 65,000 users | about 77,000 users, including 13,700 student alumni accounts | NetIDs are used at Rutgers for accessing email, administrative systems (see below), and virtually all other online services. Rutgers policy is that all students must have a NetID (Attachment K) |
| Web applications | 18 | 26 | These applications are either used by students or by those working with students. A current list is in Attachment L. |
| Mailing lists | between 130 and 200 lists | 584 official lists; 4,632 class lists | The ease of creating mailing lists today has dramatically increased their use by faculty and the Rutgers administration. Faculty can easily create class mailing lists and the administration can make more effective use of official mailing lists for official communication to students based on major, campus affiliation, etc. In addition to the official lists there are thousands of non-official lists used throughout the university. |
| Ruckus | NA | 8,000 students, 1 million media downloads | Ruckus is a new service at Rutgers that gives students legal access to music and movies. About 42% of our peers offer such a service with another 42% considering it. |

Many of these, and other student services, can be accessed through the myRutgers portal, a personal, customizable, portal to Rutgers University. myRutgers helps make online services and information both faster and easier for students to find and manage. Portal channels allow students to view their personal schedules of classes, check grades and see a financial statement of accounts. As of January, 2007, about 48,435 students have used myRutgers.

Students can learn about these services through handbooks or guides distributed at the start of the school year; similar documents are also made available for faculty/staff and department chairs (see Attachments – M, N, and O for examples of recent documents.

Additional IT-related student support services are provided through the Rutgers Libraries and the Rutgers Learning Centers.

## Standard 10: Faculty

*The institution's instructional, research, and service programs are devised, developed, monitored, and supported by qualified professionals.*

**Context:**
Middle States accreditation standards do not address IT in this area.

**Rutgers:**
Faculty on all Rutgers campuses are supported by dedicated IT staff. Complementing IT staff distributed within departments and deans' offices, support is also more centrally organized in the following offices: Office of Instructional and Research Technology (university-wide), Division of Continuous Education and Outreach (university-wide), Rutgers Libraries (university-wide), Office of Instructional Design and Technology (Camden), Office of Academic Technology (Newark), and Center for the Advancement of Teaching (New Brunswick/Piscataway).

## Standard 11: Educational Offerings

*The institution's educational offerings display academic content, rigor, and coherence appropriate to its higher education mission. The institution identifies student learning goals and objectives, including knowledge and skills, for its educational offerings.*

**Context:**
Higher education has new information sources and technologies that supplement its print-based knowledge resources and present new challenges for teachers and learners who must learn how to develop and use general or discipline-specific technologies to identify, retrieve, and apply relevant information. Therefore, institutions should provide both students and instructors with the knowledge, skills, and tools needed to use the information, new technology, and media for their studies, teaching, or research. . . effective educational offerings are predicated upon the availability and accessibility of adequate learning resources, such as library and information technology support services, staffed by professionals who are qualified by education, training, and experience to support relevant academic activities.

**Rutgers:**
Rutgers believes that university investments in IT infrastructure are at risk of not fulfilling their potential if trained IT professionals are not available to assist faculty. Therefore, a number of training opportunities are available for IT and other staff, as well as faculty and students. Many of these are conducted across the three Rutgers campuses using a variety of videoconferencing tools. Among the recent activities are IT symposia, focusing on applications of IT to different disciplines, and technology showcases and vendor fairs, where state-of-the-art technologies are demonstrated. The Newark campus also hosts an IT forum for the campus's faculty, students, and staff.

Monthly meetings on a variety of technology topics, including security, networking, podcasting, and software site licensing opportunities are convened involving individuals on all Rutgers campuses.

Training opportunities, including a program that certifies that IT staff understand technology at Rutgers, are provided locally on all campuses. Other IT training, both small group and individual, is conducted by staff in: Office of Instructional and Research Technology (university-wide), Division of Continuous Education and Outreach (university-wide), Rutgers Libraries (university-wide), Office of Instructional Design and Technology (Camden), Office of Academic Technology (Newark), and Center for the Advancement of Teaching (New Brunswick/Piscataway).

Accomplishing these activities involves IT staff from throughout the institution. In 2006, the university had approximately 313 staff members within its central IT organization, well within the range of 195 (U. Cal-San Diego) and 660 (U. Mich-Ann Arbor) reported by peer institutions. While, the Rutgers' central IT staff member counts also include administrative positions, in keeping with its decentralized organizational structure, Rutgers has distributed   approximately 300 IT staff members within units on all campuses.

## Standard 12: General Education

*The institution's curricula are designed so that students acquire and demonstrate college-level proficiency in general education and essential skills, including at least oral and written communication, scientific and quantitative reasoning, critical analysis and reasoning, and technological competency.*

**Context:**
Middle States accreditation standards do not address IT in this area.

**Rutgers:**
It is important to note that one of the outcomes of the Transforming Undergraduate Education, Implementation Task Force for Overall and Campus Programming is the establishment of learning communities. Online learning communities are expected to be developed in this area.

## Standard 13: Related Educational Activities

*The institution's programs or activities that are characterized by particular content, focus, location, mode of delivery, or sponsorship meet appropriate standards.*

**Context:**
Distance learning or distributed learning is a formal educational process in which some or all of the instruction occurs when the learner and the instructor are not in the same place at the same time; information or distributed learning technology is often the connector between the learner and the instructor or the site of origin. Programs delivered through distance learning modalities— whether by the Internet, television, video-conferencing, or other means—should meet academic and learning support standards, appropriate to the type of delivery, comparable to those offered in more traditional formats within higher education. Student learning objectives and outcomes should be consistent across comparable offerings, regardless of where or how they are provided.

**Rutgers:**
These activities occur primarily through the Division of Continuous Education and Outreach and will be reported by that office.

## Standard 14: Assessment of Student Learning

*Assessment of student learning demonstrates that, at graduation, or other appropriate points, the institution's students have knowledge, skills, and competencies consistent with institutional and appropriate higher education goals.*

Middle States accreditation standards do not address IT in this area, although Rutgers has the potential to use IT to accomplish many of its assessment goals. The institution currently has three course management systems each with an e-portfolio tool, for use in assessment. Whether by advocating increased use of e-portfolio tools or by familiarizing faculty with other digital programs, the appointment of a new associate vice president for academic affairs for teaching and assessment research  points to an increasing role for IT to play in facilitating assessment of student learning