

Information Technology: Leveraging the Investment

**A Near Term Strategy Plan for Information Technology
at the University of Notre Dame**

DRAFT

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Introduction: OIT and the University Strategic Planning Initiative

The University of Notre Dame has launched a strategic planning initiative that will guide its aspirations and activities throughout the coming decade. Emphasizing substantive participation, the design of this initiative depends heavily on input from all the components of the University. The Office of Information Technologies (OIT), like the other planning units on campus, has been asked to think carefully about its role in contributing to the University's progress and success. The results of that reflection are presented in the following strategic planning document for the OIT.

The OIT plan is guided first of all and primarily by the vision summarized by the University's planning initiative's title, *Notre Dame 2010: A Quest for Leadership*. Notre Dame remains committed to its long-standing aspiration "to be one of the great universities of the world while remaining firmly committed to preserving and enhancing the Catholic intellectual tradition." The OIT believes it has a fundamental role to play as the University strengthens its academic reputation, elevates the ranking of its academic departments and professional programs, enriches the undergraduate experience, and lays claim to excellence in more and more areas of research. The OIT sees itself as providing essential services and leadership in technology areas that will be vital to creating an environment where faculty, students, and staff can achieve the kind of excellence associated with being the leading Catholic university in the world.

The OIT plan is also guided by the plans and aspirations that have been developed by other departments and components of the University. The OIT is the central agency that supports enterprise-wide computing on campus, so its plans must always grow organically out of the plans of the units it supports. The OIT is aware that information technology is not an end unto itself, and therefore OIT's goal must always be to serve and empower other units, whether they be the academic colleges and schools who are responding to Provost Nathan O. Hatch's "Charge to Academic Units," or the units serving students who are responding to Vice President of Student Affairs Mark L. Poorman's "Charge to Student Affairs," or any of the administrative offices performing essential functions, taking part in the campus-wide "Renovare" project to enhance the University's administrative software systems. In addition, the information revolution that is radically altering our whole world at an ever-accelerating pace touches every aspect of university life. Information — the foundation of knowledge — is at the very heart of a university's mission: the generation, preservation, dissemination, and application of knowledge.

Finally, the OIT strategic plan is guided by the OIT's own inner sense of mission and purpose. The OIT staff aspire to deserve a reputation for excellence in all the technical areas that fall under their responsibility, to be regarded as a source of knowledge about the best practices in the information technology industry, and to be valued for their ability to apply technology in appropriate ways to the specific needs of university education and research. At the same time, the OIT wishes to continuously improve its reputation for customer service and true partnership with the technical and non-technical people it serves. This plan embodies paths to achieving an outstanding level professional excellence and accountability.

Underlying OIT Guiding Principles

Mission:

The purpose of information systems at Notre Dame is to provide leverage to the University in fulfilling its mission as a premier Catholic institution of higher education.

- to foster and advance the Notre Dame mission of education, research, and service
- to constantly improve services to our associates in the Notre Dame Community based upon principles of partnership and collaboration
- to empower faculty, staff, researchers, and students to take full advantage of information technology
- to transform and benefit Notre Dame administrative processes
- to serve as leaders in our chosen profession

Vision:

Realize the potential

- . . . of information technology to enable and empower faculty, staff, and students
- . . . of information technology to transform and benefit Notre Dame processes
- . . . of information technology to serve and support the Notre Dame community
- . . . of our people to become leaders in their profession.

Values:

Leaders in our profession must exhibit the qualities of courtesy, equality, honesty, integrity, and loyalty.

We are committed to the qualities

- . . . of Courtesy
- . . . of Equality
- . . . of Honesty
- . . . of Integrity
- . . . of Loyalty

These are the cornerstones of professionalism.

How Notre Dame Uses Information Technology

Virtually every aspect of the University of Notre Dame is being affected in positive ways by information technology. Whether it is using computers and networking to strengthen current and new educational programs, to provide individualized learning experiences for students, to attract and retain students best able to benefit from the University's educational experience, to attract top-notch faculty, to enhance the quality of student life, or to emphasize sound planning and increased financial strength, information technology is playing a vitally important and substantive role at the University. Most importantly, technology is helping the University of Notre Dame in its primary mission of educating students.

In 1999, the Task Force on Curricular Innovation wrote in a report to the provost, "The University prides itself on being an environment of teaching and learning, which fosters the development in its students of those disciplined habits of mind, body, and spirit which characterize educated, skilled, and free human beings. To meet this challenge expressed in Notre Dame's mission statement, we must constantly strive to innovate and improve our curriculum both in terms of course offerings and teaching pedagogy." Technology is helping to transform the teaching and learning processes at Notre Dame in many important ways. For example,

- During the past ten years, more than 700 institutions have sent visitors to DeBartolo Hall in recognition of its place as a showcase for the effective use of technology in education.
- Literally dozens of Notre Dame faculty members use WebCT, the University's course management system standard, to enhance instructional delivery. More than 75% of the students have active online learning accounts.
- In the year 2000, the University established a Center of Excellence in Nanoscience and Technology in recognition of fifteen years of quality faculty research and educational development in the area. The center actively explores multidisciplinary fundamental concepts in nanoscience and engineering with emphasis on applications to unique functional capabilities.
- The Mendoza College of Business is considered to be one of the nation's top real-time eLearning content providers through its ability to offer video-enabled courses in the Executive MBA program.
- The University's Civil Engineering Department has developed the Shakes and Quakes Outreach Program, a hands-on program successfully implemented in South Bend schools that supplements textbook learning and has recently been made accessible on the Web. The intention is to encourage participation in higher level math and science classes on a more national level, thereby renewing the talent pool for science and technology, as well as promoting a scientifically literate population. The University, providing up-to-date knowledge and technology, partners with teachers in a combined effort to challenge students in a real-world application of math and science skills.

- The Kaneb Center for Teaching & Learning offers Notre Dame faculty a wide array of assistance, education, and training in the uses of technology in the classroom through both individual consultations and group workshops. It also offers grants to “jump start” the adoption of educational technology.
- Selected comments from a student survey administered by the Teaching, Learning, and Technology Roundtable:
 - “[One of my] most effective learning experiences so far has been in Dr. Helquist’s organic chemistry class. In chem, Dr. Helquist incorporates all media into a smooth-flowing lecture that is easy to follow and hence is easy to understand. Technology has definitely played a part in his ability...”
 - “The wide access to web resources entirely changed my learning capacity and my effectiveness as a student.”
 - “[An] extremely effective experience was working on my policy paper for International Humanitarian Issues. We gathered much of our research through databases on the web and when it came time to write, we could write independently yet in consultation with one another, and merge the various parts of the paper easily.”
- The University will commit more than half a million dollars over the next three years toward instructional technology investments for enhancing the pastoral distance education program through the Institute for Church Life (ICL). According to publicity about this venture, ICL believes “theology through technology” will enrich the broader church community through improved access to quality religious reference materials and respected instruction in the Notre Dame tradition. Tom Cummings, director of the Satellite Theological Education Program, says, “The methods are new and the means of delivery may be different, but our teaching is consistent and our traditions and beliefs have stood the test of time.”
- What does the Internet look like? This is a question ask by Albert-Laslo Barabasi and his colleagues in the physics department. “Any effort to map the Internet is necessarily incomplete and out of date the moment it appears. We treat the net as though it were a natural phenomenon,” stated Barabasi. “What scientists generally do with a natural phenomenon that they do not understand is to build a model of it.” Dr. Barabasi’s latest paper on the matter, just published in the *Proceedings of the National Academy of Sciences*, presents a general framework for improving the accuracy of Internet models.

These are just a few examples of the many, many uses of technology at the University. And these uses are beginning to make a very big difference in helping Notre Dame become more effective in its central mission.

What difference has technology made in higher-education curriculum? The study of chemistry has been changed forever by the advent of the computer. The whole sub-discipline of physical chemistry depends on it, occupying ground between empirical study and the theoretical domain. The computational basis of physical chemistry connects operations on accessible matter with ideas about the inaccessible. Geology has been transformed by chemically-based techniques for

dating. Techniques of modeling and simulation have opened new lines of study in economics. Psychology has learned much from computational models of perception and intelligence. These are just some of the examples of curricular transformations we can ascribe directly to the application of technology. To be sure, not all disciplines are affected equally, nor are all faculty members enthusiastic about technology to the same degree. Nevertheless, the transformative power of technology is readily evident on the Notre Dame campus.

But it is not easy for a university to achieve the full potential of information technology. IT is a challenging enterprise, to say the least. It is very complex, very changeable, and very expensive. It is extremely difficult to balance the supply of technology resources and services with the end-user demand for them.

The growth rate for spending on information technology is something that makes almost everyone in higher education uncomfortable. Not only is there a fundamental ongoing-ness to higher education's need for technology and its support, but we have also seen a number of special points at which the pace of growth has actually accelerated – the introduction of personal computers, campus networking (especially to the residence halls), modern administrative information systems, and the growing interest for technology in the classroom. Each one of these milestones has created more users, more applications, and more need to provide support. To be faced with the need to carve out a certain definite portion of the institutional budget each year to fund and support technology, and to be further faced with the likelihood that this portion will continue to grow is very, very difficult. Nevertheless, that is the situation that every educational institution, including Notre Dame, finds itself in today.

The Framework of the Committee Reports

The OIT strategic plan considers the needs expressed within the framework established by the planning subcommittees, the Curriculum Review Committee, the Subcommittee on Finance and Fundraising, the Future of Higher Education Task Force, and the Committee on Research Issues. The OIT has a distinctive role in supporting the goals, activities, and concerns of each of these committees, as outlined in the following sections.

Curriculum Review Committee Reports

[These reports are not yet available]

The Finance and Fund Raising Report

Although Notre Dame finds itself in many ways in an enviable financial position, during the decade covered by the strategic plan, the University will not be able to count on large new sources of funds. Tuition and fees will not be able to be increased quickly, and will continue to cover only a portion of the University's expenditures, an amount roughly equivalent to the budget for salaries and benefits. The rest of the University's budget will have to be made up from other sources. Two other important sources of income, the endowment and charitable giving, will likely be diminished compared to the unusually high rates of the last decade.

The Finance and Fund Raising Report points to technology as one of the areas that is likely to increase without much chance for the University to limit it in the initial years. The OIT plan addresses this reality by including plans to keep the infrastructure and University functions as cost-efficient as possible, and to work cooperatively with Colleges and other units to divide up centralized and distributed support services appropriately.

The budget projections in the Report lead to this conclusion: "Going forward, the University will have to enhance operating revenues with fund-raising efforts to achieve its aspirations. The Report suggests increasing the information technology that facilitates fundraising, and OIT will fully support efforts in that area.

The Future in Higher Education Report

This committee report, one of the authors of which is the University's Chief information Officer, identifies trends that have either already transformed society and the higher education environment or are likely to do so during the coming decade.

We need to collectively recognize that "Computers undertake a wide range of activities ranging from processing simple mathematical functions to positioning a hiker on a forest path. Computers have added processing and computational powers to the initial functions of storage, indexing and retrieval of information. Computers have replaced paper, pencils and calculators as the dominant technology, providing vastly improved tools for the pursuit of learning, teaching and research." As we do that, the key questions articulated in this report that the University must continue to ask itself as it moves forward are:

- I. In what ways can technology be most effective in supporting the aspirations of the university and that of its constituent programs?

- II. In what ways can technology be utilized to enhance the traditional residential experience for students?
- III. In what ways can technology be used to enhance traditional liberal arts programs?
- IV. In what ways can technology enhance faculty effectiveness in all disciplines?
- V. How will the university react to the changing technological sophistication and increased expectations of its students?
- VI. What technological capabilities are critical to achieving the university's goals?
- VII. What level of investment is necessary to achieve those capabilities?
- VIII. What lies ahead for intellectual property law and how will this affect faculty, students and the University?

Notre Dame must adopt its own stance with regard to future developments in information technologies, but there is no doubt that the University will be strongly influenced by them. The OIT plan includes goals that capitalize on the strengths that Notre Dame already has in these areas and makes provision for keeping up its lead.

Research Issues Report

The Research Issues Report makes the case that excellence in research is the route to enhanced academic reputation, and that academic reputation in turn is the most influential factor affecting college choice. The OIT strategic plan is strongly committed to creating an information technology environment that will help attract strong researchers to the University and put no limits on the success of their research programs when they are here. The plan outlined in these pages envisions OIT cooperating closely with the academic departments and professional schools to identify the elements that are crucial to research universities of national reputation and to make them a reality at Notre Dame.

For example, it is clear that the policy of focusing on the “hiring of mid-career faculty with outstanding records of accomplishment (‘Blue-Chip strategy’), and with necessary physical and staff support,” implies the availability of rock-solid, powerful technology. Anything less will diminish the individual departments’ ability to compete in hiring and retention of the best researchers.

The planning units are asked in the Research Issues Report to undertake these tasks, among their primary charges:

- Soliciting proposals to advance the University’s research capabilities in important new areas of scholarship, especially in the life sciences and information technologies
- Identifying the physical, staff, and academic infrastructure necessary to support the research goals.

The strategic plan positions OIT to assist the units with these goals.

Methodology and Process for Developing The OIT Strategic Plan

In developing this plan, the OIT consulted widely with the campus at large. The OIT used the services of an experienced higher education/information technology consulting firm, Edutech International, to conduct interviews with groups and individuals throughout the University. These focus groups included 195 individuals and 64 separate interviews and involved faculty, students, staff, technical and non-technical people, college and University committees, OIT staff and management, and local IT support groups. The needs expressed in these interviews and meetings, as well as the insights into the most effective ways for OIT and the outlying organizations to cooperate in providing infrastructure and services, have been consolidated into the goals and objectives presented in this OIT plan. Profiling the top 20 national research universities, and our top peer Catholic Schools of higher education, we created a university profile to compare our metrics with the best-of-the-best. It should be noted that as we address our infrastructure needs, we must attend to more than wires, switches and hubs. Broadly conceived, the infrastructure includes:

- Human capital: sufficient numbers of highly skilled professional support staff, and faculty, students and staff, skilled in the use of information systems.
- Policies, governance, and management for information technology.
- University-wide security and quality assurance.
- Physical infrastructure (building wiring, campus backbone, and external connectivity).
- Advanced technologies and services for emerging technologies.

In recognition that the need for an IT strategic plan is critical, our planning process was driven by three factors. We wished to create a plan that:

- Recognizes that technology is not for its own sake, but is a means to an end.
- Should not be built in isolation solely within the OIT.
- Is fully in step with the University community.

As a result, the plan consists of seven strategic goals, based on the issues, goals, and objectives of the University itself, as expressed by users all over campus.

In our discussions with the Notre Dame community, the major issues that emerged were these:

Issue #1: Reliability, stability, predictability

Notre Dame's technological infrastructure is highly complex and multi-faceted. The network extends all over campus and connects to the outside world at high speed and high capacity. Virtually everyone uses e-mail. Clusters for public computing are everywhere. Faculty and students can access their files from any computer on campus.

Because the Notre Dame community has become so dependent on this infrastructure, expectations are that it will function as a "utility," much like electric power or a telephone dial tone. It needs to be always there, always working, always reliable. This has not been the case up till now.

New administrative and academic applications will require an enhanced and increased robustness of the network infrastructure. This must be in place before these new services can be implemented.

Decisions must address the problems and fundamental concept of the Notre Dame institutional file space implementation.

As the community expressed it to us, this is the most important issue in terms of their own productivity and effectiveness in their own work.

Issue #2: Governance/relationships

The second most important issue for the community is the way in which communications channels with OIT have been set up and used in the past, and the sense that changes are very much needed. The community needs to know that OIT does not act and make decisions in isolation, but with deliberate consultation, based on careful listening.

Issue #3: Distributed general support

There is a overwhelming need for distributed technology support on campus, with most of the community feeling that this is the best way to provide quality service in a timely manner. The precise manner of how to distribute services is still to be worked out, as is finding the right balance with central support from OIT, but it is clear that this is the preferred support model, at least for the first level of response.

It is also clear that a single approach will not fit everyone. Each college or functional unit has its own needs and its own experience with providing local support. This needs to be taken into consideration, and through discussion with the colleges, a school-specific approach must be worked out.

Issue #4: Specific support for classroom usage

There is a sense in the community that, as a whole, Notre Dame faculty are behind their peers at other institutions in adopting technological approaches to the classroom. No one, of course, is suggesting that all faculty have to use technology, even some of the time, but there is a perceived gap between where the faculty ought to be by now and where they actually are.

In addition, DeBartolo, while state-of-the-art when it was first designed and built, has fallen behind in its capabilities of providing an effective technological environment for classroom teaching. The world has learned a great deal about this area since DeBartolo was built, and many changes need to be made. There was also strong sentiment in the community that “smart” classrooms needs to extend all over campus, and not be limited as much as they are now to a single teaching facility.

Issue #5: Specific support for research

High-performance computing and other elements of modern-day research are extremely important to the Notre Dame community. Sophisticated hardware and software, access to research-based networks, and high-end support are all needed to be part of the University’s research environment.

Issue #6: Administrative systems

The issues for administrators concerning information systems at Notre Dame are well known and the new replacement project is already well under way. But the faculty and students had many comments as well, understanding the importance of such a system to them and wanting to know where they fit into the planning and implementation.

Issue #7: Recruitment, training and retaining of IT Professionals

Part of the success of the University in this world of information revolution depends heavily on the recruitment, training and retaining of IT Professionals. We must make a long-term commitment to recruiting and retaining sufficient numbers of highly skilled professions support staff and upgrading the information technology skills of all faculty, students and staff.

Notre Dame has made a tremendous commitment in information technology. The University has invested a great deal of money over the years in IT, and many people have contributed a tremendous amount of time, energy, and expertise in creating an effective information technology environment. Our main purpose for the near future needs is to leverage that investment and to be certain that the University is getting the appropriate return on investments and creating competitive advantages.

Notre Dame's Strategic Information Technology Initiatives

As a result of the information gathered during this strategic planning process, and an external environmental scan, the following initiatives are either being instituted or under consideration at a strategic level.

1. In October 2001, Hewlett Packard announced that on December 31, 2006 they will discontinue supporting the HP 3000 platform. The HP 3000 is the University's current corporate computing system in support of the administrative applications. Consequently, the University has a limited time to replace and/or migrate all existing information systems to new hosting platforms. The number of systems currently running on the HP is significant, and can be broadly categorized into core and ancillary systems.

The four core systems to be replaced are:

- Student/Faculty Information Systems (e.g., admissions, records, registration).
- Financial Systems (e.g., general ledger, accounts payable, budget).
- Human Resources/Payroll Systems (e.g., appointments, payroll, benefits, position control).
- Development Information System (e.g., alumni relations, fundraising, planned giving).

Some ancillary system functionality may be present in the new core systems; in other cases, ancillary systems will be replaced with new software. Examples of ancillary systems include:

- Student Housing
- Laundry
- Security Dispatch
- Student Health Services

Subsequent to the Hewlett Packard announcement, the University established *Project Renovare* to guide the transition from the HP 3000 to other administrative IT solutions. The time table and detailed transition information is located at <http://www.nd.edu/~renovare>. This is Goal 6 cited in this document.

2. The process of applying technology to provide solutions to needs, can result in various approaches. Enter IT conundrum #1. How to implement "smart" classrooms throughout the campus as requested in a Goal 4 subset?

At the present time there are 68 classrooms where each lectern contains two computers – both a Macintosh and a Windows system. Some classrooms even require a third platform operating the Unix system. This multiple platform allocation in various classrooms results in a number issues:

- Successfully scheduling classrooms to fit requested seats, time, and technology platform become problematic for the registrar
- Faculty need to learn more about the technology in the classrooms.

- Class time may be wasted while trying to get the correct combinations of switches and buttons.
- Classroom support becomes much more complicated.
- While one computer is being used the other is unusable. This resulting in a great waste of capital equipment.
- Benchmarks indicate that more support staff are required for the multi-platform classroom model.
- Benchmarks also indicate that more training and re-training for faculty are required in the multi-platform model

How to solve these growing problems of “smart” classrooms?

Our benchmarking points to faculty using laptop computers as a possible answer. This results in the following advantages:

- No dedicated computers residing in the classroom
- Faculty know how to use their laptops
- What the faculty prepare in their office follows them into the classroom, fonts, datasets . . .
- Reduced classroom support required
- Decreased interface complexity required in the classroom
- Classroom costs reduced
- Classroom assignments are simplified for the registrar

3. IT conundrum #2. How can the OIT provide centralized and decentralized support as outlined in Goal 3?

Should IT becoming more centralized or more decentralized? The industry has been wrestling with this issue for decades. Centralized IT relies on a governance structure where information management reports up through a single chain of command. Decentralized IT, on the other hand, distributes the management and support of IT through a multitude of functional command chains.

The real IT management trend is a shift towards governance structures that enable the best attributes of centralization and decentralization to be applied based on the requirements of a given function business or academic unit. In other words, IT is moving towards a scenario where centralized IT and decentralized IT can coexist and flourish under a shared governance structure.

IT has been stuck on a centralization-decentralization yo-yo. IT tends to centralize, decentralize and re-centralize again and again in an attempt to fix a more systemic problem — the inadequacy of hierarchical governance structures as a vehicle for managing an information infrastructure. A typical reorganization rearranges blocks on the hierarchy chart, which some people compare to rearranging the deck chairs on the Titanic. Petronius Arbiter (AD 60) made this clear when he said "We tend to meet any new situation by reorganizing; and a wonderful method it can be for creating the illusion of progress while producing confusion, inefficiency and demoralization."

There must be a shift from a control-oriented environment towards a collaborative mindset where achieving a common purpose is the overriding goal. This means people must shift from an "I" mentality to a "We" mentality. This collaborative structure must be adaptive and have the capacity to self-organize so that internal and external dynamics do not trigger yet another reorganization. Most of all, management must embrace collaborative forces already at work and enable those forces through an effective information governance structure.

For whatever reasons in support of centralizing certain IT functions, the governance structure must cast its influence over IT-related functions without trying to control the teams performing those functions. This means eliminating the IT hierarchy in favor of a governance structure based on a constitution partnership. Under the constitution, various functional units (i.e. hubs) fulfill clearly defined purposes within their domain. Hubs self-adapt by collaborating, expanding or disbanding in order to more effectively fulfill their stated purpose.

A hybrid approach of centralization and decentralization can flourish under this trend towards collaborative, adaptive governance. As the trend towards coexistence and collaboration gains steam, executives will hopefully see it coming and help enable the deployment of these new and exciting ways of working together.

Therefore, the answer seems to be — IT centralization versus decentralization: the trend towards collaborative governance using a hybrid model. This will allow better IT support for students, faculty, and staff.

4. A common theme in Goal 4, is “to provide leadership in the creative application of information technologies to enhance teaching and learning outcomes – (4.2) working with the Kaneb Center and the Library.

Some possible common goals are:

- Design, development, utilization, management, and evaluation of technology for teaching and learning. Through consultation services and programs, of the OIT, Kaneb and Library staff, help individuals and departments explore, integrate, and evaluate the use of instructional technology using:
 - Exploration – Assisting instructors as they explore how technology can be used to meet pedagogical goals and learning objectives.
 - Integration – Helping instructors identify, select, and integrate appropriate technologies for teaching.
 - Coaching – Provide individual coaching to those instructors who want to use University-supported instructional software programs.
 - Design – Assist instructors in their efforts to design and develop new courses that utilize instructional technology
 - Evaluation – Use surveys, observations, student interviews, focus groups and other evaluation tools to assess how instructional technology changes instructor and student roles and influences teaching effectiveness.
 - Discussion – Facilitate discussion of issues related to instruction technology

- Common meeting space in campus libraries, located close to faculty offices
- Create specialized areas within various campus library:
 - Create centers for development and study of digital media.
 - Intermix traditional and digital libraries.
 - Create laboratories for:
 - Learning technology
 - Collaborative technology
 - Imaging technology
 - Technology assessment for research and instruction.
 - Methods for achieving material using digital media
- Encourage work that:
 - Is interdisciplinary.
 - Involves student-faculty-staff collaboration
 - Focuses on new modes of learning and/or research
 - Shares results with the rest of the scholarly community
 - Takes special advantage of unique facilities (create unique facilities) and opportunities for synergy
 - Can share space with others on a non-exclusive use basis

Again, the common theme of collaborative governance rings loud and clear.

Goals and Objectives

Goal 1: To provide a robust and highly reliable technology infrastructure that supports the University of Notre Dame's teaching, research, community service, and administrative activities.

The technology infrastructure includes the physical wiring and connectivity to the campus network, the central core servers that control the network, an e-mail platform, Web services, portal services, content management, data and file storage, access to the Internet, remote access to the Notre Dame network, and all the other resources and functions that are expected to be part of the technology environment at a premier university.

- Objective 1.1 To put in place the metrics needed to monitor the availability and reliability of the infrastructure.
- Objective 1.2 To provide a 24/7, high-speed on-campus network that extends to all buildings, and to all offices, teaching spaces, learning spaces, and research facilities within those buildings using approved standards and virus protection procedures.
- Objective 1.3 To provide reliable, secure, and high-speed access to campus networked resources from off campus.
- Objective 1.4 To provide multiple links between Notre Dame and the Internet at a capacity sufficient to meet the University's needs.
- Objective 1.5 To provide network connections between Notre Dame and other major research universities and institutions at a capacity to support high-level research.
- Objective 1.6 To provide appropriate security, privacy, intrusion prevention, and authentication services.
- Objective 1.7 To maintain secure, high-performance e-mail and Web platforms.
- Objective 1.8 To maintain data and file storage that is accessible from anywhere on the network, and that is fast and reliable when accessed from any end-user platform, including Windows, Macintosh, Unix, and Linux.
- Objective 1.9 To provide network-based backup of data from faculty and staff desktops.
- Objective 1.10 To establish and support a minimum, baseline hardware and software standards for all members of the campus community.
- Objective 1.11 To develop Service Level Agreements (SLA) concerning infrastructure services with all users.

- Objective 1.12 To engage in research and development for newly developed and/or newly applicable technologies.
- Objective 1.13 To streamline the creation of Web content, personalize communication, and manage the Notre Dame brand.
- Objective 1.14 To implement an enterprise-wide content management system that will serve as the single source for the development and delivery of Notre Dame Web content.
- Objective 1.15 To launch a University Web portal that provides University community members personalized and customized access to information and services.
- Objective 1.16 To deliver additional online services through a single sign-on digital campus network.

Goal 2: To develop a responsive governance structure for the OIT that promotes accountability, communication, and collaboration, both within OIT and with all sectors of the University community.

- Objective 2.1 To make the information about the availability and reliability of the IT infrastructure available to the community on a regular basis.
- Objective 2.2 To develop IT policies and processes in collaboration with the user community.
- Objective 2.3 To establish a Faculty Advisory Board which will take a substantive role in shaping educational and research IT policies.
- Objective 2.4 To assist the colleges in developing faculty-based internal committees.
- Objective 2.5 To have reliable, steady, and open communication channels.
- Objective 2.6 To administer user surveys on a regular basis and to take corrective action for any service area rating that falls below a certain threshold.

Goal 3: To develop a support model and technical infrastructure that strikes the appropriate balance between central and decentralized support and satisfies the diverse needs of the University.

- Objective 3.1 To maintain a Help Desk that is truly useful to users and can handle most inquiries immediately, without the need for referral or call-back.
- Objective 3.2 To provide training and documentation that continually raises the ability level of the ND community users so that they have less need for the Help Desk.
- Objective 3.3 To determine an appropriate support model for the campus clusters that takes into account the different needs, resources, missions, and personalities of each of the colleges.
- Objective 3.4 To collaborate closely with the IT support staff in the colleges.
- Objective 3.5 To structure OIT services to promote a distributed, not a decentralized approach.
- Objective 3.6 To work with the College of Arts & Letters to establish a Center for Creative Computing.
- Objective 3.7 To work closely with expert user groups on specialized technical areas such as Linux, system administration, and high-performance computing.
- Objective 3.8 To provide services and training that is directed toward user independence and for self-service.

Goal 4: To provide leadership in the creative application of information technologies to enhance teaching and learning outcomes.

- Objective 4.1 To define Notre Dame’s goals for instructional technology use, in collaboration with the faculty.
- Objective 4.2 To clarify the relationship among the OIT, Kaneb, and the Library in providing faculty support.
- Objective 4.3 To work with the TLTR to provide incentives and assistance for faculty to explore technology applications.
- Objective 4.4 To work with a faculty-based committee to develop an improvement plan for DeBartolo.
- Objective 4.5 To make all classrooms at Notre Dame, including those outside of DeBartolo, be “smart” classrooms. Excluding certain areas by policy, such as seminar rooms.
- Objective 4.6 To work with the TLTR and the Faculty Advisory Board to explore the use of television in instruction.
- Objective 4.7 To work with the TLTR and the Faculty Advisory Board to determine the pros and cons of mandatory computer ownership for students.
- Objective 4.8 To develop and implement a campus wireless strategy.
- Objective 4.9 To determine specific responses to distance education imperatives.
- Objective 4.10 To provide a range of collaboration tools, beyond WebCT.

Goal 5: To utilize information technology to provide competitive advantage for University researchers in both acquiring support and carrying out their projects.

- Objective 5.1 To provide a world-class environment for the support of research, comparable to that at the research universities that Notre Dame aspires to compete with.
- Objective 5.2 To provide a computing environment designed to meet the advanced computational and educational needs of faculty and other researchers.
- Objective 5.3 To continue to participate in the Internet2 consortium to provide the connection to national and international researchers.

Goal 6: To provide superior administrative information system technologies that will permit the implementation of the most cost-effective administration, the best services to those the University serves, and the best exploitation of the University's information resources for planning and decision making.

A five-year project has recently begun to replace the four core systems of the University. *Project Renovare* will address:

- the Student/Faculty Information System;
- the Financial System;
- the Human Resources/Payroll System; and
- the Development System

as well as a number of ancillary systems such as Student Housing and Health Services.

Under the direction of a Steering Committee, co-chaired by the Provost and the Executive Vice President and including senior academic and administrative leadership from across campus, the project is being planned and administered through ten subcommittees covering all administrative applications.

Further information, including a document outlining "Guiding Principles," a timeline, status reports, and committee meeting minutes, can be found at: <http://www.nd.edu/~renovare>

Goal 7: To foster superb OIT and University IT Professionals.

- Objective 7.1 To ensure that the University has and retains the quantity and quality of staff to meet the goals and objectives as laid out in this document.
- Objective 7.2 To institute a recognition program for OIT staff.
- Objective 7.3 To create an individualized professional development program for each member of the OIT staff.
- Objective 7.4 To create an organizational effectiveness program for the OIT that promotes quality and service to the user community.