The Flagship IT Strategy: Supporting LSU’s Advance to National Prominence

Louisiana State University’s Information Technology Strategic Plan

December 2006
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Chief Information Officer Voss,

As Chairs of the five IT Foundations Task Forces, we are pleased to present you with the *Flagship Information Technology Strategy*, as the strategic plan for information technology at LSU. The Plan’s title continues—*Supporting LSU’s Advance to National Prominence*; a fitting addition in that we truly believe that the plan fully supports and enables the University’s progress on achieving the broader goals of the Flagship Agenda. We feel this plan correctly and completely articulates a vision for the advancement of information technology at LSU, and see it as the definitive blueprint for actions in the years ahead—for you as the University’s Chief Information Officer and Information Technology Services, and especially for all members of the campus community and university administration.

The Task Forces were charged with detailing a comprehensive set of outcomes—what we as a community believe is needed in terms of IT enablement—as well as the reasons behind the need for these outcomes. We have done so, and the Flagship IT Strategy provides an organized view of these required outcomes, presented in ten recommendations which are detailed by 84 specific action items. None of these recommendations are more important than any of the others and all are required to meet the goal of IT excellence that ultimately promote success with the Flagship Agenda. Thus, as implementation advances, attention must be paid to obtaining results across all areas, not just some.

A common theme emerged from all the task forces: the concepts of more modern and life-cycle replaced individual computers, abundant access to resources, and more support for the use of IT are the basic underlying components of broader success. These are the foundations of IT at LSU, and we can’t expect faculty, students, and staff to effectively use all of the planned IT enablement if they do not have reliable access to modern, well-supported basic equipment and software. We expect progress to involve a phased implementation, over the next several years, done in a cohesive manner. The Flagship IT Strategy is an immense plan and there is no expectation that it will be completed immediately. We understand that completion will take time and commitment. Let us take a moment to reflect on that last word—*commitment*.

First and foremost, we believe the campus community is committed to the realization of the vision articulated in this plan, as it was composed by representatives of that community. We believe our commitment these past several months to the articulation of the Flagship IT Strategy reflects in thoroughness of the final product. But commitment to create such a plan is by no means the end of the process. There needs to be commitment to its implementation by this same community who created the plan. The key to maintaining our commitment is progress in terms of a steady stream of component successes. If progress materializes in the areas detailed, the campus community’s commitment to its complete implementation will only grow stronger, gathering momentum as results are delivered. We understand that this commitment must continue on our part, but point out that other commitments are required to ensure the community’s ongoing support.

We expect commitment of the CIO and all the resources at your disposal to go into implementing all components of this plan, and that it will absolutely define the course of all actions taken by you and the ITS organization. Without your continued commitment to ensure that resources within your control are dedicated to implementing this plan—and not diverted into non-strategic or ad-hoc activities—it will suffer the fate of its many predecessors. We are extremely encouraged by the level of commitment you and ITS have shown in the past year, and are thus have growing trust and building optimism for your
commitment in the future. But we would be remiss if, in congratulating you on your vision, energy, and actions, we did not state directly we believe its continuity to be the most key element for success. You have stated often that the full implementation of this plan requires ownership of its elements by all of the LSU community—not just the CIO and ITS; and you are correct in this assertion. But it is an unequivocal fact that the community and administration view you as the lead advocate for broad IT enablement at LSU. Thus, your commitment to the Flagship IT Strategy must continue to be strong, vital, and unwavering.

Administration at all levels must also make a commitment to implementing this plan. Without that commitment—and the eventual funding that such commitment would produce—the plan will never be fully realized and will suffer the fate of previous failed or abandoned efforts. We are quick to point out that many of the action items in this plan require no additional funding—they require only changes in policy, process, or attitude; or those things plus a refocusing of existing resources and energies in direct alignment with the plan. But following your charge, we have prepared this plan without constraints of a specific budget, so as to present a vision of what is needed to make LSU nationally prominent in the use of information technology to support advancement of the Flagship Agenda. Full implementation will certainly call for increased levels of expenditures, both inside ITS and more broadly across the campus. LSU must come to grips with the real cost of information technology—in equipment as one would expect and especially in people that support and advance its use. We can only achieve national prominence by seriously addressing the funding shortfall—whether through better efficiencies, reallocation, or the addition of new funding sources. This is also in line with the vision of the Flagship Agenda.

In closing, we believe this process has stirred the campus to this call to action. We are counting on you to continue your commitment to see this process to its ultimate and successful end.

Sumanta Acharya
Michelle Gieg
Heath Hattaway
C. Barrett Kennedy
Joel Tohline
Chuck Wilson
Bill Wischusen
Dear Colleagues:

Information technology (IT) is now nearly completely integrated into the very fabric of our lives. IT is pervasive—perhaps as pervasive as electricity. And while a “digital divide” still exists in this country and more broadly across the globe, at Louisiana State University—and across higher education in general—information technology is the underpinning infrastructure behind most of our daily activities in a university setting. IT impacts everything—if not via its presence, in its absence. In the years ahead, our reliance on information technology will only increase; we must plan to pay even greater attention to it and the resources devoted to its use.

The technology itself—computers, networks, data, and information “bits and bytes”—remains only part of the equation. These are the physical tools that we can see and touch. But perhaps more critical are the people who apply these tools in productive manners: the human resources. These human resources include those who use the tools every day in their roles in the LSU community—faculty conducting research and classes, students learning and living in a twenty-first century environment, and staff and administrators translating academic priorities into action. It includes, too, those people who enable others use of the technology and advance the community’s effectiveness in using the tools. At LSU, we need to realize the importance of both components of a solid IT infrastructure—the tools and the people who make their use productive. We need to not only be thinking about how we modernize and periodically update our tools, but also how we ensure that as these newer tools emerge, we’re also investing in training people in their use and investing in resources to help us understand new ways to conceptualize and support how these tools can be used.

The most effective way to ensure we can address information technology at LSU is to have a well structured, broadly-based, and detailed strategy for its use. And just as important has having this “blueprint” for IT advancement, is realizing that the advancement of IT goals in support of the Flagship Agenda is everyone in the LSU community’s responsibility—not just that of the CIO and the central IT organization. Hence, the best way for such a strategic plan to be successful is for it to flow from the needs of the community served by information technology. That is precisely what we have accomplished in the Flagship IT Strategy.

Previously, “IT Master Plans” at LSU have been too focused on the technology itself, and too directed toward one component of the human resource: the central IT organization. While significant effort went into these plans, given their focus on specific technologies and only the actions of the central IT operations, they ultimately failed. Focusing on technology—which is ever-changing—means that a strategy is outdated not long after it is crafted, and unless constant, vigilant attention is paid to its updating, its usefulness quickly fades. Likewise, if the only stakeholders in success are the CIO and a small group of staff in one department, obtaining traction for the change required to build a flagship-class IT environment loses momentum and again, quickly becomes a forgotten plan. What defines the Flagship IT Strategy is that it has flowed from the community—it is LSU’s plan for IT, not the IT plan for LSU. This, and a focus on outcomes rather than specific technologies provides it the best chance to be a useful roadmap that will be of value for the 4-6 years it will take to see it to completion.

The Flagship IT Strategy sets a course for progress. It is detailed enough to help ensure that the complete spectrum of IT-enabled areas are covered and yet broad enough in its recommendations and actions to allow flexibility in both how IT-enablement is achieved, and when. It will serve as a well-defined articulation of what we need to do – and more importantly why we need to do it. It will
require financial resources – both existing and new. But as any researcher knows, in preparing a proposal for grant funding you have to have a meritorious case, lucidly presented and well articulated in order to be successful in receiving funding. The Flagship IT Strategy sets forth a very meritorious case.

The plan describes where we want to be and why these things are important. But it is like a recipe for a 10-course meal with many, many ingredients. Some of these we have on hand, so we can start to make progress on components of the feast. Some parts will require us to find and acquire the ingredients before we can complete the meal. And as we proceed, we’ll likely find we will be able to creatively stretch what we have, or serendipity might provide what we need for one course out of our work on another. Of course we are going to need to identify funding, and be creative in how we do it; but we now have the recipe for success.

The Flagship IT Strategy brings to a close the first chapter in the renovation of information technology at LSU. Over the past year, we have made several changes in the way information technology provision is structured to better prepare LSU for successful advancement of the IT-enablement of the Flagship Agenda. The University created a cabinet-level position for IT in the CIO role. The central IT organization was restructured and renamed (to Information Technology Services) and its focus on the “flagship foundations” was established, emphasizing infrastructure, support of research, support of users, and attention to information systems. Demonstrations of the potential value of IT-enablement were provided, in the form of Pélican and TigerWare. And a community driven process of setting a course for information technology—the planning process—was commenced and completed, resulting in the Flagship IT Strategy. It has been an eventful year—including (and in spite of!) the hurricanes of 2005. But it is only the first year. More years of implementation work lay ahead of us.

I would like to express my gratitude and appreciation to the FITS Task Force Chairs who have done a superb job of generating the knowledge captured in the Flagship IT Strategy: Bill Wischusen (Teaching & Learning); Sumanta Acharya (Research); Joel Tohline (Information Systems); Chuck Wilson and Barrett Kennedy (Infrastructure); and Michelle Gieg and Heath Hattaway (Student IT Enablement). They and over one hundred faculty, students, and staff who worked on the Task Forces are the very essence of the quality of this plan, and they are to be congratulated on their final product. I would like to give a special thanks to Randall Hall, Professor of Chemistry, who as a representative of the Faculty Senate, actively participated in every Task Force, and was a true partner in the creation of the plan. Within the Office of the CIO and Information Technology Services, my thanks to the Deputy CIOs and Officers, leadership, and staff who participated in both the Task Force process and the preparation of this plan. And I especially want to thank Sheri Thompson, who joined my staff in mid-2005 and who has marshaled both the process and the plan preparation to their successful conclusions. Her work fulfills the vision of the plan's creation by providing a written communication that will facilitate its sharing. LSU owes a debt of gratitude to all involved.

The Flagship IT Strategy is one of the finest such plans in the country. With its completion, we are starting well on our way to national prominence in information technology.

Brian D. Voss
It is fitting that the opening of LSU’s National Flagship Agenda references the technology revolution that has transformed our world as an analogy to how LSU is creating a similar revolution promoting pervasive change and advancement. Recognizing the link between LSU achieving national prominence in information technology (IT) and the transformation of LSU into a nationally prominent flagship institution is key to understanding the need for articulating a clear and expansive vision for provision of IT infrastructure and services at the University.

Universities have always been defined by two key features—the creation of new knowledge and the sharing of information. In the Twenty-first Century, information technology is a key strategic asset of the University as it advances both roles. New knowledge is no longer created in the isolation of an individual lab by a single researcher or small team; it is created in virtual environments that span dozens, even hundreds of partnering researchers, located anywhere and everywhere. Today—and more importantly, in the years ahead—new knowledge will be advanced through the application of cutting-edge information technology tools, such as high performance computing, and done so in nationally (and worldwide) collaborative environments supported by institutions connected to the growing national and global cyberinfrastructure. It will be shared with others also making use of information technology enabled environments—whether that be advanced visualization resources, classroom learning environments, online learning systems, or leveraged use of a pervasive information technology environment by everyone, everywhere.

For these reasons, information technology today is as strategic an asset to the University as its buildings and campuses, its funding and financial resources, its curricula, its research, and its faculty and students. Information technology enables our professors to teach more effectively, and provide richer and broader pedagogy. Information technology enables our students to learn faster and better, and acquire new skills more effectively. Information technology enables our scientists and researchers to open up new frontiers of knowledge, and expand and detail older ones. Information technology enables the enrichment of the student experience at LSU, providing the underlying infrastructure that links learning and life. Information technology enables our institutions to be managed more efficiently and effectively, through the prompt processing of data and the access to information that improves the quality of our decision making.

In order to transform LSU, we must transform our view of information technology. We should set out to transform LSU from a university that simply tolerates technology, to one that truly embraces it as an enabler of teaching, learning, research, student experience and operational productivity. We must be motivated by the understanding that information technology is a critical, strategic tool; to be a great university of the future LSU must have an exemplary IT infrastructure, plentiful IT resources, excellent IT services, and we must embrace the use of IT and technology more broadly. This embraced use and provision of
information technology has at its core a primary concept—IT Abundance. Within prudent and reasonable resources, and in line with institutional priorities, LSU should seek to provide an environment that features IT that is advanced, current, and readily available to the campus community in support of their achievement of the broad and varied missions of the institution. LSU has set for itself the goal of national prominence, via the Flagship Agenda. In similar fashion, it must set for itself the goal of providing the excellent IT infrastructure and service environment that, too, achieves national prominence. LSU should seek to be a national leader in the creative use, application, and provision of IT—as doing so enables every other facet of the Flagship Agenda.

How do we at LSU advance such a goal? First off, a careful planning process is undertaken to develop the “blueprint” for IT excellence. Careful planning and stewardship are not new concepts to LSU; we have built one of the most beautiful and impressive campuses in the nation by virtue of planning and attention to implementing a master strategy. Thus, in support of the Flagship Agenda, we need a Flagship Information Technology Strategy to set a course for progress.

The Flagship Information Technology Strategy (FITS) is a thought-provoking list of outcomes describing the LSU community’s vision for an IT environment that enables the overall success of the Flagship Agenda. It is, very much, a companion document to the LSU Flagship Agenda providing a delineated analysis of the IT component of advancement. The FITS will serve as the master plan for the entire campus community as we carry out its action items over the next five years. And it is not just a strategic plan for the University’s Chief Information Officer and the Information Technology Services organization—it is a plan for all of LSU; the community crafted the plan and is a vital partner in its adoption and implementation.

The FITS deals with the “what” and the “why” of planning LSU’s IT future. It defines outcomes that the campus community wants to see in advancing IT abundance, and describes the value of these outcomes with reasoned justification. It is not a technical document, as it avoids in large part technology specifics. While technology is ever-changing, the problems to be addressed are relatively longer-lasting, and are met by developing technologies. The FITS shies away from discussions of priorities as well, even though priorities are a fact of life in higher education and at LSU in general. But the idea is that we should not dwell on the order in which we make advancement—and that we simply must address advancement—in whatever measure we can—in all areas, and not just a few.

The Flagship IT Strategy is a large, detailed, and complete planning document, developed by the LSU community. As such, it has the capability to stir this community to action. It establishes the vision of the community for what information technology at LSU could be, and thus enables us to begin to assemble the various raw materials and resources at our disposal, and those we will acquire in the years ahead, into a cohesive and impressive asset. It serves as a roadmap toward IT excellence, which through implementation of its individual action items will provide quality IT infrastructure and services at LSU, not just a single or ad hoc series of acts. Our goals are ambitious, but achievable.

The Flagship IT Strategy recognizes that information technology is vital to the transformation of LSU into a nationally prominent flagship institution, in that IT enables the very heart of such a transformation—research and economic development, teaching, and learning which benefit both graduate and undergraduate students, and facilities and quality of campus life. It answers the call to action in the National Flagship Agenda.
The Flagship Information Technology Strategy (FITS) marks the LSU community’s efforts to define the future development of information technology (IT) for LSU. A companion document to The National Flagship Agenda, FITS delineates the University’s vision for achieving national prominence through IT enablement. FITS calls for the establishment of an IT-abundant campus, and for the IT resources to facilitate the progress of LSU’s students, professionals, and faculty within their respective disciplines.

A series of focused, brainstorming sessions generated ten recommendations and eighty-four action items. The ten recommendations that emerged are:

I. Build a solid foundation of IT infrastructure at LSU that is modern and kept up-to-date

II. Make significant strides in increasing the accessibility of the LSU community to IT infrastructure and services

III. Develop a robust, multi-tiered support enterprise to meet the varying levels and specific needs of the LSU user community

IV. Develop sound fiscal planning for IT that leverages LSU’s existing investments, increases those investments in creative and innovative ways, and expends funding resources in the most responsible and efficient manner

V. Secure LSU’s IT infrastructure, safeguard the integrity of LSU’s information resources and the privacy of its user community, and ensure the continuity of LSU’s IT infrastructure and information repositories in the face of possible disaster scenarios

VI. Develop robust and plentiful IT resources to enable research at LSU

VII. Develop robust and plentiful IT resources to enable faculty teaching and student learning at LSU

VIII. Develop sound information systems featuring a rich set of applications and tools that address the increasing need for more effective and efficient institutional processes and provide for advanced academic analytics at LSU

IX. Support LSU student use of IT, not only as a tool in their learning, but to enrich their life experiences at LSU

X. Develop IT advisory and communication channels to ensure the continued involvement of the LSU community in the implementation of the Flagship IT Strategy and ongoing day-to-day provision of IT services to the campus

The action items, while organized according to recommendation area, actually entail several other themes that emerged during this process. These themes, while broad in scope like the empowerment of the IT user and leveraging of resources, manifest into the specific, identified, needs of the user groups within LSU. While everyone would benefit directly from a modernized infrastructure, ubiquitous access to IT resources, and robust, ever present support, the day-to-day realization of IT as presented in FITS will differ for instructors, IT professionals, researchers, staff, and students.

Instructors
Providing an IT abundant environment for teaching by increasing the accessibility of IT infrastructure and services (Recommendation II) on campus, at home, and on travel are major objectives of the FITS plan. Improved e-mail services, document sharing tools, a ubiquitous wireless network, and compatibility and service to mobile devices will take these technologies to the levels that enable efficiency and effectiveness in teaching. Training and 24x7 support for these services as well as technology-enabled classrooms and labs are priorities of the Flagship IT Strategy. Specialized centers for training and support as well as vendor-provided and locally-produced documentation will support robust computer literacy (Recommendation III). Faculty technology should be provided in a life-cycle replacement funding model and a standard budgeted amount should be earmarked for technology each year (Recommendation IV). Recommendation VI specifically addresses the research expectations associated with University faculty appointments. In Recommendation VII, the Flagship IT Strategy sets objectives for teaching and learning.

**IT Professionals**
Maintaining a modern, up-to-date infrastructure (Recommendation I), increasing the accessibility of IT infrastructure and services (Recommendation II), developing sound fiscal planning for IT (Recommendation IV), and the continued involvement of the LSU community in the implementation of the Flagship IT Strategy remain key areas of interest to LSU IT professionals. A modernized infrastructure and sound fiscal planning for IT will greatly impact the day-to-day support provided to LSU. No longer would professionals need to rebuild desktops. Instead, an IT abundant environment means different challenges for IT professionals both within central ITS and dispersed among the departments. Recommendation III calls for the development of a robust, multi-tiered support enterprise to meet the varying levels and specific needs of the LSU user community. Strong departmental support coupled with a supportive, centralized ITS should provide the leveraged support needed. Integral to this growth are acquiring new skills, engaging in dialog across units, and, together, securing the integrity of LSU information and systems (Recommendation V).

**Researchers**
FITS seeks to empower researchers and research computing at LSU. Key investments in infrastructure (Recommendation I), accessibility (Recommendation II), and support (Recommendation III) will go a long way to enriching the University’s research environment. Through the leveraging of key resources and through centralized IT investments (Recommendation IV), researchers would be assured of a standard level of hardware and software, and be able to spend more of their research dollars on advancing their disciplines. For researchers, FITS means building IT abundance—a robust network, plentiful computing cycles, and document-sharing tools. Additionally, the investment in specialized support and training would alleviate the technical roles researchers take on in training their students and staff in specific technologies. Recommendation VI specifically addresses development of IT resources for research.

**Staff**
FITS seeks to empower LSU staff whether it is through enabling work from home or providing IT support for a late night project. A modern, up-to-date infrastructure (Recommendation I), increasing the accessibility of IT infrastructure and services (Recommendation II), a multi-tiered, leveraged support model (Recommendation III), life-cycle replacement of personal computing devices (Recommendation IV), and the continued involvement of the LSU community in the implementation of the Flagship IT Strategy (Recommendation X) remain key areas of interest to LSU’s employees.

**Students**
The Flagship IT Strategy (FITS) seeks to empower students’ living and learning by providing not simply an IT abundant environment, but the skills and training needed to succeed in the IT enabled workforce. Basic investments in the IT infrastructure to include the creation of a fully wireless campus, robust network access and e-mail services, modern equipment, and integrated mobile technologies (Recommendation I) will create an IT environment at LSU in which students can succeed.
Recommendation II will ensure that LSU students have the access to software, hardware, and other technology resources they need. Recommendation III ensures that they will have the support and tools to use IT while Recommendation V protects their identities and information from unauthorized use. Recommendation VIII provides for information systems applications geared toward forwarding student academic progress. Recommendation VII and Recommendation IX are specifically relevant to the student experience.

In an effort to develop a strategic plan for information technology at LSU—the Flagship Information Technology Strategy—I, as the Chief Information Officer (CIO) of the University, have formed five Task Forces to develop key areas of recommendation and specific action items that will advance the goal of providing excellent information technology infrastructure and services that will establish LSU as a leader—in absolute terms on a national basis—in the creative use, application, and provision of information technology in support of the LSU’s National Flagship Agenda.

The primary driving concept behind this Flagship Information Technology Strategy is IT Abundance. Within prudent and reasonable resources and in line with the University’s priorities, we should seek to provide an environment that features an abundance of information technology resources, wherein the state of information technology at LSU is advanced, current, and readily available to support faculty, staff, and students in their achievement of the broader goals of the institution. By seeking to be excellent in providing an environment that has abundant information technology resources and a sound information infrastructure, we do so not as its own end, but as a way to serve the broader missions of the University. We recognize that information technology is the great enabler—of teaching and learning, of research, of the student experience, of the efficiency and effectiveness of the operation of the University, and of the University’s outreach and broader impact.

The specific five Task Forces are as follows:
- Research Enablement
- Teaching & Learning Enablement
- Student Experience Enablement
- Infrastructure
- Information Systems Enablement

Each Task Force will consist of a chair designated by the CIO, and members recruited from the LSU community of faculty, students, and staff. Information Technology Services (ITS) and Office of the Chief Information Officer (OCIO) personnel will also serve on these Task Forces in ex-officio status so that they, too, may provide input for consideration and participate in the development of the Flagship IT Strategy. As the CIO, I have appointed Task Forces, but I have done so in close consultation with the Faculty Senate’s IT Committee, Student Government, and University Administration. The Task Forces do not form a governing body for IT at LSU, but may well provide the basis for an ongoing advisory function in the future.

The specific charges to the five Task Forces developing the Flagship IT Strategy are as follows:
1. Convene and discuss the CIO’s vision for information technology at LSU and review the CIO’s suggestions for areas of consideration for recommendation and action. The timeframe of the Flagship IT Strategy should cover at least five years—through 2011. However, I hope that the resulting strategy will serve LSU long into the second decade of the twenty-first century.

2. Brainstorm and discuss possible desired outcomes for LSU in regard to information technology enablement, and list recommendations for each specific area of task force assignment. While
designed to be focused on separate areas of IT enablement, it is expected that areas of overlap and commonality across the Task Forces will exist and should be so documented.

3. Develop action items to enable the recommendations. These should focus on what the outcome should be and include a brief discussion of why such outcomes are necessary; a focus on specific implementations, technologies, and timing should be delayed until subsequent steps of the process (implementation planning phase).

These three steps should be completed before the end of the fall 2005 semester if possible. The Office of the CIO (OCIO) will then use the break between semesters to collate and assemble the work of the various Task Forces into a cohesive draft Flagship IT Strategy. Once this is done, the Task Forces shall:

4. Reconvene and discuss the assembled draft Flagship IT Strategy; provide direction to OCIO for revisions.

5. Consider endorsement of the draft Flagship IT Strategy, and if so moved and supported, provide said endorsement to the CIO.

These two steps will occur early in the spring 2006 semester. Once fully endorsed by all five Task Forces, the draft Flagship IT Strategy will then be quickly circulated widely within the LSU community to obtain feedback and additional input from that community. Once this has been done, the Task Forces shall:

6. Reconvene to review any broader input and feedback, make modifications, and make final endorsement of the penultimate draft of the Flagship IT Strategy to the CIO.

At this time—approximately Spring Break of 2006—the Task Forces will suspend meetings for a brief time and initial commitment to the Flagship IT Strategy planning process shall be considered fulfilled. Following this, the CIO will—with involvement and support from the Task Force Chairs and selected members of each Task Force—seek to obtain broader endorsement by key campus governance groups. Specifically, LSU Faculty Senate, Student Government, the Deans Council, University Administration and others as recommended by the Task Forces. Once so vetted and endorsed, the Flagship IT Strategy will become final and published; publication is scheduled for May 2006. The plan will be delivered to the Executive Vice Chancellor and Provost for her consideration and endorsement and forwarding to the Chancellor for his consideration and approval.

Future of Task Forces

The Task Forces will be re-engaged to develop implementation plans for specific recommendations and action items. Leadership of Information Technology Services and the Office of the CIO will draft implementation planning documents, and then work closely with the Task Forces to finalize them by the end of 2006. It will be in this process that we will establish the how and when (and how much) activities of the plan’s implementation.

Long term, I hope that the Task Forces—or their like—will be able to be called upon by the CIO for ongoing advice, counsel, and review of IT actions and accomplishments with respect to the implementation of the Flagship IT Strategy or other significant information technology issues that arise on campus. Discussions of the long-term future of IT advisory/governance structures should be held with all interested parties following the completion of the Flagship IT Strategy development process.

This charge submitted this fourth day of November 2005 by the Chief Information Officer of Louisiana State University.

Brian D. Voss
Chief Information Officer
### Information Systems Task Force Members

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<td>Carol Wesson</td>
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<td>Rose Mary Wilhelm</td>
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<td>Chuck Wilson†</td>
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<td>C. Barrett Kennedy†</td>
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<tr>
<td>Sumanta Acharya†</td>
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<td>Heath Hattaway†</td>
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While LSU has emphasized the importance of strategic planning for all of its units, and has regularly
developed and monitored institution-wide plans, previously developed strategic plans for information
technology were limited in scope to the Office of Computing Services as an organization.

Brian Voss, hired in the spring of 2005 to be the institution’s first chief information officer, called for
the development of an institution-wide strategic plan for information technology. In August of 2005,
Voss created and filled a position, executive coordinator for IT planning, dedicated to leading the
strategic planning process.

Based in part upon his experiences with the IT strategic planning process at his former university, Voss
determined that there should be five taskforces: Information Systems Enablement, Research
Enablement, Student IT Experience, Teaching and Learning Enablement, and Infrastructure. Voss spent
several months (April through October) speaking to various constituencies, building support for the
planning process. The Faculty Senate and Student Government sought volunteers for the various
taskforces and additional individuals were asked by the CIO to serve. The taskforces ranged in size from
12 to 25 people. Chairs for each taskforce were appointed.

The five taskforces each met for four, two hour sessions beginning in early November and ending in
early December. The five task forces touched upon not only their specific areas, but on broader
concerns such as security, support, and communications.

To provide excellent and highly valued IT infrastructure and services that enable LSU to fulfill its broad
missions in teaching and learning, research, student life, outreach and community service, and economic
development and the promotion of life-long learning in the State of Louisiana.

To be a national leader—in absolute terms—in the creative use, application, and provision of information
technology to best position LSU for leadership among U.S. public universities.

Louisiana State University has embarked on its "Flagship Agenda" from a position of many advantages,
and should now seek to establish a position of information technology leadership that is consistent with
the institution’s growing strengths in line with that agenda.

Since 1860, LSU has served the people of Louisiana, the region, the nation, and the world through
extensive, multipurpose programs encompassing instruction, research, and public service. One of only
25 universities nationwide holding both land-grant and sea-grant status, LSU is the flagship institution of
higher education in the state of Louisiana.
Research at LSU is conducted by faculty in academic departments and through institutes, offices, centers for advanced studies, and other special units. The University brings in more than $120 million annually in outside research grants and contracts and, at any given time, is contributing to more than 2,000 sponsored research projects.

LSU conducts two semesters, a summer term consisting of one or more sessions, and a three-week intersession each year. Curricula leading to bachelor's degrees are offered in 71 major fields, master's degrees are offered in 72 major fields, and doctoral degrees are offered in 54 major fields. Enrollment peaks in the fall semester at more than 30,000 students, including more than 1,600 international students and nearly 5,000 graduate students. In addition to traditional teaching programs, LSU serves nontraditional students—people whose educational needs cannot be met through full-time resident college study—through the Division of Continuing Education.

The creation of an IT abundant environment is integral to LSU's success in achieving national flagship status. The National Flagship Agenda calls for the development of University programs, and the generation and support of first-tier research. Whether recruiting top students or retaining solid research programs, LSU's success is reliant upon its technology and infrastructure being, not merely adequate, but nationally competitive. The National Research Council's report Preparing for the Revolution: Information Technology and the Future of the Research University (2002) predicts that technology will continue to evolve at an increased pace over the next several decades and that the impact on the research university will be "profound, rapid and discontinuous." Furthermore, the report cautions top-tier research universities to outline how they will respond to and utilize emerging technologies in order to adapt, grow, and continue to excel.

Planning for the future in the midst of so much uncertainty and change is difficult. Nevertheless, procrastination and inaction are far more dangerous courses of action. Universities that do not plan for the future can expect to lag significantly behind those that do.

It is important that LSU move forward to develop an effective, flexible strategic plan for the use of information technology in research and academic settings, teaching and learning, student life and leadership, and administrative support. It is equally important that the plan recognize the inevitability, ubiquity, and unpredictability of the changes in technology. It must define strategies to "sense" advances in technology, to foster an ongoing dialogue regarding the opportunities and challenges that these advances present, and to provide options for assimilating new technologies into the environment.

The plan must indeed be a "Flagship IT Strategy" that complements and supports the University's "Flagship Agenda," the seven-year plan to bring LSU to a new level of excellence by the year 2010. The Flagship IT Strategy must provide a path by which LSU can harness the expected changes in information technology to achieve its flagship objectives of (1) increasing research and scholarly productivity and (2) fostering quality and competitiveness in graduate and undergraduate students.

INFORMATION TECHNOLOGY AT LSU—A HISTORY OF SUCCESS TO BUILD UPON

LSU has achieved many successes in information technology over the past several decades and has been recognized periodically by peer institutions as a leader in selected technology areas. As we move forward to harness information technology in pursuit of the flagship goals, we should build on this history of success and chart new territory as needed to achieve leadership across the board. The information technology achievements of yesteryear that serve as the basis of this bright future should not go unrecognized. The most significant successes followed simple, broad mandates, and covered areas such as:

Administrative Process Automation and Transaction Processing – The 1983 mandate from then-Chancellor James Wharton to build an MIS system led to the development of a highly integrated set of
administrative applications that facilitate the day-to-day operations of the University. Applications have been developed to support Institutional Finance, Human Resource Management, Facilities Management, Student Enrollment Management, Student Finance, Student Services, and Information Resource Management functions, among others. The 2001 review of information technology by the National Center for Higher Education Management Systems indicated that LSU “has done an outstanding job of developing in-house software in a very stable operating environment.”

Library Management – The mandate from then-Provost Carolyn Hargrave to provide more support for libraries led to the organization of LOUIS: The Louisiana Library Network. LOUIS has recently celebrated its 14th year serving academic libraries in Louisiana. LOUIS provides a host of library services for all Louisiana public and private academic libraries. Services range from catalog automation, federated searching, link resolving, authentication, inter-library loan, electronic resources, and a repository for unique digital images (digital library). Over the last decade, LOUIS has received numerous statewide and national recognitions to include the Louisiana Library Association’s Margaret T. Lane Award (2000), Academic Librarian of the Year for the state of Louisiana (2002, 2005), and received the WebFeat President’s Innovation Award (2006).

Reliable Delivery of IT Services – IT services are now critical to all aspects of the University as demonstrated by a general mandate to provide robust and reliable 7x24 infrastructure services. The Frey Computing Services Center, occupied in December 1995, is a state-of-the-art facility that serves as the hub for the IT infrastructure and the delivery of services. With 50,000 square feet, including 14,000 square feet of raised-floor machine room, Frey houses 162 full-time employees of ITS, millions of dollars in IT equipment, the Help Desk, a conference center and a training classroom, and some CCT facilities. It includes redundant power feeds, uninterruptible power service (UPS), a backup generator and chillers, and a fire protection and security system. The Operations staff is on duty 24 hours every day of the year.

Personal Access Web Services (PAWS) – Personal Access Web Services (PAWS) was developed in response to a mandate by then Executive Vice Chancellor James Coleman to improve student computing. PAWS is a services infrastructure that delivers 86,000 unique intranet portals to members of the LSU community. Services accessed through the PAWS portal include enterprise, workgroup, and personal applications that meet the specific administrative, academic, and research needs of each PAWS user. On average, students, faculty and staff execute approximately 1.7 million administrative transactions via PAWS each week, to add classes, view grades, verify financial aid, pay tuition, and certify leave, among others. PAWS was recognized with the 2000 EDUCAUSE Award for Exemplary Practices.

Student Technology Fee (STF) – The mandate to improve student computing that led to the development of PAWS also led to the passage of the Student Technology Fee (STF). Over the last five years, this fee has funded the acquisition of significant components of IT infrastructure now made available to students in public access computing labs and multimedia classrooms across campus. The Students – through visionary investments of their STF funds – have also led to the ‘jump-starting’ of technologies across campus, ranging from wireless networking to software distribution (via TigerWare, added in 2005). Students have proven to be some of the strongest supporters of the development of a flagship-level IT environment as LSU, and continue to show strong interest in further advancements, such as the Information Commons and broader software licensing.

Networking and Telecommunications – LSU has made great strides in the past decade in providing a modern, stable, and highly flexible network infrastructure, serving the voice, data, and video needs of the campus. Many new protocols and the increasing use of high performance computing have been major factors in increasing bandwidth, reliability, and extra services available through the campus data network. In 2005, ITS expanded the LSU Commodity Internet connection over three-fold, and has worked with State Government in continuing the support connectivity to Internet2 and now to National LambdaRail. As well, through efforts spearheaded by LSU and partner institutions around the
state (ULL, UNO, Louisiana Tech, Southern University and Tulane), The Louisiana Board of Regents has overseen the building of Louisiana Optical Network Initiative (LONI). LONI is to be a regional optical network that connects institutions of higher education and state government together using the fastest optical networking technologies, and also serves as a platform for high performance computing. LONI is unlike any other regional optical network in this regard, in that it is also a high performance supercomputing grid enabling research, and as such is recognized nationally and globally for its innovative approach.

Research Computing – In 1999, LSU established the first high-performance cluster in the state of Louisiana with funding from the Louisiana Technology Innovation Fund. The cluster, named CaSPer, served the state’s higher education research community as a development and training platform. CaSPer supported graduate education and research in parallel technologies as well as traditional research programs in a variety of disciplines. In 2002, LSU implemented the second-fastest computer (at that time) among academic institutions worldwide: a Beowulf cluster christened "SuperMike." This cluster, acquired by the Center for Applied Information Technology and Learning (LSU CAPITAL), now the Center for Computation and Technology (LSU CCT), significantly enhanced the high-performance computing resources that are available to Louisiana’s students and academic researchers in various subfields of information technology. And in 2005, LSU again broke new ground, installing the first-of-its-kind POWER5-based supercomputer from IBM, bringing a rich new architecture onto campus to serve researchers.

ADVANCING INFORMATION TECHNOLOGY STRATEGICALLY AT LSU

Recently, the University took several major steps toward broader recognition of the role of information technology with the creation of the role of Chief Information Officer as a member of the University’s executive administration team, the appointment of Brian D. Voss to this position in April 2005, and the subsequent restructuring and renaming of the central IT services organization, Information Technology Services (ITS), in September of 2005. One of CIO Voss’ first imperatives was the crafting of a community-driven strategic plan for information technology that supported the Flagship Agenda.

Historically, strategic directions for IT have been left almost entirely to the central IT organization. Previous incarnations of IT strategic plans have been sparse and overly focused on short-term technology goals and the specific role of central IT, rather than a holistic approach to developing a long-term strategy, addressing the broader institutional role in IT advancement, and consistent with the university’s long-term vision of its broader mission. These previous efforts, while productive in some ways leading to the successes previously highlighted, lacked an overall, coordinated, and comprehensive blueprint for how IT could best advance the broader university strategy. They were tactical in nature, rather than strategic. And they were perceived to have failed by the broader community, in the end, to deliver long-term, strategic impact on the institution.

It is now well understood that a university’s IT strategy must be synchronized with that of the university’s overall strategy (Pearson & Saunders, 2006). Thus, while oversight and responsibility for implementing specific technology actions is certainly within the portfolio of the central IT organization, the development of overall IT strategy must be created in partnership with the broader university community and the roles that all parts of the institution must play for it to be successful have to be well articulated. LSU presented its strategic plan, the National Flagship Agenda, nearly three years ago; while IT is mentioned within its vision, the University lacked a fully developed IT strategy that mapped the relationship between IT development and the University’s progress toward national flagship status. As a companion document to the National Flagship Agenda, this Flagship IT Strategy (FITS) provides the vital blueprint from which to build and measure such progress.
For information technology at LSU to achieve levels of excellence as a key enabler of the National Flagship Agenda requires an effective overall strategy that spans five foundations for IT infrastructure and services: a sound IT infrastructure, support for teaching and learning, support for the student experience, support for research, and well-managed institutional information. Hence, five task forces were created to examine these focal points. However, while the task forces were charged with providing vision for their respective, specific topic areas, the members touched upon several key, interrelated issues that have been organized into a set of ten (10) general recommendations of this plan.

The first five recommendations address key facets of a sound IT infrastructure, including physical infrastructure, access to information technology by the community, support for the use of information technology, fiscal planning, and securing and protecting LSU’s IT assets, information resources, and community members. What then follow are four specific recommendations aligned closely with the remaining foundations (research, teaching and learning, information systems, and student life experience). The final recommendation addresses the need for ongoing advisory functions and communication between all parts of the community as it relates to information technology.

Specific action items for each area of general recommendation are delineated subsequently within the proposed action items in Section I.

These recommendations are ordered in a fashion designed for logical flow of the planning process and do not connote a priority or order of importance. While the first set of common, core recommendations are in many ways required to accomplish the second set of recommendations, the community wants progress across all areas of IT enablement, not just a few. Advances across all areas will certainly help the overall momentum of the plan, and ensure that all areas of the IT-consuming community feel progress is being made.

**GENERAL RECOMMENDATIONS**

I. **Build a solid foundation of IT infrastructure at LSU that is modern and kept up-to-date**

The great universities for the twenty-first century will be those that have an exemplary IT infrastructure, a key to which is having up-to-date equipment in classrooms, in labs, on desktops, and mobile throughout the University. Old, outdated, and failing equipment means IT is disabling rather than enabling University core functions; to facilitate these activities, the basic components of user devices (personal computers), network components, and central computation and information processing equipment and facilities must be cutting-edge and regularly replaced to ensure they remain current as technology advances.

II. **Make significant strides in increasing the accessibility of the LSU community to IT infrastructure and services**

Achieving Flagship IT status requires students, faculty, and staff to have access to relevant hardware and software tools. A solid, modern, and life-cycle-refreshed infrastructure is required for users to take advantage of IT’s enabling power. Another key component for users is access to what makes the physical resources work—software. Members of the University community must have access to a common and broad set of software tools as part of a pervasive computing environment. Specialized tools required for some tasks (whether they be software or hardware peripherals) must also be available in an IT abundant environment. LSU must make a diverse set of tools accessible, affording choice to community members. Equally important, innovation should be encouraged.
Beyond providing a diverse tool set, members of the LSU community must have the skills they should make use of available information technology. We must also be aware that the paradigm of the “personal computing device” is constantly evolving; hence, we must ensure that the access provided to IT infrastructure and services closely follows trends in the types of devices that act as portals for users to enter the IT enabled environment.

III. Develop a robust, multi-tiered support enterprise to meet the varying levels and specific needs of the LSU user community

Most critical to the University’s IT enablement is support. LSU has, through its technology history, been fairly successful in providing infrastructure and access components; unfortunately, the University has often neglected to recognize how critical the human capital component is to achieving the benefits of the physical capital acquisitions. Attention must be given to building support models that work in the LSU environment; the University must also realize that without people—and the support tools they help build using technology—the IT environment at LSU will never be complete, and the progress of the IT-powered Flagship Agenda goals will suffer in their absence. Support needed to use IT should be easy and available in many forms and layers, depending upon the user and the specific technology. Investments should be made in strategically placing IT support providers on campus, and in building a model that leverages the roles these distributed providers play. Most critically, ITS must ensure that the other two components, distributed support and end users, are productively working and well supported. While a distributed environment must grow to most effectively meet the needs of a distributed user community, ITS will be called upon not only to fulfill specific support functions, but to orchestrate the overall support environment.

IV. Develop sound fiscal planning for IT that leverages LSU’s existing investments, increases those investments in creative and innovative ways, and expends funding resources in the most responsible and efficient manner

Without funding, no amount of planning will yield successful results. IT is a strategic asset, and as such, wise investments are necessary to ensure that these newest technologies best support the University’s overall goal of national flagship status. Modernizing the existing IT infrastructure and ensuring it stays fresh across appropriate life-cycles are a large part of the funding strategy challenge. The same holds true for providing the basic access tools and means, and for developing the human capital and IT-enabled online support structures needed for ultimate user success. IT is the life source of the University, no longer a tolerable necessity or a luxury; as such, the University must develop IT-specific funding plans and should no longer rely upon ad hoc financial support. Mindful of some successful models already in place, ITS should map funding strategies holistically across all areas of IT. Some such initiatives include funding strategies for classroom and student labs and plans to deploy and refresh mainframe administrative hardware. IT enablement of research may be in most dire need of strategically-planned approaches to funding. While students have provided a great deal of quality infrastructure with the student technology fee, the opportunity for further investments to yield even greater results should be explored and advanced.

V. Secure LSU’s IT infrastructure, safeguard the integrity of LSU’s information resources and the privacy of its user community, and ensure the continuity of LSU’s IT infrastructure and information repositories in the face of possible disaster scenarios

Security, integrity, and privacy are critical issues for LSU to address in order to achieve a position of leadership in information technology. As we continue to build even greater IT infrastructure and service environments, we will inevitably increase our risks for losses due to malicious intrusions or natural disasters. In a networked world—and in the open environment required at a major University—where
every device is accessible in some manner to every other device in the world, security is critical to safeguarding our technology environment. Unfortunately, there are ever increasing numbers of individuals who intend to use the network for nefarious purposes. While there are greater security tools today, there are also more dedicated and talented cyber criminals intending to do harm or gain access to information that is not legally theirs. The University has a legal responsibility to safeguard its assets and community members’ information. In 2005-06, the CIO requested an external IT Security Audit, and with that expert advice in hand, LSU must begin taking steps to ensure the integrity and safety of its IT environment.

The devastating hurricanes that hit Louisiana in 2005 have given first-hand examples of the price institutions pay because of inadequate preparation. Business continuity planning and preparation should no longer be based on hypothetical disaster scenarios; we have seen the impacts disasters can have on University operations. Proper disaster recovery and business continuity plans must take into account how critical IT infrastructure, information, and service are to surviving and recovering from disasters of varying severity.

VI. Develop robust and plentiful IT resources to enable research at LSU

One of the core functions of a University is to discover knowledge, often through research and scientific advancement. The research that will advance science is very much IT-enabled. Most of today’s research projects at LSU involve some form of IT. Whether it is high performance computation, storage of massive amounts of data, visualization of results, or collaboration with colleagues across the state and nation and around the world, IT is a critical factor in successfully advancing research at LSU. Revolutionary changes in information technology have brought about evolutionary transformation in the world’s social and economic structures. LSU has made tremendous strides and investments in this area through the efforts of individual researchers and under the broader initiative that is the Center for Computation and Technology. We can do more.

LSU must develop funding models with the foresight of changing practices at granting agencies. Even as the NSF and other granting agencies grow their funding for research, they are beginning to move away from providing hardware support at the individual institutional level. Through 2010, LSU, and institutions like it, must increase investments in computational infrastructure, so as to allow researchers the tools they should tap into the redirected funding flows in software, training, and scientific advancement. LSU is well positioned for research advancement despite shifting financing options because of the presence of the CCT, the collaborative environment that exists between that Center and the central IT environment, and a shared focus on building IT infrastructure in support of research at LSU. But there should be the recognition that growing this research-enabling IT environment can not be done simply by CCT and ITS alone; funding strategies must developed.

Additionally, the availability of these twenty-first century tools must be extended beyond the traditional “hard sciences” base of users, and into new areas of broader impact, including the humanities, social sciences, art, and music.

VII. Develop robust and plentiful IT resources to enable faculty teaching and student learning at LSU

Sharing knowledge is the other core function of a University. Knowledge is shared through IT-enabled teaching and learning. It comes as no surprise that information technology has changed the very ways in which teaching and learning are conceptualized. IT enhances an instructor’s ability to convey concepts, and enhances a student’s ability to grasp those concepts. IT expands the learning environment beyond the classroom or library, opening a world of information, insights, and opportunities. The very way
people interact with the world around them today is through information technology. LSU must build upon its strengths in this area by expanding an IT toolkit for instructors and students and further encouraging the implementation of IT in the teaching and learning processes.

The University has embraced learning management systems (also known as course management systems), but perhaps too much so, as two competing platforms are now in place. This may allow faculty the flexibility to choose the tool that best fits their teaching style, but it confuses the learners because they do not have a consistent and reliable tool for use across all of their classes. In addition, faculty can not rely upon the pervasiveness of information technology across their classes because the University does not require (or even well encourage) student ownership of modern mobile computing platforms (laptops). These and other facets of the IT environment for teaching and learning must be addressed.

VIII. Develop sound information systems featuring a rich set of applications and tools that address the increasing need for more effective and efficient institutional processes and provide for advanced academic analytics at LSU.

Information technology is a key component of managing and operating LSU’s business and academic administrative functions. These systems are no longer back-office functions at LSU—they are front and center as the campus community interfaces with them everyday. From registering for classes or tracking one’s progress toward a degree, to purchasing a piece of equipment or service for one’s department, to checking the status of one’s University bills, salary, or benefits, administrative functions are now accessible on a moment-to-moment basis.

While LSU has not been faced with a multi-million dollars investment in its information transaction processing applications, it is facing a crisis. There is a ten-year backlog of information systems requests to be processed, the architectures are too interdependent to be fault-tolerant in a risky world, and the tools used by developers are outdated, non-standard, and complex to use. Lack of ready access to information has put our key administrative officials and academic leaders in a predicament; we can process data and handle our transactions, but getting information out of that data is an arduous task, left only to the most skilled of data retrieval programmers. LSU must orchestrate more information flow out of the massive data stores and applications we have in place to ensure that we are properly conducting academic analytics, and making the best possible decisions based upon the most key commodity we have—information.

University information systems hold the greatest possible threat in an IT-enabled environment. Because the systems must be in place for the institution to function, large investments are required to manage and produce university information and keep business flowing. A majority of U.S. public and private universities in the past decade have moved toward massively complex (and expensive) Electronic Resource Planning (ERP) implementations. These ERP implementations pose a threat to other areas of IT enablement, including academic and research initiatives, because ERPs are so expensive they consume resources that could be devoted to funding other enterprises. LSU must take care to avoid such hazards by building a sound, functional, effective, and efficient information systems environment.
IX. Support LSU student use of IT, not only as a tool in their learning, but to enrich their life experiences at LSU

Students at LSU have long realized the critical importance that information technology plays in their academic lives. Students have demonstrated their interest in IT by suggestion and long-term support of a student technology fee (STF), and insistence on direct and active involvement in the ways in which those STF-provided fees are invested in IT on campus. Beyond the pedagogical benefits and applications, IT is now a part of a student’s total life experience at the University. Students have been dedicated and vigilant in examining the role of IT on campus, in classrooms, and in lab spaces, but in the future, they must also press the institution to development IT abundance beyond the physical domains of classrooms and labs. The University should make student acquisition of basic IT skills a priority, thereby preparing them not just for a more productive college experience, but for lives and careers in the world beyond the University. This could also include insistence on consistency in the IT environments students experience across campus, whether or not they are STF-funded. LSU should follow students’ desires to explore creative uses of information technology beyond LSU’s traditional student focus on teaching and learning.

X. Develop IT advisory and communication channels to ensure the continued involvement of the LSU community in the implementation of the Flagship IT Strategy and ongoing day-to-day provision of IT services to the campus

The FITS planning process has been a wonderful step toward bringing the LSU IT user community into touch with the new Chief Information Officer and the ITS organization. The concept of a user-driven, user-centric strategic plan for information technology has yielded not only an excellent plan, but it has also started a long-overdue dialogue between the user community and the central IT organization led by LSU’s cabinet-level administrator for information technology (the CIO). This process should not be viewed as completed simply because a plan has now emerged. The CIO should remain active in engaging the user community—primarily faculty and students, but staff and administrators as well—in the implementation and fulfillment of the action items delineated herein. An open dialogue with a sense of collaboration and partnership is a refreshing change that must continue in order for LSU to progress toward IT excellence. The CIO should continue to seek out advice and counsel from the user community, and actively request support of IT initiatives that they have helped to shape. The ITS unit is the heart of all IT initiatives on campus; regardless of how distributed or pervasive IT becomes at LSU, the ITS organization will continue to be the center of these activities. As such, ITS professionals have a critical role to play in ensuring that communications between themselves and the user community are strong and effective. In an environment where IT is so distributed and pervasive, ITS must be the conduit through which all members of the campus community remain on the pulse of activity, advancement, and issues.

Although ITS enables many academic activities, it is also a large service organization on the campus and is largely viewed as part of the campus administration. As such, it should remain attentive to its reputation, by being as open as possible with the campus regarding the costs of the services it provides and the quality of those services as perceived by the community at large. ITS should ensure that the community that relies upon it—and funds it—is able to see in detail how investments are being spent, and what the results of those investments are over time.
To achieve progress in advancing the general recommendations, specific action items are proposed. These represent the “what” and “why” of specific areas of activity that must begin, so that the associated recommendation can be achieved. Some actions are very straightforward in nature, and should require little effort to interpret into specific implementation. Others are more conceptual and will require more detailed implementation planning. However, these action items are likely the ones that will provide the foundation for this strategic plan’s long life, forming as they do a set of guiding principles for outcomes that will certainly stand the test of time, as technologies inevitably evolve and change.

The action items are associated with the ten general recommendations. Each is numbered in a fashion to allow both quick reference to it and easy determination of what specific recommendation it supports.

**RECOMMENDATION I:**

*Build a solid foundation of IT infrastructure at LSU that is modern and kept up-to-date.*

> We should not build infrastructure in this country and then walk away from it without maintaining it and modernizing it as it becomes antiquated.

— Jerry F. Costello, US Representative (D-IL)

**ACTION ITEM 1.01**

The University should provide its employees with the modern information technology needed to be productive, including a standard level of personal computers. As a part of this, the University should provide centralized life cycle replacement for its stock of computers.

While the level of sophistication in hardware may vary depending on the user, all LSU employees that conduct work on a personal computer should have the basic technology to be productive. At minimum, this technology should be able to run the most-up-to-date software and have the latest operating system in place to ensure the machine is secure and functions well. Old operating systems hurt the security and integrity of LSU’s network.

**ACTION ITEM 1.02**

Classrooms and labs should have standardized, basic multimedia functions that are “the latest and greatest technologies,” upgraded regularly, and well-maintained.

While classroom technologies do not usually drive pedagogy, they are used to enhance student learning. A faculty member must be assured that any classroom to which he or she is assigned will have a basic set of functioning tools that are ready for use. Standardized basic tools will facilitate easy transitions from room to room. Instructors should not have to worry that their lesson may be delayed by technical difficulties or that what they have prepared to use is not compatible with the equipment available. Such assurances will encourage the further integration of technologies into the classroom experience.

**ACTION ITEM 1.03**
To begin the process of modernizing basic infrastructure and to support subsequent actions regarding sound fiscal planning, an inventory all of the institution's information technology assets should be commissioned and completed.

It is important to have a central database documenting all of LSU’s information technology resources. The community desires to know what the University has, and such knowledge will act as a starting point of reference for all exercises focused on building and solidifying the IT infrastructure at LSU. Knowledge of existing resources will inform the modernization process and the security of LSU’s network. ITS should coordinate this inventory, but all units on campus must also contribute to and support this activity.

**ACTION ITEM 1.04**

In order for the University to continue its advances, significant resources must be directed to the overall design, development, modernization, and maintenance of a robust central computing center (Frey Computing Services Center).

The Frey Computing Services Center is a relatively new facility, featuring a great deal of usable floorspace. However, it was designed in an era when power and cooling densities for computing equipment were significantly less than they are today. Though today’s computing equipment that supports research, teaching and learning, and University information processing takes up less and less space, the technology requires greater amounts of power, and consequently, more powerful cooling systems to eliminate the larger amounts of heat generated. The Frey machine room currently runs near power and cooling capacity. As the University updates and expands the number of computing resources housed in Frey, additional cooling and power supplies must be provided.

**ACTION ITEM 1.05**

The IT infrastructure needs of future buildings on the LSU campus—especially computing-intensive facilities—must be addressed prior to construction.

As buildings are renovated and new facilities are constructed, the designs must take into account not only the wiring and network needs of the facility, but the cooling, ventilation, and power demands of increasingly technical building functions. Whereas space demands are at a premium on campus, and there is a particular exigency for research space, construction plans should be forward-thinking and take into account the specialized IT needs of the facility.

**ACTION ITEM 1.06**

The campus network, and its connections to external networks (both commodity Internet and advanced research networks), must be able to handle large volumes of traffic and be nearly flawless in its reliability and availability.

The network has to be robust enough to run unlimited transactions, especially during periods of unusually high volumes (class registration). No one should be hampered by a slow network or unable to run a batch feed because he or she is working during a peak usage time. In an IT abundant environment, people do not have to put their important transactions (the business of the University) on hold because of a busy network. There should be a strategic system in place for building and upgrading the network. This strategy should encompass University-provided life-cycle replacement of basic infrastructure that enables technology for the campus community, including suitable lifecycle replacement programs for its switches, wiring, networks, and telephony.
ACTION ITEM 1.07

Electronic mail systems are the heart of communication infrastructure for LSU community members, and a key network utility fostering collaboration and communication across the institution and, more broadly, to the outside world. In today's world of high e-mail volumes and large attachments, a service suite for e-mail that provides adequate storage and options for user interfaces must be deployed as part of the basic network services infrastructure at LSU.

E-mail is the primary communication vehicle in the twenty-first century networked world. Recently, LSU has made great strides in providing a highly usable e-mail solution for its students, but offerings for faculty and staff are woefully inadequate. ITS should immediately review e-mail service suite offerings for all members—shifting its paradigm for service offerings from a student versus faculty/staff view, to one that evaluates institutional versus individual user needs. It seems clear that e-mail is becoming a commodity, but that does not diminish the LSU community’s dependence on it; in fact, it only heightens awareness of discrepancies between readily available services (high capacities), and those currently available on campus (greatly constricted). What is needed is a set of solutions that provides options for institutional users who need reliability and system integrity, and individual users whose primarily concerns are market and cost factors.

ACTION ITEM 1.08

The IT infrastructure at LSU should be flexible enough in its architecture to respond to innovation and changing needs/priorities, and take advantage of a wide variety of opportunities presented by the marketplace. Decisions on vendors must be made with an eye toward maintaining this flexibility. It does not seem wise for LSU to “single source” itself with one IT vendor, but instead, to use a variety of architectures and a strategic suite of diverse technology vendors.

The University’s progress should not be hampered by its technology. Unfortunately, in efforts to simplify the process of dealing with vendors, and in an attempt to broadly leverage IT purchases, LSU appears to have limited its options. In the future, the University should not limit itself to reliance on a single or very limited set of vendors. At present, the marketplace is too open and opportunities for competitive acquisition too great for LSU to be, by its own choice, single sourced. This limitation appears, to the community, to have constrained both the architectural decisions for providing systems and the diversity of technologies available for use by the campus community. The community certainly understands that there are intelligent and valuable reasons for leveraging purchases, but this must be carefully balanced with the provision of a diverse infrastructure, and one that may be holistically more cost effective.

ACTION ITEM 1.09

The University-wide deployment of wireless network infrastructure should be advanced so that such access is ubiquitous and pervasive.

Wireless networking has reached maturity and its deployment at universities is now an expected infrastructure component, rather than a luxury. Most significantly, students and faculty are no longer bound by a need to connect to a fixed network connection in order to access resources. Wireless networking frees users to be truly mobile, and to access the world of Internet-based information resources and services wherever they are on campus. The presence of a pervasive and ubiquitous wireless network across our campus stimulates adoption of mobile computing technologies, which is key to twenty-first century teaching, learning, and living environments. LSU should strive to quickly—before the end of academic year 2006-07—upgrade and expand its wireless network on campus to a level that meets or exceeds coverage seen at any institution in the nation.
**ACTION ITEM 1.10**
Realizing that the paradigm for personal computing is transforming to one far more dependent upon mobile technologies (such as laptops and personal digital assistant devices), the University should plan for the power needs of these devices, specifically, by finding ways to allow the mobile user to re-charge batteries or exchange common batteries.

In order to enable the use of portable devices and IT solutions, on-campus resources for recharging mobile devices must be plentiful. Power is everything, and the reliance on more mobile devices will only underscore this assertion. Potential solutions should provide for a greater availability of “walk-up” or “sit-down” power access, as well as potential solutions for hot-swapping of a standard array of battery devices via some sort of staffed or kiosk facility. The University should undertake a study of the cost of providing this power, and identify or develop suitable funding sources.

**ACTION ITEM 1.11**
Innovative uses of recycled technologies should be encouraged.

While modernization of University technology is a key priority of this plan, the potential functionality of many machines may outlast the original intended use of the equipment. Older machines that no longer support the latest software for the office, lab, or classroom may find extended use as an e-mail kiosk, a print server, or as part of a commodity/recycle research cluster. The community must be careful not to create needs for burdensome maintenance or support in an effort to extend the useful life of equipment. Given reasonable guidance, older technologies can be put to useful service for LSU without adding to the financial or human support burden normally attendant to an outdated piece of equipment in a production setting.

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**RECOMMENDATION II:**
**Make significant strides in increasing the accessibility of the LSU community to IT infrastructure and services.**

*I do not fear computers. I fear the lack of them.*

- *Isaac Asimov, novelist*

**ACTION ITEM 2.01**
All members of the LSU community should have ready access to the IT software they need to succeed.

Software is the realization of information technology hardware, and is the brain upon which the brawn of computing operates; software provides access to the power of the computer. The University should provide the broadest possible offering of software tools to the community, leveraging campus-wide site licenses, freeware and open source tools, and special institutional pricing. ITS made significant strides in 2005 with the Microsoft Campus License Agreement, and TigerWare, but these should simply be the first of many forward-looking steps the University takes to ensure the community has access to software. Where site licensing or campus-wide licensing is neither possible nor affordable, other
sophisticated and creative ways of serving software must be explored. All members of the community should be able to easily identify where the software and tools they need may be accessed—whether that be via free download, application serving, at-cost acquisition, or availability in a fixed location in a campus lab. ITS should make a primary facet of its Web presence a veritable warehouse of information about software—and specialized hardware tools—availability.

**ACTION ITEM 2.02**

All members of the LSU community should have ready access to the specialized IT tools and resources they need to succeed.

In addition to software, a variety of other specialized tools should be made available for use by students, faculty, and staff. Every interesting and useful IT tool is not affordable to all individuals or departments; hence, having pools of these specialized resources for community access and/or check-out makes sense economically, while providing the richest IT peripheral environment to the University. ITS should work to identify needs and funding sources for these tools (such as cameras, video equipment, large-format printers and plotters, high density scanners, visualization equipment, and the like) and work to establish and maintain convenient locations and availability of these resources to the community at large.

**ACTION ITEM 2.03**

Information stations (e.g., kiosks) with a minimum of electronic mail and Internet access should be placed strategically across campus, to improve the access to communication utilities and information on the Internet.

Students, staff, and faculty should be able to check e-mail or access PAWS while away from their desks or during the time between classes. A ready supply of information stations or kiosks in high pedestrian traffic areas will empower the campus community and provide efficiencies. These stations provide alternatives to the computer labs which are at full capacity during peak times in the semester and are better used to supply access beyond basic information to the rich set of software tools that advance pedagogy. While the continued adoption of mobile computing technologies may render the need for these devices obsolete over time, such an assumption should not simply be accepted as fact, until it is proven so through detailed study of use patterns. This role also provides an excellent post-life-cycle use of desktop computers, as described in Action Item 1.11.

**ACTION ITEM 2.04**

Information technology “commons” areas should be developed in strategic, centralized, high-traffic areas, such as the Middleton Library and the Union, to promote twenty-first century era collaboration on campus. These “commons” should be showplaces of IT infrastructure and resources, which will promote not only student collaboration, but faculty collaboration as well.

An IT Commons area is an interactive physical space that encourages and enables collaborative uses of technologies. The area has sufficient hotspots, ports, and electrical outlets to host several laptops and can be the site for podcasts, Web trainings, lectures, and the like. IT Commons areas are becoming increasingly prevalent at top research institutions nationwide. LSU must follow this trend in order to attract and retain top students and faculty.

**ACTION ITEM 2.05**
Availability of technology should not be limited to the campus. Faculty, students, and staff should have access to information and resources while traveling or at home just as they would on campus.

The work of the University is not always completed during business hours and within the confines of the campus. Routinely, employees and students work on projects from home or while traveling. While PAWS provides a good portal into a number of campus resources, it is not complete. Individuals want remote access to their course information, calendars, group lists, and research. Mechanisms to easily work securely from abroad should be explored and put in place where possible. Such advances will enable the work of the University to be successfully completed without time and space limitations.

**ACTION ITEM 2.06**

New faculty and staff should have telephone services, e-mail, Internet access, and a suitable personal computer in place upon hire.

Currently, there is not an automatic or one-stop process for providing basic services to a new employee. ITS should consolidate its processes so that departments need only complete one form in order to expedite telephony, mainframe access, network connections, a logon ID and account password, e-mail, and a new computer’s placement in an office. An institutional, rather than departmental, computer program will facilitate this process as well.

**ACTION ITEM 2.07**

The University should support the use of multiple and diverse computing platforms (hardware systems and operating systems), and ensure that access to as broad an array as possible of University information systems is available to diverse technology environments. Users should not be limited in their capabilities and abilities to access LSU resources by the platform they are using. Innovation and the development of new technologies should be supported.

As a national flagship-status University, LSU should support and benefit from advances in technologies. ITS should collaborate with researchers and provide venues for beta-testing of technologies that may directly benefit LSU’s IT environment.

The University recognizes that a variety of platforms (MS Windows, Linux, Unix, Mac, and so forth) must be supported, so that users can make use of their specific capabilities and environments to meet their needs in serving the University. While the majority of desktops may run on Windows, there is a need for IT support for machines that run other operating systems. LSU information technology infrastructure and data resources must be accessible to a broader spectrum of the technologies used by its constituents.

**ACTION ITEM 2.08**

The University should ensure emerging technologies, such as hand-held PDA devices, and Internet-enabled cellular phones, interface well with common LSU applications.

With the increased use of hand-held devices, applications must be adaptive to emerging technologies. LSU community members want to be able to access their calendars, course management systems, and PAWS information from their mobile devices. ITS must assess the state of the interface market, and base its decisions for application development tool sets, in part, on the availability of mobility-enhancing capabilities.
ACTION ITEM 2.09
Members of the LSU community should possess a minimum of basic IT skills. The University should employ multiple means of skills training—including making freely available basic skills training classes and computer-based training programs—to ensure that adequate training regimes are available to every member of the LSU community.

It is expected that a National Flagship University be comprised of students, faculty, and staff that have a set of basic IT skills at minimum. Every professor, student, administrator, and staff member should be able to turn on a computer, access e-mail, navigate the Web, use PAWS, and use basic desktop productivity tools. Efforts should be made to train the University community, and a general education requirement for computer literacy should be explored.

ACTION ITEM 2.10
Members of the LSU community should have access to the electronic resources (films, journals, research articles, texts, etc.) they need to be productive students and faculty.

Resources must be allocated to create and maintain a library that is rich in materials relevant to the community of scholars within the University. The existence of information scarcity is detrimental to the University’s Flagship Agenda. Scholars should have immediate and easy access to the latest developments in their fields, as well as the standard works seminal to their research. Innovative means of developing electronic information resources, like the digital library and an institutional repository, should be explored.

RECOMMENDATION III:
Develop a robust, multi-tiered support enterprise to meet the varying levels and specific needs of the LSU user community.

We have a hunger of the mind which asks for knowledge of all around us, and the more we gain, the more is our desire; the more we see, the more we are capable of seeing.

-Maria Mitchell, astronomer

ACTION ITEM 3.01
Support should be robust, easy to use, transparent, and available in multiple levels based upon specific needs of the individual user.

LSU faculty, staff, and students should not have to search for IT support, it should be readily available and easily accessible. Members of the campus community should be empowered by their IT environment, not encumbered by it. Support for use of the IT environment is critical to its empowering capabilities. ITS should develop support models cognizant of the multiple constituencies and various levels of expertise on campus; support staff should be easy to contact and should guide users to helpful,
clear solutions. Support should be available in multiple forms, e.g., in person, in an online knowledge base, and downloadable, to provide users options in seeking assistance based on their particular need.

A leveraged support model should be put in place to meet the varying needs of the campus community. Too often, levels of expertise do not match the workloads on support personnel. In too many instances, students are charged with large scale projects and professionals are providing basic desktop support, simply because of the mechanisms departments have for IT support. A leveraged support model would be a more efficient use of human resources and talents. Such a model would provide for professional-level consultants who offer direct personal assistance in solving complex problems by appointment.

**ACTION ITEM 3.02**

A one-stop shop for all IT related issues should be developed and properly staffed. Support should be available 24 hours a day, 7 days a week, and 52 weeks a year.

While the ITS Help Desk is a good starting point for IT assistance, the user community wants a fully developed one-stop shop for all IT support. A centralized customer relations center to address hardware, software, and telephony queries and services would make acquiring services easy and would streamline currently segregated telecom and computing assistance. Ease of use and effective user-support are integral to an IT abundant environment.

Use of information technology at LSU takes place outside of the 8:00am to 4:30pm Monday-Friday work schedule, and so does the need for assistance. Mechanisms for trouble-shooting and solving errors must be in place to serve the user community when the users need them. Online resources such as a searchable Knowledge Base should be easy to navigate, up-to-date, robust, and made centrally available to the entire community.

**ACTION ITEM 3.03**

Communications between central and distributed IT staff should be strengthened. ITS should develop programs that provide improved communication and coordination between the key providers of IT support on campus in a leveraged support model.

A strong distributed support model relies upon connections to central IT. In order to reduce redundancies, provide first-rate client support, and mitigate strains between distributed departmental support and ITS, mechanisms for effective communication must be in place. Central IT must be responsive to the challenges facing departmental support personnel, and distributed support personnel must be informed of what institutional changes and policies will impact them.

**ACTION ITEM 3.04**

ITS, the Center for Academic Success (CAS), and the Centers for Excellence in Learning and Teaching (CELT) should work collaboratively to provide training opportunities for faculty, staff, and students alike.

LSU faculty, staff, and students must be technology literate to make effective use of computers, basic software packages, and technology appropriate to their disciplines or fields. LSU graduates should be ready to tackle the challenges of industry and the private and public sectors. The three agencies on campus capable of developing a campus-wide technology competency (ITS, CAS, and CELT) should partner, not only on training materials and methods, but also in finding appropriate physical resources where these skills can be developed and maintained.
**ACTION ITEM 3.05**

The University must significantly increase the number of IT professionals on campus—both centrally in ITS and distributed within the colleges and departments on campus.

Too often, student workers provide the bulk of technical support for departments. Student workers, while talented, are, first and foremost, at the University to study for a very limited time period. Departments have professional needs that must be met, and there is a need for continuity of support and IT services that cannot be provided by a transient student staff. A lack of sufficient IT professionals also puts the security of data and systems at risk. The University should ensure that best practices in IT security are in place, and that servers and sensitive data are secured. These responsibilities should not be placed upon students, but on professional IT staff.

**ACTION ITEM 3.06**

There should be a mechanism for training and certification of IT staff in the technologies they support.

The training and continued professional development of IT professionals is an institutional priority. As technologies continue to advance, IT professionals must stay ahead of the curve, as IT often progresses quarterly. Distributed IT personnel should have connections to ITS.

**ACTION ITEM 3.07**

ITS Help Desk personnel should have broad understanding of general technical questions, but should also have more developed content expertise in areas identified by community demand (statistical computing, GIS, database management, Web development, and the like).

As part of the leveraged support model, the Help Desk should be staffed with personnel who possess specialized area knowledge that is up-to-date in addition to broader, basic knowledge of common technology. The needs of users are so broad amid the LSU community that the current model is not sophisticated enough to meet demand.

**ACTION ITEM 3.08**

Documentation provided by vendors and distributed with open-source software systems should be readily available online and downloadable for use.

With the availability of campus-licensed software downloads should come downloadable user manuals and instructional guides from vendors. Users will be best served when they have both tools and instructions guiding them to the most advantageous use.

**ACTION ITEM 3.09**

Documentation should be augmented with locally-produced information relevant to local conditions and institutional rules.

High quality documentation is critical to understanding computing topics. In addition to vendor-provided publications, the University should produce information delineating critical University IT usage policies and local best practices.
Innovation is the specific instrument of entrepreneurship...the act that endows resources with a new capacity to create wealth.

– Peter Drucker, financier

ACTION ITEM 4.01

The University should build life-cycle replacement funding into its planning at every level of investment in information technology, including both hardware and software for personal, departmental, and central systems. ITS should develop a life-cycle replacement model to use, both for its own resources, and for the broader campus IT resource environment. A funding plan should be developed in support of this model and should be implemented immediately.

At present, the quality of desktops and laptops are dependent upon the user’s ability to secure funding through a grant or upon the department’s ability to cover the cost of replacement. This has created an environment in which faculty and staff must compete for scarce resources. Productivity often suffers because of incompatibilities with modern technology and equipment failures. Without a funded strategic plan to meet the long-term needs of a growing infrastructure, LSU faculty, staff, and students will not have the levels of capability and consistency needed to fully utilize the network in pursuit of their research, operational, and learning goals.

ACTION ITEM 4.02

The University should budget a standard amount per year, per FTE to cover costs for information technology infrastructure and service. These costs should include such components as life-cycle replacement of faculty and staff personal computers, data and voice communication network provision, pervasive-use software licensing, and local IT support.

The costs of providing IT infrastructure and service are not well understood at LSU. Beyond the central budget provided to ITS and specific funding sources like the Student Technology Fee, LSU lacks a significant, all-encompassing IT funding plan. The very real costs associated with the use of information technology by members of the University community should be considered as a cost of having an employee (much the way the institution is required to set aside funding to cover benefits, retirement, and the like). It has been proven that this type of IT funding strategy can be far more cost-effective than ad hoc spending and uncoordinated investment. For example, if personal computers are replaced every three years, and their common software components are provided by site-license, the quality of the environment actually improves such that less support is required to productively use that machine. There are no costs for maintenance or repair, as those are covered in the new machine warranty, and costs of support are reduced because it is far easier to provide assistance for users of a common software stack. The unseen costs of IT provision in the ad hoc model employed at LSU today are likely much greater than costs involved in a strategic, long-term IT funding model.

ACTION ITEM 4.03

Cost-savings should be sought through the leveraging of resources, including the creation of campus-wide agreements for standard equipment and software.
While the campus community wants the flexibility to use a variety of tools, campus-wide agreements for heavily used technologies should be facilitated where possible. For example, personal computers used for basic administrative functions could be readily purchased through a single vendor in large quantities to ensure modernization of machines and to meet user needs in a cost-effective manner.

**ACTION ITEM 4.04**

Funding for high performance computing resources—cycles, storage, visualization, and instruments—in support of research enablement should be more holistically coordinated, and expanded over time. New avenues featuring ITS-sought funding via grants and programs should be encouraged. The University should ultimately provide a guaranteed central funding strategy for the provision of these resources, possibly out of University indirect budgets.

Developing and leveraging partnerships as described in Action Item 6.02 should be viewed as simply a start of the process to secure a reliable source of funding for high performance computing resources at LSU. ITS should, itself, establish and expand its pursuit of hardware grants that can bring additional funding sources to bear on providing broadly available resources to the campus. And, ultimately, as both partnership and ITS-centric efforts advance, the University should closely examine its ability to establish a guaranteed source of funding, from research indirect costs, to further increase the financial support for this critical area of resource that enables research. A portion of indirect costs could be directed to advances in the areas of network capability, infrastructure, and high performance computing. An increase in the federal indirect rate would still keep LSU researchers competitive and the funds would ensure that the network and infrastructure could support the future demands of researchers.

**ACTION ITEM 4.05**

Where possible given program policies and procedures of the specific funding agency, researchers must include support and life-cycle upgrade costs into grant proposals for equipment.

Too often the real costs of equipment are not taken into account. The initial purchase of hardware is relatively cheap when compared to the longer term costs of maintaining, supporting, and upgrading expensive machines. An initial investment that does not take into account the real life of the machine (which may be less than the length of the grant) is one doomed to fail at perhaps its most critical juncture.

**ACTION ITEM 4.06**

When resources are allocated for new equipment, resources for their support should be included in the costs. Grants should include the support costs (personnel) and not just the physical IT components.

While the initial investment of capital for technology is often seen as relatively easy to acquire, funds for the support and maintenance of equipment are not readily available. Without support, new technology cannot be fully utilized. Investments in full-time support people must be made in order to reap the benefits of capital investments.

**ACTION ITEM 4.07**

Additional options for student-fee based funding—such as an increase of the existing student technology fee or a new student software fee—should be explored with student government.

Long-term recurring expenses for student IT enablement like the licensed software available on TigerWare and the licenses used for the student labs may be covered by a separate software fee, thereby
freeing tech fee funds for larger scale improvements to student IT infrastructure, support, and classroom technologies. A second source of IT funds, or an increase in the existing fee, would continue to encourage innovation and maintain the tech fee’s flexibility to fund even greater arrays of IT infrastructure and service.

**ACTION ITEM 4.08**
The policy for funding full-time appointed positions from the student technology fee, currently not allowed, should be reviewed with respect to positions within ITS that are categorically devoted solely to support of student use of technology funded by that fee.

While realizing the original decision to not use student technology fee to fund appointed support positions was made in a time of scarcity of physical resources, in the current environment and into the future, such a limitation may actually be hindering the quality of the overall IT environment experienced by students. ITS should be encouraged to work with the appropriate entity (Student Technology Fee Oversight Committee) to explore possible models where the efficacy and integrity of such appointments might be proven of value, especially in view of Recommendations II and III of the Flagship IT Strategy.

**ACTION ITEM 4.09**
Creative funding mechanisms for personnel involved in overcoming the extreme backlog of information systems development projects should be explored and put into in place.

Centrally with regard to information systems development, there exists a tremendous backlog of demanded work that could be met over a relatively short period of time (3-4 years) with a temporary “build-up” of staff resources. Other institutions have successfully deployed strategies of short-term appointments (2 years or less) to bring staff in to deal with a very large assignment, and then easily release them (and their funding commitment) when the backlog is completed and maintenance and upgrade becomes the order of business. These strategies require creative approaches to both budgetary funding and HR hiring processes, and LSU should investigate innovative approaches to solving these personnel-related resource challenges.

**ACTION ITEM 4.10**
Creative funding approaches to establish and develop IT support personnel in colleges and departments, in line with a leveraged support model suggested in action item 3.01 should be explored and deployed in pilot efforts to prove the effectiveness of the concept and gain acceptance for long term funding consideration.

Regarding providing for resources in departments to serve baseline local support needs, many institutions have found that a program to “seed” and grow local support helps demonstrate the value to local constituencies, and thus makes it more feasible for administration to reallocate resources over the long-term to highly valued local services. Growing a leveraged support environment at LSU could be in part financed through cost sharing with individual units on campus, augmented with short-term funding assistance from a centralized source to allow the units to assume the costs in parallel with achieving the benefits of that local investment.
The superior man, when resting in safety, does not forget that danger may come. When in a state of security he does not forget the possibility of ruin. When all is orderly, he does not forget that disorder may come. Thus his person is not endangered, and his States and all their clans are preserved.

- Confucius, Chinese philosopher & reformer

The security and integrity of information and of IT resources depends upon having appropriate policies. The quality of any security system can only be evaluated in terms of how well it satisfies the requirements for protection, privacy, and so forth that are defined in IT policies.

**ACTION ITEM 5.01**

The CIO should complete review of the recently received IT Security Audit, and develop an implementation plan to address points of concern raised by the auditors.

A central figure within the Office of the Chief Information Officer (OCIO)—as currently designated the OCIO IT Policy and Security Officer—should be given the authority to assume control, leadership, and responsibility of developing an implementation plan for actions resulting from the IT Security Audit. Likely, this will include responsibility for making responses to unauthorized access to the University’s information technology infrastructure, unauthorized disclosure of electronic information, and security breaches regardless of the office involved. It will also entail specification of needed technology solutions to manage network security and the integrity of information residing on centralized and distributed resources across the institution.

**ACTION ITEM 5.02**

The University should develop clear and forceful policies to address the integrity (management and protection) of information (data) and the security of IT infrastructure resources on which that information resides.

IT security is the responsibility of all of its users. The development and enforcement of security policies should be done in cooperation with the various departments. These policies will depend upon the clear articulation of institutional values, and an understanding of how the institution will make judgments when its values are in conflict. For example, individuals have a right to personal privacy, while the institution has an obligation to keep some records of individuals’ activities, and to protect itself against some actions of individuals. A key step in the formulation of policy will be the development of a shared vision of information, and information technology based on the beliefs and values of the University community: academic freedom, collegiality, openness, and so forth.

Because the development of IT policies can bring the University face-to-face with fundamental issues about its values, the process will require broad support from throughout the institution and will call for leadership at the highest levels of the University. Because the implementation of IT policies involves an ongoing process of interpretation and oversight, it will need a sustained commitment of leadership, attention, staff, and resources.

**RECOMMENDATION V:**

Secure LSU’s IT infrastructure, safeguard the integrity of LSU’s information resources and the privacy of its user community, and ensure the continuity of LSU’s IT infrastructure and information repositories in the face of possible disaster scenarios.
ACTION ITEM 5.03
Specific programmatic mechanisms are needed to assure IT security and the protection of information privacy.

Some details will depend in part upon the development of policy, but some aspects of security mechanisms are required for any policy to be effectively implemented. These include:

- Audit and controls: to verify that policy is being followed and to determine if mechanisms are working and correctly deployed.
- Education and awareness: to ensure that parties are aware of their responsibilities and to help engage everyone involved in managing and using information and IT resources as part of the University’s security plan.
- Risk assessment: to determine the need for protection, to specify mechanisms of protection, and to help prioritize choices of protection.

The University must provide the resources to ensure network security and meet the demands of federal and state regulations.

ACTION ITEM 5.04
Specific physical mechanisms must be in place to secure servers and access to sensitive information.

While network security is important to maintaining the integrity of our data and systems, the security of our data needs to be addressed at the individual and departmental levels as well. Data must be kept safe from breaches at all levels. The Office of the CIO should immediately prepare a report on the status of physical security of the University’s information servers—with special attention to an assessment of such servers not located within the direct control of ITS. Recommendations based upon the results of this assessment should be drafted and presented to the LSU community with haste.

ACTION ITEM 5.05
Data backups should be done to ensure the continuity and the future availability of data of all sorts—administrative, academic, and research.

Beyond concerns about a disaster or catastrophic loss (as described in Action Item 5.08), there are strong concerns about the ability of the institution—especially given highly distributed forms of institutional and quasi-institution data records—to recover from a loss of “live” production data. Aside from back-up procedures of main institutional data, it is not clear that there is a solid regimen for frequently, periodic, individual back-ups of data servers, workstations, and other valuable and important files. There certainly is no consolidated back-up service in place, or set policy governing protection of these information assets. Along with the security and access assessment mentioned in Action Item 5.04 above, ITS should further assess the state of the institution’s back-up and recovery of mission critical information and supportive data sets, especially those that reside outside of ITS central systems. Recommendations based upon the results of that assessment should be drafted and presented to the LSU community with haste.

ACTION ITEM 5.06
A plan should be developed and implemented to effect the removal of the social security number as the primary personal identifier in University information systems.
The rise in incidences of identity theft and the presence of new legislation makes it imperative that measures be taken to protect data and information in an effort to reduce the risk of the University inadvertently contributing to this problem. The use of immutable identifiers such as social security number in combination with name creates just such a risk for the University. Immutable identifiers that are not under the control of the University should not be used as primary identifiers, or keys, in any University information systems.

**ACTION ITEM 5.07**
The CIO should convene a Committee on Institutional Data and conduct regular meetings with the goal of defining data administration and access policies for institutional data.

The Family Educational Rights & Privacy Act (FERPA) has long been used by the Registrar and UIS as a guide for the protection and security of data and information maintained by the University. The University Registrar has done exemplary service in leading these efforts for more than 30 years. With the addition of new legislation such as the Health Information Portability and Accountability Act (HIPAA), the Gramm-Leach-Bliley Act (GLBA), and, at the state level, SB 205 known as the “Database Security Breach Notification Law,” the security of information has become much broader than the protection of student information and requires the involvement of units that manage many different types of data now covered by these additional pieces of legislation.

**ACTION ITEM 5.08**
ITS should complete an IT disaster recovery and business continuity plan with input from the LSU community and support from senior-level management at the University.

Like no other time in our history, the events of 2005 in Louisiana demonstrate the need for an effective plan to continue University operations in the event of a major disaster. We must benefit from the experience we witnessed of our colleagues in New Orleans. We learned that information technology truly is a strategic asset of the institution, and loss of the IT environment, services, and data can cripple an institution. Therefore, ITS must be prepared for the recovery of critical services so that LSU can continue to function in the aftermath of a disaster—whether that disaster be limited to the data center, the campus, or impacting more broadly the Baton Rouge region. Funding will determine to what level and in what time frame recovery will be possible. Funding for disaster recovery should be prudent, but in line with both the extent of risk and the level of expectations of LSU administration, and the campus community. The plan should provide for:

- Revisions in existing processes and procedures with regard to data management and data center operations;
- A “lifeboat” strategy to provide IT support for the University in the event of temporary evacuation of campus is required as an impact of a city-wide or regional disaster; and
- Increasing levels of recovery based on priorities for restoring key services and infrastructure. A disaster recovery plan for IT should be developed and tested.

Data back-up sites for disaster recovery and business continuity should be located in areas not likely to suffer the same impacts as the LSU campus (e.g., hurricanes). Disaster recovery planning and the assessment of risks and priorities should include both centrally-managed systems and distributed systems maintained on the campus or in various departments.

**ACTION ITEM 5.09**
The IT Policy and Security Officer should establish a Security Advisory Team comprised of a variety of departmental staff from academic and administrative units.
Security is a shared responsibility that requires diligence from all parties involved. Communication is a critical element in the extensive coordination required to maintain a successful security program. Establishing a Security Advisory Team will enable not only the implementation of security policies, but also gain additional objective input for security plans and actions. Establishing such a team will demonstrate ITS’s interest in engaging expertise from the campus community beyond the ITS organization. Security will become a leading-edge issue in establishing relationships between ITS and other units on campus.

RECOMMENDATION VI:
Develop robust and plentiful IT resources to enable research at LSU.

Can the research university survive the locomotive of the IT revolution? I think a much better way to frame the question is: how can the highly valued mission of scientific, technological, humanistic-productivity, and human-capital growth enabled by the research university best be augmented and turbocharged by the IT revolution?

- Tim Killeen, Director,
National Center for Atmospheric Research

Researchers should have ready access to the information technology hardware, software, specialized equipment they need, as well as the “human capital” to support their use of these items. Researchers spend valuable research time trying to locate University resources and a centrally coordinated effort – even one that featured distributed elements – would end much of the frustrations and inefficiencies that result when it comes to IT-enablement for research.

ACTION ITEM 6.01
The University should continue to establish and grow an array of high performance computing resources for researcher use, and should seek to maintain a top 100 status for its high performance computing capabilities.

Not only do LSU researchers need access to excellent high performance computing resources in order to conduct their research and support the public good, maintaining top 100 status will ensure that LSU remains competitive as a recruiter of top faculty and graduate students. The University should leverage its resources and implement innovative ways to increase the number of cycles available for large computing projects.

In order to create an abundant environment and provide the cycles needed by researchers, LSU should look to new technologies in order to create additional clusters outside of traditional HPC centers. The need for computing cycles is not going to dissipate; if anything it will grow exponentially over the next decade. In order to grow IT in economically constrained times, innovative tools like CONDOR clustering should be explored to maximize use of computing resources during down times.
ACTION ITEM 6.02
ITS and CCT should lead efforts to develop partnerships with campus researchers to build capacities and support research endeavors, focusing on ways to best leverage investments in these key resources.

Joint projects to enhance computing resources on campus will have greater benefits, are more likely to receive funding, and will mitigate non-productive competitions for scarce resources.

ACTION ITEM 6.03
There should be a reasonable and transparent mechanism in place regarding the allocation and assignment of available computation cycles.

In light of current cycle scarcity and in order to ease frustrations, researchers need assurances that free cycles are not being wasted nor are they arbitrarily awarded. A dashboard type tool to monitor cycle usage could in part provide a solution.

ACTION ITEM 6.04
Recognizing that the national cyberinfrastructure offers a broad and expansive array of high performance computing resources via its national centers, ITS and CCT should work to expand communication with the campus research community to facilitate its use of these external resources and national centers.

A central clearinghouse on available external supercomputing sites should be available through either CCT or the Office of Research. The University should encourage and facilitate relationships with other institutes in order to create abundance. New relationships mean increased exposure of LSU researchers to national and international colleagues.

ACTION ITEM 6.05
The University should encourage use of high performance computing beyond traditional user groups and do so by establishing and growing support for use of this technology for social sciences, arts, and humanities.

There are innumerable uses for high performance computing in the social sciences, arts, and humanities, including the generation of visual models and the running of complex statistical applications. Many researchers in these fields are unaware of the possibilities or are hindered by their lack of knowledge and experience in generating useful codes. By building the user community, advances in these fields could be fostered, gaining international recognition for LSU. Furthermore, if LSU researchers are not experimenting with applications in an HPC environment, they will fall behind other researchers in their respective fields who are.

ITS, working with the CCT, the Office of the VC of Research, and Deans, should seek ways to expand the availability of HPC resources so that the resource is available for non-traditional users, establish support mechanisms that encourage and support fledgling adoptions of this technology in these new areas, and provide incentives to researchers in these areas to explore the use of these technologies in their disciplines.

ACTION ITEM 6.06
Specialized centers to support the use of specific information technologies (e.g., visualization, GIS, mathematical and statistical computing) by researchers should be established in a coordinated fashion within the University. ITS should look for ways to establish several of these as part of a leveraged support model, providing deeper support for the more common of these specialized information technologies.
While CCT has begun to establish research centers for specialized research, basic support and introductory-level needs in these areas must be addressed without taking away from productive and ongoing research projects. Currently, researchers spend a good deal of time trying to figure out complex tools and applications instead of doing their research. Such inefficiencies hurt research productivity and hinder steady progress. Having deeper pockets of talented and dedicated support to pervasive, if not pedestrian, information technologies would certainly increase the ability of those information technologies to have impact upon the advancement of research at LSU.

**ACTION ITEM 6.07**

Advanced research software and applications should be made available to researchers, taking advantage of all means of licensing and forms of distribution and access.

Securing licensed research applications and software, currently involves either expensive individual purchases or negotiations with other departments to purchase one of their group licenses. ITS should provide a centralized site from which licensed and freeware research software and applications (e.g., Fortran compiler, SAS, SPSS, Envivo) may be provided on centrally hosted systems, made available across distributed systems on campus, or downloaded for desktop use (via the TigerWare facility). Usage could be monitored to identify popular downloads in order to justify greater cost savings. 24x7 download availability will provide greater efficiencies and enable research productivity.

**ACTION ITEM 6.08**

The University should provide robust communication and document sharing tools to facilitate local and international research collaboration.

Researchers currently share documents via e-mail and are hampered by size limitations. Whether it is joint publication of a journal article or a grant proposal, multiple versions, edits, and complex graphics must be shared easily. Tools that may be accessed remotely and used by collaborators 24x7 must be in place. Collaborative authoring systems should be encouraged as a way to distribute content and encourage sharing. With the abundance of highly-intelligent, task-oriented professionals on the LSU campus, opportunities, and complementary incentives, for collaborative authoring should be in place to encourage a team-oriented mindset and sharing of technologies.

**ACTION ITEM 6.09**

Online tools and training opportunities on common research IT tools should be available and coordinated centrally by ITS.

There are a number of common user needs in terms of available tools and applications that should be addressed not only through rich, online tutorials, but also through regularly scheduled in-house training sessions. These tools would run the gamut from lower end products like Webpage design to Fortran codes for high performance computing.

**ACTION ITEM 6.10**

IT workshops and seminars should be offered on emerging technologies and their use in research.

Specialist research and professional-level needs should be addressed. The University should invest in the development of highly technical curricula as well as bring in national experts through collaboration with CCT and the academic departments to share knowledge of new developments in IT. It is
important that as a flagship institution, LSU is on the cutting edge of technologies and their research applications.

**ACTION ITEM 6.11**

There should be coordination of multiple IT “islands” that result from multiple grants and discipline specific IT needs.

Opportunities often arise for departments and programs to fund specialized IT resources and labs. These opportunities are often taken advantage of without regard to collaboration with other units or for the support and upgrade needs of the resources once in place and after the initial funding ends. Departmental faculty or the PIs on the initial grants become caretakers of these resources, taking them away from their research. Practical policies must be in place for the future caretaking of such resources, including the possible integration of these resources into central ITS.

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**RECOMMENDATION VII:**

Develop robust and plentiful IT resources to enable faculty teaching and student learning at LSU.

*The empires of the future are the empires of the mind.*

-Sir Winston Churchill, former British Prime Minister

**ACTION ITEM 7.01**

The University must provide a single course management system that responds to the changing needs of the University.

While providing a plethora of options in the area of course (or learning) management systems might seem reasonable in light of IT abundance, too much variety forces an undue hardship on our student populations to essentially learn multiple systems. A variety may allow faculty greater choice and flexibility, the presence of more than a single system imposes an undue complication and hardship upon LSU’s students. Hence a single CMS environment that takes advantage of a multitude of tools within a strategic platform suite should be established. Concerning the existing systems, neither Blackboard nor Semester Book has proven satisfactory; Blackboard has also featured a steadily increasing licensing and support cost which is at odds with the rest of the IT paradigm of steadily increasing value for decreasing costs. A vended solution also constrains the flexibility and valuable customizations that many faculty and students would like to see. However, a wholly self-developed solution—such as Semester Book— requires a great deal of resource to maintain over time, in an environment where development resources are scarce. ITS should be charged to coordinate a broad evaluation of possible solutions, including vended and open source options, and work with the key user communities (faculty and students), to select a platform that will seamlessly integrate into LSU’s systems and meet the largest majority of user demands, and be supportable. A task force composed of faculty, students, graduate assistants (who perform a great many teaching tasks on campus), and academic leaders should be commissioned as a first step, and should seek a solution that could be implemented by fall 2007.
**ACTION ITEM 7.02**

A discipline-specific laptop program should be mandated for students. To support this, ITS should provide recommendations for configurations, arrange special vendor deals for students, and communicate these programs in the most effective manner.

While nearly all of the students entering LSU possess either a desktop or laptop personal computer, there continues to be concerns regarding the digital divide and inequities that may, in part, be resolved if laptop monies could be included in financial aid allocations. The cost of a computer may be included in the official cost of an LSU education if specifically required. Certain disciplines already require the use of laptops. The creation of an institution-wide laptop program would facilitate optimal pricing for students and ensure cross-discipline compatibilities. Initial investments in college personal computers would no longer be guessing games and the student will be assured of a laptop that meets the demands of his or her education.

**ACTION ITEM 7.03**

Online tools to support the advising and timely progress of students through their academic programs must be in place and easy to use.

The University has set a sizable increase in graduation rates as a key objective. An easy to understand application that would demonstrate what available courses fit an individual’s program and how a degree is progressing would enable efficient course selection. One of the critical factors hindering student matriculation is the enrollment in courses that do not count towards the stated degree program. Individuals find the current degree audits difficult to navigate, and find it challenging to search for available classes that are appropriate for their degree programs.

**ACTION ITEM 7.04**

Policies should be developed so that instructors may discourage inappropriate use of wireless and other information technologies within the classroom.

While technology can enhance student learning, it can also provide distractions that negatively impact the classroom experience. One might feel that technology itself should be required to present a solution, but current and foreseeable technologies in wireless communication do not offer a workable solution to this problem. Thus, faculty themselves should develop classroom policies that mitigate technology-enabled distractions like watching videos on laptops during a lecture or playing games. Students should remain able to use technology, as appropriate, to gain clarity or research class content in more depth.

**ACTION ITEM 7.05**

The creation and dissemination of electronic texts for classes should be facilitated

The rising cost of textbooks and the increasing use of electronic devices provide opportunities for electronic textbook adoption. Many publishers already have texts available in electronic formats, and an electronic text makes the book readily available without having to carry it around. Additionally, faculty would be able to incorporate downloadable readings into their course management system.

**ACTION ITEM 7.06**

Computer-based testing should be user-friendly and developed in such a way that the student’s comprehension of material, not his or her technical capabilities, is assessed.
As computer-based testing increases in popularity, there are concerns regarding the construction of electronic tests and the potential impact on students. Standards and best practices in exam development should be in place, and easily employed by teaching faculty. The Center for Assessment and Evaluation (CAE) has resources available that should be accessible and marketed to LSU faculty. The Centers for Excellence in Learning and Teaching (CELT) should offer workshops and training for faculty in this area. LSU wants to matriculate and retain students as well as properly assess their learning. Ensuring that students are not unfairly hampered by the technology used for assessment is a key factor in student success.

**ACTION ITEM 7.07**

A standard, highly-capable level of support services should be developed to help engage faculty in their efforts to incorporate information technology into their teaching. Beyond the technology itself, dedicated resources to foster an institutional climate of instructional innovation and teaching excellence are needed. The role of the Center for Faculty Development (CFD) within the Centers for Excellence in Learning and Teaching (CELT) should therefore be focused and enhanced.

This includes help in finding existing courseware, and help in using WWW, Web tools, and other routine instructional tools. This help should be available in a variety of formats, including online help, a teaching & learning knowledge base (as part of an overall online support environment), short courses, an specifically on-site, in-office, or centralized facility (such as an Information Commons location) direct consultation services. ITS and the CFD should more tightly integrate into a holistic service point for faculty seeking support in incorporating technology into their teaching.

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**RECOMMENDATION VIII:**

Develop sound information systems featuring a rich set of applications and tools that address the increasing need for more effective and efficient institutional processes and provide for advanced academic analytics at LSU.

*Collecting data is only the first step toward wisdom, but sharing data is the first step toward community.*

*Henry Louis Gates Jr., scholar*

**ACTION ITEM 8.01**

The current backlog in information systems requests should be reduced to the point where no such request sits in queue for more than 12 months. Efforts should be made to increase the level of staffing in the University Information Systems (UIS) division of ITS—at least for a limited amount of time—to reduce this backlog.

According to projections made by ITS, the queue of requested/required information systems work is such that the current staffing level in the UIS division will take ten years to empty the queue. This is not
only untenable from the standpoint of delays to meeting vital demands, but also threatens to put the institution into a situation where increased ad hoc decisions about systems acquisition and development will lead to a “patchwork” environment. Such an environment might make the institution more “ripe” for consideration of the massive enterprise resource planning (ERP) efforts that have been seen across higher education the past decade; these ERP efforts carry huge price tags and investments in them will most certainly divert funds from other needed initiatives within LSU (both IT and academic initiatives). Simply put, LSU can not afford these massive ERP efforts, and failure to ensure the function and value of the LSU information systems environment (through perpetuation of this huge 10-year backlog) makes it more likely that a crisis in information systems might lead to such an ERP decision. Creative means to fund staffing to eliminate this backlog, as detailed in action item 4.09, should be considered. As well, once the backlog is reduced, a staffing plan for UIS should be created which preserves a minimal queue and ensures prompt address of future information systems requests.

**ACTION ITEM 8.02**

The Office of the CIO should establish an effective mechanism for overall prioritization, coordination, and oversight of planning for the development and life-cycle replacement of University information systems in accordance with the University’s overall strategic plans and goals. Opening the lines of communication with the user community at large will facilitate understanding of competing needs, collaborative projects, and user-driven changes and applications.

The provisioning of information systems is expensive and time consuming for any organization. This presents a particular challenge for institutions of higher education, (IHEs), in light of scarce funding and resources. As a result, it is imperative that dollars spent on information systems be spent wisely and strategically. While the user community has a wide array of desires for new applications, staffing in UIS cannot immediately respond to user demands nor can UIS personnel work within a vacuum. Proper and ongoing development of an information systems strategy is dependent upon having a mechanism through which requests for information systems and the Flagship Agenda can be reconciled, a unified position that can be presented to the campus community and vendors, and necessary direction in the allocation of scarce funds and human resources. Over the last several years, information systems development and acquisition at LSU has been approached in an ad hoc manner. In spite of this, a number of systems and services have been deployed to address University requirements. But an equal or greater number of requirements have been incompletely satisfied, or simply not addressed at all, leading to a decreased satisfaction in the customers of information systems at LSU.

**ACTION ITEM 8.03**

A more formal information systems liaison function should be put in place to manage the relationship between UIS and units within the organizations of each of the Vice Chancellors and the Colleges.

Key to ensuring that information systems projects are effectively and efficiently implemented is the need for knowledgeable functional representatives in each of the major “business units” responsible to coordinate projects with ITS. One relationship that has proven successful in the identification of requirements and in effectively advancing systems development projects in a highly efficient manner has been the one that exists between UIS and Financial Systems Services (FSS). This working relationship has proven successful time and again in developing specifications for systems, setting priorities, and smoothing implementation difficulties. FSS serves as a bridge between the business units and UIS, and ensures that requirements and technical information are translated and understood by all parties involved. Perhaps, this structure should be replicated in other areas to improve the system development or purchase and implementation processes. Key areas for consideration are enrollment/student services, and research administration.
**ACTION ITEM 8.04**

ITS, through the UIS Division, should develop information systems that (1) encourage research and scholarly productivity and (2) foster quality and competitiveness in graduate and undergraduate students. Further, UIS should continue to develop and/or implement systems that foster the efficient and effective day-to-day operation of the University.

Well-designed information systems facilitate achievement of institutional goals (Flagship Agenda) and transform business processes. The new Sponsored Programs System (SPS), for example, is an initiative that represents a mutual commitment among UIS, the Office of Sponsored Programs, and Finance and Administrative Services to fulfill critical needs within the research community. This new application will allow for the appropriate apportioning of credit to specific investigators participating in projects on behalf of specific departments. It will also streamline research project proposal submission and approval.

Anticipated enhancements to the online registration system represent an extension of administrative transactional data into meaningful course management tools for both students and faculty. New processes to expand schedule planning, track academic progress, and project future course needs are examples of application efforts focused toward increased student retention and reduced time to graduation. A continued commitment by academic administrative units to partner with UIS to evaluate and/or transform student processing is essential to the ultimate success of this development.

**ACTION ITEM 8.05**

UIS should develop a consolidated information delivery environment, leveraging technologies and data environments already in use and expanding these with deployment of newer reporting tools and infrastructure. Further, UIS should implement an enterprise-wide data warehouse environment to support academic analytics. Planning and implementation should be inclusive of interested parties and should consider new and evolving approaches.

The University must significantly enhance the accessibility and delivery of information for decision making. Concerns about security, privacy, and disaster recovery should be balanced with the institution’s need to function effectively. The environment should enable users to access information without needing to understand complex technologies, perhaps by defining data formatting (tag) schemes that are readily understood and/or implementing standard interface technologies such as ODBC. When appropriate, users should be able to extract information into documents and spreadsheets.

**Data Warehousing**

The architecture of data used in operational systems that focus on processes and “how to” is very different than that used in information systems that focus on decision making and “what if.” The University has invested significantly in its operational systems and only scarcely in informational systems. A data warehouse architecture enables data to be cleaned, extricated, and merged in order to provide information that impacts decision making and strategic planning. Using the data warehouse approach, reports and queries are executed outside of the transactional system in order to maintain the security and integrity of vital business processes. Users are able to analyze trends, manipulate data in various ways, and make better-informed decisions affecting teaching, learning, and research. It is imperative that the report and query functions be user-driven and not dependent upon ITS in their development.

**Information Collection**

LSU must continue to successfully gather initial points of data that can later be extrapolated into information. The applications and storage systems in place must be maintained and upgraded for continuity.
**Action Item 8.06**

UIS should incorporate user-centered design techniques in major systems development projects. A common interface environment will support the efficient and effective accomplishment of the day-to-day administrative tasks of the University.

*User-Centered Design*

A goal for all of the University’s information systems is selection and development of technologies that are appropriate to the needs of their various users, suitable to the business need that is being addressed, and intuitive. To achieve this, there should be a commitment made to user-centered design, employing the latest research in human–computer interfaces and bringing an explicit focus on usability of University information systems.

*Common Interface*

University information systems are used to varying degrees by different constituencies. It is important, therefore, to use a consistent and integrated interface in applications, data, and systems to make them more user-friendly. Routing and approval, for example, are common to many information systems and should be approached consistently across the board.

**Action Item 8.07**

New, more capable application and systems development and delivery environments should be evolved with a focus on accounting for and managing the technology life cycle process.

An information technology exploratory function should be developed within UIS to identify new technologies that could improve basic technology services to the campus community and enterprise information systems within the University, and to make cost-effective investments in core technologies such as storage.

For the past 30 years, application development and delivery has been accomplished at LSU through the use of a very stable set of tools and techniques which have enabled UIS to continue to produce new information systems despite dwindling human resources. The technology in use consists of third- and fourth-generation languages (COBOL and SAS), hierarchical and relational database management systems (IBM IMS and DB2), data communication tools (IBM MQSeries and DB2 Connect), and an Internet application environment (Lotus Domino). UIS has extracted more utility and service from this product suite than anyone in the industry would have thought possible. But technology has progressed, and in order to be positioned to support information systems in the future, deliver systems at a faster pace, deliver the type of functionality today’s customers demand, and eliminate over-interdependency of its myriad applications, UIS must begin to evolve the technology base supporting information systems for the University, while at the same time, leveraging existing systems to make that evolution as seamless as possible.

**Action Item 8.08**

ITS must carefully balance the value of self-developed systems (a build approach) with a model that leverages the market of available, off-the-shelf systems (a buy approach). Neither approach should be exclusive in ITS strategy for delivery of information systems needed by the University.

“Build versus Buy” is a defining question of a modern information systems development organization. There is no single approach that is effective; each system required must be independently evaluated. However, this is not the same as an ad hoc approach! Decisions about which approach to take are interdependent upon previous decisions made in concentric systems, and impact subsequent decisions that will present themselves. However, a general principle that calls for a complete and open analysis of
market options, and a predisposition toward cost effective and timely implementations should be put into place.

**ACTION ITEM 8.09**

UIS should implement a tiered storage architecture for storage of the University’s institutional data, and integrate this technology with database management systems to support image, sound, and video data types.

This architecture should provide for the purchase and implementation of storage, such that the requirements of an application drive the tier to which its data is stored. At the same time, massive storage for University information systems should not be in conflict with technology that will be implemented as part of LSU’s research computing and computational grid elements as discussed in Recommendation VI.

The University generates a tremendous amount of data and information everyday. To house that data and information, large amounts of disk storage are maintained within the data center. That storage technology, however, ranges across a number of vendors and generations with the result that there is no single, integrated storage solution available across systems, and a significant amount of that storage is aging. Much of it is also relatively expensive, preventing departmental users from leveraging it for their own needs. In some cases it is desirable for systems and storage to be independent; for the majority of computer systems; however, a single storage paradigm would be superior to a varied and distributed one. In addition, the events of 2005 and the experiences of our colleagues in institutions located in New Orleans have demonstrated the need for newer storage technology that can provide the redundant capabilities necessary to address disaster recovery requirements.

**ACTION ITEM 8.10**

ITS should explore and then deploy a service architecture that increases fault tolerance in the access of information systems and utilities, without destroying the service levels achieved via the PAWS portal.

LSU has achieved recognition for the highly integrated and user-friendly common interface presented by PAWS (a Web-based portal). However, this common interface has also been reflected in an information systems architecture that is so tightly coupled that failure in one component can bring complete access to all systems and utilities (like e-mail) to a complete halt (or significantly degraded level of performance). In other words, the current environment’s tight coupling of all information systems actually can reduce the flexibility of access to key component systems in the event of a single point of failure, or more broadly impacting disaster. Without losing the benefits of a highly integrated common interface, ITS must explore and deploy new architectures that provide at the very least alternate access to key systems in a more fault tolerant manner. This might include direct access via the Web (and outside of PAWS) for such key services as e-mail. But at the very least, in the physical architecture behind the common interface, separation exists that promotes greater fault tolerance, increased redundancy in processing paths, and faster and more effective recovery of key services in the event of a component outage or disaster.
[Students] see technology as a fundamental aspect of their lives, seamlessly affecting all of its parts, and take it for granted just as they do the air that they breathe. Woe to the University that doesn’t grasp this.

National Research Council (2002)

**ACTION ITEM 9.01**

Training for students in technology should include highly sophisticated programs and access to appropriate equipment.

Increasingly, graduate and upper level undergraduate students should work in highly technical applications. Professors do not have the time and expertise to teach both the class material and the underlying skills necessary for course success. Students should have experts available to train them as well as time on the equipment to practice their newly acquired skills and complete assignments.

**ACTION ITEM 9.02**

LSU should develop a program of incentives to increase student ownership of computers, including some combination of direct financial assistance, negotiation of institutional discounts for student purchases, on campus sales and support, and maximum communication with prospective students about options for computer ownership.

While acknowledging Action Item 7.02 recommending that a discipline specific laptop program should be mandated for all students, the key to implementing such a program in a manner palatable to students and prospective students lies in a concerted effort to make acquisition of computer hardware easier and as inexpensively as possible, and to provide a variety of incentives and programs to facilitate that acquisition. Regardless of whether a laptop requirement is mandated, LSU must embrace the fact that students must be IT-enabled. The institution must develop ways to encourage laptop/computer ownership and ITS should be charged with developing, implementing, and operating such a program on the University’s behalf.

**ACTION ITEM 9.03**

LSU must recognize that IT plays a role in the student life experience beyond pedagogical aspects. ITS should continue to work closely with students to evaluate new technologies and IT-based services that could be adopted to improve not only the academic aspects of technology, but recreational ones that support the overall student life experience at LSU.

The life experience of a student at a flagship University involves more than just their academic experience. Information technology—and technology in general—has become an underlying component in all things in the twenty-first century. Indeed, the adoption of IT in classrooms and throughout campus as part of teaching and learning is critical to the student life experience; but also of interest and potential value are the recreational aspects of college life that are IT enabled. ITS should explore new and creative uses of technology that better the overall college experience, including those involving such things as music/video download services, and other forms of recreational technologies. It will always be the case that students will need to elect which such college-life-enhancing technologies they adopt either
as individuals or as members of the LSU student community—and elect how such technologies are funded. But the role of ITS should be to explore and introduce these technology options to students, and present an attitude of advocating their adoption, and support such adoption in line with student interests and resources.

**ACTION ITEM 9.04**

The University should provide a top quality, IT enabled, living and learning environment—ubiquitous wireless, network capabilities, and support for residence halls, Greek housing, and campus common areas. The IT enabled environment should be consistent across living and campus spaces; ITS should be charged with working to establish a seamless IT environment across all parts of the campus.

Many students live on campus and have their IT needs provided by either Residential Life or through off-campus service providers. Students want consistent, ubiquitous service across campus. ITS should explore offering Internet access to leased Greek Houses. This would present a possible resource for revenue or cost-recovery, and would provide consistency to this constituency. Wireless services should be accessible across campus, without necessitating a switch when traveling from one point to the next. The campus community wants IT to work flawlessly and effortlessly. Mobility and the ability to check the Web, conduct business, and stay connected to LSU are important to today’s LSU student and employee alike.

**RECOMMENDATION X:**

Develop IT advisory and communication channels to ensure the continued involvement of the LSU community in the implementation of the flagship IT strategy and ongoing day-to-day provision of IT services to the campus.

*We shall never be able to remove suspicion and fear as potential causes of conflict until communication is permitted to flow, free and open, across boundaries.*

*Harry Truman, former United States President*

**ACTION ITEM 10.01**

The campus community must be involved—as a full-fledged partner with both authority and responsibilities—in the development and implementation of IT strategies and service directions taken at LSU. Essentially, the Flagship IT Strategy planning process must evolve a long-term role for the task forces, to facilitate ongoing input from the community, as well as a venue to help communicate IT directions more broadly on campus.

The process that has resulted in this planning document showed the value of closer collaboration between the CIO and the campus IT-using community. While setting high-level directions for IT should be the responsibility of the University’s CIO, obtaining the valuable advice and counsel of the IT community—faculty, students, and staff—will only serve to increase the value of the CIO’s decisions. The community has, through this plan, given form to a vision for IT at LSU. It can and must serve a continuing role in helping guide the specific aspects of implementation of the many action items. The
community not only should have the perspective of giving advice and consenting authority to IT directions, it also thus assumes a significant responsibility to ensure that various elements of the implementation are carried through. The CIO receives great value in terms of communicating IT directions, situations, and challenges through the mechanism of the task forces; and this, too, speaks to the value of continuing the involvement past the crafting of the plan. But more importantly, the CIO gains through this collaborative process not an oversight authority, but a working and dedicated partner to achieving the vision herein described.

**ACTION ITEM 10.02**

The Office of the CIO and ITS should play a critical role in sharing specialized IT knowledge across the campus. As the central component in a coordinated University-wide IT service environment, ITS must ensure that there is an IT-focused Web presence that provides for the University a pathway for communicating the broad set of IT infrastructure and services described in this Plan. Thus, ITS and the Office of the CIO should develop a central LSU-IT Web site that fulfills the broadest possible mechanism for discovering facets of IT at LSU.

Untapped and unknown resources are available across campus. People have specialized skills or expertise in specific technologies that may benefit the campus as a whole. Incentives should be put in place to facilitate the sharing of knowledge and the education of users and IT personnel alike, and ITS is uniquely positioned within the University to facilitate this sharing of knowledge.

There is an expressed need for an “IT@LSU” Web site that is easy to navigate, facilitates problem solving, and lets users know more about the resources available to them as members of the LSU community. Basic items commonly used, like technical support, getting an ID, and ordering a telephone, should be readily available, as should up-to-date information on all facets of the IT environment at LSU. While not specifically an ITS Web site, the site should certainly encompass all services offered by ITS, and provide links to the broader, distributed IT services and infrastructure available from all units across campus. To the user, this site should present a seamless and holistic image of IT at LSU.

The University community should be constantly aware of IT capabilities available to them. An inventory of available tools and resources with their locations will make optimal use of an abundant IT environment. Additionally, individuals should be aware of the types of technical support available to them and the means by which they can contact support agencies.

To ensure that the IT agenda for LSU stays in line with the desires and needs of the campus community, members of the campus community should be encouraged to provide feedback on IT initiatives and progress via simple-to-navigate Web-based means.

**ACTION ITEM 10.03**

ITS should initiate a program of activity base costing for IT services it provides, so as to illustrate for the community the relative cost of its various services. This effort should be coupled with a user satisfaction survey, so that cost and quality of service (in terms of user value) can be illustrated.

To the campus, the costs of services and infrastructure provided by ITS for the benefit of the entire campus has been, to date, veiled and mysterious. Members of the Flagship IT Strategy task force found the process of engagement illuminating, in terms of their understanding of the broader roles and functions of ITS; but this process limited that exposure to only a handful of members of the campus community, and did not provide sufficient detail. A unit the size of ITS will certainly benefit from a more detailed analysis of its underlying cost structure (for services) and the sharing of that information.
broadly throughout its own organization and across the community of its users/customers. The community will benefit by having a better and richer understanding of both the cost and broadly-perceived value of ITS services, and this will help better guide the advice and direction the community provides to the central IT organization. Such a program should feature not only significant detail of costs and quality assessments, but open-access (via the Web) to that information by the community at large.
A RESOLUTION TO AFFIRM THE SUPPORT OF THE STUDENT GOVERNMENT OF LOUISIANA STATE UNIVERSITY IN REGARDS TO THE FLAGSHIP INFORMATION TECHNOLOGY STRATEGIC PLAN

PARAGRAPH 1: WHEREAS, INFORMATION TECHNOLOGY SERVICES (ITS) WAS CHARGED IN 2005 SHORTLY AFTER THE APPOINTMENT OF BRIAN VOSS, CHIEF INFORMATION OFFICER, TO BRING THE UNIVERSITY’S INFORMATION TECHNOLOGY RESOURCES TO A LEVEL OF EXCELLENCE AND ACQUIRE ADVANCING TECHNOLOGIES TO OFFER STUDENTS, FACULTY, AND STAFF THE MOST UP-TO-DATE COMPUTING SERVICES AVAILABLE IN THEIR PROSPECTIVE ROLES ON CAMPUS, AND;

PARAGRAPH 2: WHEREAS, IN KEEPING WITH THAT GOAL, ITS BEGAN THE DEVELOPMENT OF FOCUS GROUPS DURING THE FALL 2005 SEMESTER, AND;

PARAGRAPH 3: WHEREAS, FIVE (5) TASK FORCES WERE ESTABLISHED COVERING RESEARCH, TEACHING & LEARNING, INFRASTRUCTURE, INFORMATION SERVICES, AND STUDENT IT ENABLEMENT, AND;

PARAGRAPH 4: WHEREAS, FROM THOSE TASK FORCES CAME THE FLAGSHIP IT STRATEGY, AND;

PARAGRAPH 5: WHEREAS, EACH TASK FORCE HAD STUDENT REPRESENTATION, AND;

PARAGRAPH 6: WHEREAS, THERE ARE TEN (10) GENERAL RECOMMENDATIONS THAT HAVE BEEN DEVELOPED FROM THE SUGGESTIONS MADE BY THE TASK FORCES,

1) BUILD A SOLID FOUNDATION OF IT INFRASTRUCTURE AT LSU THAT IS MODERN AND KEPT UP-TO-DATE
2) MAKE SIGNIFICANT STRIDES IN INCREASING THE ACCESSIBILITY OF THE LSU COMMUNITY TO IT INFRASTRUCTURE AND SERVICES
3) DEVELOP A ROBUST, MULTI-TIERED SUPPORT ENTERPRISE TO MEET THE VARYING LEVELS AND SPECIFIC NEEDS OF THE LSU USER COMMUNITY
4) DEVELOP SOUND FISCAL PLANNING FOR IT THAT LEVERAGES LSU’S EXISTING INVESTMENTS, INCREASES THOSE INVESTMENTS IN CREATIVE AND INNOVATIVE WAYS, AND EXPENDS FUNDING RESOURCES IN THE MOST RESPONSIBLE AND EFFICIENT MANNER.
5) SECURE LSU’S IT INFRASTRUCTURE, SAFEGUARD THE INTEGRITY OF LSU’S INFORMATION RESOURCES AND THE PRIVACY OF ITS USER COMMUNITY, AND ENSURE THE CONTINUITY OF LSU’S IT INFRASTRUCTURE AND INFORMATION REPOSITORIES IN THE FACE OF POSSIBLE DISASTER SCENARIOS
6) DEVELOP ROBUST AND PLENTIFUL IT RESOURCES TO ENABLE RESEARCH AT LSU
7) DEVELOP ROBUST AND PLENTIFUL IT RESOURCES TO ENABLE FACULTY TEACHING AND STUDENT LEARNING AT LSU
8) DEVELOP SOUND INFORMATION SYSTEMS FEATURING A RICH SET OF APPLICATIONS AND TOOLS THAT ADDRESS THE INCREASING NEED FOR MORE EFFECTIVE AND EFFICIENT INSTITUTIONAL PROCESSES AND PROVIDE FOR ADVANCES ACADEMIC ANALYTICS AT LSU
9) SUPPORT LSU STUDENT USE OF IT, NOT ONLY AS A TOOL IN THEIR LEARNING, BUT TO ENRICH THEIR LIFE EXPERIENCES AT LSU
10) DEVELOP IT ADVISORY AND COMMUNICATION CHANNELS TO ENSURE THE CONTINUED INVOLVEMENT OF THE LSU COMMUNITY IN THE
IMPLEMENTATION OF THE FLAGSHIP IT STRATEGY AND ONGOING DAY-TO-DAY PROVISION OF IT SERVICES TO THE CAMPUS

PARAGRAPH 7: WHEREAS, EACH OF THE ABOVE RECOMMENDATIONS ARE ASSOCIATED WITH ACTION ITEMS THAT ARE APPROPRIATE FOR THE FUTURE NEEDS OF THE CAMPUS AND ARE LISTED IN THE COMPLETE REPORT; AND;

PARAGRAPH 8: WHEREAS, THE APPROVAL AND SUPPORT OF THE ENACTMENT OF SPECIFIC ACTION ITEMS IS CONTINGENT UPON FUTURE COLLABORATION AND DISCUSSION WITH THE APPROPRIATE MEMBERS OF THE STUDENT GOVERNMENT OF LOUISIANA STATE UNIVERSITY, AND;

PARAGRAPH 9: WHEREAS, THIS RESOLUTION IS ONE OF SUPPORT FOR THE CONCEPTS AND IDEAS CONTAINED IN THE FLAGSHIP IT STRATEGIC PLAN AND WELCOME THE OPPORTUNITY TO BE ACTIVELY ENGAGED IN THE IMPLEMENTATION PROCESS.

PARAGRAPH 10: THEREFORE, BE IT RESOLVED BY THE STUDENT GOVERNMENT OF LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE THAT WE DO HEREBY AFFIRM OUR SUPPORT OF THE FLAGSHIP INFORMATION TECHNOLOGY STRATEGIC PLAN AND OFFER COMMENDATIONS TO INFORMATION TECHNOLOGY SERVICES FOR THEIR EFFORTS IN DRAFTING THIS PLAN.

PARAGRAPH 11: BE IT FURTHER RESOLVED, THAT A SUITABLE COPY OF THIS RESOLUTION BE FORWARDED TO CHANCELLOR SEAN O’KEEFE, EXECUTIVE VICE-CHANCELLOR AND PROVOST DR. RISA PALM, DR. JERRY BAUDIN, CHAIRMAN OF THE STUDENT TECHNOLOGY FEE COMMITTEE & VICE-CHANCELLOR FOR FINANCE AND ADMINISTRATIVE SERVICES, BRIAN VOSS, CHIEF INFORMATION OFFICER, DR. WILLIAM H. DALY, PRESIDENT OF THE FACULTY SENATE, AND THE EDITOR OF THE CHRONICLE OF HIGHER EDUCATION.

LSU Faculty Senate Resolution 06-11:
Support for Flagship Information Technology Strategy

Whereas information technology is an essential component of LSU’s National Flagship Agenda; and

Whereas LSU’s Chief Information Officer has charged multiple committees of faculty, staff, and students with the development of a strategic plan for information technology; and

Whereas Information Technology Services has already begun to implement aspects of the strategic plan such as TigerWare, the Pelican high performance computing cluster, and the Microsoft software licensing program;

Therefore be it resolved that the LSU Faculty Senate affirms support for the Flagship Information Technology Strategy.
LSU Staff Senate Resolution 06-01
Support for Flagship Information Technology Strategy

Whereas information technology is an essential component of LSU’s National Flagship Agenda; and

Whereas LSU’s Chief Information Officer has charged multiple committees of faculty, staff, and students with the development of a strategic plan for information technology; and

Whereas Information Technology Services (ITS) has already begun to implement aspects of the strategic plan, such as TigerWare and the Pelican high performance computing cluster; and

Whereas the Information Technology (IT) strategy is associated with action items that are appropriate for the future needs of the campus; and

Whereas the approval and support of the enactment of specific action items is contingent upon future collaboration and discussion with appropriate members of the Staff Senate;

Therefore be it resolved that the LSU Staff Senate affirms support for the Information Technology Strategic Plan, which can be found on the Web at http://www.lsu.edu/fits.

Therefore be it further resolved that a suitable copy of this resolution be forwarded to Chancellor Sean O’Keeffe, Executive Vice Chancellor and Provost Risa Palm, Vice-Chancellor for Finance and Administrative Services Jerry Baudin, Chief Information Officer Brian Voss, President of the Faculty Senate William H. Daly, and President of Student Government Christopher Odinet.