



**Office of Information Technology
Strategic Operations Plan
January 2009**

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Office of Information Technology Strategic Operations Plan January 2009

Executive Summary

NC State's Office of Information Technology (OIT), formed in November 2007 as the university's central IT organization, collaboratively developed its first Strategic Operations Plan (SOP) during fall 2008. Initiated by Vice Chancellor for IT and CIO Dr. Marc Hoit, the OIT SOP is the first part of a three-phase strategic planning process to improve the use of information technology as a driver for change for the university. The next phases of this process will be to improve IT governance on campus and, in collaboration with the university as a whole, to develop an NC State Strategic IT Plan.

The SOP focuses on how OIT operates as an organization and how OIT works together as a team. Starting with new Vision and Mission Statements for the organization, OIT developed five OIT Operational Goals along with broad strategies for achieving them.

After a survey of OIT staff, Academic IT Directors and others, four projects were chosen to initiate the implementation of these goals:

- Student email initiative
- Data storage and backup
- Identity and access management
- University data mart

These initiatives were chosen based on their potentially high benefits to the university. The SOP includes a description of each project, timelines and expected deliverables.

The OIT SOP will be reviewed and updated every 6 to 12 months to keep it relevant.

Introduction and Organization Profile

Dr. Marc Hoit became North Carolina State University's first vice chancellor for information technology (VCIT) and chief information office (CIO) on September 1, 2008. Dr. Hoit has overall responsibility for NC State's research, academic and administrative IT, and is directly responsible for the university's recently consolidated Office of Information Technology (OIT). Chancellor James Oblinger gave his new VCIT and CIO the mandate to develop and execute a progressive information technology strategy for the university.

Soon after becoming VCIT, Dr. Hoit outlined a three-phase strategic planning process to improve the use of information technology as a driver for change for the university. The OIT Strategic Operations Plan (SOP) is the first phase of this process. The next phase will be to improve IT governance campus-wide; this process will begin in spring 2009. The final phase will be to work collaboratively with the university as a whole to develop an NC State Strategic IT Plan.

OIT is responsible for campus-wide information and communication technology services that support NC State's business functions and its mission as North Carolina's flagship university for science and technology. The organization was formed in November 2007 through the consolidation of the university's two central administrative and academic IT divisions. With a staff of more than 280 and a budget exceeding \$40 million, OIT is organized into eight units:

- Advanced Computing
- Business Services
- Communication Technologies
- Enterprise Application Services
- Infrastructure, Systems, and Operations
- Outreach, Communications, and Consulting
- Security and Compliance
- Technology Support Services

The OIT SOP planning process focused on enhancing how this new organization operates and how it works together as a team. Beginning with a daylong SOP planning retreat attended by 60 OIT managers and directors, OIT collaboratively developed the OIT vision and mission statements, operational goals and strategies through a reiterative process that took place from mid September through December 2008. OIT leadership encouraged all OIT staff to actively participate in the plan's development through informal discussions, staff meetings, status reports, an online SOP forum and a staff survey. The process is documented on the OIT SOP Forum site (<http://oit.ncsu.edu/sp/sop-forum>).

OIT Vision and Mission Statements

The OIT Vision statement expresses the aspirations, competencies and values of the organization. It offers a challenging image of the future to guide OIT planning and day-to-day operation.

OIT Vision: Be the IT organization people seek out as a partner for providing visionary strategies, creative solutions, objective information, and effective and efficient services in order to help them achieve their mission and goals.

The OIT Mission statement articulates the more specific purpose of the organization and its activities and operation.

OIT Mission: To provide nimble, effective, efficient and collaborative IT services, solutions and strategies in a timely and helpful manner that assists the university, state and nation in achieving their strategic goals.

OIT Operational Goals and Strategies

OIT consolidated a list of 30 goals into five Operational Goals to enable the organization to effectively achieve its mission and vision. Managers and staff developed general strategies to realize these goals.

Innovation, Agility and Alignment: Create a responsive, forward-looking and flexible IT environment that encourages strategic partnering and balances acceptable risk; leverage technology for solving business problems; and support rapid response to our customers' changing educational and business needs.

Strategies:

- Provide a formal venue to discuss and pilot emerging technologies, solutions and other research
- Provide staff time and resources to research and learn about emerging and changing technologies and state and federal regulations in their field
- Encourage staff to present at and participate in regional and national conferences and committees
- Communicate with customers (through surveys, forums, advisory structures, consultations, etc.) to identify what functionality is required
- Identify, collect and share relevant data to measure the value, success and return on investment for OIT services
- Prioritize the use of resources (funding and personnel) to meet strategic goals and prioritized projects
- Research technology alternatives, including those in development, open source, purchasing and outsourcing options, to select appropriate models that provide high returns on investments and meet education and business goals
- Review existing solutions to leverage them, instead of duplicating technologies or services
- Clearly define services, have Service Level Agreements (SLAs) for all services and share cost information for all services

Pervasive Transparency: Operate all services, projects, units and support in an open and transparent manner.

Strategies:

- Expand and enhance communication efforts to keep customers, staff and other stakeholders informed
- Deploy new tools to facilitate access to open, objective information to all stakeholders about OIT activities, decision making and planning
- Share, both within OIT and externally, information about solution and technology evaluations, planning and costs; name spokespeople to discuss, demonstrate and advance adoption

Collaborative Engagement: Operate under a culture of collaboration and partnership based on mutual respect, cooperation, knowledge-sharing and resource development within the organization and across campus.

Strategies:

- Maintain professionalism and respect with each customer contact
- Collaborate with other units within the university through mutual sharing of resources

and knowledge

- Identify and meet with stakeholders for input and requirements on all services
- Communicate with customers regularly and assess if OIT is meeting their needs on a per service basis
- Be an organization where all members can articulate the purpose and value of our services, and everyone works to achieve OIT and campus goals

Proactive Customer Service and Solutions: Respond to customers' needs in a timely and effective manner; maintain communications and services that meet or exceed agreed upon customer expectations.

Strategies:

- Develop a customer focused culture within OIT
- Provide services that meet or exceed agreed upon customer expectations
- Manage customer expectations with two-way communications
- Provide resources and opportunities to enable OIT staff to streamline customer service
- Ensure that OIT services can be accessed and are accessible by all customers on their own terms
- Be a technology leader and innovator, remaining current with software (versions and patches), hardware and best practices as appropriate
- Provide one-stop shopping for services, support and service information
- Create simplified paths to problem resolution including assignment of resolution paths

Reliable Systems and Security: Design, implement and manage all services and systems to produce predictable system behavior, reliable service delivery, competitive costs, data integrity, integrated security and legislative compliance.

Strategies:

- Use a sustainable funding model including lifecycle funding as part of the design of all services and new projects offered
- Consider training, security, compliance and resiliency in the design and implementation of projects
- Use and share effective project management processes to ensure the promised results
- Design systems that have redundant operations and appropriate service levels to meet customer requirements
- Promote consistent, authoritative data sources/services to avoid duplication, misinterpretation and confusion.

Implementation Projects

After a survey of OIT staff, Academic IT Directors and others, four projects were chosen to initiate the implementation of the operational goals:

- Student Email Initiative
- Centralized Storage Project
- Identity and Access Management (IAM)
- University Data Mart

These initiatives were chosen based on their potentially high benefits to the university. Each is described in more detail in the following summaries developed by the project managers.

Student Email Initiative

Project Managers: Stan North Martin & Sarah Noell

Purpose, Overview and Background

The purpose of the OIT Student Email Initiative is to review the current email services provided for students at NC State and to determine cost-effective options for improving these services.

NC State has provided all of its students with email accounts since the early nineties and access to these accounts via a webmail interface since the late nineties. These services have been highly reliable and have helped foster communication among students, faculty and staff. Two years ago the campus adopted email as an official means of communicating with students. However, the role of email continues to evolve within the university and beyond, particularly with the continual advent of other communication mechanisms.

The Student Email Initiative grew out of the growing awareness that the current environment is not meeting students' needs. At the same time, several companies, such as Google, Microsoft and Yahoo!/Zimbra, have begun providing a richer set of collaborative tools and features than what students currently receive from NC State. Two of these vendors are offering email and additional services at no fee to the university. For similar reasons, a growing number of other universities are migrating their student email service to these providers.

This initiative will review the current email services provided for students at NC State and determine cost-effective options for improving these services. A task force drawn from a variety of campus stakeholders has been assigned to carry out the evaluation and provide a recommendation. The group is charged with determining whether it is most beneficial to make improvements to the current email environment, migrate to a vendor-hosted solution, provide only forwarding service to students' preferred non-NCSU email account, or adopt other options that may be appropriate.

Information and resources related to the initiative are available online at <http://oit.ncsu.edu/student-email-initiative/>.

Goals and Objectives

At the completion of this project the task force will provide recommendations for the best path forward for email and related services for students at NC State. The report will include:

- The pros and cons of continuing the current student email environment or moving to one of the available solutions
- An evaluation of possible related IT services that could be provided as part of a solution
- Estimates of any potential reduction in costs there might be if moving to a new solution
- Estimates of transition costs should the recommendation be to change services
- An estimated timeframe for a transition to any new or improved service, with suggestions for possible phasing of that transition

This project will support the operational goals of Innovation, Agility and Alignment, and Collaborative Engagement.

Scope

The Student Email Initiative report will be based upon information from a variety of sources. Gathering student and other stakeholder information on needs and preferences will be critical in the decision-making process. The task force will evaluate the various options, giving consideration to the potential implications and consequences of the solutions. Additionally, the group will research solutions being implemented by other universities.

This project does not include implementation of any recommendations that come out of the initiative.

Authority

The Vice Chancellor for IT instituted the project and appointed the co-chairs and other members of the Student Email Initiative task force, which will make its recommendations to the Vice Chancellor for IT.

Major Constraints and Assumptions

To be successful, the solution arrived at needs to help students achieve their educational goals. At the same time, we must operate within the budgetary constraints and fulfill the mandate to be as cost effective as possible.

Consideration must be given to potential legal and security issues; for example, FERPA, electronic evidence gathering and data mining. Maintaining reliable service for official business and course communication with students remains necessary. Some solutions may require a significant shift in mindset for how services are provided to campus users, such as giving up control or access to some aspects of the service. For several potential solutions, business processes may need to change, such as account provisioning/de-provisioning, authentication mechanisms and bulk/broadcast email capabilities. While the focus of this initiative is on student email, any decision made has possible implications for the options of future faculty/staff email and related services. Support, training and implementation processes may also be major issues.

Proposed Start Date: This initiative was launched October 21, 2008

Expected End Date: A report is due to the VCIT on March 1, 2009

Project Structure

The Student Email Initiative task force is comprised of appointees from Student Government, Faculty Senate, college IT directors, College of Engineering's student-owned computing program, the Graduate School, Student Affairs, and a number of units within OIT. The membership list is available online (<http://oit.ncsu.edu/student-email-initiative/contact-information>). The team is responsible for gathering input and engaging students and other campus stakeholders. The group will also bring in others from OIT as needed.

Centralized Storage Project

Project Manager: Eric Silberberg

Purpose, Overview and Background

The purpose of this project is to enable OIT to cost-effectively expand and enhance the centralized data storage and backup services it offers to campus.

In recent years NC State has made significant investments to upgrade and expand the centralized data storage and backup capacities the university needs for critical IT functions such as highly reliable university data and file services, email services, mandated data retention, and disaster recovery/business continuity on- and off-site. New equipment includes a large new tape backup library, two virtual tape libraries (VTLs), refreshed storage arrays and updated fiber channel fabric for the storage area network (SAN). OIT currently supports 400-500TB of university data. An equivalent amount is estimated to exist in the colleges, departments and units across the campus. Customers across campus have requested additional storage space and changes in the way files are accessed. A joint effort across OIT and distributed units will be required to meet this need.

The OIT central storage and backup system was developed with an expectation of extending centralized storage to other campus units on an at-cost basis. While some campus customers have access to this service, restrictions in accounting practices and funding models have slowed delivery of the service. In addition, there are inconsistent prices within OIT for storage of email, and file space for AFS, hosted systems and block devices. An accurate and flexible storage model with cost-effective pricing is needed to offer enhanced performance, lower total cost of ownership (TCO) for campus customers, and overall university savings. To succeed, this OIT project also needs to address issues related to storage and backup support, documentation, and service level expectations.

OIT is still working to achieve the full benefits from the merger of central administrative and academic IT units in November 2007. This project will accelerate the process of reducing the overlap of processes and technologies and redundancies in file delivery services within OIT, while taking into consideration that changes to those platforms are dependent on projects such as Identity and Accesses Management (IAM) and the redesign of the centrally-provided desktop environment. Roles and responsibilities of technical staff and units changed as a result of the OIT merger, as well. Communication, handoff and collaboration processes between storage specialists and systems administrators need to be developed as OIT grows and changes. This project will help address these issues, with the intention of improving OIT operational efficiency and cost-effectiveness.

Goals and Objectives

- Establish a detailed price model for storage to be used for budgeting and capacity planning for OIT internal projects and charged services
- Develop a tiered architecture and services model that balances availability, performance, stability, data protection and costs
- Create simple tiers of services for non-OIT customers that make block level storage and/or file services available offering enterprise class storage and backups with lower departmental costs

- Create a communications channel for storage related projects within OIT and across campus
- Develop a plan to minimize overlap of existing OIT storage technologies to reduce costs and improve manageability
- Create a group to begin the design of the next generation OIT file services model.
- Develop a recurring assessment of the amount, types, growth, location of campus data both centralized and decentralized
- Review existing OIT storage technologies in light of data retention and compliance requirements as well as disaster recovery preparedness

This project will support the OIT operational goals of Proactive Customer Service and Solutions, Collaborative Engagement, and Reliable Systems and Security.

Scope

The project will address data needs within OIT including but not limited to students and staff email; file systems (AFS and NFS), Netware, Windows file services; and Database storage. The project will include current customers of OIT's Technology Support Services, Infrastructure, Systems & Operations, and Hosted Systems. It also extends to the broader campus to any unit that has a need or desire to access centralized storage. Direct attach fiber channel and network file services are the current platforms. Desktop backup is not currently part of the project, but it may be addressed at a later date.

Authority

The objectives stated in this charter are governed, authorized and supported by the Sponsors and Stakeholders of centralized storage services through the Centralized Storage Project Oversight Committee making recommendations to the VCIT.

Major Constraints and Assumptions

This project will investigate a cost model that allows customers to purchase multiple years of storage across fiscal years and acquire recurring funds for maintenance and expansion of existing storage systems.

Proposed Start Date: February 1, 2009

Expected End Date: August 1, 2009. Meetings will take place monthly during the six-month project duration and quarterly on a continuing basis after establishment

Project Structure

Storage policy & oversight team

This team will review policy implications of storage issues across campus and guide the technical working group and the charged-services team. Recommends to the VCIT.

OIT storage technical working group

Core storage operators as well as technical representatives from the major units will meet to discuss needs, communicate plans and design joint solutions. Recommends to the storage oversight team.

OIT charged-services team

This team will address all chargeback related services as well as serve as the liaison with receipts-supported units that access OIT services. Recommends to the storage oversight team.

Identity and Access Management

Project Manager: Mark Scheible

Purpose, Overview and Background

It is critical to the success of the University to implement a cohesive Identity and Access Management (IAM) program that provides strategic leadership in implementing and enhancing authorization and access services to support existing and future IT systems that depend on these services. Over time, our current environment has become a collection of isolated authentication and authorization mechanisms that do not provide a unified and easily managed environment required for modern IT services. This initiative will be undertaken as a collaborative effort across the university to ensure all requirements are met and to take advantage of the wealth of technical knowledge and experience that currently exists throughout the campus.

IAM deals first and foremost with an individual's personal identifiers and attributes that distinguish them from all other university students, employees, affiliates or guests. This data, and the credentials that are issued to the individual (username, CampusID, etc.) are used to identify or authenticate the individual. Access to university and external resources (authorization) is granted to individuals based upon the entitlements they receive. These entitlements are issued as a result of group memberships (e.g. all faculty, second year engineering students, etc.) determined by various attribute values the user has (e.g. affiliation, year and program of study, etc.). All of this identity data must be authoritative, secured and accessible to those who have the authorization to use it. It is generally made available for this purpose through an enterprise directory service.

Information and resources related to this initiative are available online at:
<http://oit.ncsu.edu/iam/nc-state-identity-and-access-management-initiative>

Goals and Objectives

The overarching goal of this project is to provide a unified authentication and authorization environment with clearly identified authoritative sources, efficient access control mechanisms and a secure, compliant environment that meets the needs and privacy requirements of the university constituents and provides a maintainable and cost-effective structure.

Specific objectives include:

- Create and implement a cohesive Identity and Access Management Roadmap
- Provide leadership in the definition, protection and use of identity data for Students, Employees, Guests and Affiliates of the University
- Simplify and enhance the campus authentication infrastructure
- Enable secure, reliable access to campus resources and services for the NC State community that is easily maintained through the use of roles and group membership
- Implement an Enterprise Directory Service for campus to provide a single, secure location for commonly accessed authoritative user and resource data
- Enable and support the federation of campus identities
- Reduce overall administrative costs and ensure effectiveness and adaptability of IAM services

This initiative supports the OIT operational goals of Reliable Systems and Security; Collaborative Engagement; and Innovation, Agility and Alignment.

Scope

The intended scope of the IAM initiative will be university-wide, with IAM services being provided to the entire campus as well as to UNC System institutions as requested. Federated services may be provided to a wider community if authorized.

Authority

The objectives stated in this charter are governed, authorized and supported by the Sponsors and Stakeholders of Identity and Access Management services through the IAM Oversight Committee who make recommendations to the Vice Chancellor of IT.

Major Constraints and Assumptions

Resources required for implementing the objectives of the IAM Charter will be provided through the authority of the IAM governance (IAM Oversight Committee). Staffing of collaborative service teams or working groups will be determined as each IAM project is chartered.

Proposed Start Date: January, 2009

Expected End Date: Identity Provider (IdP) services in production, 3/31/2009; Project end date, 2010; IAM services - ongoing

Project Structure

IAM Oversight Committee

Reviews IAM projects, sets priorities, and makes funding recommendations; recommendations to the VCIT. Representatives include Human Resources, Enrollment Management and Services, Office of Extension, Internal Audit, the Graduate School, Advancement Services, Office of International Services, Distance Education and Learning Technology Applications, Finance and Business, NCSU Libraries, Academic IT Directors, and OIT.

IAM Technical Strategy Team

Responsible for reviewing the relationships between all IAM services and proposing new project strategies to the Oversight Committee and VCIT. Also responsible for creation of project teams, setting expectations and reviewing progress.

IAM Working Groups

Primarily technical teams for implementing IAM projects and collaborative efforts. Representatives will be project-specific from designated areas.

University Data Mart

Project Managers: Karen Helm, Lewis Carson and Connie Reitfort

Purpose, Overview and Background

The purpose of this project is to develop a data mart, dashboard, and query tools that will provide easily accessible, decision-support information for NC State's executive officers, deans, and department heads.

The data mart will reside in a centralized database with consistent data and a user-friendly interface. The dashboard will include selected measures of university, college, and departmental quality, effectiveness, and efficiency. The data and constructed measures will be consistent across multiple years, requiring standard census dates and definitions.

With the implementation of compatible student information, HR, and financial systems, NC State can now more easily integrate them into a unified data mart, develop a common set of performance measures, and develop retrieval tools for decision makers across the university.

Goals and Objectives

- Identify and define key data elements and measures that executive officers, deans, and department heads need to use for tracking performance, planning, and other business functions
- Build a data mart to house these data elements and construct measures
- Build a high-level dashboard to display and provide drill down capacity for these measures
- Provide an appropriate query tool for fixed, adaptable and ad hoc reports from the data mart. Configure the tool to guide clients to selected appropriate comparisons
- Design the data mart, dashboard and query tool to include as much of a unified view of all university data as possible. Implementation will be phased
- Recommend a continuing process for monitoring the effectiveness of the data mart, dashboard, and query tools, and continue development as needed

This project will support all five OIT operational goals.

Scope

The definition phase will identify the data elements and measures to be included in the data mart. Users of the data mart will be consulted for their needs.

Data definitions, reporting periods, and organizational structures will be addressed. The data areas for the first phase will include information that is already reported in a consistent format, such as enrollment, credit hour, degrees awarded, employee, and year-end financial data. Others will be added as needed and when resources are available.

The project teams will search for an appropriate set of tools for creating the data mart and dashboard, and for ad hoc queries. The teams will implement the approved plan.

Authority

The project will be formed as a task force with a steering team that makes recommendations about data mart and dashboard content to the Provost and that makes recommendations about data structures and retrieval tools to the Vice Chancellor for Information Technology.

Major Constraints and Assumptions

The assumption is that this project can be accomplished with existing personnel, data holdings, and knowledge. The major constraint is resources for development: analyst and programming time, specific tools, and infrastructure such as databases. There will be a search for appropriate software tools, beginning with tools currently under license. If currently licensed tools and hardware are not adequate, funding for an appropriate tool and additional hardware may be an additional constraint.

Consistency between internal and external reporting will be enforced, which will facilitate communication between the university and external agencies like UNC-GA. Structural changes to the data will be made to suit customer requirements. For example, the current organizational structure will be applied to history so that measures look like the current structure has always been in effect. Measures and ratios will be pre-calculated so inappropriate constructs are not possible.

Proposed Start Date: February 2009

Expected End Date: December 2009 (for data definitions and project scope implementation plan)

Project Structure

A Steering Team will be formed consisting of representatives from customer groups (executive officers, deans, and department heads) and process owners (University Planning Analysis (UPA) and Enterprise Application Systems). The Steering Team will be developed as part of the initial planning.

A Service (Technical) Team will be formed consisting of team members who actually do the work or supervise those who will help do the work. There will be one from each major content area represented: University Planning and Analysis, OIT application / database representative, OIT security representative, the Graduate School, Registration & Records, Accounting or Budget Office, Human Resources, Research Office, a college representative, a department representative.