Planning for Technology as a University Strategic Asset

Presented by

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Chief Information Officer and Associate Provost
Professor

UGA Strategic Planning Committee
August 25, 2009
Technology, as an Institutional Strategic Asset...is central to the mission and the strategic priorities of the University

• Enterprise Administrative Systems  
  - Student Information, Financial Aid, HR and Payroll Systems, Finance
• Instructional/Learning Management Systems
• Research Computing/High Performance Computing
• Collaborative and Productivity Computing  
  – Email, Calendaring, Campus Portal, Video Conferencing, Desktop/Mobile Computing
• Infrastructure  
  – e.g., Data Center, UGA Network, Virtualization, ‘Green’ computing, Telephony
• Information and Data Security, Standards, and Policies
Strategic Planning: 2009 Faculty Survey

Strengths

- Student Quality
- Faculty Quality
- Study Abroad International Programs
- Life Science Research
- Physical Infrastructure
- Engagement with the State

Areas for Increased Emphasis

- Graduate Education
- Faculty Numbers
- Technology Infrastructure
- Engineering
- How to maintain the Humanities in tight budget climate?
Context: Campus Expectations

- **Responsive, reliable, service-oriented** departmental/local and central computing services and operations

- **Access, support and training** for ‘mainstream’ course management systems (e.g., WebCT, Blackboard)

- **Access and support** for *High Performance and Parallel Computing* capability, connectivity, functionality

- **Accurate, reliable, timely, and consistent one-stop access** to university data processes/procedures including *data warehouse/data mining* capability

- Institutional **security** for sensitive and critical data; **contingency** and **disaster recovery** planning, solutions and implementation
Campus Expectations (continued)

- Technology **life-cycle management** to leverage campus procurement, avoid duplication, manage from an ‘enterprise’ strategy
  - Depreciation
  - Replacement
  - Upgrade of core systems
  - Applications for instruction, research, outreach, administrative

- **Support** for Public Service and Outreach/Extended Campuses systems and services state-wide, and through international education
  - e.g., Griffin; Gwinnett; Oxford; Costa Rica
...while also providing services to, and support for:

- 34,600+ students
- 10,057 UGA workforce
- $227 million in sponsored research activity
- 84 Student housing buildings; 372 Athens Campus buildings (excludes leased space)
- 7,370 Athens Campus basic rooms (classrooms, labs)
- Extended Campuses (e.g., email; classroom/labs; wireless; PeachNet access)

- 11,000+ online courses enabled through UGA Course Management System (WebCT)
- 79,752 individual students enrolled in WebCT enabled courses

- 4,900,000 million, on average, incoming email messages per day
- 4,330,000 million unsolicited and/or SPAM deleted/eliminated per day
- 569,530 delivered to inboxes daily

- 6.6 million transactions each month on the IBM mainframe not including drop/add;
- 10 million transactions during drop/add

- 52,698 devices on the campus network (e.g., computers, printers) excluding wireless
- 24,720 unique PAWS users per month
- 3,550,321 annual PAWS (wireless) logins
<table>
<thead>
<tr>
<th>President/Senior VP</th>
<th>Vice President/Deans</th>
<th>Auxiliary Services</th>
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<tbody>
<tr>
<td>Athletic Office</td>
<td>University Testing</td>
<td>Administrative Services</td>
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<td>Equal Opportunity</td>
<td>University Housing</td>
<td>Central Receiving</td>
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<td>University Health Center</td>
<td>Central Office Supply</td>
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<tr>
<td>Academic Affairs</td>
<td>Student Affairs</td>
<td>Central Duplicating</td>
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<td>Greek Life Office</td>
<td>Campus Mail</td>
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<tr>
<td>Office of Instructional Education</td>
<td>Student Support Services</td>
<td>Risk Management</td>
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<td>International Student Life</td>
<td>Directory Assistance</td>
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<td>Office of the VP Instruction</td>
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<td>Controllers Division</td>
<td>Registrar</td>
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<td>Bursar’s Office</td>
<td>Admissions</td>
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<td>Contracts &amp; Grants</td>
<td>Cooperative Extension</td>
<td>Parking Services</td>
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<td></td>
<td>Service: CES</td>
<td>UGA Card Services</td>
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<td></td>
<td></td>
<td>Office of Security and</td>
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<td></td>
<td></td>
<td>Emergency Preparedness</td>
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<td>Physical Plant</td>
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</table>
**Strengths**

- Core network robust enough to take full advantage of data, voice, and video convergence in addition to future addition of automation systems
  - e.g., energy and building automated systems

- UGA Data Center is a Tier-2 Data Center providing 99.75% availability; 16,000 sq ft of space for adequate growth over next 5 years; environment to house critical core systems including:
  - Research Computing Center
  - Administrative systems (e.g., Student System; Financial Aid)
  - Instructional systems (e.g., Blackboard course management system; SAKAI)
  - Hosting services for mission-critical Departmental Servers
  - USG/OIIT Administrative and Instructional systems
  - UGA Telephone system
  - UGA Cable TV systems
Strengths (continued)

• Planned for, and built-out, ‘distribution layer’ of core network allowing capability to extend network services to each building on residential campus as well as remote campuses

• Proactive ‘relationship-building’ by CIO through strategic planning, advisory and governance models, and partnerships; examples include:
  – Center for Teaching and Learning
  – Research Computing Center (RCC)
  – Griffin/Extended Campus
  – Office of Admissions
  – Information Technology Management Forum
  – UGANET
  – Student Government Association
  – USG/OIIT
  – Medical School Partnership
Concerns: 2007 OCIO/EITS 5-Yr External Program Review

• University units lack easy and flexible access to information needed for planning, management and reporting including lack of standardization for common data elements necessary for data mining/warehousing;

• The Student Information System is outdated (35 years old) and does not meet the needs of its users; standard application systems ‘life’ is 7-12 years without major upgrade

• Legacy enterprise (administrative) systems are at risk due to their aging software architectures, difficult of hiring staff with skills in legacy technologies, and lack of a robust business continuity plan;

Central IT organization (EITS) underfunded by nearly half of comparably-sized research universities and more like one-third of comparable flagship institutions

- pay below-market salaries
- suffer from division of staff across multiple buildings
## Core Statistics: Central IT Organization Comparisons

<table>
<thead>
<tr>
<th></th>
<th>UGA</th>
<th>Peer</th>
<th>Aspirant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment:</td>
<td>33,831</td>
<td>35,278</td>
<td>37,839</td>
</tr>
<tr>
<td>Funding:</td>
<td>$32,222,104</td>
<td>$42,313,082</td>
<td>$63,815,342</td>
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<tr>
<td>Central IT Staff:</td>
<td>222</td>
<td>251</td>
<td>322</td>
</tr>
<tr>
<td>Central IT $/Institutional Headct:</td>
<td>$734</td>
<td>$1,239</td>
<td>$1,291</td>
</tr>
<tr>
<td>Central Funding Per Student</td>
<td>$1,046</td>
<td>$1,362</td>
<td>$1,913</td>
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</table>
UGA-Voiced Concerns

• Decentralized residential/extended campus IT environment

• Lack of standardization for core services/equipment limiting campus users and remote campuses from taking full advantage of core enterprise solutions
  – e.g., wireless; access layer network equipment that interfaces with Foundry core and distribution network

• Academic and administrative units lack easy and flexible access to information for planning, management and reporting

• Current Mainframe is near ‘end of life’ and cannot be effectively upgraded
  – projected that maintenance and operational costs will appreciate substantially over the next 4 years and system utilization is projected to increase by 15% to 25% per year thus requirement for future replacement
Concerns (continued)

• Need for additional generator capacity/electrical capacity in support of emergency HVAC and Research Computing Center growth
  – e.g., Medical School, Engineering and Biomedical priorities

• Need for standards for campus data network to assure appropriate access by decentralized campus units to the point of connection to the campus backbone requiring consolidation and/or centrally managed data network

• Absence of remote business continuity/disaster recovery site for mission-critical applications

• Outdated (35 year-old) Student Information System (OASIS, Financial Aid) unable to meet modern, web-based, 24x7 access to services by student, faculty and staff
Concerns (continued)

• Dissatisfaction with current administrative legacy systems supporting data management and integration
  – consensus is that administrative systems are inefficient, difficult to modify,
  – do not offer integrated data warehouse/data mining capability

• Outreach community expresses concern regarding heterogeneity of commercial Internet Service available and the need for UGA/EITS to provide Virtual Private Network Service
At the same time... 2010-2020 UGA Drivers

- MCG/UGA Medical School Partnership
- Enhanced Public Health/Health Sciences
- College of Engineering
- Full Degree Programs Online: Residential/Extended Campuses
- Modern, web-based administrative platform
  - e.g., Student System, Financial Aid, HR, Finance, Grants/Contracts
- 24x7x365 any place, any time, by any device access to UGA data, information, educational resources
  - e.g., Podcasting; I-Tunes U; Asynchronous access to course support materials/lectures
...in addition...2010-2020 Industry Trends

- **Virtualization** and the impact on Data Center, energy and management
- **Energy and Green IT** focused on efficiency of Data Center Operation
- **Data Deluge** reflecting 650% increase in stored data in 5 years
- ‘**Consumerization**’ and **Social Networks** driven by students and faculty with increasing use to engage in teaching/learning and administrative business
- **Unified Communications** integrating interfaces with technologies into single, integrated application suites accessed from single mobile device
- **Mobility** and **Wireless** 7x24 access any time, any place, ....any device
- **Convergence** of strategies driven by need to integrate applications and disparate systems across **web services**
Technology, as an Institutional Strategic Asset...is central to the mission and the strategic priorities of the University

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<table>
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<tr>
<th>Research Computing</th>
<th>Issue</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absence of ability to provision state-of-the-art constellation of research computing, high performance computing, data storage (NSF reference to Cyber-Infrastructure)</td>
<td>Only have <em>Keep lights On</em> support for Research Computing Center</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Administrative Computing</th>
<th>Issue</th>
<th>Status</th>
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<tbody>
<tr>
<td></td>
<td>Dissatisfaction with current administrative legacy systems supporting data management and integration Consensus that administrative systems are: Inefficient Difficult to modify Lack modern self-service interfaces Do not offer integrated data warehouse/data mining capability</td>
<td>Continued ‘add-on’ of independent administrative system No enterprise/holistic approach to integration for enabling ‘one-stop’ secure access to institutional data Current status reflects continued decentralized, silo, customized unit ‘shadow’ systems</td>
</tr>
</tbody>
</table>
Nanoscience Research
Prof. Zhao and Zhongyue Zhang compute electric field distribution around nanostructures

New Website http://RCC.UGA.EDU
## Impact: Investigator Contributions

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Contributor</th>
<th>Shared or Dedicated</th>
<th>Origin of Funding</th>
<th>Cost</th>
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<tbody>
<tr>
<td>2005</td>
<td>CTEGD-J. Kissinger</td>
<td>Shared</td>
<td>Start-up UGARF</td>
<td>$100,000</td>
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<tr>
<td>2006</td>
<td>IOB - Y. Xu</td>
<td>Shared</td>
<td>GRA</td>
<td>$500,000</td>
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<tr>
<td>2006</td>
<td>COE - M. Hannifin</td>
<td>Dedicated</td>
<td>Dept of Ed.</td>
<td>$20,000</td>
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<tr>
<td>2006</td>
<td>BIRC – L.S. Miller</td>
<td>Dedicated</td>
<td>Franklin College</td>
<td>$25,000</td>
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<tr>
<td>2007</td>
<td>Statistics - Meyer</td>
<td>Shared</td>
<td>NSF/SCREMS</td>
<td>$80,000</td>
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<tr>
<td>2007</td>
<td>CTEGD - J. Kissinger</td>
<td>Dedicated</td>
<td>NIH</td>
<td>$20,000</td>
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<tr>
<td>2008</td>
<td>Biofuels - A. Darvill</td>
<td>Shared</td>
<td>GRA</td>
<td>$90,000</td>
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<tr>
<td>2008</td>
<td>Public Health - S. Rathbun</td>
<td>Dedicated</td>
<td>College of Public Health</td>
<td>$50,000</td>
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<td>2009</td>
<td>Biofuels - A. Darvill</td>
<td>Shared</td>
<td>GRA BESG-DOE</td>
<td>$75,000</td>
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<td>2009</td>
<td>IOB-Ying Xu</td>
<td>Shared</td>
<td>NSF / UGARF matching</td>
<td>$1,103,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$2,063,000</strong></td>
</tr>
</tbody>
</table>
Funding: All Investments (~$11.5M to date)

Total RCC Investments FY03-FY09
(Equipment, Software, Maintenance & Personnel)

- UGARF 35.07%
- OVPR 16.83%
- CIO 18.65%
- Provost 3.55%
- UGARF Grant Matching 2.87%
- GRA 9.46%
- GRA SU 0.87%
- Franklin College 0.22%
- DoED 0.17%
- NIH 0.17%
- Public Health 0.43%
- NSF 7.38%
- SU 0.87%
- GRA SU 4.33%
**Question:** What does Research Computing Look Like, i.e., the “Top500”?

<table>
<thead>
<tr>
<th>Rank</th>
<th>Machine / School</th>
<th>Year</th>
<th>Processors</th>
<th>TFlops</th>
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</thead>
<tbody>
<tr>
<td>6</td>
<td>Texas Advanced Comp. Center/Univ. of Texas Austin</td>
<td>2008</td>
<td>62976</td>
<td>433</td>
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<td>58</td>
<td>Texas Advanced Comp. Center/Univ. of Texas Austin</td>
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<td>5848</td>
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<td>87</td>
<td>University of North Carolina</td>
<td>2007</td>
<td>4160</td>
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<td>267</td>
<td>University of Minnesota</td>
<td>2007</td>
<td>2048</td>
<td>17</td>
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<td>355</td>
<td>University of Minnesota</td>
<td>2008</td>
<td>2304</td>
<td>15</td>
</tr>
<tr>
<td>&gt;500</td>
<td>University of Georgia IOB cluster</td>
<td>2008</td>
<td>1024</td>
<td>10</td>
</tr>
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</table>
In regard to the inclusion of Technology as a UGA Strategic Asset...

Technology infrastructure, network, systems, applications, human capital have not historically been considered and/or planned for as long-term institutional Strategic Assets (e.g., long-term investment, life-cycle planning, capacity planning, depreciation)
Critical Success Factors

• Delineation of *Institutional IT priorities*

• Strategic Planning for IT at *all Levels*
  – CORE/Central IT, Colleges, Individual departments and Units

• Inclusion of IT as Strategic Asset in *University Master Plan*

• Development of a *5-Year IT Strategic Investment Model*
  – Sustainable Funding
  – Reduces duplication and waste
  – Captures economies of scale
  – Identifies service costs that are escalating while service levels are flat or shrinking