

College of Engineering

Vision Plan for Information Technology

2006-2007

(<http://www.engr.utexas.edu/itg/vision/>)

College contact: Bob Gloyd (gloyd@mail.utexas.edu, 475-6091)

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Summary of College of Engineering ITAC funding requests for AY 2006/2007

Project Title	Brief Description	Requested Funding
<ul style="list-style-type: none"> Spectrum of live interaction capabilities benefiting classroom instruction 	A practical spectrum of proof of concept pilot projects are envisioned to facilitate distant guest lecturers and other features to offer and extend the classroom experience. The ability to participate from various locations, interactively annotate common discussions with figures and equations and preserve classroom interactions for review and study are also considered key functionality. All existing campus capabilities will be explored, classified and pursued as appropriate as will identifiable solutions within higher education at large and suitable industry solutions. Successful pilots will be propagated.	\$200,000
<ul style="list-style-type: none"> Classroom 2010 pilots and propagation 	Several pilots have proven successful and generated momentum that needs to be pursued in order to fulfill the aspirations for our classroom learning spaces.	\$500,000 (per year for 5 years, entering 2 nd year)
<ul style="list-style-type: none"> Distributed/ Virtualized Data Centers 	A well architected, distributed and redundant data center culture needs to be prototyped and implemented across campus. Engineering, Business, Communication and likely other Colleges/Schools envision working together to identify and build a practical and replicable distributed data center model for the campus in concert with appropriate centralized data center facilities.	\$150,000 (Engineering contribution toward overarching cooperative model)
Increasingly critical operational imperatives – recurring funding in nature		
<ul style="list-style-type: none"> Network Funding 	Adequate network funding remains a priority of IT funding, and will remain so until consistent funding is identified. (please reference appendix 2)	\$450,000 per year
<ul style="list-style-type: none"> Security hardening & scaling system management outreach 	Emphasis is on extending securely delivered services and security updates to all college constituents through a set of proactive measures which will optimize resource use and management and protect the productivity of unrecoverable classroom time. A security conscious culture needs to be further developed and equipped with proactive diagnostic tools and properly trained response teams to address security breaches and protect the productivity of our learning activities.	\$150,000 per year FTE and maturation and scaling of initiated pilots
Total:		\$1,450,000

OVERVIEW OF CURRENT IT PROGRAMS AND INFRASTRUCTURE

Engineering continues on its diligent commitment to foster world-class learning through the innovative and appropriate integration of technology into the curriculum.



- Enhance the educational **experience** through student-centered learning
- Provide a supportive **environment** to nurture STUDENTS, faculty, and staff
- Foster a first-class learning **community** that reaches beyond the classroom

Engineering's heritage of Learning Resource Centers, Studio Classrooms, laptop mobility carts, robust server infrastructure, Faculty Innovation Center, deployment of Multimedia Teaching Podiums (60 classrooms), pervasive wireless infrastructure (128 access points in 5 buildings) and Laptops for Learning Initiative (now entering its 10th year) depict the consistent efforts of the College to identify and address the practical roles of Information Technology to improve pedagogy.

Engineering leverages the ITAC allocations for visionary IT projects at typically greater than a 100% matching level. We have yet to commit any Vision Plan funding toward recurring expenses and we aspire to continue this commitment.

The primary sources of funding available to the College of Engineering to support the IT infrastructure and activities are through student fees. Currently we are in the midst of a transformation from a collection of fees (Instructional Resources fee, Instructional Technology fee, Information Technology fee, and Graduate LRC fee) toward a flat-rate tuition fee. Historically these sources of funding have been incrementally consumed by increases to operational obligations and rate increases have not kept pace with needed funding amounts. The impact of the flat-rate tuition upon this situation has yet to be determined.

The benefits of a **Virtual Server infrastructure** are being experienced in the School of Business and College of Communication, as the College of Engineering has shared the unprecedented flexibility in prototyping, testing and deploying services offered by a virtual infrastructure. Engineering recently hosted a Lunch and Learn for the TechDeans and representatives from Communication, Business and Engineering presented the remarkable benefits of a virtual server infrastructure and interest is burgeoning across campus to the point that some sort of cooperative hosting of virtual servers certainly needs to be developed in order to facilitate the adoption of this breakthrough technology across campus as the preferred server-infrastructure platform. ITS representatives were also in attendance at this meeting.

Tablet PC utilization in the classroom has gotten some additional traction in the past year, as we were able to get 26 tablets in the hands of tenured track faculty through the innovative use of the Computer Life Cycle (CLC) program and supplementary funding directly from the faculty members or their departments. Wireless use of Tablets in the classroom as presentation tools by faculty is peeking interest and viable solutions are being piloted.

USE OF PREVIOUS ACADEMIC YEAR ALLOCATIONS

We were able to leverage an ITAC allocation of **\$189,000** with **\$633,946** from various sources for a total of **\$822,946K** to implement a spectrum of IT projects as depicted below. As is typical, when we receive the ITAC funding we brainstorm on IT projects that are contemporarily appropriate and immediately fund these activities, thus ensuring a high correlation to funding and implementation. We also do some closing activities at the end of the fiscal year to ensure projects have been brought to a close or clearly understand delays, typically when physical plant scheduling has been involved.

All of our allocations were tightly coupled to **direct classroom and learning environment improvements**. A couple “hall of shame” classroom projects were funded and some significant learning space transformation projects were also funded.

Engineering IT Committee Vision Plan allocations for fiscal 04/05

				\$189,000 ITAC			
Dept	Project Title	Tot%	Proj%	Allocated Funding w/10K Supplement	Matching	Match%	Totals
ASE		11%					
			11%	\$ 22,000	\$13,000	59%	\$35,000
BME	Classroom upgrades	18%					
			18%	\$ 35,723	\$ 35,723	100%	\$71,446
CE	Prototype Classroom for Design Education	23%					
			23%	\$ 46,500	\$ 60,000	129%	\$106,500
ME	Presentation capabilities for ECJ 5.410 to enhance the use of Tablet PCs in the classroom	45%					
			38%	\$ 75,000	>\$500,000	>667%	\$575,000
	Classroom remediation		~7%	\$ 15,000	\$ 10,000	67%	\$25,000
PGE	Tablet PCs for direct use in the classroom	3%					
			3%	\$ 5,000	\$ 5,000	100%	\$10,000
TotReq>				\$199,223	\$623,723	<DeptMatch	
TotVisionPlanAllocAvail>				189,000	\$633,946	<TotalMatch	
Supplement provided>				10,223		TotalImpact>	\$822,946

Highlights of these implementations include a groundswell of enthusiasm for the **Tablet PC** for interactive use in the classroom – complemented by other initiatives as well.

NEEDS AND PROPOSED USE OF FUNDS

Although we would primarily like to continue to emphasize our multi-year **Classroom 2010 vision** (ref appendix 1), several other projects must be articulated as well, especially since they could contribute or detract from the implementation of the Classroom 2010 vision.

- **A distributed and virtualized data center culture needs to be nurtured across campus.**
 - o It needs to be acknowledged that course critical content is already highly distributed and although linkages to content will likely emanate from the campus courseware solution, the content will be housed at increasingly dispersed locations. A wholly centralized solution is insufficient to address the inherently distributed nature of content creation and curation. **Engineering, Business and Communication** are certainly interested in helping to mature and deploy this much needed model across campus and will likely enlist other campus partners.
 - Engineering and Business have substantially completed core proof of concept work in the cooperative data center arena.
 - Engineering, Business and Communication have significant virtual server implementations and are biased toward virtual servers as the preferred server-infrastructure platform.
 - These cooperative partners are proposing to build contemporary data center nodes that will host appropriately synchronized/duplicated/replicated data and services. The data center nodes will have both active and passive components and will be architected around virtual servers running on space efficient blade server hardware using an affordable Storage Area Network. Sophisticated switching and networking accommodations will permit rapid switch-over should failsafe services be needed.

- **A College-cooperative approach toward developing and providing a full-spectrum of classroom-capture, stream hosting and conferencing services appears optimal and needs to be nurtured.**
 - o Some Colleges or Schools have developed skills, capabilities and capacities that could easily be scaled and distributed to other Colleges. An umbrella service-bureau needs to be formalized to facilitate the delivery of these services in a cost-effective and customer-friendly fashion.
 - Engineering is proposing to help facilitate the transformation of these existing campus services in partnership with Colleges/Schools willing to host the services as a service to the campus.
 - Additionally, needed services will be identified and candidate Colleges will be identified to prototype and potentially host the service as a service to the campus.

- Adequate and sustainable **networking infrastructure and security hardening** funding remains crucial and jeopardizes all other service offerings if not sufficiently addressed. Specific amounts are identified in appendix 2.

Cross-College collaborative software licensing efforts that should be acknowledged

Description	Partners	Costs
AutoDesk AutoCAD	Engineering and the School of Architecture cooperatively fund a broad-spectrum use license	~\$30K/year currently
National Instruments LabVIEW	Engineering, Natural Science and the VP of Research partner to provide an unlimited license for academics and research	\$24,995/year
Microsoft Premier Support	Engineering, Business, ITS, Facilities	~\$97K/year

Appendices:

1 – Classroom 2010: Unleashing Learning Spaces

Leveraging experience, success, vision and opportunity to create the learning environments of tomorrow...

Building upon systemic transformational efforts to fundamentally evolve learning dynamics through project-centric learning experiences, Classroom 2010 plans to harvest practical best practices and build prototype classrooms in each of the **classroom categories**:

- Lecture Audiences (large and medium)
- Distance/Distributed
- Seminar
- Project
- Computer
- Laboratory

And then **propagate the enhanced classroom models to all 60 classrooms** within the main campus Engineering buildings by 2010. Additionally, classroom models will be shared with the campus community and promoted, especially in learning spaces where Engineering faculty teach across campus.

Faculty will engage with undergraduate and graduate students to explore and articulate enhanced learning dynamics supported robustly by our **Faculty Innovation Center**, catering to the course content needs of faculty, and our **Information Technology Group**, ensuring IT infrastructures are robust and responsive to class needs.

Tablets PCs will be used as the computing conduit for this transformation to weave **courseware**, (Blackboard enhanced by Agilix GoBinder/Mobilizer and adaptive testing tools), **assessment** (Classroom Performance System-CPS) and **learning portfolios** (Polaris) in **morphable classrooms** that can adapt to student-centered project-bias learning needs. (Grants will be sought from Microsoft, HP and other industry partners in these pursuits.)

The focus will be on enhancing and unleashing learning opportunities throughout the College, leveraging existing resources in new ways and building future classrooms in ways that are conducive and available for unfettered learning.

- Next generation Multimedia Teaching Podiums are already being deployed
- Performance and Learning infrastructures will be actively pursued and enhanced
 - Classroom Performance System (CPS)
 - Courseware: adaptive testing and mobilizing
- Furniture, lighting and acoustical enhancements to address and transcend challenges

**"The best way to predict the future is to invent it."
-- Alan Kay**

2 – Critical Network Infrastructure Lifecycle Funding needs

Adequate funding for the mission critical network infrastructure remains a crucial concern with the College of Engineering. Historically, we found allocating a portion of the ITAC Vision funds leveraged with College funds necessary to maintain essential networking capability. To transcend this undesirable situation, the College has proposed a Network Lifecycle Model, integrated into our fee structure, to provide for sustained maintenance and necessary expansion of the network. The following table shows the proposed schedule.

Network Infrastructure Lifecycle Funding Budget Overview

Equipment (cost per year on 5 Year Lifecycle) **\$250,000**

Year	Areas Covered (proposed cycle)
Year 1	WRW, CPE-East
Year 2	ECJ, ETC
Year 3	ENS
Year 4	BME, futures/new technology
Year 5	CPE-West, wireless, all building upgrades

All years contain an amount that is non-building specific to cover software, training, tools and additional areas.

Salary (3 Full Time Employees - proposed)

Position	Salary	Annual Salary with Fringe Benefit
Senior LAN Administrator	57,500	73,600
Network and Security Administrator	57,500	73,600
Tech staff	40,000	51,200
Total	155,000	\$198,400

Total per year, nominally \$450,000

Adequate network bandwidth, connectivity and redundancy remain chronic networking issues. While some buildings cannot currently add a single additional connection to their existing infrastructure and struggle to identify funding for expansion, other buildings have a growing concern for single points of failure that could be disastrous for mission critical network infrastructures. All of these concerns converge to the necessity of having a consistent source of network funding as proposed in our lifecycle funding model.