



CRITICAL INFORMATION TECHNOLOGY ISSUES FOR FLORIDA ATLANTIC UNIVERSITY



Developed by The Division of Information Resource Management

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Executive Summary

The mission of Information Resource Management (IRM) is to plan for and provide high quality information technology resources in support of research and teaching across all campuses, and to facilitate the efficient execution of administrative and public service functions of the University.

During 1996-97 Florida Atlantic University (FAU) positioned computing services as one of its top priorities. To help accomplish this goal IRM was transferred from the Administration and Finance area to Academic Affairs. At the beginning of the 1996/97 academic year, University Provost Osburn ordered a review of IRM. The purpose of the review was threefold:

1. What general needs for computing and related technology exist at FAU currently and what is needed for the next decade, and who are the customers that have those needs?
2. Are IRM's current structure and staffing appropriate for serving these customers? If not, what changes need to be made?
3. Given that the university's budget cannot be expected to include extraordinary increases for such items, what priorities should be established for funds that will be available?

Vice Provost Dean chaired a university-wide committee that undertook this task and spent a year reviewing IRM and all of its functions. At the end of the review, it was determined that in order for IRM to meet the goals outlined, additional funds and staff were needed. The University, as a result, permanently increased IRM base budget by \$1,000,000 in the 1997/98 fiscal year.

At the same time, IRM submitted its 1996/97-2000/01 Strategic Plan to the Board of Regents setting forth specific goals to be achieved during these time periods. They included:

1. Make network applications accessible to all faculty, staff and students
2. Allow maximum application of the network for internal and external connectivity
3. Provide full networking capabilities on all FAU campuses, and
4. Develop a plan to allow for multimedia presentations and effective use of technology in support of the instructional process.

With the support provided by President Catanese and the University's Senior Executive Staff, IRM has been able to meet the goals it set for FAU ahead of schedule. However, the area of technology is one that rapidly changes. If FAU is to remain competitive in recruiting outstanding faculty and students it must assure its technology infrastructure matures and moves forward to meet the challenges that lay ahead.

As FAU defines its future and begins to implement the Strategic Plan as directed by President Catanese to chart its growth to 46,000 students and Carnegie Doctoral/Research-Extensive classification, it becomes more obvious that Information Technology will be a critical element in FAU's transformation.

The IRM senior management team has carefully analyzed the University's technology environment, reviewed the most current draft of the University Strategic Plan, and consulted with colleagues around the country to determine what FAU's future technology needs will be. What follows are twelve Critical Issues IRM has identified that must be investigated and implemented if FAU is to meet its goals of growing to 46,000 students and becoming a preeminent Carnegie Doctoral/Research-Extensive institution.

What follows is a series of critical issues as determined by IRM senior management team. This list contains twelve issues that FAU must implement if it is to achieve the goals it has set for itself. The identified issues are a result of a six month study that initially started off with almost 40 issues identified as "must do" activities facing IRM and FAU. Through a series of prioritization and combining of issues, the twelve issues identified evolved.

The issues have been categorized and prioritized within each category to suggest criticality and progression. The three categories of issues are Organizational, Technical-Enterprise, and Technical-Focused. Organizational implies that the issues within this category are university-wide and not necessarily technical in nature. Instead, they are all related to the University's ongoing commitment to Information Technology and IRM's ongoing commitment to the University.

Technical-Enterprise issues relate to projects that will have an impact on the total university, all campuses, and all user communities. Technical-Focused issues are those relating to a special entity supported by IRM that will enhance segments of the university community.

It is important to note that the issues addressed in this paper will take time to implement. It is also important to realize that it will take resources, both fiscal and human to implement these projects. However, it is most important to remember that without implementing these issues FAU will not meet the goals it has set for itself in the 21st century.

The following chart is designed to present the Issue, the Timeline, the Cost and the Impact on FAU for each of the twelve issues.

Issue	Timeline	Cost	Impact
FAU Strategic Plan	2000-2010	TBA	Once these issues and their corresponding write-ups have been accepted and funded, FAU will take a giant step into the 21 st century and become recognized as a premier institution of higher education in the Southeast and the United States.
Customer Service	4-6 months, ongoing	\$12,000 Initial + \$5,000 Annually	IRM intends to go forward with a comprehensive customer service program designed to build upon existing organizational strengths and create new opportunities where needed.
Funding Model	Annually	\$1,400,000	While the current infrastructure is designed to meet the basic requirements of faculty and students, it clearly lacks the elements required to meet the challenges of a high-level research and technology centric institution that is articulated as one of the mission of FAU for the next ten years.

Issue	Timeline	Cost	Impact
Accountability	Ongoing	\$100,000 Initial + \$50,000 Ongoing	This plan will assist the University to set the proper technology course and at the same time, engage units who are direct beneficiaries of these services.
Staffing	Six Months	\$350,000 Initial + \$350,000 Annually	. These funds will enable IRM to invest in its single most important asset as well as it will pave the road for recruitment and retention of top-rated technical staff to move the university forward.
Security	Summer 2001	\$50,000 Initial + \$10,000 Annually	Implementation of security measures described will help to ensure the University protects its community from unauthorized intrusion into their data resources.
Convergence	Summer 2002	\$752,000	FAU will be able to present itself as one of the few universities in the United States that has a fully function converged voice, video and data environment.
Network Infrastructure	Summer 2001	\$1,450,000	Network infrastructure is indeed the backbone for most technology services provided to the University community, and

Issue	Timeline	Cost	Impact
			will encompass even more of those functions in the future
Instructional Technology	Summer 2003	\$1,972,000	This plan is committed to meeting faculty and staff needs with effective educational and informational programs, materials, and products that reflect a high standard of artistic and technical excellence.
Computer Labs and Computer Mandate	3-5 Years	\$425,000 Ongoing + \$10,000 One Time Per Seat x 1,000=\$10,000,000	Computer labs must replicate the workplace and a mandatory computer ownership requirement for all students would elevate FAU's ranking among its peer institutions.
Groupware	Summer 2002	\$172,000	Groupware has the power to transform FAU's distributed environment into a single virtual campus.

Issue	Timeline	Cost	Impact
Web Based Adm. Systems	12-18 months	\$800,000 Annually	The impact on the University of this implementation will be to provide a graphical, easy to use, and standardized look and feel for access to information. It will provide a state-of-the-art view of the University from a technology standpoint, and increase productivity and information access in the process.

ORGANIZATIONAL ISSUES

ISSUE: The FAU Strategic Plan

Look to FAU

In the 21st century, the public will look to FAU for a dynamic learning environment that promotes personal and intellectual discovery in a context of productive university/community partnerships.

Prospective students will look to FAU to stimulate learning and creativity through the acquisition, extension, and application of new knowledge and artistic expression. Students will choose FAU because of the excellence of its academic programs, its civil and productive interactions among students and between students and teachers, its responsiveness to meeting the lifelong learning needs of diverse populations, and its engaging on-campus environment.

Peer institutions will look to FAU to stimulate intellectual discovery through the scholarly and creative activities of its faculty. These endeavors will be recognized for their originality, innovation, and effectiveness. As a leading research institution, FAU will join its peers in addressing critical problems of the region, nation, and world. Quality research and student learning will be closely linked as faculty share inquiry and discovery with students in the laboratory, studio, library, and field.

Business, government, cultural, and educational institutions will look to FAU as a strong community partner and for its contributions to the regional development of economic, technological, cultural, and educational resources. The community and state will look to FAU for its leadership in connecting public education with the public through effective collaboration and exchange.” (D. Leland, Looking Toward the Future, Florida Atlantic University Strategic Plan 2000-2010, Executive Summary, 2000)

The report includes eight goal statements. They are:

- Goal 1 To increase student access on each of FAU’s partner campuses
- Goal 2 To provide student support services and other activities, which contribute to an exciting and supportive learning environment
- Goal 3 To encourage curricular and pedagogical innovations responsive to the diverse learning styles, circumstances, and educational needs of FAU’s students
- Goal 4 To achieve recognition from local, regional, national, and international constituencies for excellence of FAU’s academic programs
- Goal 5 To enhance graduate education and research

- Goal 6 To expand partnerships with business, government, cultural and educational institutions
- Goal 7 To promote the academic and organizational integration of FAU's partner campuses
- Goal 8 To develop and allocate resources on the basis of strategic priorities and performance

Close attention to the eight goals will bring into focus the importance and centrality of IRM in implementing and achieving each goal. There is not a single goal that does not affect IRM and the way IRM must prepare for the future. IRM must closely monitor the development and expansion of each goal to assure that IRM's input is provided and that IRM is kept abreast of the issues in order to implement them in an orderly and timely fashion.

Goal

To successfully implement the FAU Strategic Plan and address all Information Technology (IT) issues in a timely and efficient manner.

Objectives

- A subcommittee from IRM needs to be developed to insure that the technological aspects of each goal are clearly defined in relation to the existing IT environment versus that being proposed.
- A funding model must be developed that specifically addresses the IT needs identified in the Plan
- Once the plan is put in place, care must be exercised about allowing major deviations that would mandate major IT modifications or expenditures of personnel or fiscal resources

Timeline

A timeline for this project will be difficult to project. Since a University-wide committee is developing the Strategic Plan, IRM must wait until their deliberations have been completed and the report accepted by the President. Once this occurs, IRM will work with appropriate university officials to begin the implementation process.

Budget

The budget, much like the timeline is not within IRM's control. IRM will, as the Strategic Plan is being finalized, provide budget estimates for those issues that are either directly or indirectly within IRM's scope of responsibility.

Impact Statement

This Committee has been directly charged by the President of FAU to analyze critical areas and suggest processes and procedures to prepare the university for their eventuality. IRM's Associate Provost is a member of this committee. Once these issues and their corresponding write-ups have been accepted and funded, FAU will take a giant step into the 21st century and become recognized as a premier institution of higher education in the Southeast and the United States.

ISSUE: Customer Service

Exceptional customer service is key to the success of any technology entity. The process of creating this level of service has clearly definable components: evaluation and adjustment of existing service program(s), recognition of both perceived and unperceived service needs (internal and external to the organization), creation of new service models when necessary and the purchase of materials/equipment necessary to implement the program.

The current status of customer service provided to the FAU community by IRM was evaluated through a series of interviews with directors or their representatives in each area and included the Northern and Broward Campuses. The interviews revealed a variety of existing service models with varying degrees of effectiveness. Some areas are predominately proactive while others are predominately reactive. All departments are mixed in their approaches, using such vehicles as remote system monitoring by outside vendors, on-call employees equipped with cell phones and/or pagers, some established response times, maintenance contracts, Service Center and ComWare software packages for the Help Desk and Telecommunications respectively, varying degrees of customer service training, an occasional end user survey and help lines. All had plans for addressing the inevitable lack of staff. And, even though no identifiable service model or approach was found throughout the organization, concern for the level of service provided and how that service is perceived by the University community was universal

Although numerous perceived needs exist internal to IRM the following stood out: staff training in customer service, increased utilization of existing software modules for the Help Desk and Telecommunication Services, the need to survey end users to determine needs, an increase in the use of the Web to process requests and inform end users, and the need to create a more clearly defined service culture. Additionally, the six hundred Boca Raton residential students who will be connected to the data/voice network with the opening of the Undergraduate Residential Towers in the Fall of 2001 will alter the customer service model for this campus.

Perceived needs external to IRM are funneled through various IRM Committees. The concerns are valid and are generally addressed in a forthright manner. IRM now enjoys a much improved image in the University community. However, there is still more that can and should be done. Further defining and improving the perception of external concerns is key to the improvement of the service IRM provides. The same holds true for internal and external unperceived needs.

Goal

A program for improving customer service by creating a more clearly defined service culture and meeting the University community's perceived needs, can largely be addressed by existing IRM staff. Programs of this nature have been popular in the corporate world ever since America realized that Edwards Deming's Continuous Improvement model was largely responsible for making Japan a world power after World

War II. These programs do not have to require a lot of money. However, they do require buy-in from upper management and front line service providers, coupled with consistent enforcement by supervisors.

Objectives

A successful service program has two major components: Process Improvement and Personnel Buy-in. In the case of FAU's IRM department, key personnel can be trained in-house to conduct team meetings and determine the most effective process improvement plan. Process oriented programs must do the following:

- Determine what the end users think is important
- Clearly identify what services are being provided
- Chart the current process
- Identify benchmarks
- Identify improvement areas
- Develop a "Mistake Proof" process
- Monitor process implementation and execution
- Measure customer focused results and satisfaction
- Make end users aware of changes and improvements
- Continue to review and correct the process

Obtaining staff buy-in is essential. If staff cannot be "sold" on the concept being presented, the program will not succeed. Fortunately, IRM has many people who genuinely want to do well. A presentation or a series of small group discussions, agreed upon by all directors, would be the best venue for introducing the program. Again, it cannot be over emphasized, consistency and participation on the part of directors and supervisors will be an essential part of the buy-in process. Process teams can also address any on going motivational issues such as employee recognition, bonuses, plaques, mugs, etc., and present them for incorporation into the program.

Timeline

Initial Implementation

It will take four to six months for the initial implementation of the program. During this time the IRM staff will receive customer service training, form process teams, define new processes and begin implementation.

Program Actualization

With the completion of the initial implementation, it will take an additional twelve to eighteen months for the University Community and the IRM staff to believe that the changes are permanent and that the level of service has improved significantly.

Process Continuity

The customer service process requires periodic review and adjustment. This is best accomplished by scheduled annual/semi-annual reviews or new process sessions that coincide with the implementation of a new technology or program.

Budget

Initial Costs

Additional expenditures for the customer service program will be minimal. As of this writing, they are limited to the cost of an external speaker and/or customer service training and in-house training materials. While the Help Desk is hoping to add Right Now Web software, it is not a cost being generated by this program and software modifications to the Telecom Services ComWare package will be born by the department.

Initial cost \$12,000 - \$15,000.

Annual Costs

A satisfactory on-going recognition program consisting of customer service recognition and awards to individuals or teams can be maintained for approximately \$5,000 per year.

An exceptional customer service culture is among the least expensive items for an organization to fix and maintain. It also indirectly benefits morale and retention - people want to be associated with the perception of success.

Impact Statement

That FAU is a rapidly growing, exciting, ever more successful educational institution is obvious and generally accepted. Less obvious is the dependency of that success upon the technology provided by IRM. Within IRM's framework, one of the major factors in determining the organization's success is the manner in which services are delivered to faculty, staff and students. A university that is perceived as technologically outdated will have enrollment and retention challenges. A successful customer service program also positively influences an employee's perception of the working environment, their ability to successfully perform the job for which they were hired, the degree to which the institution values the individual employee and, especially in the case of technology, the ability of the institution to realize its goals. Therefore, IRM intends to go forward with a comprehensive customer service program designed to build upon existing organizational strengths and create new opportunities where needed.

ISSUE: Funding Model

With unyielding consensus, FAU wants the very best IT infrastructure available for its faculty, staff and particularly, its students. The fundamental challenge is often identifying the most practical IT funding model. These models continuously engender a great deal of discussion and debate over cost versus benefits. While accountability review will always encourage such discussion, it is counterproductive to scramble from one budget cycle to the next without a secure source of funding that addresses incremental growth and inevitable refresh cycles for such a vital organization. FAU's strategic planning goals rely on a well-funded IRM to achieve its objectives. Initiatives such as Distance Learning, network and Internet access on multiple campuses, an integrated student information system, and pursuit of Carnegie Research I status, require a substantial increase in IRM's base budget. A goal oriented strategic plan recognizes the imperative to find a way to fund the initiatives.

Goal

FAU's IRM must develop a consistent source of funding that will be in place year after year as a baseline funding source to meet the challenges ahead. The detailed model must address the capital and recurring costs associated with IT.

Objectives

A. Further analyze equitable and practical methods for implementing the measures that will yield the baseline funding. Areas to explore include:

- Percentage growth based on the University FTEs
- The number of port connections to the FAU network
- A student fee integrated into the tuition schedule
- Increases based on new initiatives.
- Technical funding budgets within the colleges
- Equitable distribution of funds between IRM for overall operating costs and Broward and Northern campuses, for example.

B. Investigate lease versus purchase of desktop computers and determine the optimal Total Cost of Ownership (TOC).

- Consult with FAU purchasing and finance/accounting professionals
- Review Gartner Group study
- Research methods employed by other universities of similar size and geographic composition

C. Review the IRM organizational model in light of the funding model with special attention to reporting relationships and the mission of the University.

Proposed Funding Model

Essentially there are five broad areas of IT that require funding and four methods of enhancing or securing baseline funding that could be applied to each area as the cost model below reflects:

Areas	Acquisition	Operation	Incremental Change
Equipment	Equipment Purchase or Lease	Maintenance	Refresh Cycle
Software	Software Purchases / One-time Licensing	Annual License Software Maintenance	Additional seats As needed
Personnel	Planning, Design and Selection of Application Development Equipment and Software Installation	Routine Monitoring and Operation Problem Correction User Liaison, Administration	User Changes Moves Adds Deletes Software & Hardware version changes
Communications	Initial Network Infrastructure Development and Hookup Charges	Monthly Tariff Charges and intranet maintenance	Refresh Cycle
Facilities	Facilities Development (ex. Labs) Wiring Costs	Space Expense Expansion Electricity	

Source	Ranking 1-4	Model
Student Fee matriculation	1	A % of student tuition will be allocated to support student related infrastructure
Port Charges	2	There will be a monthly tariff charge for each network connection. This port charge must cover overall IRM network operating costs, with any additional funds to be split equitably between campuses based on student FTE's.
Baseline Budget increase based on FTEs	3	IRM base budget should be increased based on the growth of FTEs
Baseline Budget increase based on new projects	4	IRM base budget should be increased based on the growth of new projects and responsibilities

Timeline

Initial Implementation

The initial implementation of any of these funding models to enhance IRM's budget should start with the next fiscal year. Recommendation one which stipulates levying a local tuition fee should be incorporated into student tuition for the academic year. Recommendation two which is designed to collect port fees will require accurate tallying of all active data ports. A large portion of this information has already been collected and is available for review.

Process Continuity

IRM will develop an automated system to bill and to collect port charges. This system will be designed with utmost flexibility to automatically adjust charges as additional ports are added or excessive data ports are removed. The differential local fees for technology will be collected as part of student tuition and fees.

Budget

Initial and on-going Revenues:

The monthly network tariff charges will be utilized to address the on-going maintenance cost of active data communications equipment. With the rapid growth of Boca as well as all partner campuses, these costs have grown exponentially. Student technology fees will be used solely to enhance student access to technology resource benefiting students.

Tuition Differential Local Fee to enhance student access to technology:

\$20 per student per semester x 21,000	\$ 420,000
Annual Revenue:	\$1,000,000*

* Based on smaller summer term head count.

Network Port Charge:	
\$10 per month per port x 3600	\$ 36,000
Annual Revenue:	\$ 400,000*

*Estimated

Total:	\$1,400,000.
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Impact Statement

The much-needed infusion of these funds will enable IRM to endure the growth demand, and to offer a faster, more reliable, and scalable network architecture. While the current infrastructure is designed to meet the basic requirements of faculty and students, it clearly lacks the elements required to meet the challenges of a high-level research and technology centric institution that is articulated as one of the missions of FAU for the next ten years.

The University has under taken several major initiatives to promote and foster better student life on campus. One of the key elements is to encourage students to participate in on campus technology-based collaboration, and to provide students with access to the latest technological tools. This type of environment will induce learning and will self-promote the university. The local tuition differential fees will provide a steady source of revenue to address these challenges, and will enable the university and IRM to develop a systemic plan for technology refresh, and to meet the demand for new student facilities. Furthermore, based on the 2000-01 BOR report on SUS tuitions and fees, FAU Local and Activity fees are among the lowest of any university within the State.

ISSUE: Accountability

It is imperative that FAU'S IRM formalizes a methodology to measure IT service delivery and to ascertain whether FAU's IRM is achieving its mission and goals. Each area of IT services should be measured and reported on to the Florida Board of Regents (BOR) and other governing bodies within FAU. Not only is this accountability mandated by the BOR, but also it is essential to provide a basis to determine both staffing and funding for IRM. Particularly, the anticipated growth of FAU's student population to 46,000 within the next ten years will require all units to be more accountable as they will be asked to provide more services with ever dwindling state funding. It is evident that demands of providing an academic instruction and research technology infrastructure to support the activities associated with this growth must increase in parallel. Additionally, the business-to-business requirements within FAU will continue to be taxed by a growing student population. While there are numerous IT tools and paradigms available today to successfully provide innovative and cost effective solutions to these challenges, it is recommended that IRM first develop and engage in a sound Performance Measurement Model. IRM should continue to evaluate and select best practices of one or a combination of Performance Measurement Models developed by one of these bodies; Zona Research, Gartner Group, International Data Group (IDC), or Ernst and Young LLP. These models provide the basis for accountability assessment and reflect trends over time, and by the same token, provide IRM with accurate information to realign business practices and to provide accurate reports to the BOR and other University executives as needed.

Recognizing this essential responsibility to be accountable to the user community has been one of the cornerstones of IRM's mission. IRM is currently laying the necessary groundwork to provide better accountability reporting.

Goal

Each college, school, office and department within FAU should be encouraged to participate in developing accountability strategies to maximize the distributed approach to IT service delivery that has been so successful to date.

Objectives

A. Develop a process for advanced planning to help determine the goals and objectives to be stated and quantified in the Performance Measurement model. In addition to measuring performance there are several other primary objectives that IRM should take into consideration with regard to providing accountability to the University, the BOR, and the user community.

B. Develop and review policies and procedures that provide guidelines for the implementation, delivery and maintenance of IT services to ensure applicability and clarity is of the utmost importance.

C. Form a committee charged with reviewing all existing policies. This same committee should be responsible for identifying areas under the auspices of IRM that are not yet governed by a formal policy. Both new and existing policies should be evaluated in terms of the strategic mission of the University and IRM along with other consideration such as fair use of computer resources, computing practices that clearly consider University, state and federal guidelines and laws, and address issues concerning the World Wide Web, electronic messaging and other emerging technologies.

D. IRM must review its own internal processes. The same principles of systems analysis that IT professionals apply to the business world will be applied to the way IRM performs in terms of computer system availability, network integrity, application development, implementation, maintenance, customer service, and security. Since the Help Desk is the focal point for outside service delivery it deserves special consideration in this review. Another interface point resides in the understanding that IRM has with its clients, who have a diverse interest in both academic and business office arenas.

E. Service Level Agreements provide a means for customers of IT services and IRM to come to a clear understanding of the services to be delivered, timeframes and costs. Like any good contract the development of service level agreements can insure that both parties benefit from the arrangement. Attendant documents that detail a scope of work, a certificate of completion, and maintenance terms should be created to complement the service level agreement.

In summary, there are four areas to be developed further to attain accountability of IRM to the University and the BOR. These areas are: a performance measurement model that is updated annually; a policy and procedure review and formulation by committees specifically charged with this task; an IRM internal process review; and the implementation of service level agreements between IRM and its customers.

Timeline

Initial Implementation

The initial phase of developing some of these models is already on its way as the University is embracing a comprehensive assessment of services as part of SACS self-study process. IRM has also formulated a committee charged with developing a set of comprehensive policies governing fair access to technology as well as proper handling of University resources. It is our recommendation that each college or unit should also engage in development of a three-year technology plan with quantifying deliverables, and performance measurement models built-in. The initial development of these plans would take six months. During this period, IRM as well as other academic and administrative units will allocate resources to formulate a committee charged with development of an overarching technology and accountability outline with sections dedicated to address specialized departmental needs. This group will be working with a consulting firm charged with preparing the final plan.

Program Actualization

With the completion of the initial planning cycle, it would take an additional six months to collect and incorporate University community comments and suggestions into this plan. Some goals of this plan will be implemented as the plan is evolving.

Process Continuity

All accountability and planning exercises require a guideline for periodic review and course adjustment. All elements of this plan encompassing integration of technology into the curriculum, policies, service level agreements, technology mandate, and accountability measurements should be reviewed on an annual basis.

Budget

Initial Costs

Developing a sound, comprehensive, and dynamic technology plan requires a dedicated team of professionals who are committed entirely to development of this project. Information Resources Management has already begun to evaluate and as needed adjust internal processes; develop tactical departmental plans; and implement accountability measures, however, these initiatives should be integrated into a proactive university-wide technology deployment and technology accountability plan. The estimated cost of engaging a consulting firm would be at \$100,000.

Initial cost: \$100,000

Annual Costs

Since the template will be developed during the initial phase, the recurring cost would be at \$50,000, which would be to address plan adjustment and re-prioritization.

On-going cost: \$50,000

Impact Statement

More and more units are now realizing the benefits of office automation, and more academic units have begun to integrate technology to the curriculums. These changes combined with technology savvy students have increased demand on IRM services at an exponential level. This plan will assist the university to set the proper technology course and at the same time, engage units who are direct beneficiaries of these services.

ISSUE: Staffing

It has been well publicized by U.S. Government Labor Bureau statistics that there is a higher demand for IT professionals than there are individuals to fill the positions offered. Since the strong market trend for IT personnel is going to continue for the next several years, it is critical that qualified and motivated staff be recruited and retained to address IRM's on-going commitments. There are three initiatives that should be pursued to provide the IT staff of FAU with attractive incentives that assures retention of qualified individuals.

Goal

FAU's IRM must develop strategies to strengthen its ability to attract and retain high-tech workers in order to fulfill the current and future commitments of FAU.

Objectives

A. Revamp the current job classification/pay incentive categories

Currently FAU, like most Florida state universities, has organized its IT work force into a number of discrete positions, based on responsibilities and pay scale. As a result, promoting an employee typically involves the tedious process of having that person apply for a new, higher-level position or in some cases, requires the cumbersome process of re-classification for monetary purposes, while the responsibilities remain the same. Under a new job classification system called broadbanding that process would no longer be required. Several universities throughout the United States have adopted broadbanding because it makes it easier for departments to promote employees without involving a lot of red tape. This new approach is widely used in private industry as well as the Federal Government with the General Services step process.

Broadbanding is an approach to compensation that focuses on performance and market, uses a few, wide salary bands to deliver pay, and emphasizes management pay decisions while keeping the human resource department involved in the process as expert advisors. IT jobs would be arranged in groups or families of a wide range of positions. This new system is intended to be an improvement for employees and their supervisors. Its advantages are: it broadens focus from job content and scope to include the knowledge, skills and abilities of the individual doing the work, thus enhancing the pay for performance system; better maintains a competitive job and compensation structure to aid in recruitment and retention; and, streamlines administrative processes.

With broadbanding, a manager can more easily encourage his/her employees to broaden their skills and abilities. This is valuable to IT organizations because technology tools are evolving very rapidly, therefore, constant learning and training are necessary to stay current. Employees that are motivated to continually broaden their skills and abilities are critical for the success in a total quality/continuous improvement environment, like the one that FAU's mission statement describes. In contrast, the jobs in traditional

organizations are narrow and specialized. Furthermore, the current job classification system does not have a mechanism to advance employees over a number of steps or levels of responsibility/pay raises at regular evaluation intervals. While pay raises and step advancement would be based on merit, there must be a predetermined set of measurements by which to evaluate performance. This empowers employees to achieve success in the organization since they will know in advance what kind of behavior merits advancement. It also will protect the organization from accusations of inequitable treatment toward its employees.

B. Develop a mechanism to award one-time bonuses for outstanding job performance

Working in conjunction or separate from the broadbanding system is the second component to strengthen staffing; a one-time bonus for extraordinary performance on a particular project. Since bonuses are not part of the base salary, their budgetary implications are minimal and non-recurring. Furthermore, they promote a positive attitude and reward good performance among the staff as they compete to earn these bonuses.

C. Perform periodic surveys of the IT job market to reevaluate salary ranges.

FAU should establish a mechanism to annually review and adjust salary ranges of IT professionals in critical classes or bands to stay in synchronization with the IT job market in the private sector. This survey should include salaries of other sister institutions, peer institutions and the metropolitan tri-county marketplace. This process should consider salary adjustments for 33% of the IT personnel pool per year. Furthermore, this review should also recommend re-tooling and deploying of IT staff in positions no longer viewed as essential to more vital areas. As part of this process, proper funding should be allocated and secured to build the skill set of these IT professionals as they transform to meet new challenges.

D. Offer Non-Monetary Perquisites

- Training Opportunities such as certifications that would make an employee more valuable on the job market and at FAU.
- Internship Program

E. Explore multiple avenues for recruiting staff

- Employment Professionals (Head Hunters)
- Internet Website Posting (ex. Monster.com)
- Coordinate with professional and vocational schools for student placement.

Timeline

Initial Implementation

The initial phase of this process will include evaluation of all position descriptions; modification of all IRM classes; creation of new university-based classes (broadbanding) to address areas that are not covered under the current classification system; and to formulate a set of performance based guidelines to award bonuses. This process will take approximately six months to complete.

Process Continuity

Since there are several new areas of technology under rapid development, it will be necessary to evaluate and as needed create new job descriptions and classifications to address these emerging areas (i.e. E-commerce, Security, ERP). This process will be directly tied to the budgeting cycle, and will include evaluation of both technical as well as managerial positions and classifications.

Budget

Initial Costs

To properly compensate, and to minimize the equity gap that currently exists in technology positions between FAU and its peer and sister institutions, IRM requires \$350,000 new funds to apply as salaries-benefits, training, and bonuses. These new funds will close the salary gap for about 1/3 of IRM employees. At the same time; it provides IRM with the ability to better retain technical staff with competitive one-time bonuses (non-recurring), and to provide selected personnel with a comprehensive re-tooling (training) program.

Base Cost:	\$250,000
Professional Development and Bonuses:	\$100,000

Annual Costs

Since this process is continuous, and the core of funds will become part of the employee's base salary, the second and third year process requires base as well as new funds to complete the three-year equity cycle. The funding for the subsequent year will be as follows:

Base Cost (recurring):	\$250,000
Professional Development and Bonuses:	\$100,000
New Cost (year two):	\$250,000
New Cost (year three):	\$250,000

Impact Statement

Within the past three years, IRM has made two attempts to address salary inequities, however, the funding level of IRM at these two phases has hindered a comprehensive revamp and full equity adjustment, and as a result several key IRM employees have accepted higher paying jobs with local companies and other institutions which has delayed completion of several important initiatives. These funds will enable IRM to invest in its single most important asset as well as pave the road for recruitment and retention of top-rated technical staff to move the university forward.

TECHNICAL-ENTERPRISE ISSUES

ISSUE: Security

Security of IT resources and services is entering a new era. The traditional platform and application security built into systems to protect the integrity of their data have worked well, but are not enough in today's environment. The connection of processing platforms and workstations to the Internet have introduced a whole new and far reaching set of security challenges that were not even imagined a decade ago. To ensure that data and resources that need to be shared can be shared and those that need to be protected can be protected will require a whole new set of policies, procedures and systems to implement. Security and privacy of data are expected, as is the easy access to Internet resources throughout the enterprise. The challenge is how to provide both without introducing burdens that discourage use.

Goal

The key to providing an overall enterprise security system which will provide needed access to those authorized, authentication where required, and prevent access to those that are not will be the implementation of what is known as an enterprise directory service.

The whole point of using a directory service is to create a single repository for all your network's authentication and configuration data and to control both users' and applications' access to that repository. To create a single repository that provides access to services, file servers, databases, and other applications, you need a communications link between the directory service and proprietary applications. ¹

¹ Extract from: LDAP and the Future of Directory Services, Part 2 © 2000 Duke Communications International, Inc., November, 1997

Directory services are just beginning to come of age. Those that have started and are struggling with their implementation can attest to the difficulty of implementing and managing this service. However, it is evident that such services are the only way that can provide access, authentication, and security of resources to be accommodated in the future. New systems will be built assuming that a directory service will handle the security, so the applications can concentrate on functionality. Implementation will not be easy and is far more than a network project. Its successful implementation will require the participation and support of all of the user community as well as the technical staff. In addition, new policies and procedures will require development to ensure its operational viability.

Objectives

The first building using Dynamic Host Configuration Protocol (DHCP) as a connectivity standard versus static Internet Protocol (IP) addresses is in the process of being brought on line (Humanities). The ultimate goal is to implement an authentication system that

requires every user of enterprise services to log into the network before services are made available.

IRM is also working with a local firm in West Palm Beach, Securit-e-doc to build an encrypted e-mail solution for FAU that will be deployed on an as needed basis. This implementation is currently taking place and will be operative during the Fall 2000 term.

Timeline

The authentication project is also moving forward, but cannot be completed in time for the fall Term, so may have to be delayed until December, 2000 or Summer, 2001.

Budget

The incremental costs for this implementation will be approximately \$50,000 for firewall hardware, software and implementation. Recurring costs will be about \$10,000 per year for maintenance and support.

Impact Statement

Implementation of the security measures described will help to ensure the University protects its community from unauthorized intrusion into their data resources. In addition, it will identify network transactions that are in violation of University and public policy compliance to protect the University from liability of abuses.

ISSUE: Convergence

FAU is in a communications environment where the demand for voice, data, and videoconferencing service is rising very rapidly; and it will rise much more aggressively as the university's growth targets begin to be realized. Given the wide geographic disbursement of FAU campuses, the cost of maintaining separate networks for voice and data will become an increasing source of cost frustration over time. In addition, the cost of providing separate management systems and separate support organizations will only further strain budget limitations.

Therefore, a process entitled convergence needs to be implemented. Simply stated, convergence is the combining of distinctly separate networks into one integrated network. Today IRM supports and funds three separate networks: voice, video and data. By implementing a converged network, IRM will combine voice, video and data into one network.

Some of the practical reasons why FAU needs to work toward a converged network:

- Reducing network costs by sending voice over Wide Area Network (WAN) circuits
- Getting the most efficient use out of our WAN circuits
- Allowing for better collaboration and conferencing, such as having PC applications sharing with real-time voice/video
- Reducing management costs
- Moving to a single network management strategy

The concept of convergence describes this trend toward tighter integration. Converged networking encompasses several aspects, all of which are related to the aggregation of networking activity.

The benefits of a converged network can be best described from its protocol, application, technology and organizational values and enhancements. The following information is from a white paper by 3Com.

Protocol convergence is the movement away from multiprotocol to single protocol (typically IP) networks. While legacy networks are designed to handle many protocols (e.g., IP, IPX, AppleTalk) and one type of data (so called the "best effort"), converged networks are designed to support one protocol and provide the services necessary for multiple types of data (such as voice, one-way video, interactive video, best effort).

Application convergence represents the appearance of applications that integrate formerly separate functions. For example, Web browsers allow the incorporation of plug-in applications that allow Web pages to carry multimedia content such as audio, video, high-resolution graphics, virtual reality graphics, and interactive voice.

Technology convergence signifies the move toward common networking technologies that satisfy both the Local Area Network (LAN) and WAN requirements. For example, ATM can be used to provide both LAN and WAN services.

Organizational convergence is the centralization of networking, telecommunications, and computing services under a single authority, for example, the chief information officer. This provides the necessary managerial framework for integrating voice, video, and data on a single network. (3Com, Converged Networks, August, 1998.)

These aspects of converged networking allow the integration of voice, video, and data services from the edge of the network to the core. Moving to a converged network model is a major shift for any organization; and therefore it is one that needs to be done in a careful, closely planned manner.

Goal

The goal of a converged network is to aggregate networked appliances and applications. In FAU's domain, this converts into integrating the currently independent voice, video and data networks into a single network capable of supporting all noted transport systems.

Objectives

In order to build a converged network the following must be considered:

- Work with vendors to determine the efficacy of a converged environment
- Visit agencies that have implemented a converged environment
- Conduct a cost analysis and determine ROI.
- Investigate the operational impact on existing systems (voice, video, data)
- Select equipment that will allow for growth over the next 5 years
- Select a transport carrier
- Begin implementation
- Begin to do business differently, this will require staff retraining

Timeline

It is estimated that it will take eighteen months to complete the convergence process. Plans have already been executed that will enable IRM to begin the rollout of this process in the first quarter of 2001. As a result, if plans go as designed and funding is available, FAU should have a converged network by summer 2002.

Budget

IRM has already begun to purchase the requisite materials and equipment needed to design and develop a converged network for all FAU campuses. Budget entities include:

Purchase Cisco 8540 routers and associated equipment to allow communication between campuses. \$200,000 (already purchased, will be delivered by 12/00)

Lease an OC-12 (622 mbps) communication ring to connect FAU's five major teaching campuses(Boca Raton, Tower, Davie, MacArthur, Davie) that will replace the current 10 mbps circuits. IRM is currently soliciting cost information from several vendor to ascertain what the costs involved for the new circuitry would be over a five year period.

Cost estimates: \$125,000 a year for four years (connection fees) and \$4,200 per month for the life of the contract (60 months) = \$752,000

Note: IRM pays \$10,000 a month for the FAU's existing 10 mbps circuits.

Impact Statement

By implementing a converged network environment IRM will be able to work more efficiently, effectively and economically to provide FAU a more proactive network. IRM will increase the capabilities of the university faculty, student, staff and administrative constituencies in the realms of teaching, research, and service. And, FAU will be able to present itself as one of the few universities in the United States that has a fully functional converged voice, video and data environment.

ISSUE: Network Infrastructure

IRM, with funds provided by the university, has drastically improved the infrastructure for FAU's enterprise network over the past few years. New intra and inter-campus connectivity has been introduced greatly improving the bandwidth available to virtually every workstation and server in the University. IRM has moved the university from a position where most user workstations were sharing a 10 megabit per second link within the floor of a building to where over 75% of the connections are either 100 megabit (or 100 megabit capable) or 10 megabit switched connected to the backbone. IRM has connected to the Internet2 so advanced researchers can use high speed networking as an integral part of their research projects and not interfere with the regular Internet traffic. IRM has increased the university's bandwidth to the Internet by a factor of 4, and provided a redundant link in the event the primary Internet link fails. In other words, FAU is really in pretty good shape, today.

Goal

As the need for bandwidth grows exponentially through the increased use of the network for instructional support, video sessions, and collaborative communications, it won't be long before FAU once again begins to struggle to meet requirements. To prevent this, IRM must plan ahead.

Lifecycles of the infrastructure equipment (switches and routers) is only slightly longer than the PC, which would dictate the need for replacement in the 5 – 7 year time frame. Some of the new switches have already been in place for nearly three years. The rapid changes of technology throughout the IT areas all impact network services, and, therefore, network infrastructure. IRM must plan ahead for equipment replacement and enhancement, as well as the heavy maintenance burden that this very expensive equipment requires to remain in service.

The need to understand the impact of new and revised academic programs that intend to use network services must be articulated by the Colleges in order for the enterprise network services to be prepared to meet these new demands. This might impose a new requirement for academic planning, which heretofore has not been a consideration. In addition, a mechanism to project the impact and propose the remedies to potential service deficiencies will be among the keys to program success.

Objectives

Plans are currently being developed to increase the bandwidth between campuses and to the Internet and Internet2. As technology has changed, and competition for high speed data services has become more intense, there is a possibility of providing very high speed services for only a fraction more than the cost of existing services. The specifics of these services to be implemented will be developed over the next few months, and hopefully be ready for implementation by Summer, 2001. The basic parameters that are being considered are OC-12 circuits to each major campus location, a primary service of at

least 9mbps to the commodity Internet with a T-1 back-up and another path through FIRN's DS-3 connection to FAU as a third path to the Internet, and OC-3 to Internet2. Although not yet available, it is anticipated that this will be ready for use by early 2001.

Introduction of wireless technologies for areas impractical to wire, open areas, and areas for special events will emerge over the next few years. IRM has committed to a pilot project with a local manufacturer/supplier who will supply the equipment to provide wireless connectivity to several buildings and open outdoor areas on the Boca Raton Campus. Plans are underway to deploy this equipment as a pilot to determine the usability and viability of expanding this service throughout the University. At this time, the technology is so new that it is not possible to determine the likely costs for deployment on a University-wide level.

Timeline

It is anticipated that both projects, the conversion from 10 mbps to OC-12 inter-campus connectivity and the wireless pilot project will begin during the first quarter of 2001 and be ready for use on the Boca Raton Campus sometime during the Spring 2001 term. If this approach to providing services proves successful, a full build-out on all campuses, to include both open areas and buildings will be undertaken during the summer 2001

Budget

The upgrading of the inter-campus connections will be approximately \$700,000 over five years. IRM is currently working with four Internet providers to obtain the best rates available. This cost, while large, is not substantially more than IRM is currently paying for the 10 mbps NMLI connections. The current rate is \$127,000 annually, or \$635,000 over an equivalent timeframe.

Costs for wireless technologies are not yet stabilized nor are services standardized. Current projections are that the transceiver price for a scaled area would be between \$2-4,000. It is estimated that it would cost between \$500,000 and \$750,000 to make all FAU campuses wireless capable

Impact Statement

Network infrastructure is indeed the backbone for most technology services provided to the University community, and will encompass even more of those functions in the future. Ubiquitous access to technology services including computing, instruction support, distance learning, inter and intra-campus collaboration, connectivity of research networks and resources are all functions that are dependent upon a reliable and available network. Network service is becoming as necessary as electricity for the business of the University, and, as with electricity, it is taken for granted until it's unavailable. The infrastructure assures availability and reliability.

TECHNICAL-FOCUSED ISSUES

ISSUE: Instructional Technology

"Instructional technology is the theory and practice of design, development, utilization, management, and evaluation of process and resources for learning." (Instructional Technology: The Definition and Domains of the Field, (1994) Barbara Seels and Rita Richey, Washington, D.C., Association for Educational Communications and Technology)

In the 1961 A.J. Brumbaugh Report entitled **Report of the Planning Commission for a New University at Boca Raton**, this university was specifically destined to be an uncommon university of programs, faculty and instructional delivery. Throughout the 1970's and 1980's learning resources importance and influence waned for a number of reasons; the advent of new technologies as well as the influences of new and expanding programs. By the early 1990's the digital age began to embrace the academic world and true high technologies were making significant inroads into higher education.

The use of instructional technologies provides access to a variety of media services and instructional technologies in support of instruction and research. Further, it provides creative, technical and consulting services to enhance the teaching-learning process. Although different in functionality the instructional technology departments that effectively work closely together include audiovisual media services, distance learning and instructional design and development, visual communications of graphics and photography, television engineering and television production. However, these areas, currently found in IRM's University Learning Resources, cannot exist in isolation from the other IRM divisions. To meet the ever-changing paradigm shift, advancing communications and interpersonal devices, including the enhanced technologies of H.320 and H.323 teleconferencing, will be more readily available for inclusion into academic course presentations as well as used by all staff for educational interactions and university business purposes.

Goal

IRM will lead the university in developing long-term plans and alternative models for utilizing and funding instructional development, communication systems, computing technologies and convergence for instruction.

IRM will develop policies and infrastructure to develop long-term plans and procedures to systematically convert traditional teaching spaces to multimedia as well as specify multimedia and instructional technology standards for new construction.

IRM will be properly funded to provide the systematic development and deployment of instructional technologies (hardware and software) into classrooms, electronic storage and delivery systems, production facilities, as well as analysis research.

Objectives

Significant advances will have to be made due to FAU's landmark commitments for improving the realm of instructional technology for all faculty and students. To this end Instructional Technology growth must be based in:

- Needs of the existing and potential student base
- The establishment and management of infrastructure, policies and procedures, budgets and
- The creation and management of a process that integrates this infrastructure into the academic and service life of the university
- IRM will be proactive and establish processes for promoting transformation of traditional courses into mediated presentations or technologically delivered
- Focus on addressing cognitive learning styles with instructional technology
- Ability of the university to adequately support with financial and personnel resources
- Acceptance by accrediting agencies and bodies

Timeline

First Year

Review and finalize needs. Make public relations announcement to campus faculty, staff. Select first set of general classrooms, establish equipment priorities including laptops, prepare position descriptions for two Audio/Visual specialists and two instructional designers, two graphic artists, place orders for specified equipment. Design workshop presentations. Prepare infrastructure and policies and administrative procedures. Select and employ Audio/Visual specialists, Instructional Design, graphic personnel. Final specifications for server, television/video traffic/ visual communications. Initial H.323 selection and acquisition.

Second Year

Select additional general classrooms for upgrades. Establish equipment priorities including laptops, prepare position descriptions for one Audio/Visual specialist and one instructional designer. Finalize high definition/digital professional studio/master control design. Employ Audio/Visual specialists and Instructional Design personnel. Acquire additional AV upgrades. Announce faculty development implementation processes and hold first round of competition. Acquire high definition equipment and integrate new installations.

Third Year

Select additional general classrooms for upgrades. Establish equipment priorities including laptops. Acquire final initial audiovisual upgrades for general classrooms and finalize high definition/digital hardware. Prepare, distribute and analyze research data.

Budget

AV Classroom hardware for Boca Raton Campus (70 rooms) video projector, computer, document camera	\$ 595,000
AV Technical support staff (3-AV @ 35K s/b)	\$ 111,000
AV/OIR Graphic artists (2 @ 40K s/b)	\$ 80,000
Distance learning expansion (Web-based, staff)	\$ 285,000
Instructional designer (3 s/b)	\$ 160,000
Technical staff in support of instructional design (3 s/b)	\$ 111,000
Professional digital television engineers (2 s/b)	\$ 90,000
Computing system upgrades (Bldg 22)	\$ 100,000
Office furniture, supplies, communications, computers and associated support hardware/software (AV Media offices, distance learning offices, ID offices)	\$ 40,000
Faculty incentives, mini-grants, professional travel	\$ 120,000
High Definition/digital professional studio/master control	\$ 250,000
H.320 and H.323 initial units and upgrades	\$ 30,000
TOTAL	\$1,972,000

Impact Statement

As we look to the future it becomes clear that the technology and support services that have been and continue to be traditional in higher education are in a state of substantial change. The instructional technology plan outlined here will significantly impact the paradigm in a very positive manner by providing upgraded and expanded services directly to faculty and students. This plan is committed to meeting faculty and staff needs with effective educational and informational programs, materials, and products that reflect a high standard of artistic and technical excellence.

ISSUE: Computer Labs and Computer Mandate

IRM continues to receive requests for increased and enhanced computer lab facilities even though space and funds are limited. At the same time, many colleges and departments are evaluating the feasibility of requiring students to purchase their own computers. Some departments believe students should own laptop computers that can be used on campus for class work and lab work.

While these issues almost appear contradictory, both are valid requirements that support the universities strategic plan and growth objectives. Computer labs don't seem to be shrinking because students own their own computers. Students who own laptop computers often bring them to campus, though no computer mandate presently exists and institutionally owned and supported computer labs are available. In order for IRM to meet these new challenges they must recognize and address new issues... particularly the balance between institutionally owned and student-owned equipment and of developing and delivering a broader range of services.

A computer mandate is already in existence at FAU. The College of Business, Executive MBA program requires all students to own laptop computers and bring them to class. The School of Architecture, under the auspices of the College of Architecture, Urban and Public Affairs, has requested permission to implement a policy of mandatory computer ownership for all students. The College of Engineering has also begun exploring a mandatory computer ownership policy for engineering students. In order for IRM to support these, and future programs, which include varied and diverse hardware and software platforms, IRM must take the lead in planning, designing and developing appropriate standards for interfacing with our network and policies for using personally owned equipment in and on institutionally owned facilities.

Goal

IRM will investigate the issues surrounding a computer ownership mandate for students, and prepare a recommendation, which includes specific standards, understandable policies and an organized transition plan. IRM will propose a comprehensive plan for establishing and supporting a university-wide computer mandate.

Objectives

IRM will organize a team, and charge the team with developing and managing FAU's student-use computer systems. The team will include representation from each of the peer campuses academic computing divisions. The objectives for this team are:

- Investigate issues surrounding a mandate requiring all FAU students to own their own computer.
 - Liability
 - Network Access/Security (authentication)

- Refresh cycles; Software & Hardware
 - Service/Support (See Critical Issue, Funding and Revenue Considerations)
 - Computer Sales/Lease (See Critical Issue, Funding and Revenue Considerations)
 - Develop appropriate standards, guidelines and support structures.
 - Others TBA
- Develop and submit a comprehensive proposal, requiring all FAU students to own their own computer.
 - After gaining programmatic approval, plan, prepare and launch support services and programs to disseminate the standards, policies and services.
 - Track usage in instructional and open labs and forecast trends for predicting future requirements.
 - Determine and recommend specific refresh cycles for all lab equipment. Consider budget issues (See Critical Issue, Funding and Revenue Considerations)

Justification

In order to stretch budgets to meet the enrollment-growth projections, FAU must adopt radical new approaches to student computing. Technology has had an overwhelming impact on the entire educational environment. No longer is the question, ‘*Will technology really add value to the education process?*’ The answer is yes, it does. Technology has made, and is continuing to make, radical changes in the educational philosophies, processes, and environments. Institutions that don’t embrace bold new ways of incorporating technology into the educational environment will operate at a significant disadvantage.

An overwhelming issue for all higher education institutions is the increasing and perpetual cost of maintaining computer equipment for student use. The cost of upgrades and on-going maintenance should to be addressed on an annual basis, yet few schools have annualized computer budgets. Student owned computers would provide a significant relief for those strained computer budgets. If students are required to purchase their own computers, IRM could concentrate their spending on uniform and ubiquitous access to the FAU network backbone and support for smaller labs, with high-end equipment that students are not likely to purchase on their own.

Budget

IRM currently supports more than 600 computers, in about 18 labs across all campuses. In order to maintain the desirable three-year refresh cycle, one-third of all equipment

must be replaced each year. This will require close to \$400,000 each year... and as computer use continues to grow this number would increase. A portion of these funds could be reallocated for services that support student-owned computers. Two critical services could be implemented as self-supporting auxiliary services that produce revenue. IRM could establish them as a value added reseller for computing equipment and they could open a repair service for supporting institutionally owned equipment as well as faculty and staff owned equipment.

Estimated Expenses:

Maintain existing labs

3-yr refresh cycle \$400,000

Support for Student Owned Computers

Modifications to Network Infrastructure	*See Network Infrastructure Issue
Authentication	*See Network Infrastructure Issue
Classroom upgrades (connection per seat)	\$10,000 each
Tools & Equipment	\$5,000
Support Facilities	\$8,000

Time Line

Assess issues surrounding mandatory student-owned computers	30 Days
Draft Standards, Policies and Support Services	90 Days
Draft Project Proposal	60 Days
Implement Support Services	1 Year
Upgrade classrooms for laptop connections	4-5 Years
Network Upgrades & Authentication	2 Years

Summary

Some of the ideas presented here have not been properly evaluated and measured to determine whether they are appropriate or worthwhile. They are presented solely to make the point that many things are possible... and that thorough study... and solid leadership, are required in order to determine the future of student computing. A systems team, representative of all campuses, working with the existing academic advisory group, should begin immediate work toward that end.

Impact Statement

Implementing a mandatory computer ownership requirement for all students would elevate FAU's overall ranking among it's peer institutions. It would enable FAU to more fully prepare its students for their future roles in business and society. Students will have expanded financial options for purchasing computers if a mandate is endorsed. While the program may not save significant dollars, it provides for better long term use of available funds that may enable the refresh cycles we desire. The computer sales and repair service

options have the potential to offset existing expenses... and should within a 3 year period become self-sufficient.

ISSUE: Groupware: Computer-Supported Cooperative Work

FAU, as a distributed university, needs to facilitate human interaction and collaboration among its constituents, especially those located at geographically separated facilities. Employees who need to work collaboratively and exchange information and ideas can experience a significant gain in productivity through the use of a groupware product. Groupware includes processes that automate simple or complex collaboration, regardless of the location of the participants. It supports simple exchanges like sharing information, scheduling meeting or resources, exchanging tasks, as well as complex collaboration such as multiple level routing and electronic approvals, on-line interaction with colleagues, and conducting on-line meetings. FAU can take advantage of existing electronic technologies to build a tightly coupled communication network that supports human collaboration and exchange among workgroups and teams, which require people to work together even though they are physically separated by time or distance.

Goal

IRM, will take a lead role in implementing groupware and defining associated standards and configurations, in order to assure that all areas will fully interact with each other.

IRM will implement a distributed and scalable University Wide Groupware infrastructure that provides a computer-based interface for collaborating and communicating among local and remote colleagues. Groupware is a set of software applications and utilities that support person-to-person exchanges in a transparent and seamless way. Groupware services include, Electronic Messaging, Automated Routing, Collaborative Development of Documents/Files, Group Calendars, Automatic Scheduling, Resource Scheduling, Electronic Meeting Systems, Desktop Video Conferencing.

IRM's existing network infrastructure and Microsoft site license agreement will support MS Exchange. Several university areas have already implemented Exchange on a limited basis or on an evaluation basis.

Objectives

IRM's objectives to meet this goal are to:

- Provide technology-based productivity tools
- Maximize the productivity levels of interactive and collaborative work, regardless of campus location
- Enhance the cohesive and uniform operations of tasks requiring interaction and collaboration among workers regardless of campus location.

Justification

As FAU is challenged to do more with less, one of the areas we need to look at is the broad range of automated productivity tools. The benefits of implementing Groupware resemble the standard clichés that describe productivity gains. Yet, benefits such as increased quality, better customer service, lower cost of sales and more flexible and responsive organizations describe groupware to a tee. Implementing groupware will reduce the number of meetings and travel time; provide faster turn-around time for routine processes; integrate geographically disparate team members; eliminate mundane and repetitive follow-up tasks; provide the ability to share development tools; and allow global sharing of information and coordination.

The cost of doing business at FAU is higher than single campus organizations because of the need for travel among the campuses and the lost productivity time associated with the travel. For example, the volume of phone calls currently required to set up a meeting can be reduced to a single computer transaction. On-line forms can be developed for routing items that require multi-level approvals pre-defined routing paths carry it smoothly from start to finish, collecting electronic signatures when approved. Groupware will provide significant savings in both time and money for FAU.

Proposed Rollout

IRM, as the University's designated leader for developing and providing strategic direction in the use of technology, will coordinate the standards, guidelines, policies and operations for using groupware on FAU campuses. IRM will plan, design and implement a single enterprise-wide groupware product. Since the major underpinnings for using MS Exchange, as our groupware solution, already exist on all campus locations, IRM will launch a pilot project to further explore and evaluate the various components as well as other functionally equivalent solutions. The project team will then develop a rollout plan for bringing other university divisions on-line.

An implementation team will manage the pilot project, with representation from all campuses. The team will define policies and configuration settings and implement groupware capability on every campus for IRM staff use. Some groupware features will require full participation. The pilot project will enable the IRM groups to become familiar with the products, decide which components and services are most beneficial, prepare required policies and procedures and develop user documentation and training.

Once these pilot tasks have been completed, IRM will, in conjunction with the administrative advisory group, map out a plan for systematically implementing the selected groupware products across all campuses.

Budget

The overall cost for the pilot is very reasonable since the network infrastructure is already in place. The client interface and e-mail is used as the primary transport for most groupware features. The client interface will need to be installed on all staff PC's and, at

least during the term of the pilot, their e-mail should be configured to interact with FAU's POP3 e-mail server. Given the resources, IRM is in a position to begin the pilot immediately. Examples of possible deployment estimates follow:

14 Domain & Backup Domain Servers @ \$3,000	\$42,000
7 Exchange Servers w. Software @ \$15,000	\$105,000
Client License and MS-Outlook	N/C
User Training (can be developed in-house)	\$25,000

Time Line

Set-up Pilot Program	60 Days
Duration of Pilot Program	6 Months
Develop systematic roll-out	30 days
University wide roll-out	2 years

Summary

Groupware applications offer the potential for saving FAU significant amounts of time and money by automating lengthy and repetitive processes, reducing supply and handling costs and reducing travel expense. Both the initial implementation cost and the cost of on-going support are relatively small. Groupware applications are mature products... most have been used individually for more than 15 years and the combined suite of productivity tools, called Groupware, is now almost 10 years old.

Groupware is uniquely suited to FAU's distributed environment because it enables the geographically separated peer campuses to work together as a single campus. Data, of all types, is exchanged electronically as if no physical separations exist. This fact alone is, perhaps, the most compelling reason for implementing a university-wide groupware system at FAU.

Impact Statement

Over the past 10 years organizations have been implementing groupware systems to improve the level of productive associated with routine tasks and collaborative exchanges. FAU can leverage existing resources to install a distributed groupware system that will increase the levels of productivity while reducing overhead costs. Groupware has the power to transform FAU's distributed environment into a single virtual campus.

ISSUE: Web Based Administrative Systems Environment

Goal

Over the next several years the user interface to virtually all administrative systems will undergo a transition to the “Web Look”. This is brought about not only by the ease of use made possible through Web Browser compatible screens, but also the ability to interface with many different platforms (sometimes simultaneously) with the same look and feel for the users.

Ease of use becomes more necessary, as systems that traditionally supported central office functions such as the Registrar and Controller are now expected to be available to all faculty and staff utilizing these systems for performing their mission. Thus, the user base for systems that was measured in the dozens a few years ago is now measured in the hundreds. Thus, intuitive screen layouts and point and click operation will need to replace systems training sessions conducted for users. Many will not have the time or opportunity to attend such training sessions, yet will be expected to utilize the systems as necessary for their duties. Design and implementation of these Web “screens” will take a great deal more interaction with users about how they access data than was the case with legacy systems, which had little flexibility for changing their look. In fact, Web based “screens” can even be customized for each user without compromising data integrity.

The need to provide a common user interface to whatever application is used, and where it is being run is necessary to provide efficiency of operation as well as integrity of data. The ability to interface a Web “screen” to multiple platforms simultaneously greatly reduces, if not eliminates, the necessity for redundant data entry for different systems. The use of these technologies is expected to grow tremendously over the next few years, as the transition from traditional legacy based systems incorporate their flexibility and utility.

Objectives

The SIS Project (OASIS) will be the first major administrative application to utilize a web-based interface with its users. It’s component, Web4Students, is being implemented as the system goes live. The first subsystem of OASIS, Admissions, is scheduled for Spring 2001. The Registration, Records, Financial Aid, Housing, and Billing and Receivables subsystems are scheduled for implementation during the Calendar Year 2001.

Other tools and facilities are being investigated to determine their applicability to provide web interfaces for existing legacy systems that will continue to operate for the foreseeable future. No schedule is yet determined for the selection of the tools and the development of these interface systems.

A pilot system using a web interface and automatic routing was developed and is in operation for the submission of travel requests. The system is operational, but the variety of business rules used by the Colleges and the campuses have added complexity to the system and rendered it less than optimal in some situations. A review of business rules will be a prerequisite before more such systems can be developed.

Timeline

This major enhancement to FAU's web-based administrative environment will occur sequentially over the next 12-24 months.

Budget

The major cost of full deployment of this technology in the future will be more linked to the human resources required than the hardware and software. FAU will have a hardware platform and software environments capable of handling most web-based requirements for several years with the new SUN E10K server being install in the Winter 2000.

Ongoing cost for the OASIS project are estimated at approximately \$650,000 annually. This is mainly for personnel and maintenance agreements. The only other major cost is the maintenance on the SUN E10K server that will be about \$150,000 annually.

Impact Statement

The impact on the University of this implementation will be to provide a graphical, easy to use, and standardized look and feel for access to information. It will serve faculty, staff, student, alumni, visitors, potential students, and others with information they require and are authorized to receive through the same tools they use to access the World Wide Web for other information. It will provide a state-of-the-art view of the University from a technology standpoint, and increase productivity and information access in the process.