

# Management Operations Review Team (MORT)

## Report of the IT Organizational Structure

### Tiger Team

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#### Committee Charge

Executive Vice President (EVP) Diaz and Provost Woodson created a Management Operations Review Team (MORT) to seek and implement improvements to our operational services. The MORT team consists of Dean Akridge (Agriculture), Dean Jamieson (Engineering), Dean Weiser (Liberal Arts), Vice President Almond (Business Services), Vice President Buckius (Research), Vice President McMains (Physical Facilities), Vice President McCartney (Information Technology), and Managing Director Ken Sandel (Office of EVP and Treasurer).

The MORT group selected information technology (IT) on the West Lafayette campus as the first focus area to examine potential synergies and costs savings. Six committees, called Tiger Teams, were formed to examine the following areas: data centers, campus IT organizational structure, email services, OnePurdue, desktop computing services, and the computer labs. Each team was tasked to provide recommendations to improve the management, efficiency, and accountability of campus-wide information technology operations.

#### Executive Summary

The MORT IT Organizational Structure Committee was asked to develop a plan for examining how well IT needs are being met by the current IT organizational structure. However, it is understood that two priorities exist in the current fiscal environment. The need remains to review IT across the campus to ensure that the organizational structure positions campus IT to meet the strategic priorities of the University. At the same time, circumstances dictate that we identify specific opportunities for immediate cost savings. This document represents the committee's efforts in both regards.

The first portion speaks to the challenges of the current IT organizational structure as generally observed by members of the committee. It then makes specific recommendations for changes in organizational structure that are viewed as preliminary measures that could facilitate a more direct means of coordination. These actions will facilitate identification of opportunities for immediately increasing IT effectiveness that could return short- and mid-term cost savings. It should be emphasized here that these recommendations are made in the absence of a full review. As such, they are made only for the purposes of providing a short-term mechanism to better facilitate the decision-making process. There is no expectation that these recommendations obviate the need for the full analysis.

The second portion lays out a detailed plan for a comprehensive review of the IT organization along with a description of the goals and objectives desired. This section reflects the need to conduct a thorough analysis to ensure that IT is organized for the long-term success of all enterprises within the University.

The committee suggests that the overall joint evaluation be conducted and managed by the current MORT IT Steering or subsequent assessment/implementation committee. A sense of urgency should be

established, and we should ensure both executive and peer sponsorship. A clear and concise vision should be developed — a picture of the future that is relatively easy to communicate. A vision is recommended by this committee, but should be further developed and agreed upon with the participation of the Organizational Assessment Review Committee and the IT community. Change should be plainly aimed at addressing the highest-priority issues (both opportunities and challenges) facing us and the organization. The language should instill a sense that the choice is not whether to change, but how.

Other possible opportunities for cost savings viewed as outside this committee's original charge to develop a review of IT organizational structure can be found in Appendix B. The list is offered by the committee, in conjunction with the Building IT Synergy team, as observations of where additional opportunities might lie. They have not been investigated by this committee.

Finally, the State Regional campuses are beyond the scope of this initiative.

## **Background**

The need for, and difficulty around, overall coordination and management of IT has long been recognized by IT leadership throughout the institution. The distributed manner in which individual IT units operate autonomously toward the specific goals of their respective units has led to both good and bad outcomes. On one hand, the distributed model has enabled IT efforts that are sharply focused on local priorities. This model enables top-level leadership (deans, academic department heads, and administrative unit heads), to which local IT groups typically report, to establish the levels of IT investment most appropriate for their needs. It also facilitates the ability for local-unit leadership to focus that investment towards unit-specific goals and priorities.

While the historically distributed model of IT organizational structure has served to effectively meet local need, overall coordination toward institutional strategic goals was made difficult. Similarly, it became difficult to effectively manage the overall IT enterprise toward measureable accountability and continual improvement.

It has also created autonomously operating IT units in which decisions are often made without awareness of other efforts occurring across campus. These modes of operation led to duplication of effort and greatly varying levels of coordination and collaboration across individual IT units. It also made difficult any consistency in the approach to — and type, quality, and total cost of — IT services being offered across the enterprise. Opportunities for leveraging economy of scale toward greater buying power or lower management costs were also frustrated. Skill sets, training, job titles, descriptions, expectations, and performance evaluations all varied greatly, creating challenges for human-resource management and making it all but impossible to identify the IT staff serving the University. It is equally difficult to identify the IT expenditures.

These recognized challenges motivated many IT leaders to begin collaboratively developing innovative methods toward more effective and efficient approaches to IT service provision. These efforts led to the development of the SMARTcomputing program.

The overall goal of SMARTcomputing is to provide a secure computing environment that is managed and administered in a collaborative manner, dividing responsibility for desktop support between the central

and distributed IT groups at Purdue University. Responsibilities are assigned based on efficiency and effectiveness. For example, the group recognized that management of baseline hardware and applications configurations is best leveraged at the central level, whereas support for specialized hardware and discipline specific applications is best handled by individual departmental IT areas.

To achieve this goal, the SMARTcomputing project team, under the leadership of a 12-member steering committee, worked with more than 25 IT departments to:

- Identify standardized desktop hardware that could meet the computing needs for 80 percent of campus and leverage an RFP for multiple years with a single vendor partner selected to maximize cost savings.
- Identify a baseline software-application configuration that would meet the needs of all departments.
- Identify a centralized enterprise-management tool to serve both central and departmental needs and submit a single RFP for the institution to achieve cost savings.
- Maximize the management of expenditures by streamlining costs associated with the processes for purchasing, provisioning, and managing the desktop environment.
- Proceed under the assumption that savings on the desktop and the centralized management tool would pay for the costs associated with the program.
- Determine a program-governance model, with an organizational structure that represents both the central and distributed IT units, to oversee the SMARTcomputing program in the future.

As a result of the program and strategic sourcing, more than \$1,000,000 has been retained within Purdue and is currently spent toward the above goals or realized in departmental savings.

The success of SMARTcomputing, and its subsequent expansion to other computing platforms, led to the formation of a dedicated committee focused to continue Building IT Synergy (BITS).

The mission of BITS will be to develop processes, templates, and frameworks similar to those used in SMARTcomputing that promote, foster, and facilitate new and strategically aligned services under the auspices of the distributed IT leadership. The framework consists of a governance process, IT alignment process, and procedures to submit initiatives for consideration. For IT initiatives that warrant action, ad-hoc committees will be spun off under the leadership and sponsorship of BITS.

The continued successes of the SMARTcomputing and BITS programs are substantial. They are also, however, very slow and cumbersome in effecting change and, on their own, will not be sufficient to develop the flexible and agile IT organization required today and in the future. The Team recognizes that greater levels of mission clarity, manageability, measureable accountability, and coordination will be needed to align the IT enterprise toward the mission and defined goals of the institution. At the same time, the organizational structure must empower local units to invest in, and focus, IT toward unit-specific priorities. The following organizational structure concept is offered to the Management Operations Review Team for consideration.

## **Organizational Structure Concept**

A recurring objective throughout our task force meetings has been the need for better synergy, coordination, and communication across the IT function on campus. Improvements in coordination, both in tasks and sourcing, are expected to lead to the synergies and resulting financial benefits the campus seeks. Improvements in communications between units that provide IT services on campus could both improve the transfer of best practices between units and identify and rectify issues where aspects of service-delivery models of a particular unit decrease security, increase cost, or reduce effectiveness. The most common way in which organizations coordinate their activities is through their organizational design and supervisory-reporting relationships. The desire for more, and better, coordination suggests that a change in structure is needed.

That said, an equally vigorous discussion has revolved around the relative merits of local autonomy and decentralization versus centralized command and control. The concern about the loss of responsiveness and flexibility that centralization might bring about was present in all the units, but was most pronounced in the academic units that support our faculty.

It is important to realize that in IT functions, as in all cross-cutting lateral functions in the University, autonomy and control need not be an either/or choice. There will be cases in which a service or solution is better addressed in a centralized fashion and instances in which a more decentralized approach is warranted. These different approaches must be reviewed and analyzed to ascertain which approach is best under what circumstances. It is also important to point out a distinction between centralization of management versus a centralization of service delivery. Clearly, to be responsive and to perform well, some tasks and services must be delivered in a co-located and distributed fashion. The follow-on decision on how to manage the distributed service will depend on additional factors, including, but not limited to, cost, standards, specialization, redundancy, and security. Our review process outlines a format to use for that analysis.

Sensitive to the timing challenges of our economic realities, and guided by our committee discussions, we do feel we can propose an organizational model for early review and consideration by the Sustaining New Synergies team.

To begin, based on the survey of IT staff on campus, roughly 70 percent of the total staff count resides outside the academic units — 50 percent in the ITaP organization, and an additional 20 percent in the other central administrative offices on campus (i.e., Housing & Food Services, Student Services, Business Services, Physical Facilities, etc.). The remaining 30 percent of campus IT staff reside in the academic units. Based on the same audit, at least 75 percent of any staff-count increase since 2003 has occurred outside the academic units.

While ITaP does provide many commodity core services to the academic units, the proposed structure takes as a functional premise that there is a greater dissimilarity in the applications and software needed to support faculty within the academic units than in administrative staff offices.

As a first step in organizational realignment, we propose that all the non-academic IT support organizations be consolidated into a single organizational enterprise reporting to the Office of the Vice President for Information Technology (OVPIT) in a “solid-line” fashion. This new consolidated structure will have dotted-line coordinating relationships to the administrative vice presidents as appropriate.

This restructuring will immediately lead to additional scale and scope economies across 70 percent of the IT organization.

In making this recommendation, we recognize that all administrative areas are not identical and that there are unique systems and applications supported in these areas that differentiate and enable them to excel. There will likely be many groups that are operationally efficient and effective. We also recognize that it will be important, in many cases, to retain this local IT presence and expertise. This structure will allow us to capitalize highly developed practices and extend that expertise and efficiency to other areas. The newly consolidated units would be expected to be organized in such a way that keeps them responsive to their units.

As a further step, we propose that each dean of each academic unit consolidate the IT organizations in each college into a single organization — with all IT staff solid-line reporting through a college IT director, and with a director reporting in a solid-line arrangement to the dean of the college or their designee. This consolidation will allow the distributed units to be more likely to achieve scale and scope economies across the remaining 30 percent of the IT organization.

Directors in each college will be expected to represent the needs of their faculty and students with respect to core academic services with the OVPIT's office, while implementing policy decisions made by the University with respect to IT provision.

To facilitate coordination, it may be desirable to designate a small subset of the academic-unit directors as senior liaisons clustered along "similar" academic teaching and research endeavors (i.e., social sciences, life sciences, etc.). In this model, each college director will have a dotted-line relationship to the senior liaison and, in turn, the senior liaison a dotted-line reporting relationship to the OVPIT. (This is similar to the way directors of financial affairs are currently managed.) It is important to recognize that these roles would be fulfilled by existing director-level staff in the colleges/schools.

Certain academic units support staff positions that are very similar to those supported outside the academic units. Clearly, there are synergies to be gained in adopting the best practices that occur either centrally or in the distributed units. Consequently, both the expanded OVPIT office and the college directors will be expected to implement new IT business models as appropriate. In the academic units, these adjustments would occur first for staff, then for faculty.

Further, there are clearly IT-related academic-business processes that are similar across all academic units, allowing for additional synergy to be captured. The academic IT leaders will be charged with seeking out and capturing that synergy across their units.

A further consolidated organization will allow for a critical analysis of the provided IT applications and solutions — discontinuing tasks that add limited value and seeking a more parsimonious and efficient environment for the solutions we do provide.

It is important to note that when the committee reviewed the information technology staff audit and the submitted organizational charts, we came to the belief that the audit will need further review. We believe an "information technology professional" is an individual who works with the technology hardware and software to facilitate the delivery of information. Not everyone involved in "information technology" on the campus had been captured by the audit (e.g., some individuals involved with Web site support), nor was every full-time employee (FTE) listed in the audit an individual who might

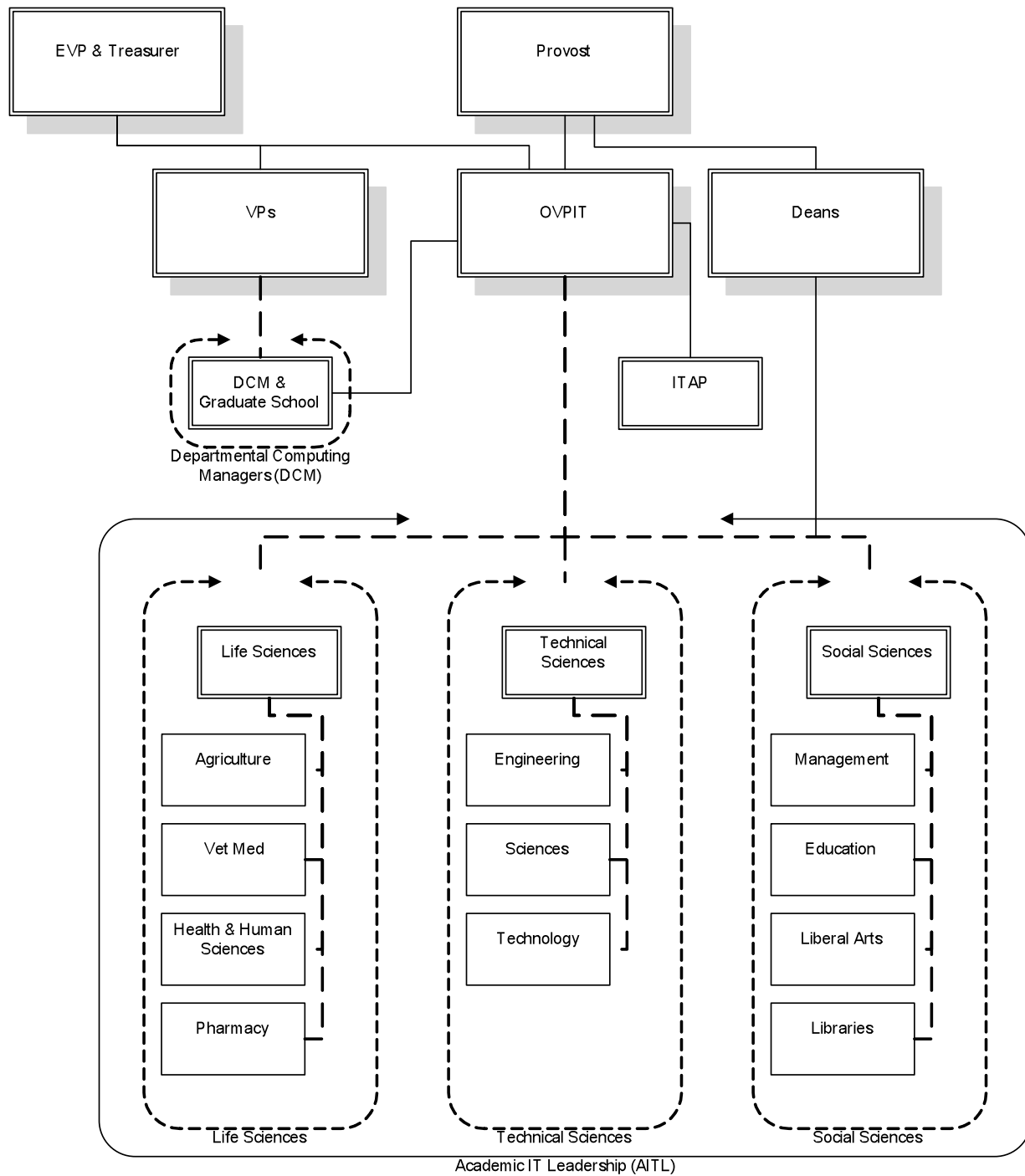
appropriately be considered an “information technology” professional (e.g., some of the business or data analysts who make or facilitate decisions based on the information delivered). Clearly, additional review, and a more granular job description analysis, will need to be conducted during the proposed reorganization.

We further emphasize the importance of supplementary analysis. As observed in some of the feedback received by the team, “this report simply presents recommendations, and there are few details at this time as to how the finished reorganization would actually look or function.”

Over the course of implementation, this new structure will leverage campus resources, allowing: expense reductions through economies of scale; the development of campus standards; the improvement of management approaches, reporting, and metrics; and unifying the training, pay structures, and position descriptions of IT staff.

## **Recommendations**

### **Proposed Organizational Structure**

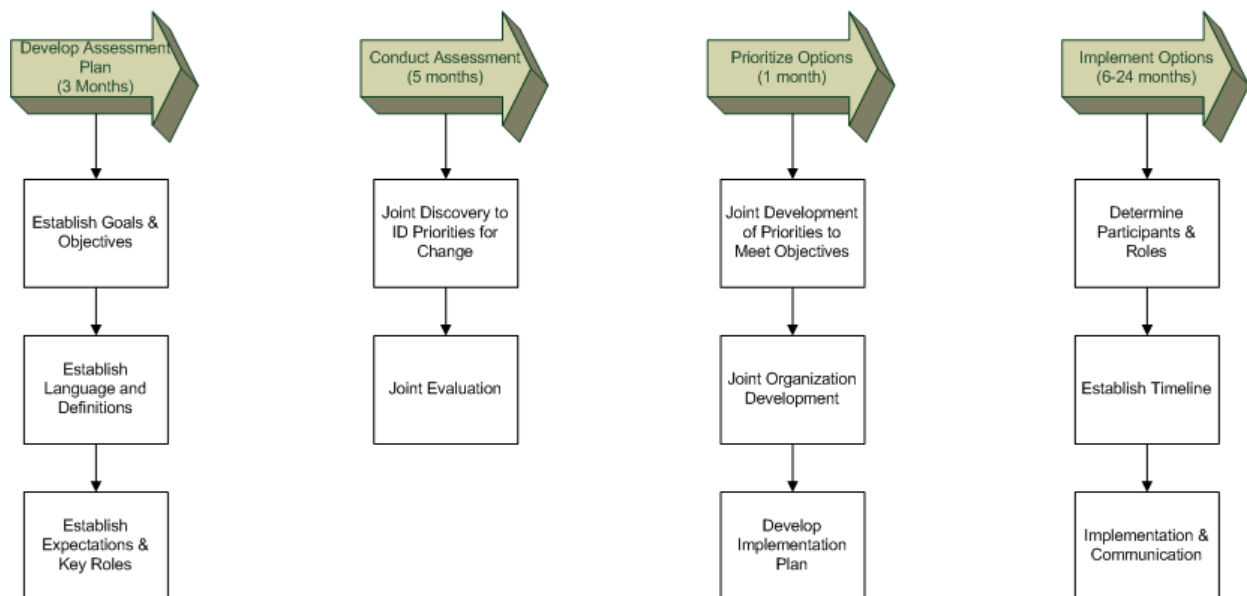




## Analysis Process — Organizing for Long-Term Effectiveness

The analysis process depicted below describes a comprehensive and inclusive review process toward long-term effectiveness of campus IT organizational structure. It is designed to vet out both organizational structure and approaches for IT service delivery. The following illustrates the primary steps and associated timeline of the process.

# Campus IT Organization – Review Process



## Develop Plan (3 months)

- A. Establish goals, objectives, outcomes, and timeline.

*Assumption: Any recommendations must map back to overarching goals of original purpose and charge of the IT organizational assessment team. At all times, the University's Sustaining New Synergies strategic plan should be a guiding factor.*

1. Establish Goals (why):
  - a) Extract these goals from charter document.
  - b) Re-map these goals to the goals of the assessment team.
  - c) Who needs to provide input of goal of assessment? Determine the appropriate stakeholders.
  - d) Determination of "what is in and what is out" of scope.
2. Establish Objectives (how):
  - a) Create a roadmap for the assessment team.
  - b) Decide on the approach and component of recommendation.
3. Establish Outcome (what):
  - a) What are the components of the final recommendation?
    - (1) Approach to assessment.
    - (2) Advisory or consulting group.
    - (3) Internal versus external assessment.
    - (4) Detailed WBS (plan) as a deliverable.
4. Establish deliverables, timeline, and measures of success.
  - a) Sift through the information coming into the Sustaining New Synergies Web site to look for ideas for cost-saving approaches.
  - b) Incorporate accepted recommendations developed by other Tiger Teams.
  - c) Assess current campus IT services.
    - (1) Look for duplication, overlap, and inefficiency.
    - (2) Look for missing components that can be solved in a better way.
  - d) Identify the IT people who might be more efficiently placed. They must move up to positions of greater responsibility. This will necessarily result in a loss of control at the department level.
  - e) Evaluation of various reporting structures. Examples:
    - (1) Centralized through ITaP.
    - (2) Business-office model of answering both centrally and locally.
    - (3) Competing services approach; allowing ITaP to charge at a competitive rate.
  - f) Encourage the use of campus-wide standards similar to the SMARTcomputing program. This could include services such as accountant maintenance, software installation, software upgrades, patches, image installation, and backups.

- g) Better communication about software/functionality deployment by ITaP and other groups.
- B. Establish expectations and key roles during the process.
  - 1. Establish project team, which reports to the MORT IT Steering Committee.
  - 2. Formalize a point of contact for all IT organizations.
  - 3. Communicate guiding principles and priorities.
- C. Establish language and definitions around the process.
 

*Assumptions: Semantics and jargon can sometimes divert intended meanings. A glossary of terms should be constructed to ensure all participants in, and final recipients of, Tiger Team reports have a clear understanding of the intended final product.*

  - 1. Identify and clarify language relevant to IT effort and structure, for example:
    - a) Efficiency
    - b) Metrics for success
    - c) Levels of support
    - d) Distributed support/processing
    - e) Centralized support/processing
    - f) Desktop
    - g) Server
    - h) Mainframe
  - 2. Publish and maintain single glossary to a Web site.

## II. Conduct Assessment (5 months)

- A. Joint discovery to identify priorities for change.
  - 1. Capture information on the current IT organizational structure.
  - 2. Consider alternative structures.
  - 3. Investigate other organizations and other IT “business models.”
  - 4. Survey some IT people; consider existing challenges and opportunities.
    - a) Career development
    - b) Change to reporting structure
    - c) Training
- B. Joint evaluation
  - 1. Identify stakeholders.
    - a) Faculty / Staff
    - b) Students
    - c) DCM
    - d) AITL
    - e) ITaP
    - f) Organizational Assessment Review Committee (MORT)
  - 2. Involve focus groups. Focus groups to assess needs will be conducted by members of the analysis-implementation team. Focus group members will be

assigned by the assessment team. Focus groups will deliver report of needs assessment within four weeks of their charter. One of the stakeholders should co-chair along with one member from the analysis-implementation team. For ITaP, ask the Chief Information Officer (CIO) to organize, and be responsible for, deliverables. The Organizational Assessment Review Committee will provide imperatives, directives, and any dollar amount of cost savings required.

- a) Empower all stakeholders to act on the vision — inclusive, cross-representative groups to design solutions. Stay out of their way (i.e., provide direction and goals, but don't try to influence solutions).
  - b) How would we organize to accomplish it? Form cross-representative groups with pertinent expertise to propose ideal organizational structures that serve to enable highly effective delivery of that particular service (i.e., a focus group to consider how email is best managed is formed from those already delivering this service).
  - c) What are the opportunities and challenges? Opportunities: Diverse views from the people across campus doing the work on a daily basis. People feel empowered and create effective solutions. Challenges: Time-consuming, risk of recommendations coming from a limited perspective.
  - d) How do we determine the most important values we want to maintain or add? Focus groups will determine, and report, values that will be incorporated by the Assessment Implementation Team (from a holistic perspective).
  - e) What are the short-term wins? Show that IT services are operating normally (continuity) or in an improved way. Ensure that milestones are communicated and celebrated. Communicate all savings (e.g., merging cost centers has saved estimate \$\$\$\$). Demonstrate greater opportunity for training and career development. Communicate the vision of strategic alignment and then show measurable milestones toward these goals.
3. Vet recommendations at all key milestones of the organizational development plan. Ensure inclusion and vetting in these four key areas:
    - a) Vision development
    - b) Plan development
    - c) Timeline goals & roles
    - d) Recommendations
  4. Develop implementation timeline.

### **III. Prioritize Options (1 month)**

- A. Joint development of priorities to meet objectives.

B. Joint organization development .

1. A proposed assessment approach for the technical infrastructure and applications.

- a) Catalog the “what,” the various solutions and services that each unit depends on for its business processes.
  - (1) Service and solution value and importance should be determined by the unit clients and not solely by the unit IT organization.
  - (2) Examples of this concept are: course -management solutions, email, groupware, printer management, wireless, etc.
  - (3)
    - (a) Ascertain the 80 percent that are most central to their functioning.
      - (i) These are more likely to hold services that would potentially be “commodities.”
    - (b) Ascertain the 80 percent of remainder.
      - (i) These would be more likely to be specialized services.
    - (c) Ascertain the last 4percent.
      - (i) These would almost always be local and specialized needs, and often leading-edge.
- b) Catalog the “how,” the software or architecture that solutions or services are provided. An example for course management would be Blackboard from central IT and Katalyst in Krannert.
- c) Catalog the “who,” what organizations provide the solutions the units draw upon — what units provide the solutions that are utilized.
- d) Ascertain the “how well,” determining the combination of quality and efficiency for each service or solution provided for a unit. Some effectiveness measures for the solution in question must be developed. This could include client satisfaction, system availability, or desired and utilized functionality.
- e) Review the resulting matrix.
  - (1) Review the common “whats” to ascertain where synergy might be gained across the campus.
    - (a) What services are widely utilized and have a commodity component?
    - (b) What services are more unique and have a specialty component?
  - (2) Seek those “hows” that are inferior, or exceptionally unique, and add limited discernable value to the overall entity.

- (3) Identify the “whos” that have a notable level of skill and effectiveness that suggest they could be a center of excellence for the solution.
- (4) Identify the “whos” that are ill-trained or poorly resourced to provide an acceptable level of service.
- (5) Special attention should be paid to areas with existing scale economies or services that lend themselves to obtaining scale economies.
- (6) Special attention should be made to focus the organization on a parsimonious and limited set of solutions for common problems.
- (7) Special attention should be paid to identify commodity solutions and services that lend themselves to effective and efficient provision by independent third parties.

2. Critical human-resource management issues to consider in the development of a change program.

- a) Reconcile disparate IT position descriptions across the enterprise.
  - (1) Develop job families/unified position descriptions.
  - (2) Take the approach either campus-wide or perhaps in newly merged units.
- b) Job family/skill base.
  - (1) Identify minimum qualifications for position levels.
  - (2) Objective skill measurement to insure competence.
- c) Job family/compensation issues.
  - (1) Pull up or push down compensation out of band for the job family.
- d) Restructuring/performance evaluations.
  - (1) Have past evaluations follow employee.
  - (2) Create new/common/communicated evaluation criteria and feedback system.
- e) Physical locations.
  - (1) Co-location as possible and appropriate.
  - (2) Distributed staff liaisons for some centralized services.
- f) Training for managing in the new structure.
  - (1) Increasing supervisory skills.
  - (2) Skills development to manage outsourcing arrangements.
- g) Service-provider coordination and communication.
  - (1) Mechanisms are built to facilitate coordination between commodity- and specialized-service provisions to reap new synergies.

- (2) Mechanisms are built to ensure coordination across staff that provide a service, fostering skill development, training, and best practices.
    - (3) Mechanisms are built to ensure that the autonomy of units is not allowed to impede coordination, cooperation, and the development of campus synergy.
    - (4) Safeguards would be available to ensure that compelling strategic rationale would result in reasonable variations in approach.
  - h) Client feedback process.
    - (1) Clarity on service-level expectations and commitments.
    - (2) Clarity and communication on appropriate feedback mechanisms.
    - (3) Dotted-line and solid-line reporting relationships.
  - i) New capability and service creation.
    - (1) Formal processes for new service/capability scoping and implementation.
  - j) Budgetary and financial issues.
    - (1) Reallocating budgets to match the new organizational structure.
  - k) Potential staff outplacement issues.
    - (1) Out of IT or off of the campus.
- 3. Change management plan
  - a) Communications
    - 1. Obtain current communication management plan(s), if it /they exist, and examine those communications.
    - 2. Link unit communications plans, and coordinate communication across the enterprise; provide a single canonical source for information on the change plan for stakeholders internal and external to the committee.

C. Develop implementation options.

#### **IV. Implement Options (6-24 months)**

- A. Determine participants and roles.
- B. Timeline for making changes: Need multiple phases.
- C. Implementation and communication.

## Appendix A: Team Membership

The IT Organizational Structure tiger team consisted of the following members:

David Carmichael	Director of ECN and Information Technology — Engineering
Logan Jordan	Associate Dean of Administration — School of Management
Julie Kercher-Updike	Associate Vice President — IT Customer Relations — ITaP
Timothy Korb	Assistant Department Head — Computer Science
Denise Laussade	Director of Treasury Operations
Bill McInerney	Professor of Educational Leadership & Cultural Foundations — Department of Educational Studies
Paul Schwab	Director of Natural Resources & Environmental Science, Pre-Environmental Studies, Professor of Agronomy
Terry Schroeder	Assistant Director for Business Services Computing
Pat Smoker	Department Head — Agriculture IT (Chair)
John Turek	Director of the Medical Discovery Resource Unit, Assistant Dean, Professor of Basic Medical Sciences
Sam Wagstaff	Professor of Computer Science (Vice Chair)



## Appendix B: Further Cost-Saving Opportunities

### Cost-saving suggestions for sustainability

1. Standardize on printers/multi-functional printer/copy network devices. Potential to offer these devices through the SMARTcomputing program.
2. Use UniPrint and track number of pages printed at each printer. Knowing that pages printed are tracked will establish a baseline and has the potential to discourage unnecessary printing by the mere fact that people know we are tracking.
3. Virtualize servers. This would not only save hardware costs; it will also provide energy savings.
4. Establish an ad-hoc committee to look at cost models and service levels. Today, ITaP provides centralized services for backup, file storage, co-location, etc., but departments don't require and/or can't afford the costs associated with enterprise-level service. Could consolidating such services at a reduced level of service be offered at a lower cost than multiple departments can provide for themselves?
5. Establish recruiting, hiring, career path for IT personnel.
6. Look at outsourcing web-hosting services or consider consolidating internally.
7. We are currently reviewing virtual desktop infrastructure (VDI). If this proves to be as cost-effective and energy-efficient as we anticipate, then roll out VDI everywhere it is feasible.
8. Offer a low-end machine through SMARTcomputing.
9. Augment staffing with student labor.
10. Eliminate desktop printers and associated consumables.
11. Compose and enforce a reasonable minimum knowledge, skills, and ability for IT "professionals" on campus. Begin in earnest a program for some sort of IT accreditation to ensure IT workers can perform, and revamp hiring practices to enforce.
12. Redesign IT areas around services instead of departments.
13. Leverage existing inventory systems. This increases visibility of our "footprint" of hosts and provides statistics on age, power/efficiency, and space usage. This would also identify hardware and software purchased but not implemented/used.
14. More integration of help desks across campus.
15. Reassess any consulting and determine if the functions can be brought in house for less.
16. Eliminate/consolidate any duplicate/multiple services. For example:
  - a. domain name servers
  - b. ticketing systems
  - c. SharePoint servers
  - d. signage systems
  - e. email systems
  - f. Banner systems
  - g. ePO servers
  - h. Active Directory systems
  - i. networks
  - j. firewall systems
  - k. DHCP servers
  - l. Storage (backup services, file services, data storage services)
  - m. Data centers
  - n. Labs
  - o. Report writing

17. Outsource Boiler TV to Comcast and do more external advertising with some funds coming into Purdue.
18. Sell advertisements on Purdue University pages, Boiler TV (increase what is already done).
19. Eliminate hard copy for Inside Purdue, etc.
20. Smart licensing — coordination and inventory of licensing or a central point through which all software must be purchased, maintained.
21. Reduction in number of phones.
22. Make use of video-conferencing technology to reduce travel expenses.
23. More effective energy management (green) for computing, establish a policy for all machines to be turned off at night or used in Condor pool, use central managed services to wake up machines for patching for those turned off.
24. Leverage IT staffing and vacancies across the organization, provide career development, and career paths.