Recommendation for the Creation of an IT Research Support Team at Missouri S&T

Objective:

To develop an effective mechanism for supporting and facilitating Missouri S&T’s long term strategic goal to become one of the top five technological research universities in the United States.

IT proposes to create a team within IT whose dedicated focus is to support the research centers and research faculty at Missouri S&T. This team will be a collaborative partnership between the research faculty community and IT.

Introduction:

Missouri S&T has numerous recognized research centers, as well as a large number of individual researchers. All researchers on this campus benefit from a baseline of standardized IT services in conducting their research. Other support and assistance efforts are generally provided ad hoc and in a largely decentralized manner. In many cases, researchers obtain equipment independently, resulting in equipment that does not match IT’s standards for computing machines and are therefore more difficult for the IT department to support effectively.

Some research centers have their own dedicated technical support personnel. Graduate students are also recruited to provide technical support on research projects. While working within the research centers, these individuals develop a large body of knowledge about the research projects. Unfortunately, this knowledge is often not captured or documented for later reference. Graduate students eventually leave and even full time staff members leave for better opportunities elsewhere or simply retire at some point. This turnover of graduate students and staff members without effective transition can be disruptive to ongoing research projects. Research grants can span multiple years, thus assuring that there will be some turnover in students or dedicated support staff. IT is very interested in forming partnerships with researchers to help manage these transitions.

Researchers are often engaged in interdisciplinary collaborative projects on this campus, as well as with colleagues at other institutions (academic, corporate, and governmental). Their research technology and tools are designed to support their collaborative needs. This includes numerically intensive computing resources, end-user workstations networked together for increased performance, and other electro-mechanical devices interfaced with data collection and analysis tools. IT has one FTE to provide limited support of these technologies, but the current availability of FTE is insufficient to meet the increasing needs of researchers on this campus.
At this point in time, IT has several areas of concern with respect to the state of research technology support on this campus:

- Faculty may be directed toward different IT groups when requesting service, with little coordination between groups (e.g. researchers may need to talk to the server team, which may point them to the desktop infrastructure team, who may point them back to the server team, and so forth). This leads to a great deal of frustration on the part of some researchers who feel they cannot obtain a clear path forward from IT.

- Researchers may have a solution that meets their basic needs, but do not typically provide details to IT on how well the solution works or what problems had to be overcome in order for the solution to work. IT would value the knowledge from the faculty so that IT can develop its own knowledge base on research support. IT has much to gain from increased feedback from the faculty research community.

- There is an unclear mapping between support effort and what is required for any given research effort. IT may not fully understand how well the effort to support a research project actually fits the researcher’s technology support requirements. Is IT spending too much time on supporting one researcher over another? Too little?

- IT does not have any clearly defined service levels or expectations with respect to researchers. Other areas of IT (such as the Help Desk and EdTech) have worked hard to develop some descriptions of the various service levels so that IT customers know what to expect when they contact IT. Because research often deals with unknown factors, it can be challenging to determine reasonable expectations for all affiliated parties.

- There is currently no consistent funding model for IT research support activities. Generically, IT-related services are increasingly an important component in virtually all scientific and engineering research. IT would like to work with appropriate campus authorities to develop a funding model for the increased IT-related needs of research faculty. Such a model should include preliminary consultation during the grant proposal process.

A dedicated support team for research would benefit the research faculty – leveraging the resources and knowledge of professional IT staff and services to better serve researchers. This research support team will attempt to address the concerns outlined above by:

- Providing a common point on campus where research faculty can go for technology support on research projects.
- Educating IT support staff on tools and technology that researchers need in order to do their work, as well as learning about additional tools and technology that IT is familiar with.
- Development of an ongoing dialog and a governance framework between IT research support group and the researchers.
- Establishing service level expectations for both the research faculty and IT support staff.
- Developing a long-term, sustainable funding model that accounts for some growth over time to support the increasingly important research mission of the University.

These concerns are also factors that impact the teaching faculty community (many members of which are also part of the research faculty community). To address the concerns of IT and
teaching faculty, Missouri S&T and IT created a team dedicated to supporting the educational technology needs of instructors on this campus (Educational Technology or EdTech). The EdTech team supports the classroom and CLC computers, provides guidance and support for instructors desiring to implement technology, and directly supports the use of Blackboard and personal response devices ("clickers") in the classroom.

For the past two years, EdTech has:

- Served as an interface between the IT and teaching faculty communities by pointing faculty in the right direction for support when they contact IT. EdTech also serves as an advocate for the teaching faculty to present their needs and desires to the IT community.
- Leveraged teaching faculty knowledge about technology by providing forums where they can educate their fellow instructors on how technology can be used to successfully improve student learning outcomes.
- Helped teaching faculty identify the most effective technology tools to support faculty members’ teaching styles.
- Provided teaching faculty with a certain level of expectation on how much support they will receive by contacting EdTech for assistance.
- Increased in size as EdTech’s services, support, and activities have increased. As teaching faculty members have come to recognize the value that EdTech adds to the campus, funding has been increased to allow for additional staff and students to be hired to support EdTech’s activities.

**Plan for Implementation**

*Mission:*
IT will create a dedicated, service-oriented organization within IT to support the research activities on campus. IT staff will work with investigators in any discipline to help determine what specialized or customized computational resources are required to support the needs of the University. This will be a partnership between faculty engaged in research and IT.

Success in this endeavor will be based on the following ideals:

- Proactive networking within Missouri S&T’s research community achieves a critical mass of clients, creating synergy and momentum from which to develop new computational resources and grant opportunities.
- A technically diverse team of staff members combines with a creative environment to foster innovative solutions to researchers’ needs.
- A collaborative funding model enables researchers to leverage Missouri S&T’s staff time and equipment as appropriate.

*Services:*
IT’s research technology support group will solicit input from the research faculty community on which services IT can provide that will best support the research mission of the campus.

Some representative services may include the following, but IT reserves the right to limit these services based upon internal budget and personnel constraints:
• Facilitate access to current research tools and statistical methodologies and to promote these methods to the research, instructional, and administrative communities at S&T;

• Encourage a collaborative research environment for researchers through the development and use of innovative computing technologies;

• Provide training and consultation in the appropriate use of statistical methodologies and computer software;

• Help researchers identify existing technologies on campus for re-use, instead of obtaining duplicate technologies that may only be used infrequently;

• Directed emphasis of IT staff time to support researchers' technology needs in these areas:
  o Research equipment and technology
  o High powered computing resources
  o Linux/Unix workstation support
  o Windows workstation support for research activities

A comprehensive list of services will be developed over time as the research technology support group becomes more enshrined into the campus research community culture.

Initial Resources Required:
The initial group should consist of approximately 4 FTE. These FTE will be allocated to support the following areas:

• Research equipment and technology – this includes the highly specialized equipment purchased by research centers to engage in their research activities.

• High powered computing resources – this primarily includes resources such as the NIC cluster, but may expand over time to include other high-powered computing resources.

• Linux/Unix computing resources

• Direct desktop support for research activities – many researchers are provided with or purchase on their own desktop machines to aid their research. IT can provide consultations and (often) assistance with initial setup to ensure the desktop machine interfaces well with our campus network infrastructure in addition to interfacing with specialized research equipment.

This proposed research support group would report to the Director of Technology Support Services within IT.

This team will require some initial space so that team members can be co-located with each other. They will benefit from having smaller "workshop" spaces across campus to support research.

Funding:
A fully detailed funding model proposal for the research and technical support group will need to be developed in the near future (Spring 2010). Campus administrator and researcher input will be necessary to achieve a funding model that is sustainable for the foreseeable future.
**Governance Framework:**
IT believes that a successful partnership between IT and researchers is dependent on a governance framework to direct IT support and provide initial guidance as to the needs of the research faculty community. The actual structure of the governance framework will be determined at a future date with input from both IT and the research faculty community.

**Principles for Success:**

The following principles will be used to help guide IT and researchers towards a truly collaborative partnership to enhance the research mission of this campus. These principles are derived from the lessons learned at Georgetown University (Pirani & Spicer, 2006), when they successfully created their own research technical support group.

*Faculty must determine research IT support direction.* Researchers are under special pressures to produce results in a time frame specified in their funding grants. IT’s role is to provide researchers with the technical knowledge and support they need to be successful within the constraints of their research grants.

*Look internally to the researchers to understand and support their IT needs successfully.* Neither researchers nor IT has the answers to every question. However, researchers ultimately know the questions they want to have answered. IT can help researchers identify the right tools to find the answers to those questions.

*Communicate to build trust-based relationships.* Significant time needs to be spent with IT meeting the individual researchers, not as members of a department, but as people trying to solve a problem. You need good communication between investigators and service providers to understand the researchers’ capabilities and to come up with new solutions. This communication over time develops trust.

*The quality of people makes the difference in successful research support.* Good people are critical. They have to be knowledgeable, flexible, and results-oriented.

*Give careful thought to organizational design and job functions in order to hire and retain good research IT support people.* Research support requires technical competence, creativity, and a willingness to take risks.

*Use the familiar to introduce the new.* All newly discovered or invented knowledge is built upon foundations of previous knowledge. Both researchers and IT staff need to be able to introduce new ideas and concepts by creating a path from the “known” to the “unknown”.

*There are benefits in considering open source solutions.* Often proprietary applications fill only a portion of a group’s needs, and those applications can’t be easily extended or modified. Open source tools can have surprisingly deep and rich support resources, as well as options for further developing the open source tools in a way that best serves a researcher’s needs.

**Conclusions:**

Information Technology is poised to offer a tremendous resource to support the research faculty on this campus. IT has already created an educational technology resource (EdTech) that can serve as a model for implementing a similar resource for research technology support. Research technology support offers many benefits through knowledgeable support staff, shared
resourcing between research centers, technology training and computer support. Additionally, since many faculty members are engaged in both teaching and research, there will undoubtedly be a lot of cross-communication between EdTech and the research technology support group. IT benefits by being able to provide a more stable, and more sustainable, resource for supporting the research mission of Missouri S&T.
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