

Roadmap

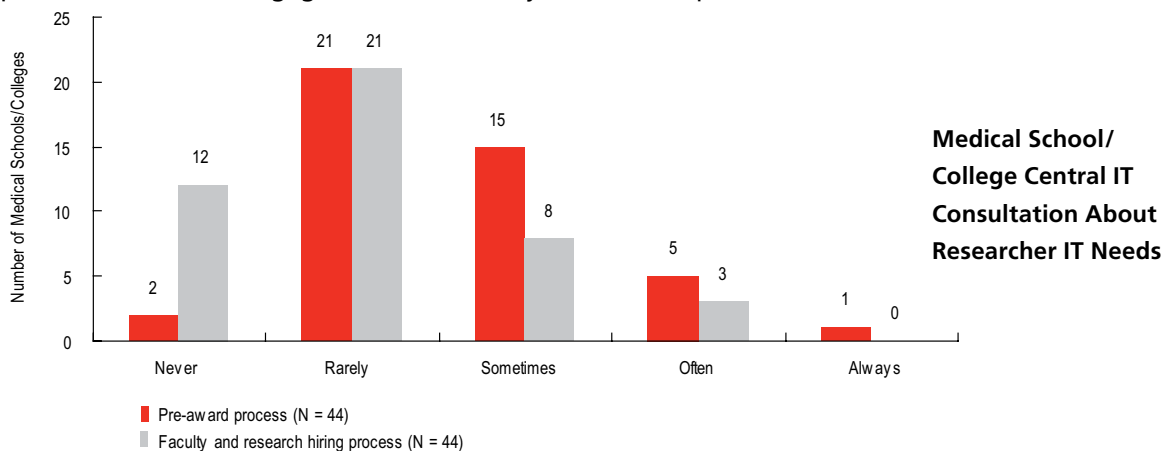
TOOLS FOR NAVIGATING COMPLEX DECISIONS

IT Engagement in Research: A View of Medical School Practice

By Bob Albrecht and Judith A. Pirani, Fellows, EDUCAUSE Center for Applied Research

KEY FINDINGS

- Nearly 80% (79.6%, or 39 out of 49 of responding medical schools) experienced an increase in the amount of computation-intensive research over the past three years. No respondents report decreased use of primary IT infrastructure elements relating to network, computation, data management and storage, or services.
- Just over half (54.2%, or 26 out of 48) either disagree or strongly disagree that they have a sustainable budget model for IT infrastructure, and 49.0% (24 out of 49) disagree or strongly disagree that their budget for IT services is sustainable.
- Infrastructure elements, particularly high-performance computing and high-performance networking, are most often funded primarily from the larger institution's central IT budget. Larger institutional or medical school central IT budgets are the primary funding mechanism for tools and applications at 56.8% (21 out of 37) of medical schools.
- Only 9.1% (4 out of 44) of respondents indicate that they have regular meetings to discuss IT needs for research with top decision makers, and 46.0% (23 out of 50) do not engage in long-term planning to determine IT needs for research. When respondents were asked to select from a list of mechanisms through which medical school central IT organizations are able to engage researchers, the most common response is "no formal engagement," chosen by 36.4% of respondents (16 out of 44).



Q: To what extent is medical school/college central IT consulted in the pre-award process of contracts and grants to identify IT needs and resources?

Q: To what extent is medical school/college central IT consulted in the faculty and researcher hiring process to identify their IT needs and resources?

Today's medical research environment is exciting, dynamic, and increasingly complex. In the medical sciences alone, developments in biotechnology, genomics, proteomics, informatics, computational genomics, and other IT-intensive disciplines offer the potential for revolutionary breakthroughs. The nature of research itself is changing, too. Funding agencies favor collaboration among researchers from different disciplines; and these agencies impose progressively stricter and more complex data-privacy and

This Roadmap synthesizes 50 responses to a January 2007 survey sent to the 125 medical schools and colleges in the United States and interviews with IT leaders at 10 medical schools and colleges, and it summarizes the 2008 AAMC and ECAR study, IT Engagement in Research: A View of Medical School Practice, by Mark R. Nelson. To order the full study or to learn about subscribing to ECAR, visit the ECAR website at <http://www.educause.edu/ecar/> or contact us at ecar@educause.edu.

METHODOLOGY AND TERMINOLOGY

The AAMC and ECAR study *IT Engagement in Research: A View of Medical School Practice* used a web-based survey to gather quantitative data. ECAR Fellows, with input from the AAMC, revised a survey used in ECAR's original study, *IT Engagement in Research*, published in 2006. The survey was sent to 125 medical schools and colleges in the United States. Respondents to the medical school survey were predominantly chief information officers (CIOs) or other top administrators from 50 medical colleges, yielding a response rate of 40.0%. To enhance the understanding of survey results, ECAR conducted qualitative interviews with IT leaders at 10 medical schools and colleges in the United States, chosen from a prioritized list of interview candidates supplied by the AAMC. Note that for stylistic variety and simplicity, in the text we use the terms *medical colleges* and *medical schools* synonymously.

data-management procedures, which particularly impact clinical research. Consequently, centralized IT resources and services now show growing appeal for medical school researchers.

All of this implies a need for greater IT resources, but an underlying concern is the preparedness of today's medical school central IT organizations to meet these demands. *IT Engagement in Research: A View of Medical School Practice*, an EDUCAUSE Center for Applied Research (ECAR) research study commissioned by the Association of American Medical Colleges (AAMC), provides a baseline perspective of medical school IT engagement in research and offers insight into the current state and the future challenges faced by medical school central IT organizations.

The report's key message is one of organizational dissonance. Respondents report accelerating demand for centrally supported high-performance computing, networking, and data management but slow growth in funding for the requisite IT infrastructure and services. This potential gap must be addressed, and our research suggests, given their existing resources, that medical school IT organizations will be hard-pressed to do so.

Just as important is the reported reasonable cause for concern about the ability of medical schools to best align limited funds and investments with the research needs of medical school faculty and researchers. *IT Engagement in Research: A View of Medical School Practice* describes a medical school central IT lack of involvement in pre-grant activity, a lack of researcher input into IT planning, and an informal, ad hoc approach to IT engagement in general. Researchers' willingness to reconsider their need to own their infrastructure and support resources provides an opportunity for a rich dialogue between central IT organizations and researchers. The success of the dialogue, however, depends on the ability of central units to reach out to and engage researchers, and on the willingness of researchers to participate.

Today, nearly two-thirds of respondents perceive that their researchers are "extremely satisfied" or "somewhat satisfied" with the IT infrastructure and the IT services provided by the medical school central IT unit. However, as research needs and demands grow, and as funding mod-

els are perceived as not sustainable, the conclusion must be drawn that medical school IT units can expect lower researcher satisfaction levels longer term.

The Medical School IT Support for Research Environment: A Snapshot

Most respondents characterize their medical school's mission as research focused, with 44.0% of respondents (22 out of 50 responses) indicating a Research Essential mission and 48.0% (24 out of 50 responses) indicating a Balanced (between research and teaching) mission. To support research, 52.3% (23 of 44 responses) report a distinct unit in their IT organization with the explicit mission of supporting faculty, clinicians, or other researchers with their research needs. Almost one-third (16 out of 50 responses) of medical schools have less than one FTE in the medical school central IT unit dedicated to research support, and an additional 28.0% (14 out of 50 responses) have between one and three FTE. While one-half (22 out of 44 responses) report that they have experienced an increase in staff over the past three years at the school's central IT level, almost two-thirds (29 out of 44 responses) anticipate an increase in such staff over the next three years.

Respondents report an increasingly complex research landscape: 79.6% (39 out of 49 responses) of responding medical schools experienced an increase in the amount of computation-intensive research over the past three years. The four IT support services most commonly selected by respondents as researchers' fastest growth in demand are software application programming and development at 38.6% (17 out of 44 responses), IT consulting services at 36.4% (16 out of 44 responses), development and maintenance of websites related to research at 34.1% (15 out of 44 responses), and hosting services for individual researchers' servers at 28.0% (14 out of 50 responses). All medical schools, regardless of mission type, report that molecular medicine is the academic discipline that exhibited the fastest-growing demand for research IT over the past three years.

The report covers four primary IT infrastructure elements in research: the network, computation, data management and storage, and services. No respondents report decreased

RESPONDENT PROFILE

Respondents were asked to choose the mission that best describes their medical school from the four statements listed below. Each mission type is preceded by the shorthand name used to refer to these categories of institutional mission.

- ▶ **Research Essential:** Research and teaching are the primary missions, but research is what really drives faculty and institutional success. (22 respondents)
- ▶ **Balanced:** Research and teaching are both primary missions, and they are equally important for faculty and institutional success. (24 respondents)
- ▶ **Teaching Favored:** Teaching is the primary mission, but faculty research is rewarded. (4 respondents)
- ▶ **Teaching Essential:** Teaching is the primary mission, and faculty research does not factor heavily in faculty and institutional success. (0 respondents)

use of any element. Data storage has been and is expected to continue to be the fastest-growing infrastructure element; most respondents expect high-performance computing and networking to grow more in the next three years than in the past three years.

Organizational Dissonance Resonates Throughout

The key observation coming out of the research environment is one of growing demands; *IT Engagement in Research: A View of Medical School Practice* investigates medical schools' readiness to meet these demands by understanding how research-related IT is funded within the medical school central IT organization and how this organization aligns itself with the medical school research community.

Funding sources vary. Infrastructure elements, particularly high-performance computing (54.2%, or 26 out of 48 responses) and high-performance networking (50.0%, or 20 out of 40 responses), are most often funded primarily from the larger institution's central IT budget. It is interesting to note that for data storage (37.5%, or 15 out of 40 responses), and especially for the support and services elements (43.9%, or 18 out of 41 responses), the medical school central IT is more often the primary source of funding. This may signal that some infrastructure elements are often carried by the larger institution, while more direct research IT expenses are funded at a local school level, providing medical school central IT with greater control in investments at the local level to support research amidst other competing priorities. Interestingly, 24.3% (9 out of 37 responses) of respondents report that tools and applications are funded using a chargeback model, the highest of any of the technology categories. Another 18.9% (7 out of 37 responses) of applications are funded through other sources, such as grants or external resources.

Our findings, however, are not encouraging regarding long-term funding prospects. A full 54.2% (26 out of 48

responses) either disagree or strongly disagree that they have a sustainable budget model for IT infrastructure, and 49.0% (24 out of 49 responses) disagree or strongly disagree that their budget for IT services is sustainable. Not one respondent "strongly agrees" that it has a sustainable budget model either for IT infrastructure or services.

To recover costs, 40.4% (19 out of 47 responses) report that they engage in the allocation of indirect cost recovery funds to their central IT units—either IT support services, IT infrastructure, or both. The dominant method that medical school central IT organizations engage in to bring in external dollars and resources to the medical school was participation in grants and contracts: 61.7% (29 out of 47 responses) engage in this activity. We also found that 19.1% (9 out of 47 responses) say they seek partnerships with technology companies to gain external resources.

Regarding the ability to align limited funds with rising resource requirements, *IT Engagement in Research: A View of Medical School Practice* highlights informal and ad hoc engagement on IT support for research throughout the medical school organization. When asked to select from a list of applicable mechanisms through which medical school central IT organizations are able to engage researchers, 77.3% (34 out of 44 responses) choose "ad hoc consultations on as-needed basis"; another 36.4% of respondents (16 out of 44 responses) choose "no formal engagement." When asked about the relationship between the medical school central IT organization and the medical school research office 53.7% (22 out of 41 responses) choose "We coordinate our activities as necessary when common issues arise."

The informal pattern of consultations leads to a lack of adequate planning and budget procedures. Only 9.1% (4 out of 44 responses) of respondents indicate that they have regular meetings to discuss IT needs for research with top decision makers. Almost half, 46.0% (23 out of 50 responses) of the surveyed medical schools say that they do not engage in any form of long-term planning to determine researchers' IT needs.

RECOMMENDATIONS

IT Engagement in Research: A View of Medical School Practice highlights the growing demands of IT support for research, less-sustainable budgets, and the need for improved engagement. The following recommendations are offered to address these issues:

1. Make IT support for research a major organizational imperative.

Whether it is the cultural reluctance of researchers to rely on central IT, or IT's traditional focus on administrative and teaching applications, IT support for research appears to have fallen off the radar. Research needs continue to accelerate and to gain complexity, yet the stunning number of medical schools without even a plan for IT support for research is a warning bell. Medical school central IT organizations must strive to refocus strategic resources on IT support for research.

2. Enhance the medical school community's engagement in IT support for research.

Hand in hand with its designation as an organizational imperative is the engagement of the medical school community to define the requirements for IT support for research. The only way to truly understand researchers' needs and the value central IT can bring is to engage with them directly. One of the most striking findings from the study was the limited extent to which medical school central IT organizations currently engage the research community through formal mechanisms, long-term planning, advisory groups, participation in grants, or involvement in faculty recruiting to identify potential needs.

Granted, the research culture of medical schools may hinder communications efforts, but over time it could yield a better outcome for everyone involved with research-related IT resources within the medical college. Medical school IT organizations can use researchers' increasing interest in centralized IT support of infrastructure and services to open dialogues. IT involvement in the hiring process, for example, could identify potential IT needs required for research. Where possible, support for those needs should be built into grants or corporate sponsorship opportunities. Through better communication and diligence, both sides will better understand existing needs, available IT resources to meet those needs, and how to coordinate resources more effectively to benefit the entire research community.

3. Create a sustainable funding model.

Preparing for the future of IT support for research creates an interesting funding challenge for medical school IT organizations. However, it has one advantage in that it often has primary responsibility for funding IT support for research, while larger institutional IT departments are often more responsible for meeting underlying infrastructure and operational needs that are more often dispersed across both administrative and research users. This local "in the neighborhood" element gives medical school central IT organizations an increased opportunity for informal and in-depth engagement with researchers and other administrators to help locate new external and internal funding opportunities and create a means to alter the underlying economics of current budgetary models: for example, greater involvement in the grant development process, assisting faculty with the identification of their research IT needs that a grant might support, engagement with other medical school administrators (such as the dean of the medical school or executives within the research office), or external organizations (such as consortia). All can lead to improved research for IT either through better identification of needs or new sources of funding.

Over half (52.3%, or 23 out of 44 responses) report that the medical school central IT is rarely or never consulted during the pre-award process for contracts and grants to help identify IT needs and resources. This is surprising, given the importance of grants in bringing in external dollars and resources. During a faculty and researcher's hiring process, 75.0% (33 out of 44 responses) report rarely or never being asked to match the new hire's IT needs with current IT resources.

Today, 62.5% of respondents (25 out of 40 responses) perceive that the researchers in their medical schools

were "extremely satisfied" or "somewhat satisfied" with the IT infrastructure, and 47.5% of respondents (19 out of 40 responses) claim a similar level of satisfaction with the IT services provided by the medical school central IT unit. One conclusion that can be drawn from *IT Engagement in Research: A View of Medical School Practice* is that as research needs and demands grow, and as IT leaders perceive funding models to be unsustainable, medical school IT units can expect lower researcher satisfaction levels.