

**Title:** Libraries and IT: Are We There Yet?

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**Abstract:**

**Purpose** – This study looks at the impact for users on University library and information technology services, present and future, following merger.

**Design/methodology/approach** –The authors examined user survey data from the early 1990's through the 2006 LibQUAL survey, collected information through interviews with faculty and Information Services, and examined the National Science Foundation and the American Council of Learned Societies reports on cyberinfrastructure.

**Practical implications** – This article is useful to others thinking the organizational relationship between libraries and campus information technology.

**Findings** – While the merged Information Services Organization is not yet a resounding success from the perspectives of staff in Information Services or faculty, it is a brave attempt to respond to the future.

**Originality/value** –

**Keywords:** academic libraries, computing centers, technology, merger, cyberinfrastructure

**Article Type:** Case Study

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Creativity is not the finding of a thing, but the making something out of it after it is found. - James Russell Lowell

Technology infuses today's library services affecting how we find information, how it is delivered, and what we create or do with it once in our possession. The technology our students and scholars use to record, interpret, and imprint data

with their own experience and knowledge permeates the higher education experience. Technology enhances or threatens the prospect that someone can with certainty return to a piece of information or its subsequent repurposing as time goes by. The fragile nature of digital creativity and scholarship challenges libraries and technology centers to reconsider traditional roles and collaborative models necessary to support teaching, learning, and research today and tomorrow.

Because libraries and their services depend heavily on technology, the organizational marriage of technology and libraries may seem the most expedient model for channeling streams of data into navigable bodies of scholarly information. Merger, however, can be every bit as difficult as the literature of the last quarter century suggests. Measuring the impact on faculty and students is also difficult. The benefits or harms to users may not be readily apparent or may take time to materialize and may not apply equally to faculty and students. Surveys are a common way to assess the user experience in an institutional context. Dialog with users is another. To fully understand the potential ability of an IT/Library merger to support research, teaching and learning requires not only understanding the user experience today, but also reconnoitering in the direction today's institutional values may compel us tomorrow.

In this article, the authors will examine and interpret the impact of IT and Library merger at the University of Kansas by looking at historical and current information found in the literature on merger, data from KU library user surveys, the perceptions of faculty and leadership in the merged organization gleaned through interviews, and reflection on future needs to support research and scholarship with cyberinfrastructure.

### **The University of Kansas**

The University of Kansas (KU) is a state-funded, doctoral-granting institution with a Carnegie classification profile that includes very high research activity. KU has 85 academic departments, 29,272 students and 2,200 faculty and is an Association of Research Libraries (ARL) institution with 7 branch libraries.

The KU Libraries and central Information Technology (IT) organizations have a long history of close collaboration and organizational overlap. While this overlap has never represented a deeply integrated organization at many unit levels, these entities work together under an administrative framework known as Information Services. This organizational merger began in 1996 with the appointment of the first Vice Chancellor of Information Services, who also served as Dean of the Libraries. Today Information Services is three distinct but administratively and functionally interconnected branches: Libraries, Information Technology, and Networking and Telecommunications. The most closely merged units and programs are the library's Instructional Services unit which provides both bibliographic and technology instruction, Public Computing Support for labs and library workstations, Scholarly Digital Initiatives, the Academic Data Research Services Alliance which supports statistical data analysis, use of data sets, and geographic information systems support, and the Enterprise Academic Systems unit which supports library and digital library systems as well as those for learning management and campus communication.

### **A decade of literature on Library and IT Mergers in Higher Education**

The literature of library and computing center mergers from 1979 through 1998 is well established in “An Issue in Search of a Metaphor, Readings on the Marriageability of Libraries and Computing Center” (Freeman 2000) found in *Books, Bytes and Bridges* (Hardesty 2000). The latter includes a broad set of writings on Library and IT merger and is recommended reading.

In the last decade, there have been several publications written about the merged organizational model. Hardesty (1998) interviewed computer center administrators and librarians at 51 small colleges to study their differences, similarities, and relationship and the innate difficulty merger represents. Hirshon (1998) provided a comprehensive summary of the growth in number of campus IT and Library mergers, their organizational models, CIO leadership, and other pragmatic issues. Bolin (2005) conducted a similar review of 50 land grant universities and found that 88% of these institutions had traditional organizations with the Dean of the Library reporting directly to the Provost and the Computing Center Director reporting either to a provost or other administrative official while 12% had non-traditional organizational patterns grouped into 4 models. Renaud (2001 and 2006) wrote of the complexity brought on by degree of merger, the different cultures of libraries and computing centers, the difference in the compensation and status of people working as librarians from those working in IT, the predominance of mergers in private liberal arts colleges and potential complexity of mergers in large institutions, issues of leadership, and alignment with governance. Lewis and Sexton (2000) examined organizational issues and cultural differences in merger in the U.K. at the University of Sheffield.

Some authors have linked the need for IT and Library collaboration or merger to the changing and future needs of users for technology-based services and resources. Herro (1999) covered the literature of merger from the user services perspective and surveyed CIO's at small institutions with merged organizations in 1998 to “determine why their institutions converged, how services to users have improved following convergence, and if institutions would converge again.” Foley (1998) discusses the methodology of merger at Lehigh University, the challenges and issues, and the use of virtual functional teams and client interest groups. Frand and Bellanti (2000) wrote about the merger of computing and library services at the Anderson Graduate School of Management at UCLA and creation of a library “without walls.” Ferguson, Spencer, and Metz (2004) wrote of the dimensions of merger, administrative, physical, collaborative/operational, and cultural necessary for understanding the potential for successful integration. Ferguson (2003) wrote of the leadership required to face the massive changes ahead of libraries in transitioning from print to digital and the need to create viable frameworks for this transition within a higher education environment that is also rapidly changing. KU's Information Services organization, in its present iteration, was documented by Goodyear, Russell, and Ames-Oliver (2006). Recent reorganization efforts put into practice concepts from the literature of organizational development, change management, and process facilitation to create campus-wide engagement about services and infrastructure resulting in greater collaboration and service delivery particularly between Information Services (IT and Libraries) and Student Success.

### **A Look Past and Present Through Surveys**

Surveys are snapshots in time. They expose perceptions, desires, and experiences at a moment in time and may point to satisfaction or gaps with current services, but they do

not necessarily tell us where we are headed or how to move forward strategically during times of rapid change. As KU Libraries have increased their reliance on technology and as organizational merger has knitted Libraries and IT together, the most readily available historical and current snapshots of user perception about services comes from surveys.

KU Libraries have a long history of user assessment. From 1991 through 1993, KU Libraries conducted a “General Satisfaction Survey” of users based on an ACRL model survey. In 1995 the Libraries undertook a substantial student survey. In 2000, 2003, and 2006 the libraries participated in what is now known as LibQUAL+ developed for libraries by ARL.

### **Library User Surveys 1991 – 1993**

The 1991-1993 General Satisfaction Surveys were completed by 1,118 users and netted 1,318 comments. 57 of those comments (4%) specifically mentioned technology. Technology at that time consisted primarily of the library catalog and a CDROM network of electronic databases. While the results were not tabulated specifically with technology in mind, an early picture emerges in these and future surveys of insatiable appetite for more and better electronic resources, for improved tools to access, deliver and make sense of information, for fast and unfettered technology infrastructure, and for helpful people to steer the course through this new electronic world.

User comments in 1992-93 already showed uneasiness with quality and quantity of electronic information: “[The] online catalog is not up to date with what is in the stacks,” “I think the cd-rom database system is extremely helpful for research. It would be nice to have more years of data in the Biological Abstracts,” “Flipping through the Avery Index is a pain, but since periodicals aren’t online, it’s a necessary evil,” and “The best new thing in the library is MathSci on CD-ROM. It really helps my work, in both teaching and research.” The early 1990’s also revealed both the precocious technology pessimist, “the computer offers little possibilities,” as well as the technology optimist who implicitly trusted what he saw online: “...one may find anything on the online catalog,” The tools for finding content challenged users, “I feel like the on-line system is a bit difficult for me,” and, “We need an online catalog that allows keyword searches. Journals and proceedings are sometimes nearly impossible to find because they are listed in only one way.” Frustration with computing infrastructure, facilities, equipment, and network, was evident in a few comments, “Psych-Lit [sic] was working very slowly. I had to reboot twice”, “Computers went down,” and “We desperately need a printer hooked up to the on-line system.” The perception of library staff as helpers ran the gamut from perceived animosity when asked for help with copiers or computers to glowing satisfaction, “Everyone (staff) is really helpful,” One 1991 user summarized, “I love the library, clean, quiet--tons of computer support “

### **1995 Survey of Students**

In the 1995 student survey, KU Libraries gathered information from 144 graduates and 274 undergraduates. Themes of content, tools, computing infrastructure, and staff resources further emerged in comments and quantitative data from these surveys. Electronic content and services were a primary reason that 8% of undergraduates and 15% of graduate students used the libraries. When asked to select the top three spending priorities for KU Library, graduate students (18%) asked for more electronic

databases while both undergraduates and graduates wanted the catalog to better index print collections. "I would like on-line text available on the periodical databases," "Add lots more on-line services available 24 hrs. a day," and "Internet Services would be great!"

Users comments about tools became more sophisticated, asking for "boolean logic on the on-line catalog; remote access to CD-ROMs; grad student access to OCLC & pre-1960 MLA CD-ROM." Dissatisfaction with computing infrastructure occasionally surfaced. "[The] on-line Catalog is too slow," and "I wish the library had a computer lab." Many users were still either unaware or disinterested in the availability of modern technology. 46.6% of users indicated they were unaware or had not used Internet from library terminals and 43.2% had not used or were unaware of remote access to library databases. Library staff, who garnered high marks for providing traditional library services, appeared less savvy or available to help with technology in the eyes of some users, "[There was] no reference librarian to help w/medicine search," "Librarians do not know how to work electronic devices at times," and "I don't get verbal steps to follow when I actually need demonstration." Users asked for "Better instruction in the use of specific library tools i.e., CD\_ROM Database," "Short classes explaining how to use some of the software on the computers," "Guided tours, demonstrations on how to use electronic equipment," and "[a] more user-friendly way of easily teaching students how to obtain info from computer sources." Students also wanted assistance from the library staff with diverse technologies including "Internet access, e-mail, [and] classes about what they are and how to use [them]."

While user surveys between 1991 and 1995 do not provide a consistent set of quantitative inputs and outputs, the authors interpret in the comments early rationale for thinking about IT and Libraries as a combined organization at KU. The needs amplified by users, for more electronic content, better tools for discovery, robust computing infrastructure for speedy and reliable access on and off-campus, and staff well-versed in using technology and interpreting electronic content, were known and may have influenced the administrative and organizational changes that led to the 1996 creation of KU Information Services and the eventual integration of technology and bibliographic instruction, library and campus technology systems, and combined lab/library public computing support services. (University 1995) (University of Kansas Information Services "History" 2007)

### **LibQUAL+ Surveys, 2003-2006**

In 2000, 2003, and again in 2006, KU Libraries began to take advantage of new standardized criteria to measure library performance and the satisfaction of users using the ARL LibQUAL+ survey and for comparison with other participating institutions. These surveys were directed at faculty, staff and students and, in the 2006 iteration, looked at dimensions of library service in three areas: information control (printed and electronic resources and the infrastructure to support their use), library as place, and the affect of service (the nature and quality of service provided by library staff). Perceived service levels were measured as a reference point in relationship to a user's minimum expected and desired level of service.

The Library summarized its 2003 LibQUAL results as user desire for electronic and print content in the form of journals and library materials, for easy-to-use tools, and for infrastructure to support convenient access to library collections, including access from

home or office, and modern equipment for easy access. (University of Kansas Information Services "KU Libraries" 2007)

In 2006, the appetite for electronic and print content, particularly journals, showed no abatement, and library tools for remote access as well as physical access to collections remained important. Data from institution-specific questions showed that 50.6% of faculty accessed library resources through the library web site daily, up from 22.7% in 2003. Even so, faculty perceived levels of electronic and print resources as lower than the minimum they expected. At the same time 44% of faculty used resources on the library premises weekly, up from 41.6% in 2003, and daily use of library facilities by all users increased 8.7% in the same period. A curiosity is that faculty perceived the service level for "community space for group learning and group study" as actually exceeding their desired level. The number of public workstations in the library system increased roughly 30% between 2003 and 2006 to fill the entry levels of the largest libraries with desktop PCs as well as laptops to borrow and use in the library. At the same time, the library opened a storage annex and began physically moving materials offsite. While any interpretation of these statistics by the authors is speculative, some comments seemed to reflect faculty disagreement with the library's choice in provisioning library space as technology-centric commons. "Please, prioritize substance over space," "A library should be a space for private study. Group work can take place in many other venues," and "With most students having their own laptops or home computers, it is wrong to devote so much first floor space to computer terminals," Others indicated they simply do not use the physical library. "I primarily use the library to request journal articles -- either thru [sic] the electronic journals or by ILL. I have only set foot in the library once, to put a text on reserve for my students." One summarized the shifting definition of the library in an increasingly virtual world, "...my use of the library is 99.99% through electronic journals. Does electronic use constitute 'library premises?'"

Student responses in 2006 to LibQUAL+ for both undergraduates and graduates, perceived issues of content and tools (information control), library as place, and library staff (affect of service) differently than faculty. Student expectations were met at least at the minimal levels in all areas except graduate student expectations for print and electronic journal collections. Students were broadly satisfied with library as place and with the technology found in these places although it was not necessarily used for access to the library's electronic resources: "I have only used the computers inside the library for work on blackboard, (which could also be done from home.) I have not used the Library for anything else to date." A graduate student highlights the social aspects of library spaces, "[The library] is a great environment for studying; also it is a good place to meet with people you know or just walk around looking for people in your classes to glean information from them." A graduate student commented on helpful research assistants and library "specialists more than willing to assist me, and [they] have made individual appointments with me to show me databases that are particularly helpful for the discipline I am researching."

In summary, LibQUAL results from 2003 and 2006 reveal that KU Libraries met the expectations of most students at some level while pointing to possible tensions with some faculty over the purposing of library facilities as technology commons and group meeting spaces. Based on surveys, the authors interpret the most visible and tangible current value to library users afforded by merger is probably the development and support for public lab and library workstations in the technology commons. While many academic libraries can and do provide technology commons for their users without the

support of a central IT organization, combined support for lab and library computing at KU is a sensible and scalable synergy. This approach maximizes the use of student technology employees who may work in either lab or library, enables mass deployment of row upon row of computer workstations cloned from a basic image, and unifies the presentation platform for users whether in library or public lab. In *Educating the Net Generation* (Oblinger and Oblinger 2005) the authors talk about why these commons environments are important for learning:

Interaction [for learning] is not limited to classroom settings. Informal learning may comprise a greater share of students' time than learning in formal settings. The type of interaction, peer-to-peer instruction, synthesis, and reflection that takes place in informal settings can be critically important. In fact, the full range of students' learning styles is undercut when interaction is limited to classroom settings.

These technology-filled spaces are also important for library staff. They create an opportunity to interact with students. The extent and quality of interaction deserves more study. One possible indicator of quantity of interaction is found in reference statistics: questions increased by 16% between 2004-05 and 2005-06 following a decade of decline.

It is still too early to tell if other merged units will yield tangible and visible benefits. In 2005 Arnold Hirshon wrote about the convergence of computing and communications technologies affecting entertainment and popular information content. He predicted this convergence would also permeate the realm of scholarly content with the expectation that "the time for e-content will be always, the place will be everywhere, and the demand will become insatiable." (Hirshon, 2005) Closely aligned Library and campus IT organizations would seem well suited to meet these challenges for support of new modes of delivering or accessing scholarly content in diverse formats from sources perhaps less conventional.. Libraries bring knowledge and historical responsibility for collecting and organizing scholarly content while campus IT may be best prepared to support interactive and mobile technologies and to provision the computing infrastructure required for the high-demand highly-mobile environment Hirshon envisioned.

### **A Look at the Present and Future: Faculty and IS Leadership Perspectives**

[KU] is a research university. Doing research is your first responsibility [and] we expect that you will make significant new discoveries throughout your career. This is hard work, but merely making those discoveries is not adequate. You must share them with the wider world, and we require that you do this in two ways: publish your discoveries so that they will have an impact nationally and internationally; and bring your discoveries into the classroom so as to have an impact on your students. Both of these are required for a successful career. (Lariviere 2006)

These were the convocation remarks of a new Provost to faculty followed by an interview in the same month where he stated, "The most fundamental [economic development role for KU] is that every year we give to the world 5,000 new graduates who will go out and change the world." The Provost also recognized the need for robust computing and information infrastructure in a goal put forth for KU with deep impact for

Information Services. We will create a “truly first-class information technology infrastructure” to support research and teaching. (Provost 2006)

To better understand campus present perspectives and future directions for research and teaching in relation to library and technology services, the authors interviewed 17 faculty and Information Services leaders in the spring of 2007. The questions are found in Appendix A. Conversations focused on the KU environment, finding and creating information, and the role of the university in supporting “cyberinfrastructure.” Definitions of cyberinfrastructure vary in the literature, but the authors defined it as something different and broader than the facilities, network, systems and software that make up computing infrastructure. In talking about cyberinfrastructure with faculty and IS leadership, the authors relied on the ACLS (2006) definition of cyberinfrastructure as the shared information, expertise, standards, policies, tools, and services developed to support scholarship. The observations of those interviewed provided insight into faculty and IS Leadership thinking about the support required for research and digital scholarship and whether or not that support might be enhanced by a merged IT and Library organization.

### **Interviews on Research and Scholarship at KU in 2007**

In talking with faculty and IS leaders about current perspectives of research and scholarship, one interviewee summarized the growth of research at KU in the 1990's as going from a “small liberal arts college on steroids ...to a major research university.” Interviewees noted that KU's rigorous emphasis on research and on becoming a top-25 university (Hemenway 2002) are “ratcheting up research [and the] importance of obtaining grants” with implications for promotion and tenure processes. One interviewee spoke of different expectations by different schools, with publication in peer-reviewed journals the primary focus for some and alternative or additional forms of dissemination and scholarship appropriate for others such as software creation, data sets, and simulations.

Interviewees concurred that the biggest disciplinary footprint for research at KU is in the sciences, particularly the life sciences. It is technology intensive, requiring not only facilities and instrumentation but also “big pipes” (the network), “big iron” (high-end computing platforms) and a strong basis of IT support. The humanities at KU were viewed by some as well supported through a dedicated research center and endowment fund. The social sciences were viewed by some as the less supported. Multidisciplinary research was mentioned as increasingly important. Faculty and IS Leadership noted the need for better connections and cooperation between the medical and main campus and between disciplines. One interviewee spoke of the need for renewed connections between the sciences, humanities and social sciences much as there had been in the 1950's when research was previously in the university limelight. Another said, “KU should operate as one campus [and] multiple [research] sites ... should not serve as barriers.”

Certain disciplines, certain areas within those disciplines, and the ultimate applicability of research results were all seen as factors that impact what research is funded. Locally, the KU Center for Research (KUCR) and its 7 research centers were mentioned by some as “our historic strategy and priorities” for research support and funding, impacting funding and influencing or impeding the development of technology



infrastructure through its control of grant overhead funding. There was considerable tension expressed over how research funding is controlled and used. Globally, one person noted that “we are hampered by NFS/NIH funding models,” and another described the “sweet spot for research” in the social sciences as the Venn-diagram intersection existing between “GOOD IDEAS and FUNDABLE IDEAS, and what the funding agencies will support.” Several believed that research in the social sciences was less funded and supported when compared to the sciences and humanities. One noted a diminishing market for publications in the humanities and social sciences which in turn would eventually affect the discipline itself and begins to shift the quality of the graduate experience. Another reflected on the difficulty of publication for faculty in specialized areas such as Management Information Systems that have only a few peer-reviewed journals to serve as outlets for publication. Technology transfer was seen as focusing support on the marketability of research. Funding and economic factors impact scholarship. This is not unique to KU.

Although the Provost’s messages about the importance of research at KU did not specifically mention the role of the libraries; the services of libraries, the work of librarians, and print and electronic collections were characterized by one IS Leader as important in meeting the “library challenge to fill a great need for bringing information to community in ways that helps [faculty] innovate, create, imagine, without barriers” and to “shape new generations of scholars both as graduate students and as new faculty at KU.” Faculty and IS Leaders recognized in positive terms the traditional role of libraries as they emphasized the continuing drive of scholars to find, use, and create data, to connect with both traditional library resources, tools, and content. At the same time, they recognized growing reliance on resource discovery outside institutional control. One interviewee was almost apologetic in preferring Google as a search tool saying, “I know [Google] has flaws, but it is so much faster [than library tools].” Fast, flexible, and comprehensive access to scholarly content, particularly in electronic form, was deemed crucial. Organization and dissemination of research data produced by KU scholars was considered challenging especially when there were interim products of research to be shared, when research relied on software and hardware tools that would have to be migrated over time, or when alternative formats for disseminating research results were the outcome. One faculty member mused that while technology has changed the capabilities for accessing information and analyzing information in creative ways, the essential directions and questions endure. The traditional role of libraries was understood while at the same time there appeared to be growing awareness of external partnerships that may affect how scholarly content is discovered, organized and made available over time.

Faculty recognized the push for big pipes, big iron, and big dollars, while also expressing concern for support of individual researchers as an overlay on the robust technology base layer. As one faculty interviewee put it, “Success takes people - people you have a long-term relationship with, who know ... the differing situations for people”. Interviewees saw within libraries a service orientation and capacity for individual relationship building missing in the IT organization. They bristled at their perception of a “one size fits all” desktop support model that doesn’t recognize individual needs and at the notion of all contact with IT funneled through a help desk. Individual researchers commented on the financial strain created by technology charges for essentials like network ports and data storage. In some ways this mirrors the frustration expressed in library surveys over perceived inadequacy in collections of print and electronic journals. One interviewee complained at having to purchase or subscribe individually to scholarly

content not freely available through the libraries. In thinking more broadly about the support needs for researchers, one interviewee noted that teaching and research are very integrated and faculty require a single environment for storing and sharing research coupled with individual control in managing the digital rights. The authors interpret these comments as faculty expectation for freely available and unfettered technology access, robust collections of scholarly materials accessible anywhere and anytime, and desire for individual control of the technology environment as it relates to their own research priorities.

### **Faculty and IS Leadership Perceptions of the merged IT/Library organization**

Does the marriage of Information Technology and Libraries at KU contribute to the effective support of faculty and students as they seek and use information? From the perspective of some leading Information Services it does. For others, it is the collaboration rather than the organization that is most important. IS leaders commented, "It's all about the Information," and "Information and the delivery mechanism can't be split." One remarked, "[Technology] breaks down the 'brick and mortar' distinction. [The] Library for example is not just the building, but also available globally and locally in new ways." Another noted that in helping scholars, "The key is whether IT and Libraries collaborate, not whether we have a single organization. People will find a way [to work together]. The organizational structure forces the issue and shows that we are in it for the long haul." Yet another characterized Information Services as a "mosaic not a melting pot." One IS leader urged we do more. "Libraries could benefit from more experimentation. IT could benefit from more user focus. Expand the type of information that libraries deal with. We haven't pushed the model far enough."

Others in Information Services pointed to the challenges of bringing together staff in such a diverse organization and that an IS-like model, while good and desirable, may not be scaleable to a large and complex institution like KU. Most successful mergers have involved smaller institutions. One IS leader stated that librarians "have to be seen as essential partners in solving problems [and as] parts of research teams" while another observed that we don't have much depth in staffing and referred to Information Services as "a thin veneer layer" possibly not capable of substantive support in its current state. Interviewees within and outside of Information Services noted the historic under-funding of technology and the mark it has left on the current IS organization. Yet there was also recognition that print and electronic collections have historically faced funding issues as well. One person voiced anxiety that libraries might be losers in the Information Services organization, stating that "the convergence of IT and Libraries is problematic. Technology is driving things." IT/Library convergence was characterized by another as "loss of identity" for libraries.

Despite the long years of organizational overlap between KU IT and Libraries, Information Services still contains two mostly distinct organizational halves with specialists comfortable working in both viewed as more of an anomaly than a probability. However, one IS leader summed up today as transition, "Partnering [between IT and Libraries] while building is important. In 10 years we will develop people who can do both [work in IT and Library]." One person summarized it thus, "The merged organization works in spite of itself. It isn't about organizational structure, it is about working together."

In general faculty were ambivalent about whether or not a combined library/IT model was important. They recognized the dependency of libraries on IT and the value of some level of partnership or connection regardless of organizational structure. Several commented on the service orientation that libraries provide as a needed model for IT. For one, clarity of purpose for the merged organization was at issue as well as “how libraries define themselves” and their role within the research process beyond archiving the resulting books and journal articles. One interviewee noted that in the future research areas are “all going to be massively data-driven. The role of technology is paramount.... Focus needs to be on information technology and this requires enormous data collection and analysis capability. We must accommodate the data.”

In summary, interviews with Information Services leadership and faculty tell us that the “jury is still out” on whether or not the combined Information Services unit contributes to the effective support of faculty and students. Moving forward, Information Services may offer new roles for both librarians and technologists and opportunities for staff to work with researchers, to foster collaborative connections, to support innovation, and to evolve the traditional library roles of organization, access, and preservation in the emerging digital environment. The IS organization may allow us to “push the envelope” and engage both the library and IT halves in creating a first class information and technology environment in partnership with research centers and others who support the learning and teaching environment. Thinking differently about our organization and about ourselves creates both anxiety and hope. The question for librarians and technologists alike is how to step up to this challenge. The answer to this challenge may lie in moving beyond physical and technology infrastructure to engage IS in building and supporting a truly first-class cyberinfrastructure. As one IS leader reminded us in our interviews, we are a young organization and “IS has only started learning what it can do together.” Perhaps the true value that the integrated Information Services mosaic provides lies in addressing the future.

### **Cyberinfrastructure and the Future of the IT/Library Merger**

...a new age has dawned in scientific and engineering research, pushed by continuing progress in computing, information, and communication technology; and pulled by the expanding complexity, scope, and scale of today’s research challenges. The capacity of this technology has crossed thresholds that now make possible a comprehensive “cyberinfrastructure” on which to build new types of scientific and engineering knowledge environments and organizations and to pursue research in new ways and with increased efficacy. The cost of not doing this is high, both in opportunities lost and through increasing fragmentation and balkanization of the research communities. (NSF 2003)

This report is therefore primarily concerned not with the technological innovations..., but rather with institutional innovations that will allow digital scholarship to be cumulative, collaborative, and synergistic...the widespread social adoption of computing is transforming the very subjects of humanistic inquiry. In 2006 most expressions of human creativity in the United States—writing, imaging, music—will be “born digital.” The intensification of computing as a cultural force makes the development of a robust cyberinfrastructure an imperative for scholarship in the humanities and social sciences. (ACLS 2006)

These two excerpts from the respective reports of the National Science Foundation and American Council of Learned Societies on cyberinfrastructure illustrate some large questions for all disciplines (sciences, social sciences, and humanities) that extend beyond the simpler questions of technology infrastructure:

- How to adequately build and support effective research environments for the future?
- How to discover and explore new research questions?
- How to preserve the record of research and human expression?

Further analysis reveals the complementary nature of the conversations – each highlighting issues of particular importance to the target community, yet when brought together, helping to articulate the comprehensive needs. Researchers want to collaborate with their colleagues regardless of physical proximity or institutional affiliation – and they want systems that will afford fast communications, information sharing, and increased productivity. (NSF 2003) The primary mode of connecting to the latest developments in many disciplines is shifting into the Web and only later into more traditional (and slower) modes of publishing such as preprints or the final published work, (NSF 2003). Access to data is increasingly important for conducting research, and the amount of available data is growing, (NSF 2003). Data, and other information, should be held in well curated data repositories and digital libraries that are widely accessible via the Internet. (NSF 2003) The world's cultural heritage should also be more effectively placed within reach of people. (ACLS 2006) In achieving this vision of near comprehensive access to information, there are enormous issues to be worked out regarding adequate preservation, copyright and other rights management issues, and effective methods for keeping digital information and digital information tools, alive and useable into the future. (ACLS 2006)

Effective cyberinfrastructure can break down disciplinary boundaries and afford new means of analyzing and creating information – for sciences in particular, the traditional research methods of theory and experimentation have joined by capabilities for simulations and modeling via computational environments. (NSF 2003) Researchers will begin exploring new questions and areas as a result of the additional tools, capabilities, and information available through cyberinfrastructure. (ACLS 2006) The Information Economy and needs for a workforce trained with new skills, and capabilities to participate in that economy, are critical drivers for creating this cyberinfrastructure. (NSF 2003) And this development of new skills should not be driven only by technological or scientific advances, but also by understanding and sensitivity to humanistic, cultural, and social dynamics. (ACLS 2006)

The building and maintaining of such infrastructure requires complex and close collaboration among a wide variety of stakeholders. Those stakeholders will add their own unique, and yet complementary, skills, interests, and desired outcomes for cyberinfrastructure. We must account for the NSF reports comment about the 'push-pull' dynamic of technological progress and complexity of questions, together with the ACLS report's wish for a 'cumulative, collaborative, synergistic' form of scholarship and the recognition that current knowledge creation is primarily 'born digital'. And we should recall the desires expressed by users in KU Libraries surveys and interviews from the 1990's onward, and echoed in the cyberinfrastructure reports, to more readily access, create, house, share, and preserve created knowledge in ways that afford flexibility, customization, new capabilities, and new benefits.

We might then consider that the two main campus resources for managing information (the information itself as well as the means and capabilities of transmitting the information); Information Technology and Libraries, ought to be working more closely together. This need appears as a recurring theme throughout our analysis. Users want the abilities for work to be fluid, fast, and occurring wherever the users are. “These phenomena point to the need for the library and IT organization to work together to support today’s scholars and students in a much more seamless fashion...a growing potential for integration [between Libraries and IT] exists on all campuses.” (Ferguson 2004). The NSF and ACLS reports both evoke a public goods model for cyberinfrastructure; and that such developments should be built for wide access and use, and serve as a foundation upon which individuals or groups can additionally customize their own environments with additional tools, content, or other resources that will afford interoperability and connectedness. This public goods approach for cyberinfrastructure is further reinforced where the NSF report notes, “Although good infrastructure is often taken for granted and noticed only when it stops functioning, it is among the most complex and expensive thing that society creates.” (NSF 2003)

### **Benefits and Harms for Users, Providers, and the Organization**

As we move forward with scholarship, teaching, and learning the intertwining of information technology and information content is a reality. In truth, it has never been any different. We should continually remind ourselves that tools and processes are in constant development and evolution. In their time, scrolls, books, typewriters, computers, and the Internet were (are) all new means to capture, create, and convey information. Tables of contents, indexing, and databases were (are) new ways to organize and manage information. Libraries and data centers were (are) new ways to house and preserve that information. Each wave in its turn has presented challenges, frustrations, learning, support needs, wonder, delight, and potential for users and providers alike. Conventional wisdom reminds us “there is nothing new under the sun” and paradoxically “times change, and we with time”.

The promise of a merged organization is in the cross-fertilization of knowledge, ideas, experimentation, and services in support of the university. IT by itself can be seen as just an information carrier, a ‘pipe’. The library by itself can be seen as just a collection of content ‘a bucket of water’. Success hinges on the ability of the merged organization to give priority to the ‘true’ information agenda – getting the water through the pipes, to the users, and supporting users to transform, share, transport, and save that information. The challenge is to create an effective centralized organization that is still capable of understanding, and responding to, the more specialized and unique needs of different aspects of the target audiences. Efforts at combining and integrating library and information technology through KU Information Services groups, Instructional Services, Scholarly Digital Initiatives, and ADRSA, are recent experiments in meeting the needs of users as researchers and creators of information through this interaction of previously separate and disconnected staff, tools, processes, and objectives.

The potential harms resulting from a merger of libraries and IT seem almost the flip side of the benefits. That ‘library issues’ will mask and distract attention away from IT (research computing) issues; that ‘IT issues’ will excessively dominate library directions and uses; finally, that the Information Services organization will be perceived as an unnecessary, irrelevant, and confusing administrative structure.

## Are We There Yet?

So, “are we there yet, are we there yet?” No, but close enough to holler “He’s leaning on me.” “She’s taking up too much room.” “He threw my books out the window.” “Make her stop looking at me that way.” The promise of the merged organization lies in the future, not in our difficult adolescence today. When librarians can work collegially along side IT professionals and not feel it lessens their status on the faculty playing field; when those same IT staff intuitively understand why it is important to build terabytes and terabytes of secure data and invest in insuring its integrity and future access; when researchers are supported by a collaborative information services team able to address the full spectrum of information and technology needed for a research or teaching project; when IT support staff can scale desktop solutions to meet the differing needs of the librarian, GIS specialist, or researcher in the social sciences; when archivists have a place at the table as we talk about the future of the campus email or student records system; when budgeting for building the big network pipes doesn’t feel like throwing the books out the window; and when the management and curation of data is as important as the subset of practices needed for data security, then we will be much closer to our destination.

Have students and faculty benefited or been harmed by the merger of IT and Libraries? If you ask many librarians who value the more traditional roles of librarianship, they may say that the Information Services organization has eroded traditional library roles and the benefits those roles provide to library users. The Libraries have lost their identity and librarians are in danger of being reduced to technologists. If you ask teaching faculty, you would learn that some of them struggle with student aversion to print and microforms, but they are moderating their instruction to accommodate student preference; after all student preference mirrors their own for electronic access and e-delivery. If you ask the research community, they will likely say the organizational structure either does not matter or does not make sense. Libraries are customers and consumers of IT, just as they are. The value of libraries for research is perceived in their collections, service orientation, and at the end of the research cycle in providing access to and preservation of the historical record. The value of IT is in enabling the conduct of research and its dissemination in many forms. If you ask students, they might acknowledge that finding quiet study area in the Library can be challenging; but the open spaces with row upon row of computer workstations serve both their broad information-seeking and learning needs as well as ubiquitous space for meeting and gathering in both the real and virtual realms.

While the merged Information Services Organization is not yet a resounding success from most perspectives, it is a brave attempt to anticipate the future. The growth in networked content, capabilities, and digitally-driven scholarship and learning has created more facets for libraries, IT, faculty, and students, to influence and manage while still offering traditional services. From here, the mosaic grows only more complex. Perhaps it will be our legacy to the next generation of students and scholars.

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## Appendix A. Interview Questions

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"Going Enterprise: Merging Campus and Library Technology Services at the University of Kansas" Research Article Project

FORMAT - 45 minute interview

INTERVIEW QUESTIONS:

***As we think back 10-20-30 years, it is obvious that technology has driven many changes in how we learn, teach, and conduct research. We have some questions for you to address with respect to technology's impact and significance in your work in higher education.***

**1. KU Environment. Describe how you see KU's strategic directions and role of some of the major information technology and information content providers with respect to those strategic directions.**

- What do you see (from your perspective) as the strategic directions for scholarship at the University of Kansas?
- How large a role does/will technology play in achieving those strategic directions successfully?
- What roles do libraries play in achieving those strategic directions successfully?
- What role do external players have (Google for example) in achieving those strategic directions?

**2. Finding Information. Describe how you use information today in your role with the university in either teaching, researching, or managing information.**

- When you need to find information on a specific topic in your field, how do you do it? Describe briefly the process, steps, and tools you might use.
- Is the organization of information in your field changing? How is it changing?
- Do libraries, or the services they extend to you through the internet, play a part in your current use of information? ...for that of your students? How do the 'virtual' or internet aspects of library services matter to you or your students?
- How relevant and how successful are libraries in creating an environment that is effective for users? Please explain.

**3. Creating information. Talk to us about your role as a creator of information.**

- What kinds of information do you create in your profession? Please provide some specifics.

- How do you share and disseminate information within your profession and with others?
- Is the role of formal publishing changing in your field? If so, how?
- Are you concerned about the availability of the information you create for its intended audience today? ...for future users?
- Do you have available to you the support (tools, resources, services, support) that you require as a creator of information?
- What do you require that is not easily supported through the University's current resources? What do you see as some of the most challenging aspects of your work for a centralized, university technology group and/or libraries to support adequately?

**4. Role of the University. *Have you had an opportunity to read either the Dec 2006 report "Our Cultural Commonwealth: The Report of the ACLS Commission on Cyberinfrastructure for the Humanities and Social Sciences" or the previous parallel NSF-sponsored report "Revolutionizing Science and Engineering Through Cyberinfrastructure: Report of the National Science Foundation Blue-Ribbon Advisory Panel on Cyberinfrastructure?" The ACLS commission report offers this definition:***

Cyberinfrastructure is defined as the "layer of information, expertise, standards, policies, tools, and services that are *shared broadly across communities of inquiry but developed for specific scholarly purposes*: cyberinfrastructure is something more specific than the network itself, but it is something more general than a tool or a resource developed for a particular project, a range of projects, or, even more broadly, for a particular discipline. So, for example, digital history collections and the collaborative environments in which to explore and analyze them from multiple disciplinary perspectives might be considered cyberinfrastructure, whereas fiber-optic cables and storage area networks or basic communication protocols would fall below the line for cyberinfrastructure.

- KU Libraries and KU Information Technology are part of a combined organization called Information Services. Do you believe the marriage of these organizations contributes to the effective support of faculty and students as they seek and use information?
- Given the rapid growth and development of technology and its direct influence on the environment for teaching, learning, and research what steps must KU undertake now to provide cyberinfrastructure (information, expertise, standards, policies, tools, services) for scholarly purposes?
- Is the concept of digital curation (adequate preservation and forward migration of information) as important for the university as curation has been in the print and analog world?

- What should faculty, students, researchers 20-30 years into the future expect us to do today?