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HUBS AND CENTERS AS TRANSITIONAL CHANGE STRATEGY FOR LIBRARY COLLABORATION

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Abstract

Libraries of science and technology universities worldwide are adapting to a changing environment where cyberinfrastructure, eResearch, and new technology-intensive approaches to teaching and learning are transforming the very nature of universities. While many have adopted new technologies and the resources and expertise to manage them, this is only an initial step. Libraries are experimenting with organizational models that will transform their work capacity and expertise. The goal of these libraries is being an entity that feeds and produces collaborative synergies between faculty, students, information professionals, and technologists.

Virginia Tech, among the top research universities in the United States, and its constituent libraries are adopting a unique organizational change strategy that implements eScience and cyberlearning roles. This two-part strategy begins with establishing 'hubs'. The hubs are collaborative, cross-departmental groups in which library employees of varying backgrounds and skills come together on common themes of strategic importance. The hubs act in one sense as a 'research & development lab' to explore, imagine, and brainstorm new library initiatives as well as engender deeper understandings of the university's core academic enterprise. They also are a 'strike force' that implements, supports, and assesses emerging library roles in relation to the institution's academic mission. In these ways, hubs also create learning and scholarship opportunities for their participants beyond the individual task-oriented projects.

The second part of this strategy involves the establishment of research and service centers. At Virginia Tech, these are the Center for Innovation in Learning (CIL) and the Center for Digital Data and Scholarship (CDDS). These centers are designed to incubate and sustain new collaborative synergies between libraries, researchers, instructors, and learners by providing expertise, resources, and new infrastructures to address specific academic research-based needs. The centers become focal points for library action, focused on learning and research activities within other university entities. Benefits to library employees come in the form of scholarship and research with potential for collaboration and new initiatives as relationships grow among project participants.

The authors will discuss transformational aspects of the change management model, with lessons from their early experiences. They also will discuss how the model can be adapted by other libraries of science and technology-centered universities.

Keywords: Change management; organizational development; organizational learning; university libraries

Introduction

Science and technology-centric research universities are renewing their dedication to creating new knowledge and to generating the people and organizations that will produce it. They are witnessing the rapid growth of new cross-disciplinary paradigms such as eResearch and cyberlearning, which encompass emerging discipline-related realms such as eScience, eSocial Sciences, and the Digital Arts and Humanities. The new cyberinfrastructure for learning and research includes high performance computers and large databases with fast processing-capable local network and Internet linkages, which are used to enhance knowledge transfer among faculty and students and to accelerate the pace and significance of new knowledge discovery. There are other significant drivers in the contemporary higher education environment beyond information and communication technology. Perspectives on how higher education institutions should be governed and funded are changing rapidly on a global scale, with privatization taking on a more significant role. Learning and research programs are moving into virtual or physical-virtual hybrid environments and increasingly are being carried out inter-institutionally and internationally with multiple university, governmental, corporate, and non-profit organizational partners. The new interdependent, complex training and development of instructors and researchers with new skills, new technologies and economic models, and policies in education, research, and information/data are transforming the academy, and more specifically, how university libraries function in a global, data-driven, and thoroughly e-enabled environment.

University libraries are responding to the vast amount of external change with new infrastructures, services, and areas of expertise. These libraries have experienced the creation of services in areas such as data curation, electronic publishing, digital repositories and preservation, content and knowledge production, and new physical and virtual learning and specialized research spaces. In the United States, there are leading examples of university libraries responding to the rapidly changing environment. For instance, the University of Pittsburgh Libraries is becoming a major publisher. Libraries at Johns Hopkins, Purdue University, and others are rapidly growing digital research data services. Others such as Stanford University and North Carolina State University are designing forward-leaning library facilities designed for cutting-edge learning and research. There also have been new instructional modalities that leverage social media and new skills taught in areas such as data management, visual and media literacy, and digital fluency. While many library leaders can see what their organizations need to become, the process of selecting methods, tools, and organizational theories that will transform their libraries remain unclear and challenging.

Library leaders need strategies and mechanisms for transitioning their organizations. There are useful models in the leadership and management literature for planning the act of organizational transition. The Virginia Tech Libraries are working toward building a transition model comprised of these leadership and management models as applied in an exemplary, transitioning university library.

Systems thinking, appreciative inquiry, and the 4-D planning model

The model under development does not address how most contemporary library planning occurs, which is focused on current functions and services and on how to evolve them. Instead, the model being employed focuses on building new systems through understanding the external change agents and their effect on the parent organization (i.e., university), and then looking at the university library and how it can contribute to university-level adaptation. This approach borrows from the Appreciative Inquiry (AI) model of planning and information gathering to undergo organizational change. AI offers four planning steps:

1. Discover (i.e., strengths) – What are our organization's strengths? What are examples of the best things that we have done? When have we been most innovative? Most recognized by others? When have we been excellent and most proud of ourselves?
2. Dream (i.e., aspirations) – Based on building upon our "centers of excellence" that we just reviewed, what are our highest hopes and aspirations for the library? Also, are there any areas in which we aspire to being excellent where we are not currently?

3. Design (i.e., opportunities, work design) – Based upon the aspirations we hope to achieve in the Dream phase, which opportunities have the most potential? Also, how do we design the work of the Libraries (expertise, technologies, spaces, work processes) so that we are well positioned to accomplish these goals (opportunities)?
4. Deliver (i.e., results) – Based upon the opportunities, we have begun designing our library organization to achieve these targets. We must affirm our commitments to them, celebrate our successes, identify the lessons learned along the way, assess our progress toward achieving our aspirations and opportunities, and take actions to ensure our sustainability.

Much of AI planning emphasizes the peak moments of organizational excellence and strives through planning and analysis to make these defining moments and behaviors the organizational norm. As the phrase *appreciative inquiry* suggests, planners ask questions of employees, customers, and other stakeholders that lead to a focus on what is going well and how to capitalize on it as well as identifying new areas in which the organization wants to be excellent. Research shows that when planners focus too much on what is wrong, deficient, or needs fixing in an organization, this causes the problems to become worse (Hammond, 1996). On the other hand, AI provides a contrast because it attempts to focus the majority of the organization's members on understanding the positive and successful elements of its activities and culture. AI posits that when this happens, rapid organizational transitions can occur (Seel, 2008).

In the organizational transformation work conducted at the Virginia Tech Libraries, the 'Dream' and 'Design' phases of the AI 4-D model are emphasized. This has led to articulating three strategic vision areas on which the Libraries is designing its programs and services. The strategy, or dream, is to lead and collaborate in the following areas:

1. Curation – emphasizing the lifecycle management of scholarly, scientific, creative intellectual output along with data and information objects that hold archival value for the university community, both digital and physical
2. Communities – optimizing the efforts of learning, research, and service communities to realize their goals through leveraging data, information, and knowledge, both tacit and explicit
3. Knowledge – partnering in knowledge creation and production processes as well as disseminating, sharing, and sustaining that knowledge, both faculty- and student-produced

Utilizing elements of AI and the 4-D model can expand the library's capacity for articulating new directions and for identifying the opportunities to reach them.

Organizational values, perspectives, and adaptive leadership

Given the rapid external changes affecting universities, libraries need to prepare for transition and become more adaptive and innovative organizations. Another transition component is identifying the organizational values that will inform the library's transition. In the case of the Virginia Tech Libraries, its leadership identified the complementary values of experimentation, entrepreneurialism, and the encouragement of risk-taking among the values it wishes to promote. These values specifically set the tone for the qualities the Libraries are seeking in transition efforts and newly designed work activities.

Adaptive leadership methods can assist libraries in executing transition and embedding in them the ability to adapt to external change (Heifetz, Linsky, & Grashow, 2009). The method begins with the phase called *get on the balcony*. This is where the organization's leadership works with managers and employees prone to be early adopters and can understand the vision. Second, is *identifying the adaptive challenge*. This is where the organization collectively examines the external change agents and how it must adapt internally. The third step is *regulating distress*, which is where the leaders make sure that employees are exposed to the change agents effecting the organization, but also moderate the amount of exposure they have, so as not to overwhelm them. Fourth, is *maintaining disciplined attention*. The comfort of past practices or the distress caused by new practices can

distract employees. Leaders and managers should create temporary structures like transition teams to help employees concentrate on the new plans. Fifth, is *give work to the people*. Leaders and managers must let go and allow the employees to do the work. The sixth phase is to *protect the voices from below*. As employees are given work to perform, they also may speak up in support of the new routines. The leaders and managers' role is to protect these vocal, adapting employees and make sure they are acknowledged and supported and not unduly criticized by other employees. The adaptive leadership model, coupled with elements of AI and the 4-D model can be core strategies for libraries to adapt and transition in a rapidly changing environment.

Transitioning at Virginia Tech

As Virginia Tech Libraries' leadership team considered various strategies to nurture forward-looking cultural values, such as entrepreneurialism and risk-taking, they recognized that this had to be more than business-as-usual. An effective transitional process could not emerge from top-down strategic planning, but rather, it required participation from all levels of the organization.

One of the most pertinent issues to address, and modify when necessary, was motivation. Many large organizations suffer from functional fixedness, which is a cognitive bias that limits perceptions to only accepting established roles (Duncker, 1945). Library employees, as well as library users, can often default to a traditional view of how libraries operate and the services they provide. This directly challenges the drive for innovation because of the potential to disrupt current identities.

In order to recognize aspirations (Dream Phase) and to move in new directions (Design Phase) the Libraries needed to break from role-based thinking, toward a more dynamic and integrated paradigm. Managers and staff needed time off from day-to-day concerns in order to immerse in flexible projects and future-looking initiatives. Therefore, the Libraries gathered inspiration from other innovation-seeking organizations, such as Apple, Google, and Facebook, to distill their culture and methodologies. This led to two distinct pathways: Hubs and Centers.

HUBS: an internal strategy

The Libraries' management team knew that it had to recognize and value current practices, while also looking toward the future into new areas. To help articulate the difference between these objectives two definitions were developed:

- Core functions are foundational programs, processes, and services that are carried out by departments. Examples include: reference, circulation, instruction, and cataloging.
- Hubs are organizational units that explore common themes or issues of emerging strategic importance. Time is allocated to library faculty and staff members to work on self-directed and team-based projects

The Hubs were created as an internal strategy for moving the library into the Design Phase of the transition process. Hubs encourage the formation of collaborative cross-departmental groups consisting of employees with varying backgrounds and skills. These groups are charged to behave as research and development units with the freedom to explore, imagine, and brainstorm about new library initiatives, as well as to develop deeper understandings about the university's academic enterprise. This framework opens numerous possibilities for capacity building and infrastructure development. It encourages entrepreneurialism and risk-taking in a safe environment while also providing space for mentoring, peer-to-peer interaction, idea cultivation, and change transitioning.

Virginia Tech launched implementation of this internal strategy with two initial operational hubs:

Learning Hub

The Learning Hub serves as a platform for expanding engagement across the university's teaching and learning enterprise. Combining talents, interests, and expertise within the organization, this

project-based group is designed for experimentation and educational entrepreneurialism. It seeks to harness a “pioneering spirit” and apply it across the larger learning landscape beyond the traditional or core expectations of library instruction.

The aspiration of this hub is to operate as a research and development unit, gathering, synthesizing, and testing new concepts, as well as a strike force, implementing, supporting, and assessing pedagogical ventures. This effort serves as an interface and connector to campus-wide programs (such as First-Year Experience) with an emphasis on integrative learning, transdisciplinary opportunities, and deep intellectual engagement.

Hub members work with course instructors on implementing experimental learning, applying new pedagogies, designing academic experiences and encounters, developing learning environments, and employing new technologies and literacies. Membership resembles a faculty fellowship model with self-directed independence framed around an active community of practice. Participants have the freedom to engage interests, but are also expected to undertake specific endeavors ranging from hands-on support and co-instruction to knowledge building, proposal writing, and visioning.

Hub members are currently working on individual areas including assessing the facilitation of massively open online courses (MOOCs) as well as directions with open educational resources and citizen science. They are also partnering to explore campus environments including SCALE-UP classrooms and academic programming in residence halls. Collectively, the learning hub is developing a curriculum mapping model gathering information from accreditation documents, course syllabi, and interviews about the content, skills, assignments, and frustration points, associated with particular majors. This project will not only enable the libraries to optimize core instructional efforts, but to also create new paths and partners related to the broader learning-based initiatives.

eResearch Hub

The eResearch Hub serves as the library's platform for examination of emergent issues in networked research and for deeper engagement with the Virginia Tech research enterprise. The hub empowers members to explore new eResearch roles through individual and team-based projects primarily focused on local cyberinfrastructure, or research environment, issues. The hub leverages and develops expertise in eResearch to address new data management and publishing challenges in digital research. Members aspire to examine researchers' practices, workflows, and applied technologies in data/information management to uncover opportunities for library engagement and to add value to research processes through optimized data curation services.

The principal challenges presented to members in year one: *How can we make research 'better' at Virginia Tech? How can we help faculty and students create new knowledge and organize this information in state-of-the-art digital research and scholarly environments?*

Current efforts center on the library's digital services, policies and workflows, with members collaborating to reinforce service infrastructures and to develop an organized network of library expertise prior to deep dives into research environments. This approach builds an encouraging momentum as early contributions quickly translate to immediate impact on the library's capacity to support eResearch. Members become part of an active physical and virtual community with shared interests in eScience, digital humanities, information and data policies, digital curation processes, data management, metadata, project documentation, impact metrics, and new and experimental forms of scholarly communications. The hub grows through experiential learning as hub members design frameworks for stakeholder engagement, literacy program development, space transformation, and for identifying and archiving digital data and scholarship at Virginia Tech.

Members are encouraged to exercise their expertise and demonstrate risk-taking as they launch and invite library participation in new initiatives. The hub creates learning opportunities for the library as members communicate project updates and conduct dry-runs of eResearch programs in

data management, scripting and programming languages, web frameworks, digital repositories, virtual communities and research environments, ePublishing, data visualization, data analysis, open and public access, and copyright. Data issues are central problems for the entire organization and the hub applies systems thinking to the design of learning opportunities that help the library evolve as a flexible and adaptable organization. Our commitment to library-wide participation and collaboration only strengthens our platform for engagement with external partners in supporting networked research and collectively addressing the challenge *'how can we make research 'better' at Virginia Tech'?*

CENTERS: an external strategy

Research centers are crucial academic vehicles for advancing science, making new discoveries and aligning resources to address emergent fields of inquiry, often drawing upon interdisciplinary approaches and cutting edge techniques and technologies. Centers provide platforms for excellence in research and strategic institutional accomplishments, and, specifically for Virginia Tech Libraries, partnerships with external mission-similar units and with faculty in other centers, labs, and research institutes across campus. The centers also serve as an external strategy for moving the library into the Design Phase of the transition process.

Virginia Tech Libraries' involvement in centers springs from research interests in developing eResearch and cyberlearning infrastructures that support creativity, innovation, and data-intensive research across disciplines. Participation in research centers based within or jointly sponsored by Virginia Tech Libraries also enable our faculty to experience work structures more similar with other disciplinary faculty. They spend time in library-based centers engaged in research and new service initiatives as they continue to perform their 'core' responsibilities in reference, instruction, and cataloging. Involvement in library-based centers not only strengthens their position as experts and partners in data curation, eResearch, and cyberlearning, but also their participation in academic pursuits within the overall research enterprise.

An expected impact of a stronger library research agenda is a change in campus perceptions of the library from traditional information service provider to a valuable partner in new initiatives. We anticipate that new perceptions and deeper research collaborations will translate to more tightly integrated library resources, services, and expertise within campus research and learning environments.

The Virginia Tech Libraries are currently involved with two centers:

Center for Innovation in Learning

Virginia Tech's Center for Innovation in Learning seeks to stimulate, support, and assess innovative approaches to augmenting the human intellect by means of information and communication technologies. The focus is exploring the edge of traditional learning methods and encouraging the application of new pedagogical practices.

Endeavors supported by the CIL share several important characteristics:

1. The work is *nimble* and has the *potential to scale*.
2. The work is *differentiated* from core practices.
3. The work is *intensely aspirational*, motivated by an unusually strong sense of mission and purpose.

The CIL was formed to spark innovation across the university. With the radically changing nature of higher education, new opportunities are emerging that require a focused and lateral effort. The center serves as both a venture capital arm providing seed money for new projects, but also as a creative partner providing support and encouragement. An advisory board consists of executive leaders from Learning Technologies, the Graduate School, the Division of Undergraduate

Education, and the University Libraries. These four units share in funding as well as shaping strategic directions.

Virginia Tech's Center for Innovation in Learning is more than a collective toolkit; it's a mindset for the application of change. CIL embraces a startup mentality in which project teams are assembled with representatives from around campus, rather than relying on a hierarchical staff. This encourages coalition building and the convergence of diverse skillsets, experiences, and attitudes. This approach is a critical component because it results in a "changing the world" perspective, which is a powerful motivator. The aim is not just to dabble with new techniques or technologies, but rather, to bring forth cultural transformation.

The center serves as an instigator for change, but also an incubator for ideas and creativity. CIL fosters partnerships by leveraging *networkedness*, linking together faculty and staff who otherwise might not have met and presenting them with projects that they might not typically initiate. This access to university-wide insight and to campus movers-and-shakers is invaluable to the library, providing not only enterprise-level perspective, but also helps to position librarians as leaders and change-shapers across campus.

Center for Digital Data & Scholarship

Virginia Tech Libraries' Center for Digital Data and Scholarship is a research center administered by the library and augmented by initiatives of the eResearch Hub. The center strives to facilitate excellence in global and interdisciplinary collaborations in digital research while building on the University Libraries' strengths in institutional digital curation for preservation.

The center is built on three core themes: partnerships, technology, and services. We strive to partner with individual faculty, research labs, centers, and institutes to solve academic-based problems through applied research in informatics, cyberinfrastructure, and eResearch technology development and to conduct studies of research environmental issues (including data and information policies), virtual communities, and researcher networks. We also offer campus-wide curation, consulting and training services that support the lifecycle of digital data and scholarship at Virginia Tech.

The center strives to contribute Virginia Tech's digital data to the broader network of research and values the impact of linked data and scholarship on academic visibility, creativity and scientific progress. The center offers programs to promote awareness of open movements and the immediate and long-term benefits of data sharing and preservation, including ways the academy can begin to transform research and scholarly environments. The center's programs address both the lifecycle of digital data and the disciplinary contexts in which creative and research outputs are produced, including eScience and the digital humanities. Cross-departmental consultants within the center help researchers understand the underlying issues and technologies that impact the problem-solving possibilities presented by networked knowledge and offer guidance in data curation for preservation and reuse.

Digital services offered by the center include data management, digital publishing (including support for new experimental forms of scholarly communication), virtual communities, and repository services, consulting in digital curation and data management planning, and support for researchers' informatics and scholarly communication initiatives through a small grants program and an open access subvention fund. The center's stakeholders committee currently consists of representatives from each of the eight colleges and seven interdisciplinary research institutes, Information Technology, the Graduate School, and the Office of Research.

Conclusion

As libraries adapt to change, it becomes imperative for leadership to articulate a clear vision and to provide temporary frameworks that enable adaptive evolution of library expertise and collaborations.

This article describes Virginia Tech Libraries' adaptation of AI 4-D model and creation of hubs and centers as organizational change models and platforms for collaboration that strengthen the library's capacity to adapt to a rapidly evolving higher education ecosystem. Our approach enables the library to engage with mission-similar organizations and with disciplinary faculty to enrich research and learning accomplishments and to even more fully integrate library faculty into the intellectual life of the institution. Initial results of the approach have been positive. We look forward to sharing the results of future longitudinal studies of the impact of this approach on the role of libraries of science and technology-centered universities in supporting eResearch and cyberlearning environments at Virginia Tech.

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