

Reflecting Corporate Strategy: MITRE Information Services Clusters

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Abstract

The corporate strategic plan of The MITRE Corporation in recent years has placed great emphasis on collaboration, especially cross-corporation collaboration. In response, MITRE's Information Services department created a new structural organization for our staff. Using broad technical areas of expertise that align with the corporation's technology program, Information Services created nine "cluster" groups to facilitate cross-corporation communication and collaboration within our department.

The cluster model exists as an internal departmental structure that facilitates communication, collaboration, and mentoring within Information Services. Clusters meet regularly to discuss their current research and knowledge management activities, and to plan and deliver information products that fulfill specific needs of the technical community they represent. Each cluster is led by an Information Services staff member who is designated a subject matter expert. During the first 18 months, clusters have evaluated commercial products, provided training, created wiki and SharePoint sites that target specific corporate interests, and triaged research requests. This paper outlines the process of cluster development from concept to implementation and discusses the lessons learned.

Introduction

The essence of a team is shared commitment. Without it, groups perform as individuals; with it, they become a powerful unit of collective performance. The best teams invest a tremendous amount of time shaping a purpose that they can own. They also translate their purpose into specific performance goals. And members of successful teams pitch in and become accountable with and to their teammates. The fundamental distinction between teams and other forms of working groups turns on performance.

J. R. Katzenbach, "The Discipline of Teams," *Harvard Business Review*, 2005

Katzenbach's phrase "shaping a purpose they can own" aptly captures the intent of the MITRE Information Services' research clusters. For the past several years, MITRE's leaders have emphasized knowledge sharing and collaboration across the Federally Funded Research and Development Centers managed by the corporation as a way to maximize our value to our government customers. In 2007, Information Services developed a new operational model that attempts to reflect those corporate objectives of collaboration and sharing knowledge across the

organization. Research clusters give MITRE's information analysts a mechanism for enhancing both customer services and personal professional development. Each cluster is autonomous, but networked, focused on a broad subject area, but ultimately working to support the corporate goals.

Background

The MITRE Corporation. Established as a not-for-profit corporation in 1958, The MITRE Corporation is chartered to work in the public interest. It began with employees from the Massachusetts Institute of Technology's Lincoln Laboratory creating MITRE to develop new technologies for the U.S. Department of Defense. As a national resource, MITRE applies its expertise in systems engineering, information technology, operational concepts, and enterprise modernization to address our sponsors' critical needs.

The corporation manages Federally Funded Research and Development Centers (FFRDCs) for the U. S. federal government. For the Department of Defense, MITRE operates the DOD Command, Control, Communications and Intelligence FFRDC. The Center for Advanced Aviation System Development is operated for the Federal Aviation Administration. The Internal Revenue Service and U.S. Department of Veterans Affairs are managed by the Center for Enterprise Modernization. In March 2009, the Department of Homeland Security awarded MITRE the contract to operate the Systems Engineering and Development Institute (SEDI) FFRDC. The SEDI provides advice on concept evolution, development integration, best practices in lifecycle systems engineering and management, and program-level technical and integration expertise across the homeland security enterprise. MITRE also operates its own independent research and development program that explores new technologies and new uses of technologies to solve our sponsors' problems in the near term and in the future.

Currently MITRE has 6,800 scientists, engineers, and support specialists—65 percent of whom have advanced degrees. Staff members work on hundreds of different projects across the company, demanding a high level of technical, operational and domain knowledge. The research-intensive nature of MITRE's work program requires cutting-edge information and research services.

MITRE's Information Services department. Within a year of its inception in 1959, MITRE began providing library services. It functioned as a traditional library until the mid-1990s when the circulating book collection was eliminated to channel more resources toward electronic information delivery. By the late 1990s, the MITRE Library was transformed into Information Services. The primary focus since then has been management and delivery of electronic information resources, knowledge management support, reference, custom research services and analysis. MITRE Information Services is an operating unit within the Corporate Center for Information & Technology. Our division is Corporate Communications and Knowledge Services. Like the company as a whole, most of the Information Services personnel have master's degrees, in library and information science, and some hold another master's in a specific discipline. Staff are located in Bedford, Massachusetts, and McLean, Virginia.

MITRE was one of the early adopters of the “Embedded Librarian” concept. Beginning in the 1980s, Information Services provided custom research through librarians assigned to one of the FFRDCs or a particular department or project. The analyst was frequently located geographically with the organization he or she served. Embedding the librarian, known as the liaison, within the domain organization became a successful and popular model for service delivery. It provided an exceptional environment for the analysts to gain specific domain knowledge as members of the department or project team. This operation model ensured that MITRE technical staff had the focused, custom research and analysis support needed as the company grew. Along with the InfoDesk, the custom research and analysis liaisons successfully delivered the information resources and research demands of MITRE’s technical staff.

In 2005, Information Services engaged in the LibQual survey conducted by the Association of Research Libraries. Although designed to provide analyses of academic and public libraries, the survey included elements that were somewhat applicable to corporate information organizations. Based on the survey results, MITRE Information Services learned that customers wanted improved access to electronic tools and resources, that the department’s web portal needed revision, and that the information analysts were perceived as providing excellent customer service, but that they lacked a high level of technical and direct project knowledge.

In addition, since the 1990’s the corporation stressed a practice of collaboration and knowledge sharing. Expressed as bringing the corporation and its body of knowledge to bear, this practice is seen as essential to MITRE to address sponsors’ needs.

Reconsidering Our Service Model

Compelled by the LibQual survey results and the corporate goals of knowledge sharing and collaboration, Information Services leaders decided to assess our service model to determine if the Center liaison structure was the best approach for service delivery. For the larger Centers, the single liaison model was proving to be less viable. A single liaison could not effectively support all the research needs of a Center or large division. Moreover, we began to see an enhanced demand for knowledge management services in addition to traditional research. The assessment’s goal was to define a model for providing services that would address the corporate goals of collaboration and knowledge management and give analysts opportunities to improve their technical skills, while continuing to provide a high level of customer service.

An examination of the information analysts’ project and research assignments showed that many staff members were supporting work projects in several FFRDCs. For example, one analyst was providing research on unmanned systems to military, aviation, and intelligence projects to three operating Centers. Additionally, research assignments originating within the corporate research program often engaged in systems engineering initiatives with applications that reached across several FFRDCs.

The objective of the MITRE research program is to focus on our sponsors’ important technology problems and identify areas where advanced and emerging technologies can improve mission performance or enable fundamentally new concepts of operations. Among the broad

areas of research are enterprise engineering, communications, information technology, information management, intelligence and military systems, and decision support. The research program relies on Information Service's InfoDesk, custom research, analysis, and electronic resources support. A new service delivery model would need to reflect the corporate goals of knowledge sharing and collaboration within the framework of the MITRE research program, provide opportunities to share knowledge, streamline the research triage process, and target training and products to enhance the overall value of our services to our MITRE customers.

Developing a New Model

To plan for a new operational model, we engaged Information Services management and provided a project plan outlining the objectives and process. Although the outcome was uncertain, the analysis was intended to provide a detailed understanding of the current state of service delivery, and to identify any gaps or areas for improving operations. The ultimate objective was to ensure that our service model reflected the corporate goals and that any new alignment or structure provided an opportunity for our staff to enhance their technical and domain knowledge.

Conducting a survey. When the proposal was approved, we began the process by collecting information on the expertise of the Information Services staff by means of a survey. The survey asked each individual to rate their subject and resource experience or knowledge relative to the technology areas within MITRE's research program.

Using a "tiger team." Next, we held discussions with a "tiger team" comprised of selected department members. We collected their feedback on what was and was not working with the liaison model. The team reviewed the proposal and provided insights into the current state of the service as well as recommendations for evaluating and implementing a new model.

Mapping our expertise. Brainstorming sessions with a few tiger team members resulted in a "map" of the corporate research areas and the subject matter expertise of the Information Services staff. The map showed that our staff had varying degrees of expertise and experience in most of the technology areas of concern to MITRE. Business analysis, information technology markets, intelligence, aerospace and military domain knowledge were strongest among the staff. The map indicated that areas for enhancing our expertise included Web 2.0 technologies, communications, and program management. As information professionals, we do not have the technical expertise of the engineers. However, the map indicated we needed to build on our existing strengths to enhance our knowledge of MITRE's technology programs.

In addition to the need for improving the range of technology and domain awareness, the staff identified the increased demand for knowledge management services as a business need. With the adoption of Microsoft SharePoint as an enterprise tool, customers were requesting support for managing information collections.

Asking the right questions. To meet the business needs of the corporation, we asked the following questions:

- How do we align our services to meet the information needs of the engineers and scientists?

- What is our value proposition?
- How can we grow our expertise to enhance the relevance of Information Services?
- How can we leverage our team's expertise across the corporation?
- How can we meet the officers' mandate to improve collaboration and knowledge sharing?
- What steps can we take to improve our customers' understanding of the value of Information Services?
- What steps can we take to build relationships in order to bring the right information to the right customer?

The questions were posed to the department during staff meetings. Discussions centered on the analysts' need to improve awareness of their colleagues' activities as a means to improve our understanding of the broad technology programs. There was a genuine interest in breaking down the stovepipes that had defined the department's structure for many years. The staff expressed an interest in developing their technical skills, particularly the use of enterprise tools such as SharePoint and Web 2.0 technologies.

The cluster concept emerges. The idea of cross-Center teams that interact and share ideas gradually came into focus. The staff suggested using the teams to focus on tools for developing information products customized for customers in specific domains. One of the staff members suggested the term "clusters" to define the concept of these cross-Center groups. The cluster concept began to materialize and appeared to address many of our questions.

Aligning our services to reflect the corporate research program would provide a mechanism for enhancing our staff support for project tasks. Our value proposition would focus on knowledge management as well as research services. Meeting within cluster teams could serve as a vehicle for mentoring and sharing expertise, enhancing collaboration, identifying and connecting cross-Center projects, and linking research and knowledge management needs across the corporation. Information products such as newsletters, wikis, and other information management and delivery platforms could be developed specifically for the research areas, as opposed to one-size-fits-all information products. On an ad hoc basis, the analysts had always communicated information about their project work, but no formal model existed to ensure that relevant and timely sharing and collaboration took place. The clusters could formalize that that interaction.

In the initial proposal for the clusters, the anticipated benefits included:

- Growth in subject expertise for all staff
- Expanded customer networks
- Improved backup and reach-back support
- Better identification of stakeholders
- Improved delivery of information products tailored for specific domain areas
- More balanced workloads

After the surveys, analysis, and feedback were collected and evaluated, the cluster groups rolled out in the fall of 2007. Going from the initial concept to implementation took approximately six months.

Implementing the Clusters

In the fall of 2007, we established nine cluster groups, each reflecting a broad technology area within MITRE's research program or business operations, and encompassing topical areas such as aviation, homeland security, healthcare IT, intelligence, and military systems.

Cluster structure and meetings. Based on the initial staff expertise survey, 19 staff members from Information Services were assigned to two or three cluster groups, which range in size from four to ten analysts. Each cluster includes staff from both locations, Virginia and Massachusetts. Individuals who expressed an interest in increasing their awareness in a particular area could also join a cluster. A cluster lead was assigned to each cluster to serve as the coordinator charged with planning meetings, setting agendas, and ensuring that cross-cluster communications take place.

A subject matter expert (SME) was also identified for each cluster. The SMEs were selected based on their knowledge and experience with that cluster subject and is the first point of contact for custom research requests that come into the department through the InfoDesk. Before the clusters existed, the only method for triaging research assignments was a request to the team lead to find additional support. The cluster structure eliminated the management-driven process of identifying an analyst with the requisite expertise and time to take on assignments.

SMEs are charged with communicating with their team in order to maintain an awareness of all tasking associated with the designated subject area. This is managed through direct, regular communication and through team meetings that take place every 4 to 6 weeks. Meetings are conducted via conference calls or video teleconferencing. The cluster model allows each group to operate in a manner that best suits the collaboration, training and product delivery needs of the team members and the customers they support. The only standard requirements are to communicate, share knowledge within and across the clusters and the department, and align services and products to customer needs.

The role of the tiger team. Including the tiger team was critically important during the planning and implementation phases. It was essential for the staff to feel ownership of the process. Addressing concerns about the change from the liaison model required discussion with several analysts who expressed apprehension about the possible loss of established customer relationships. There was concern about the loss of autonomy and the added time demands of additional meetings. Several staff members admitted they saw no potential value in the restructuring.

The tiger team played a vital role in advancing the transition from the liaison model to cluster teams. They provided suggestions for the subject areas, recommended team affiliations, and operational processes. Along with department managers, the tiger team members helped assuage concerns about customer management. Many of the analysts have years-long relationships with customers. Those associations do not change with the cluster model, but are encouraged to continue. Department meetings went from semi-monthly to monthly in order to allow time for cluster meetings. For those members who saw no potential value, we asked them to engage and give the clusters a chance to succeed.

Outcomes

In the 18 months since their inception, the clusters, by design, have been dynamic and adjusted to meet changing customer demands. Membership has shifted with workloads, and with the introduction of enterprise tools such as wikis and other Web 2.0 type tools, the clusters have provided targeted training to meet specific customer requirements. The clusters have also succeeded in serving as vehicles for mentoring teammates and colleagues, particularly in the use of specific tools and technologies.

The clusters are able to provide time-sensitive products. For example, the recent presidential transition generated requests across the company for news and alerting services. A cluster group that focuses on government management quickly assembled a wiki, RSS, and SharePoint products that delivered updates on vetted content of precise interest to the MITRE community. Creating, populating, and managing those sites would require extensive time from a single analyst, but the cluster group can delegate responsibilities and stand up the resources within a few days. The presidential transition sites avoid unnecessary duplication of effort and they are monitored and updated regularly without demanding excessive amounts of any individual's time.

Other examples of cluster work include wiki pages that provide MITRE technical staff with a starting point to vetted information resources on targeted topics, and SharePoint sites that provide environments for document management and collaboration. Cluster members also provide support to their colleague's newsletters and alerting services.

Shared work tasking is another successful outcome. The cluster meetings offer opportunities for teammates to develop relationships with co-workers. One result has been a successful hand-off of work tasks while co-workers are out of the office. The analysts feel more confident that the assignments are well managed by knowledgeable colleagues.

Staff feedback. The initial proposal for the clusters included a phase for collecting staff feedback and evaluating the effectiveness of the clusters. After operating for 18 months, a survey was taken in February 2009 to gauge the current state of the clusters and to identify areas for improvement. Of the 19 cluster members, 17 responded. The feedback indicates that the teams see advantages to the cluster model, although there are still areas for improvement.

The anonymous survey asked the members to rate how the clusters were meeting the goals articulated in the original proposal. It asked if the clusters were providing opportunities for training and skill development, improving triaging of research requests, providing a venue to learn more about MITRE's work in the cluster topic area, and encouraging communication and collaborations with department colleagues. The survey also asked if time spent in meetings was "well spent" and if the analysts increased their understanding of work programs across the corporation.

Respondents were asked to score each element on a scale of 1 (disagree) to 5 (agree). For each question, the total score exceeded the "neutral" level of 3, suggesting that overall the

clusters are achieving their initial objectives. The scores for “improving skills” and “triaging requests” were the highest, with average scores of 4.2 and 3.7, respectively. “Time well spent” scored 3.6. “Communications,” “improved domain knowledge,” and “increased cross-Center awareness” all scored 3.4 or 3.3. Although all the scores are above the mid-point, they indicate that we still have opportunities to build on the initial successes.

The survey also asked for areas for improvement. The feedback included recommendations for evaluating cluster size, suggestions for improving overall effectiveness, and training opportunities. There were also comments about managing the meetings and improving their efficiency and effectiveness.

In their own words. When asked to comment on what they like best about the cluster, staff members responded:

“Finding out new projects and work assignments across [our department] and MITRE. The clusters have also given me the opportunity to not only learn new technology skills, but implement them for actual information projects.”

“I like having a set of folks to share and collaborate with on targeted requests that is achieved by understanding the clusters, their individual coverage areas and the people/expertise available within each cluster area. As a cluster lead, the ability to triage incoming requests to a responsive and competent team of people who take their cluster member responsibilities seriously is invaluable. It's also nice to have a team that can spawn off a sub-team to act in an advisory capacity within Information Services.”

“Working with a small part of our group that has common, targeted focus; getting to have more in-depth discussions about areas of interest; learning from those with like interests and knowledge.”

“Increased awareness of my colleagues' activities that are related to what I do.”

“Working with other members of [the department] with whom I don't normally work. It's also been helpful to find out about additional resources within MITRE.”

“They do help us focus on a subject area and the work others are doing. It's almost like a mini dept meeting where we would go around the room, giving a brief description of what each of us was working on.”

“Regularly scheduled meetings to share activities and communicate ideas of ways to collaborate. We share more ideas about actual research projects with which we are involved. This sharing is more topic-relevant. Our previous method of sharing activities department wide with our round robins at meetings sometimes got to be too irrelevant. This way we are more focused on items of more interest.”

“Working with the people I see so infrequently; learning about new technologies and ways to deliver research results.”

Focus groups. As a follow-up to the survey, MITRE's Corporate Communications department conducted focus groups with Information Services staff members, probing for specifics on how the clusters can adapt and implement changes to improve their overall effectiveness.

Two focus groups were held in March 2009, one in McLean and one in Bedford. The one-hour sessions focused on the specific actions the department could take to enhance and improve the cluster model. The summary findings of the focus groups noted that there was still some confusion about the function of the clusters. A second area needing clarification concerned the role and responsibilities of the cluster leaders, and a third concern centered on the need for defined meeting schedules.

Written mission statements and clearly defined goals were recommended as a means to solidify the overall concept. Establishing and enforcing the responsibilities of the cluster leads and the meeting schedules were suggested to address the second and third areas of concern. As a result of the survey and focus groups, department leaders are working with the cluster leads to ensure that all the issues defined by the survey and focus groups are addressed. The goals now are to build on the successes of improved communication, collaboration, and skill development and to enhance the clusters through better mission definition and meeting structure.

Lessons Learned

For the department, the primary lessons learned during the first 18 months of cluster operation include:

- Aligning the cluster mission and goals to the corporate strategy enhances the function and operation of the department team as a whole.
- Including the staff from concept, through planning and implementation helps ensure their engagement and ownership of the process.
- Giving the clusters authority to make decisions about services customized for the specific domain areas ensures that customers receive appropriate and effective service.
- The staff's overall understanding of the corporate work program is improved with cross-company teams that communicate in a formal structure.
- Engagement of the department manager is key to ensuring that the clusters stay viable.
- Continuous communications is vital to the success of this initiative—both within the clusters and within the department.

Going forward, department management will continue to work with the clusters to identify areas where we can build on the lessons learned.

Conclusion

The clusters have a “purpose they can own”—ensuring that Information Services is providing the research, knowledge management, and information products that support MITRE’s goal of delivering systems engineering and information technologies that address our sponsors’ critical needs. We believe that aligning our internal structure to reflect the corporate strategy is essential to ensuring that MITRE Information Services continues to serve the vital information needs of the corporation.

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