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The Politics of Information Management

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INTRODUCTION

Developing, sharing, and working with information in today's environment is not an easy task. With today's technological advancements, the management of information appears to be deceivingly easier. However, building and maintaining an infrastructure for information management involves complex issues, such as group consensus, access and privileges, well-defined duties, and power redistribution. Furthermore, higher education institutions are continuously faced with the need to balance the politics of information sharing across departments, whether the administration operates in a centralized or decentralized manner.

The need to develop, share, and manage information in a more effective and efficient manner has been proven to require a challenging shift in the norms and behavior of higher education institutions as well. This shift does not have as much to do with the actual use of technology as it does with the cultural environment of the institution. Davenport notes:

> Information cultures determine how much those involved value information, share it across organizational boundaries, disclose it internally and externally, and capitalize on it (Davenport, 1997, p. 35).

Depending on the history, people, and cultural environment, each organization faces its own dilemmas around the task of compiling and sharing information.

This case details one institution's attempts, at a departmental level, to develop an information system for planning and decision-making. It looks at the department's effort to manage and track students and to design a management tool that would help departmental faculty to function more effectively. It examines the challenges faced in managing information and the behaviors that drive new information management processes with the increased use of technology.

CASE QUESTIONS

- Whose responsibility is it to lead information systems integration in higher education? Who will or will not benefit from this?
- How do certain behaviors and group norms help or hinder the effective design and implementation of information systems?
- How can decentralized organizations negotiate and balance the competing demands and goals of the institution?

CASE NARRATIVE

Background

Midwestern University (MU) has an enrollment of approximately 15,000 students. Since it was founded, the mission of MU has been to provide world-class leadership in teaching and research. Within MU there are 15 academic departments and several administrative units. University administration had historically taken a very centralized approach to program enrollment, recruitment, financial aid, and general administration of student-related matters. However, more recently, top-level administration has encouraged individual departments to take more local control of their planning, ranging from student administration to budget setting. The push for local or departmental control has not been accompanied by the requisite development of reliable information systems necessary for both short- and long-term planning. This decentralized approach has placed departments at a distinct disadvantage due to increasing levels of accountability at the department level.

Historically, information such as student enrollments and financial aid allocation flowed downward from central administration offices to the departmental level. The upward flow of information consisted of a set of checks and balances associated with departmental graduation requirements. In addition, data that were specific to the department level did not flow upward (e.g., faculty advising lists and student progress reports). Administrative divisions were centrally managed with multiple databases tracking data in functional units. For example, enrollment data were maintained and controlled by admissions, but the graduate studies office controlled doctoral student data. Many of these systems were run with old and outdated software, and the university struggled with the lack of a coordinated information system that managed all data collected throughout the university. This resulted in issues of data integrity, redundancy, and accuracy, with a low level of trust concerning the interpretation of data.

Enrollment data were maintained at the university level. These data were available to assist the department in knowing how many students were enrolled during a particular semester. However, it could take three to four weeks to obtain data from the central student information system, and field definitions were seldom defined. Additionally, because students were not centrally tracked through the various stages of doctoral completion, it was difficult if not impossible to ascertain the types of classes, services, and faculty commitment that students required with any degree of certainty. Departments relied on anecdotal information to conduct planning, and this became a standard and acceptable practice by default. Additionally, many faculty suspected that there were dozens of students who slipped through the cracks in the process somewhere along the line and might have been precipitously close to dropping out.

There was also a high level of dissatisfaction among MU students with regard to information management. Students were frustrated with the number of repetitive steps and processes involved in their educational experience. For example, students needed to register for classes at the registrar's office. However, depending on the class students wanted to register for, they may have needed to receive departmental signatures prior to registration and then go to an entirely different office to make tuition payments. Because of the amount of time spent in completing these tasks, students' frustration level only increased when the data across these areas could not be shared.

The Arts and Humanities (A&H) department has approximately 200 doctoral graduate students, 200 graduate master students, and 300 undergraduates enrolled. Unlike the master

and undergraduate students, who have structured two- and four-year programs, doctoral students went through several different stages of enrollment; first as graduate students enrolled in classes, then as doctoral candidates once they passed comprehensive exams, followed by a period of time during which they took independent dissertation-related methods courses and dissertation writing seminars. This multi-stage process was very complicated to track and the department had been unable to determine with much accuracy at what stage in the matriculation process their 200-plus doctoral students were at any given time.

This had many implications for departmental planning. The opportunities and challenges presented by a more decentralized structure of decision-making needed to be supported by reliable information. In conjunction with this challenge, the department began to conduct long-term planning for doctoral course offerings and faculty dissertation loads. This affected planning for core courses, research seminars, and dissertation writing workshops.

Additionally, there were implications for faculty workload since work with doctoral students could be a very time-consuming process at various stages of their degree. In fact, the proposal and final writing stage for doctoral students working on their dissertations often required a large investment of faculty time, mainly consisting of reading draft chapters and supplying timely feedback.

The Politics of Information Sharing

With the University's push to a decentralized model of operation, departmental accountability and ownership of doctoral student data were becoming a priority. The need for the department to track and assess doctoral student status was crucial to both the doctoral students' and departments' success. Members of the department decided that they needed to do something about the situation. They agreed to tackle their first goal – how to improve access to student information.

In an attempt to address this issue effectively, a needs assessment was conducted. This consisted of determining what type of information was required about doctoral students in order to do more short- and long-term planning. During the planning process, the department faculty realized they did not even know how many doctoral students had continuous enrollment over the past two semesters, let alone how many students were projected to graduate that year. There were larger issues of completion and attrition that faculty wondered about but seemed afraid to find out. Simple questions were unable to be answered, such as: how long do doctoral students take to complete the program, how many students have completed their coursework but not yet taken their comprehensive exams, how many students need to take a dissertation writing seminar the next semester, and how much financial aid support do students need to graduate.

Not only were there student-related questions without answers, but there were also issues of faculty workload. There were 25 full-time faculty members in the A&H department. Seven of them were untenured but on the tenure track. It had been brought to the Dean's attention in promotion and tenure reviews that the junior faculty might have a disproportionate amount of the doctoral student load. However, when asked, the department chair was only able to answer the question based on general estimates and hearsay. There were no reliable data regarding faculty workload issues. This lack of information regarding doctoral students and faculty workload only made stronger the department's chair request that the information management of the department be improved upon.

The departmental culture was one in which information was heavily protected. Traditionally, the sharing of information had been the source of political disputes. Faculty

neither felt that they gained anything by sharing information about doctoral workload, nor did they see the need to. In this case, senior faculty members typically had a lighter doctoral student workload than junior members and wanted to avoid workload reallocation. However, junior faculty who had a heavy workload struggled to obtain and share doctoral student information with other faculty. In this case, these issues only added to the closed nature of sharing information in the department, since information sharing behavior was neither recognized nor rewarded.

> Whether we like it or not, information politics involves competing interests, dissension, petty squabbles over scare resources (Davenport, 1997, p. 78).

A First Step

Two years earlier, the department chair had instructed his administrative assistant to begin to collect and maintain departmental doctoral student data using a Lotus spreadsheet. These data were kept independently of the university-wide information systems. Numerous challenges associated with creating, sharing, and updating the spreadsheet files were faced. The historical operation of the department was heavily reliant on another office's data, and faculty's self-management of their doctoral students led to information that was not readily available at the departmental level. Furthermore, it was very difficult for the administrative assistant to consolidate the information from the disparate systems and faculty members. Specifically, the data that were to be compiled included information such as: the number of credits for students currently enrolled, their year in the program, their comprehensive exam completion status, their faculty member adviser, and the amount of time students had left to finish their coursework.

As indicated, this information was not centrally located and each system varied in type and form. Within the department, some data were in hardcopy only, filed in a file cabinet or in handwritten notebooks that faculty used for personal tracking of their students. Some of the information was not even documented or available in an accessible system. With so many varying types of systems and the data being scattered throughout the department, the effort to consolidate the information into a spreadsheet was difficult. In order to create a workable tool, the scope of the data collection effort was limited only to departmental doctoral student information.

Once the information was collected and consolidated into the spreadsheet, reports were summarily disregarded by faculty. When looking closely at why the spreadsheet failed, several items were identified. For example, there was the limitation that spreadsheets impose on data – data must be depicted in columns and rows, and the ability to crosscut data is limited. For example, a header row contained student year, faculty adviser, and the number of years that student had been enrolled. The spreadsheet had 50 columns across and more than 200 rows down. Because a spreadsheet cannot be queried, the only way to find or organize the information was by sorting the entire spreadsheet. This became cumbersome because, if a multiple column sort was conducted, Lotus would sort one column at a time, independent of the other columns, with the end result being a sorted list of all students not just the category desired. The administrative assistant tried to counteract this by taking a portion of the complete spreadsheet and cutting and pasting it into another file. This resulted in multiple spreadsheets with information that needed to be updated in eight or nine different files. Even if the person responsible for doing this kept track of the updates, it would be extremely inefficient, redundant, and prone to error.

The inability to develop special views of the data and custom reports was a limiting factor with the spreadsheet. This querying limitation only increased the lack of support and use for reliable information. A second, and more obvious challenge, was the administrative assistant's lack of sophistication and training around the software itself.

The Web-Based Relational Database Project

Despite the initial failure, the chair of the department asked two technologically minded faculty members, both untenured, to write a proposal for building a relational Web-based database that would consolidate and centralize data from several different areas of the university, including other administrative offices outside the immediate department. They submitted a proposal to build a Web-based, password-protected database that would be accessible to all faculty. The proposed system would be easy to use; they estimated that it would take approximately two hours to train a computer-knowledgeable individual to use the system. The data would reside in one file, and reports could be created automatically. They would provide two-hour training for the administrative assistant, a two-page list of instructions of how to import data and produce reports, and a one-page list of instructions for faculty members on how to access and use the database via the Web. They estimated that it would take them eight months to complete the project. The department chair gave them $7,000 the next week to begin their work.

The design team was led by the two faculty members. An outside consultant who specialized in database design was hired to join the team. Because the Web-based technology was somewhat new to the department, a consultant specializing in Web development was also brought on to help create the proposal and pilot system.

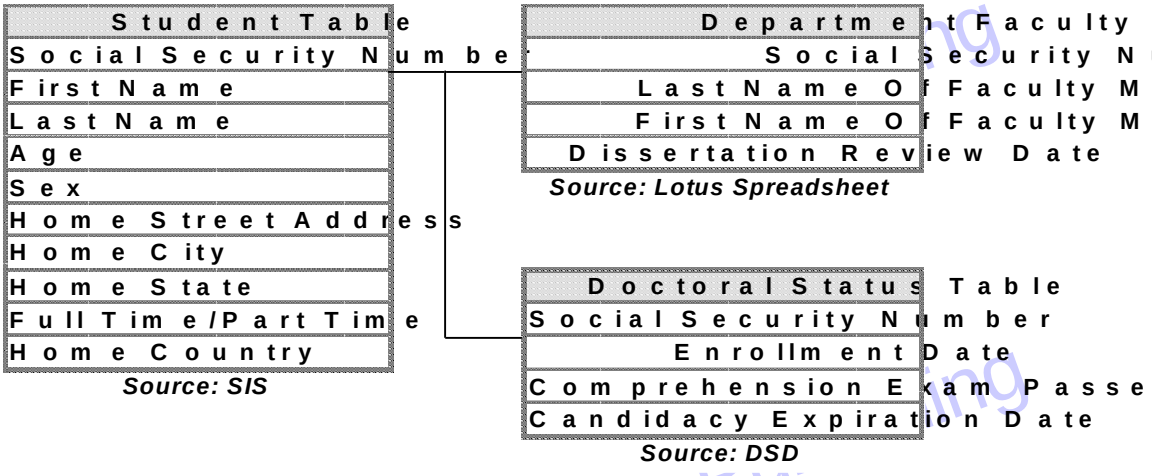
In creating a proposal that would define the scope of the project, the resources required, and the required information for the database, the two faculty members divided the project into three main phases – planning, design, and implementation. This provided them with a framework that gave measurable and clear checkpoints that were dependent on departmental faculty approval.

The planning stage first involved a requirement study that consisted of identifying a comprehensive list of the department's information needs. This also required looking at external data requirements and the systems that data would come from. The additional data that would be gathered from across the university included data from the Student Information System (SIS) managed by the Registrar's Office, the Doctoral Student Database (DSD) managed by the Graduate Studies Office, and the Student Payment System (SPS) managed by the Student Accounting Office. Student data for each of these systems were to be consolidated into the A&H relational Web-based database, along with additional data that were collected at the departmental level only (e.g., faculty advisers and dissertation chairs).

The two faculty leaders conducted interviews with each of the faculty and prioritized requests from the departmental members and the chair. The need for new data that had not been collected previously by any office was also identified. The compilation of all the requested data came from approximately 20 different subsystems both manual and electronic. As described earlier, these systems ranged from word processing to handwritten notebooks.

The next phase required designing the relationships between the data elements and tables. The database consultant helped to incorporate a database design that was able to depict the relationships between each of the different data tables with relative ease. This provided an initial understanding of system complexity by focusing on the relationships between data, data types, and source. This exercise was essential in proactively understanding how the new system would

Diagram 1: Sample Relational Table



be queried and what information would be collected in the new system. Diagram 1 shows a relational schematic of how a few tables in the database would be linked by student social security number, a primary and unique key across each table.

The diagram illustrates the relationship between the new tables to be created and the source of the data. The design team determined that approximately 32 tables with 500 data elements would be required in the new Web-based system. This included information such as: demographics, address, first enrolled, last attended, dissertation chair, whether students attended school full time or part time, and when their doctoral candidacy expired.

The issue of data maintenance was raised as a main concern in the design phase, and the team recommended a system manager to keep the data integrity at an optimal level. The team selected software tools based on the data complexity and faculty interviews. Having a clear understanding of the faculty requirements concerning doctoral student information, explicitly outlining the data relationships, and assessing the current mix of systems and interfaces, the team was able to confidently select effective software tools for implementation. The main goal surrounding the selection process was to identify a user-friendly and intuitive front-end that would provide faculty with ease and functionality for sharing and accessing data.

The last phase, implementation, consisted of running a pilot with faculty, training the faculty, and receiving sign-off approval from the chair to operationalize the entire system. In piloting the system the two faculty members demonstrated the capability of the new system at a faculty meeting and also provided one-on-one demos. Based on these demos, faculty members requested even more features and functionality from the system. Not only did the team implement the requested functionality, but they also incorporated an automated feedback form that would allow new feature requests to be delivered to the core development team on an ongoing basis. For example, if a faculty member identified a new feature she or he wanted, the faculty member could complete an online form that would forward the request to the right development team member. In addition, a response could then be provided back to the faculty member indicating when and if the proposed feature would be integrated. Up to this point, the core team thought the support for the system was mostly positive and energetic.

As faculty members started to use the pilot, problems began to surface. In order for the information system to become embedded as an integral part of the department's planning and decision-making processes, faculty needed to verify data and recommend reports for use. However, faculty started to resist requests for updated information, such as confirmation of their status on all of their doctoral committees. Because these data were not centrally maintained, the current information was anecdotal and was sometimes passed on incorrectly by word of mouth. When faculty were pressed to provide a list of their doctoral advisees, they either did not have the time or could not figure out how to look at the existing list online. Some faculty went so far as to have their secretaries print out dozens of pages of student information so that they could check it manually.

When there were finally enough data in the pilot to begin to produce reports with calculations from the relational database, such as faculty workload, enthusiasm for the project started to fade and issues of information sharing, politics, and resistance to change became visible. Additionally, the administrative assistant quit during this time leaving no trained replacement.

At this point, support and participation levels were quite low. When faculty members complained that they still did not understand how to use the Web-based system, additional one-on-one training was offered. Some faculty thought the system was too complicated and reverted back to their old paper systems of tracking, while others simply did not participate, saying that the system was cumbersome. Unlike the planning and design phases, faculty members began to show non-supportive and unresponsive behavior to the pilot system. In fact, the few faculty members who did use the system were still collecting and managing their individual information and only checking the system as a secondary source, even though this system was easily accessible from their homes or offices and globally available on the Web.

Information that was once individually owned and managed became visible to the entire department. Historically, faculty were not used to working together collectively to solve department-wide problems. Furthermore, as the two untenured junior faculty members were the main drivers behind the proposal, senior faculty were most vocal in their resistance to the system, which meant that a full-scale implementation looked doubtful. As Green indicates, this lack of support is critical in technology and higher education integration:

> […] failing to recognize and promote faculty who invest in technology in their scholarly and instructional activities sends a chilling message about the real departmental and institutional commitment to the integration of technology in instruction and scholarship (Green, 1999, p. 8).

ANALYSIS

What would a successful implementation of the Web-based system have looked like? Would it have changed the department's attitudes, changed the behaviors around information sharing, or improved the overall experience for doctoral students? These questions have gone unanswered because of the complex interrelations of technology, people, and information-related change.

Although the department chair and faculty members initially decided to move forward in improving doctoral student information availability, two very different attempts, both

resulted in failure. The spreadsheet and the Web-based database were functionally different, yet both failed around similar issues: group buy-in, information ownership, data collection, and an inability to change the working norms and culture.

In both cases, garnering initial buy-in did not seem to be difficult. The faculty and the department chair wanted to increase access to student information. Everyone agreed that the use of technology could provide the department an advantage in planning and meeting goals and objectives. However, when faculty members were asked for information or asked to change their working patterns, few cooperated. There was a discrepancy between what agreement or buy-in meant, specifically between what was said and what was practiced. The faculty agreed, in theory, that the use of technology was needed to increase access to student information. However, it could be argued that the buy-in was not present when the ideas required change in work and behavior patterns. Furthermore, the responsibility for design and collection was handed-off to individuals in the group with junior status. Even though they had more technical expertise, their junior status may have dissuaded senior faculty from embracing the project, and in fact, the two junior faculty members were neither recognized nor rewarded for their efforts. Morgan notes:

> When a high-status group interacts with a low-status group, or when groups with very different occupational attitudes are placed in a relation of dependence, organizations can become plagued by a kind of subculture conflict (Morgan, 1986, p. 137).

In the design process, the faculty were challenged by setting standards and specifying criteria in order to define data fields. This process worried some faculty. For example, the ability to measure doctoral student workloads may have raised a discussion around redistributing work. The image that some faculty portrayed of being overloaded could have been proved or disproved. Obviously, some faculty might have benefited and others might have faced unease and additional work. The data collection and information ownership activities were difficult because of the underlying norms and behavior of the department.

> Different norms, beliefs, and attitudes to time, efficiency, or service can combine to create all kinds of contradictions and dysfunctions. These can be extremely difficult to tackle in a rational manner because they are intertwined with all kinds of deep-seated personal issues that in effect define the human beings involved (Morgan, 1986, p. 137).

The complete list of recommendations and requirements for implementing the system across the entire department was never fully realized. For example, a "system owner" who had skills in information management was recommended. However, the chair and fellow faculty members did not think that such a person was necessary or needed. An appreciation of the technological skills required to maintain the system was not present. In an attempt to leverage other technologically driven functions of the university, the faculty team tried to involve the director of Information Systems (IS) at the university to help drive the implementation as a pilot project to gain support. Despite the system being well received by the director, the IS department was unable to support the effort because of costs and other in-house responsibilities.

Furthermore, the chair and faculty members wanted to hand off the maintenance of the system to an administrative assistant even though the skill sets required and recommended by the core team did not match. Secondly, despite the $7,000 grant allocated to this initial effort during the proposal stage, the estimated cost to roll out the system across the department was closer to $150,000. The faculty team came up with these estimates based on the work done in the design and implementation phase. Specifically, the technical development work, the expected database size and volume, and the maintenance of the new Web-based technologies drove up the team's estimate. As the continuation of the project became extremely expensive, the department chair did not approve the roll-out plan.

One of the most challenging issues was the working norms and culture of the department concerning issues of data ownership and sharing. This department was resistant to technology in practice and was not open to sharing information, let alone integrating their respective information processes. The culture at the department level was not one that was open to sharing information. This was especially apparent when faculty did not support the need to share workload profiles nor discuss doctoral information with other faculty members. This attests to the importance of not moving forward until there is evidence of real commitment from other stakeholders.

Lastly, and perhaps most importantly, the data and information availability that the system provided were not culturally aligned to the individualistic, competitive, and non-sharing environment at the department. These are known to be major factors in the failure of information system project design and implementation (Lyytinen and Hitschheim, 1987), and which ultimately contributed to the system implementation not being rolled out across the entire department. As Senge illustrates:

> New insights fail to get put into practice because they conflict deeply with internal images of how the world works, images that limit us to familiar ways of thinking and acting (Senge, 1990, p. 174).

CONCLUSIONS

Prior to the onset of information-related initiatives, whether it is a new system, a push for new behaviors in managing information, or training faculty members with new tools, higher education institutions must examine information-sharing behaviors. In order to begin this examination, it is critical to understand the people who will drive, implement, and sustain the change. Similar to the resistance towards the implementation of the Web-based system in this case, if change is to occur, new systems and structures that can drive information-related change (e.g., rewarding people for sharing information) must be examined. As higher education institutions strive to improve access to information and integrate new technologies, it is clear that the information environment (including the people and their behaviors) is a critical deciding factor while striving for and designing new information management processes for decision-making.

In summary, improving the use of information technology in higher education cannot be the task of a single department, professor, or person. There are critical success factors that must be addressed concerning ownership, politics, and information sharing, despite the traditional challenges of information technology costs and maintenance. A national campus computing survey indicated that 62 percent of all higher education institutions have a strategic plan for information technology, yet there are still many difficulties associated

with the norms and behaviors of an organization's culture during implementation (Green, 1999). Therefore, when embarking on the infusion of information technology into a higher education setting, the possible non-technical challenges must be considered. Notes Morgan:

> When we choose a technical system (whether in the form of an organizational structure, job design, particular technology) it always has human consequences, and vice versa (Morgan, 1986, p. 38).

This is important to realize so that a department or organization is not faced with trying to design a technical solution for a non-technical problem.

In this case, the problems encountered in required data collection were not technical in nature, but rather a result of a pre-established set of norms among the faculty. Distinguishing these issues, where visible, is important for the design and implementation of information systems in higher education. Says Davenport:

> Information and knowledge are quintessentially human creations and we will never be good at managing them unless we give people a primary role (Davenport, 1997, p. 3).

This primary role is not merely a leadership position on a committee that approves a technology or makes new information polices in higher education. Instead it is the central role in which people, their behaviors, their information sharing attitudes, and the environment of an institution are examined, understood, and incorporated into the information-related change.

DISCUSSION QUESTIONS

1. What are the similarities and differences between the first attempt to implement the simple spreadsheet and the second relational Web-based system? What people, system, and information aspects drove the outcomes?
2. What issues of information sharing for faculty appeared to drive their behaviors and reactions to the system?
3. Is faculty access to student information necessary in order to carry out department-wide planning? How does this impact university-wide goals and objectives?
4. How can information technology leaders address non-technical issues that may interfere with the design and implementation of information systems?

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