CASE STUDY

A New Information System for the Public Policy Department

Things are changing rapidly at the Public Policy Department at Upstate University. Just three months ago, you were hired as administrative assistant to the Chair, Alex Wu. Your job duties include broad responsibilities to develop and manage systems and provide for student support and service. Just this past week you have learned that Alex is stepping down and a new chair, Georgette Richmond, will be taking over next semester. Among other transitional tasks, Georgette has asked you to take a look at the Information Systems that support the department and make recommendations to her as to how best to modernize and update these systems. The information systems supporting the department have evolved over the past 7 to 10 years and are working just fine. However, the university is now moving to a new student records system that employs an Oracle relational database system. Once operational, the new system promises to make an abundant array of new data available to the department easing the data entry loads for staff working for the department and helping to keep various data sources more completely synchronized.

Current Data Systems within the Department. At present, the department relies on three linked tables of data for its main information needs. Each of these tables was constructed by a different chair in the past and has been "rolled over" into Excel spreadsheets and appears to be working just fine. The first of these is a spreadsheet that keeps track of faculty members. The chair, working with the support of the departmental secretary, keeps this data up to date and it serves as a key source of information about all faculty. A second spreadsheet is used to support the regular scheduling of classes. The department maintains a tentative course schedule that projects all courses to be offered four semesters into the future on a rolling basis. Each semester when the registrar needs to schedule a new semester, the department chair simply prints off the schedule for the next year and asks the department secretary to input the new schedule into the registrar's class entry form. This spreadsheet is maintained primarily by the departmental secretary with advice and support from the Chair. The third spreadsheet contains information on students. Traditionally this information is kept by your office. Data on all students is first captured when a student applies to the program. During the application and recruitment process, this information is used to support admissions decision and upon admissions to track student recruitment. Once students arrive on campus, this data is updated to provide a current record of all students including information about their advisor, concentration, internship status, and a host of other pieces of information necessary to track student progress. The attached table tracks some of the major entities and their attributes in these three existing databases.

In addition to these three formal sources of data, you have been informed that other faculty keep their own more or less formal information systems. For example, the director of the Ph.D. program keeps additional information on all students enrolled in the Ph.D. program. This information includes detailed information such as when and

whether they have taken their comprehensive exams, and other information necessary to track degree progress. Each year this information is used in the annual review of each Ph.D. student. In addition, some faculty keep records on all of their advisees, making notes of what courses they have advised them to take sometimes appending additional advising notes. You understand that many of these informal faculty systems are in the form of hand-written paper files.

Problems with the Current System. You are familiar with the old adage, "If it ain't broke, don't fix it", so you have asked around to see if these functional systems really do have problems that need to be fixed. You have been told about a number of issues.

First, all of these separate data systems take a lot of time to update and to maintain. You have been told that individual faculty members, the departmental secretary, the chair, and a graduate assistant in your office spend a lot of time keeping all of these systems up to date. And much of that work is repetitive. For example, if a student changes his or her home address, that change has to be entered in multiple places. Several staff have noted that the registrar's office captures these changes already, so why not just use their address updates to keep all of the departmental records current? On the other hand, if all of these diverse systems were to be integrated and linked to the registrar's system, then when the department learns of a student's address change, it could help make the change on behalf of the registrar's system.

A second problem is that these data systems always seem to be drifting out of synch. Lists of student advisees taken from the faculty database may not match a similar but logically related list of faculty advisors taken from the student data system. In part this problem is related to the first problem in that all of the staff working on data systems do not have enough time to keep up on each other's updates. But it is also more fundamental because the various systems seem not to have routine and reliable mechanisms for sharing data and keeping up to date with each other.

A third problem is that even with all of these information systems, it seems as if the Chair always has to do a special piece of analysis to get necessary information for other than routine purposes. And these special studies are taking up lots of time that could be used for different purposes. For example, the chair recently wanted to know how many graduating students took all of their core classes with full time faculty. Getting this information proved to be a huge task and ultimately a graduate assistant had to spend several days working out of the registrar's office working on the university's data system—the information simply could not be extracted from the data systems within the department.

Hope (with some reservations) comes from the Registrar's new relational database system. Offsetting these several problems are some promising signs that may be coming down the line from the registrar's new relational database system. This new system replaces a legacy system that has been used to support admissions, registration, and transcript generation for many years. It is a fully relational system that has been carefully designed by professional consultants using the Oracle database system.

Although the design was completed over a year ago and a successful pilot has been run, the new system is still not fully functional. There are a number of "quirks" in the new system that prevents it from generating historic electronic transcripts that are exact matches to what the legacy system produced. Apparently curriculum and other changes over the years, captured within the legacy system need to be re-programmed into the new system and this is taking longer than had been expected.

In addition, the registrar's office has a number of security and privacy concerns. Since this system is being used to collect and post student grades, they feel that the system should be relatively closed with limited access by authorized users in all departments on campus. They want to make sure that only a limited number of authorized work stations have full access to all information. However, standard and secure forms that display fixed data items (such as a student's current registration status or a faculty member's class list) can be made available very broadly. That is, while the registrar wants all students, faculty, and administrators to have access to the data that they need to do their work, she is loathe to give open access to all data in a willy-nilly fashion. The whole system needs security and confidentiality procedures that are consistent with good practice and in many cases federal law concerning student records.

Hence, while the registrar's office is open in practice to opening their data resources for departmental purposes, they recognize that everyone should have modest expectations and be prepared to move in a slow and cautious manner.

Your Assignment. Georgette Richmond has asked you to prepare a decision memo that she can share with the department faculty on this matter. She seeks a focused memo that recommends a process to move forward. She recognizes that a full redesign can and will take a lot of effort, and so she is not looking for all that effort to be done yet. She wants a high level view of how to proceed, what factors she should be considering, with some options for moving forward. She understands that there may be some technical advantages to using a newer database technology that may be compatible with the new system being created by the registrar. One of her requests is that you produce a mini-pilot version of a relational database that she can use in her discussions with non-technical members of the faculty[1]. However, your memo should not be just a technical treatise; she is definitely interested in the full range of organizational, policy, and cost factors that will impact on moving forward with a new information system. Your brief decision memo will need to be scanned and comprehended by non-technical faculty members very quickly. However, technical appendices to the memo will be necessary to convince the more interested members of the faculty of your proposal.

Attachments:

1. Major Entities and Attributes for Existing Databases for the Public Policy Department
2. Sample Multi-Semester Scheduled Based using scheduling database

[1] This section of your report, most likely an appendix, could build on Question #1 in the problem set on "Databases, data models, and normalization". It should be build in Access.