Laurier Enterprise System Upgrade

Ron Craig
Wilfrid Laurier University

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“SCT just informed us that 3.0 will be released next month. Support for our 2.0 system will be dropped by year end.”

Rene, Laurier’s IT Officer, leaned back in her chair, looking out at the slate grey sky and the cold rain beating down. Was the weather an omen of days ahead? She slowly nodded her head, and silently sighed to herself. Then she spoke, “Well, now we know for sure. And our estimate was very good. All we need to do is get on with the job of upgrading our system.”

She thanked her IS Manager for his call and hung up. It was late October 1997 and that left two short months during which support for 2.0 would be maintained. But how concerned should she be about this?

Foremost on Rene’s mind these days was the situation with Laurier’s enterprise system, SCT Banner. SCT’s policy was to support only the current (3.0) and previous (2.1) release. This could leave Laurier in a difficult position if they needed help. Greatly compounding Laurier’s problem was the fact 2.0 was not Year 2000 compliant. Upgrading from 2.0 would not be easy, as a tremendous amount of customization had been incorporated into the system and none of this had been documented. Rene’s exposure and understanding of the system were minimal—she had never worked with the package and had little involvement in the original installation. However, she knew that the University was totally dependent on this system, and she was determined to get on with the job.

Rene looked down at the recently received consultant’s report on her desk. It briefly outlined concerns with the University’s Human Resource Information System (HRIS) and a basic plan for migrating it to the current version (Appendix 1). The HRIS was one of four Banner modules needing upgrading, and the estimated consulting cost for this part of the system exceeded $100K. On top of that would be hardware costs, as the new system would require moving to a client/server architecture. A rough total project cost estimate, on this basis, would be $600K to $900K. This year’s entire IT upgrade budget was $250K, most of which was already spent on other high priority items.

BACKGROUND

The University

Wilfrid Laurier University (Laurier) is situated in Ontario, Canada. It is primarily an undergraduate liberal arts university, with selected professional schools. There are more than 6,000 full-time undergraduates enrolled, as well as 1,500 part-time students,

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1This case was written while the author was a Visiting Fellow in the School of Information Technology at Murdoch University, Australia.

2SCT is a major software and services company, serving more than 2,500 clients worldwide. They compete in four markets, including higher education, utilities, manufacturing and distribution, and government. Banner is one of their higher education products.

3The other modules include Student Information, Accounts Receivable, and Alumni & Development. Laurier does not use Banner’s Finance module.
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Teaching Case: Laurier Enterprise System Upgrade

and less than 1,000 graduate students. Laurier has some 285 full-time academic staff, and more than 800 employees in total. Its annual budget approaches $60 million.

Laurier’s IT Group

The newly merged IT group at Laurier comprises three departments and some 30 people. Information Systems (IS) looks after administrative computing, maintaining existing applications and implementing new ones. Computing and Communication Services (CCS) looks after academic computing plus the University technology infrastructure (central computer system including network, user support, and phone system). Audio Visual Resources is the third department. CCS and IS have directors who report to Rene. The AV Manager reports to the CCS Director.

Rene was recently appointed (July 1, 1997) Laurier’s first IT Officer, with a mandate to merge the two separate departments of Information Systems (administrative computing) and Computing and Communication Services (academic computing and phone system), develop and implement an IT strategy for the University, and provide a means for greater user involvement in IT decision making. This was a half-time position, and Rene had been seconded from the School of Business and Economics for a year. It was now the fourth month of her appointment and she had a good understanding of the many problems facing the University. However, she did not yet have a good understanding of how to solve these problems. Clearly, her initial mandate was no longer a priority.

The IS Department had been effectively leaderless for more than a year, but was now in good hands. One of the first things Rene did was to appoint an IS department member as Acting Manager. The previous Director had left in the spring of 1996 to work with SCT as an international project manager (with his first assignment in Australia). Rather than search for an experienced replacement, the University appointed an interim Director who had no IT experience. This interim Director also had other responsibilities, so he was only in the IS position half-time. When Rene came in, he went back to his previous position in another department. In retrospect, Rene saw this simply as a budget decision: with escalating software maintenance fees, the money saved from the Director’s position allowed the department to cover the increasing Oracle and Banner annual maintenance fees. Banner costs increased by 10% per year, while Oracle increases were greater this year due to licensing changes. Together, software maintenance fees now exceeded $125K per year, and continued to grow. Under Laurier’s budgeting system, these costs were IS Department expenses, rather than a University-wide cost. For several years, no increase had been provided in the IS department budget to allow for these cost escalations.

The Banner System

Much of Laurier’s administrative computing needs are handled by the Banner package. In 1989, the University made the decision to replace a number of in-house developed applications, written in Fortran and Cobol, with an integrated package running on a relational database. It was becoming increasingly difficult to maintain the various programs, as many of the original programmers had left. Furthermore, while many of the applications were very efficient and effective for day-to-day use, they completely lacked management reporting and query capability. The need for decision support from the University “database” (which was simply a collection of flat files) had increased greatly in the 1980s. To overcome this problem, a managerial database had been created by periodically pulling information from various files. This managerial database was regularly updated and used extensively by the Vice President of Finance and Administration.

The decision to move to Banner was finalized at a large University community meeting in the spring of 1989. Many of those invited were unprepared for the decision, having learned about the meeting’s purpose only weeks (or days) prior. As explained at the meeting, Laurier had few options. The current in-house developed systems were not providing needed management information and the hardware platform on which they ran (a Honeywell mainframe) was no longer supported by the vendor and needed to be replaced. The only viable option presented was the Banner product, which ran on top of an Oracle DBMS.

While the decision to move to an integrated administrative system was farsighted (most Canadian colleges and universities did not make this decision until the mid or latter 1990s, with increased costs, problems, and urgency), the lack of user ownership of the system led to implementation problems. Greater user acceptance of the new system was encouraged by agreeing to customize the product so that in both look and functionality it was similar to existing applications. As well, since Banner was an American
product and designed for the USA educational system, it did not meet all the requirements of an Ontario university—again, customization was the solution.

Replacement of the administrative applications was a massive effort, taking some five years to complete. Intensive retraining of both technical staff and end users was required. Hardware shifted from the Honeywell mainframe to a Sequent midrange platform. New system software included dynix (a Unix variant), Pro C, and the Oracle DBMS. Users in some departments had to learn completely new ways of completing their jobs, while others experienced less drastic changes. For analysts, it was their first experience with an RDBMS. The number of analysts doubled during the implementation phase, and even after completion of the project they were kept busy.

Shadow systems were just starting to appear in various departments during the late 1980s, and this trend continued during the Banner project. For example, Human Resources felt they could not wait for the HR module to be installed, so purchased their own micro-based HRIS in 1990. When the Banner HR module was finally installed during 1993/94, they continued to use their shadow system (and still are today). During the years of the Banner implementation, the IS department had little response capacity for user requests. Control over data and systems was another issue, and standalone systems allowed users to maintain full control.

In the process of implementing Banner, Laurier heavily customized the Oracle database, changing existing Banner programs and creating add-on applications. These modifications included adding new columns to existing tables, adding new tables, redesigning existing forms and reports, and writing many new forms and reports. Unfortunately, in the rush to get the system up and running, none of these changes were documented. While some standard naming conventions had been adopted (e.g., database columns added or modified by Laurier were given names starting with “W”), not all changes followed these conventions. No one, neither end users nor analysts, knew the magnitude of these changes, but they numbered in the hundreds. In hindsight, everyone realized the folly of not documenting these changes and wondered if the degree of customization could have been reduced.

Laurier’s initial decision was to buy and implement the entire Banner package: Accounts Receivable, Alumni & Development, Finance, Human Resources (including Payroll), and Student Information System. Implementation of the various modules was sequential both between and within modules (i.e., Payroll was implemented one year, then another portion of the HR module in the following year). When the Finance module was being installed, it was found not to meet Laurier’s needs. Hence this module was returned, and an in-house Finance system developed from scratch. This system was designed to look like the Banner applications (menu driven), and used the Oracle database. Since the new Finance system depended on inputs from other Banner modules (e.g., payroll data, student tuition, residence fees, etc.), interface programs had to be written.

There were many benefits, as well as costs, with the new system. Clearly the old system would have been incapable of meeting the increasing demands from government for various reports. Much better information was available for senior management, and this helped as Ontario universities went through several years of cost cutting. Academic departments had access to student information, which helped with student record keeping and counselling. An unforeseen cost was the loss of good people who made significant contributions to the project implementation. Analysts who had practical experience with Oracle were in high demand locally and elsewhere, and most of the IS staff involved in the initial implementation had moved on to positions at other organizations. Even end-users who participated in the initial installation had been sought after. A junior payroll clerk, who took to the Banner payroll system like a duck to water, was hired by SCT to help install a payroll system at an American university. She left, but not until Laurier’s payroll system was almost fully implemented.

The question of Banner’s future had come up several times over the years. The University started a strategic planning exercise in early 1993, defining Laurier’s core values, developing a mission statement, and setting out longer term goals. A subcommittee was established for each major goal, and the Information Technology task force developed a set of subgoals, along with a detailed list of projects required to reach these. Included in their report was reference to the University administrative software system and Banner. Yet the recommended subgoals and tactics were neither adopted nor funded. CCS used the subgoals as their long range plan, but given the limited financial support, progress was very slow.

In early 1996, the current situation of administrative computer systems was reviewed by the IS department and Laurier acknowledged the need to upgrade to a newer release of Banner. However, with the IS Director’s departure shortly after this, the matter lay dormant.
Later that year a Presidential Advisory Committee on Information Technology (PACIT) looked at the use of IT in teaching and learning, in research, and in administration. Its February 1997 report noted the Banner system needed to be upgraded to a current release. The overwhelming emphasis of the PACIT report was the application of IT to the academic side of the University. The administrative subgroup placed their emphasis on training end users to make better use of the current system and recommended a training person be hired. They did not recognize the precarious situation Laurier was facing with Banner.

Fear, uncertainty, circumstances, doubt and denial seemed to be the reasons for inaction on the Banner upgrade. The IS Director’s departure in 1997 was unexpected and left no one to champion the project. IS reported to the Vice President of Finance and Administration and 1997/98 was his final year in the position. There was no sense of urgency among end users, nor even awareness of the situation. Another impediment was the technical change it would require. Banner 2.0 was based on centralized hardware, while 2.1 switched to a client/server approach. No one at Laurier had very much experience with this type of computing environment and many departments were still using terminals. Project magnitude (size, effort, and cost) was enough to scare off some people. Laurier had a history of financial conservatism, along with short term IT planning, and in the short term the easy solution had been to ignore the growing problem. Yet Rene realized that “in the long term, there is no short term.”

In reviewing the SCT consultant’s report on Laurier’s HR module, Rene was concerned about the HR unit’s lack of interest in using, or upgrading, their part of the Banner system. After installing the initial Banner module during 1993/94, they continued to use their shadow system and basically ignored Banner. The head of the department had been less than enthusiastic about Banner during its installation and currently had much higher priority items on his agenda. Payroll was the only HR group using Banner and they seemed to be in a tenuous situation (not because of Banner, but because of payroll requirements imposed by various union agreements). Payroll had to run more than 100 payrolls annually. It was difficult for the group to schedule holidays and batch jobs were regularly run from home late at night (when the load on the administrative system was light and the program running could be remotely monitored). The consultant’s report highlighted these concerns.

YEAR 2000 PROBLEMS

Like all other organizations worldwide, Laurier had a Year 2000 problem. Rene was worried when she started the position and found no one concerned about this (except the IT staff, who were too busy to take on additional tasks). The most significant part of Laurier’s Y2K problem was the Banner software system; however, it also affected all other IT areas on campus. Laurier was now running an early release of version 2.0, which was not Y2K compliant. Version 2.1 was Y2K compliant and had now been out for almost two years. Version 3.0 was due within two months, and version 4.0 was tentatively scheduled for release around the end of 1998 or early 1999. SCT’s practice was to support the current and previous versions. This meant Laurier would soon have an unsupported administrative software package on which the University was totally dependent. Updating to 2.1 did not make sense, as it would likely be unsupported by the time Laurier implemented it. So 3.0 was the release to implement.

It was uncertain when Laurier’s system would experience severe date problems. Students preregistered in February for the following academic year, so February 1999 was a likely time. The Business Office ran billing processes at the start of every term and had run into a minor problem in September 1997. The office supervisor felt that the problems in September 1998 would be more severe. SCT could give no indication of what to expect. While SCT used Laurier’s customization as a reason for their inability to comment, it was clear they expected all their clients to be using later versions (which were Y2K compliant).

Even the Sequent platform running Banner was not Y2K compliant. It would need upgrading by swapping a processing board and modifying the firmware. Likewise, the development platform (purchased during the summer, with the intent of mirroring the Banner system) required upgrading.

Just as Banner was not Y2K compliant, neither was the in-house developed Finance system. When it had been developed during 1991/92, the decision was made to use the same date format currently used by Banner—two digits for the year. Further, since Laurier’s fiscal year was from May 1 through April 30, the Finance system displayed fiscal years in a YY/YY format (e.g., 97/98 referred to the fiscal year running from May 1, 1997, to April 30, 1998). The fiscal year was stored as a four-digit number (e.g.,

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*The SCT consultant had been brought in by the new Acting Vice President of Finance and Administration because of the Payroll situation.*
97/98 was stored as 9798) and many calculations were performed with this. In conjunction with the Banner upgrade, the Finance system interface with Banner would need significant work.

There were an additional two dozen smaller Oracle applications in use by various departments. Some of these interfaced with Banner, while most were stand-alone. All of these applications had been developed during the past seven years and currently no one knew their Y2K status.

While people in IS were concerned about lack of action on Laurier’s Y2K problem, they did not have a plan. Nor could they suggest how a plan could be prepared.

OTHER ISSUES

Rene reported directly to Laurier’s President. She had been asked by the previous President to take on the position for a year. However, that President had been recruited by another university and left a month after Rene began. This was the new President’s second month at Laurier and Rene was still uncertain of his priorities. He had expressed surprise at the lack of video conferencing facilities and had asked Rene to contact his former university to learn what they were doing. Rene needed to determine his preferences and direction and yet it was too early for him to finalize his priorities. The new President had come from a university that was implementing an Enterprise system for the first time, so he understood the magnitude of a first-time install.

The entire area of customization frustrated Rene, primarily because she did not know the extent of it and neither did anyone else! However, all indications were that it was extremely extensive and that users would be reluctant to give up any of it. Secondly, the experienced people she talked with at other institutions all warned about minimizing the degree of customization. Some of them had been successful in persuading their organization to minimize changes, while others lamented the problems they faced because so many changes were made to their base system. At issue was changing Laurier’s business processes, policies, and procedures to match those supported by “plain vanilla” Banner or customizing the package.

To Rene, customization had three major costs: you paid for the initial software, you paid to make the initial changes, and you paid by having to modify every new release. Plus there was the delay in utilizing new functionality in each release. Laurier, through the $75K annual maintenance fee, had already paid for release 3.0. Yet users were still stuck on the old 2.0 release. In talking with end users, Rene used the analogy of living in a shack, when there was a mansion next door. It was already paid for and only the moving costs and inconvenience needed to be incurred.

She wondered how many features of the current system were unused. Users did not seem to understand very much about their systems and when new personnel came into a department, they received no training. Could 2.0 have existing functionality which could benefit departments, or even replace customized portions? To what extent would 3.0 allow elimination of customization?

Then there were the shadow systems existing on campus. Could these be transferred to Banner? How could users be encouraged to switch over? Should Rene even be concerned about this, given the challenges IS already faced?

On the technical side, it was not clear whether Banner should be upgraded in a sequential manner (installing all the various releases that would take Laurier to 3.0) or as a fresh install of 3.0. The sequential route would require going through every major release that Banner had brought out in the past five or six years (some of the minor revisions could be skipped). Some modules would require less than half a dozen upgrades to get to 2.1, while others would require between 10 and 20. Since 2.1 was Y2K compliant, getting to that stage would solve the immediate problem. While 2.1 was not expected to be supported by SCT beyond the end of 1999, the lack of direct support was a small problem compared to the Y2K problem. At issue was the amount of effort required to install each release, compared to the effort of doing a fresh install of 3.0. This effort, in turn, was a function of the degree of customization (i.e., installing each new release would require reviewing, possibly modifying, and then testing every customized component).

Upgrading Banner wasn’t the only issue facing Laurier. The entire Y2K situation required a concerted effort, yet end users seemed to be oblivious to the situation. Infrastructure needs were high and this year’s IT budget was allocated to replacing several pieces of hardware. The main academic server was in the process of being upgraded and new tape backup systems for both the academic and administrative computers were ready for installation. The current backup systems had insufficient capacity to support
anticipated growth this year and required significant manual intervention. While the new backup systems were fully automatic, it would take considerable effort to program them. Already one CCS person had been sent for basic and advanced training on these systems. Not in the budget, but requiring attention, was the failing UPS system. It was at its limit in terms of age and ability to sustain critical equipment during power outages and a battery had failed during recent testing (resulting in temporary phone and computer system failure).

Rene thought about the lack of IT policies at the University level. To her, IT was strategic and the opportunities were endless. Yet past experience showed it to have only a support role at Laurier, and a relatively minor one at that. When, and if, she had time, she needed to start formulating IT principles that could guide the organization.

While the Banner project had not yet commenced, forthcoming personnel changes would impact the (yet unestablished) Steering Committee. The Assistant Vice President of Human Resources was taking early retirement at the end of the year and a search for a new Registrar was underway. The current Acting Registrar had applied for the position, but it was unknown whether he would be successful. It was expected that both positions would be filled sometime early in the new year.

Currently the Finance system was virtually unsupported. Both developers had left Laurier, the second one only last month. Because none of the remaining analysts had any experience with it, they did not want to move to supporting it. One analyst had reluctantly agreed to take temporary responsibility, as long as the University searched for a new analyst with finance experience. Rene had made arrangements with the departed analyst to provide ongoing support, on an as-needed basis.

The situation in IS with analysts did not look good. Already short one analyst, another had given notice and was leaving at month end (the new union agreement took away three weeks of her holidays). While the Department was already advertising for replacements, the list of applicants was short and not very impressive.

Another issue was the “dirtiness” of the present database. Originally imported from the old Fortran/Cobol system, its quality was unknown. Alumni and Development had discovered many problems with their portion and Rene felt it likely that other parts of the database had similar problems. While Banner 2.0 supported referential integrity, it had never been turned on. Moving to 3.0 required the implementation of referential integrity, with considerable effort.

Then there were the issues that no one was yet aware of. How many existed and how serious were they? Rene always worried about what she did not know!

WRAP-UP

So there were many things on Rene’s mind. She was challenged by both the number and magnitude of the tasks needing attention. She was worried about her lack of experience and the likelihood of making bad decisions. Resources were limited, both people and money. The technical problems were large, but definitely solvable. What about changing attitudes on campus and making this project the priority it required? There were so many things to work on and most were essential. Most of all, her concern was with the consequences of inaction and delay, for SCT would soon drop support for Laurier’s system and the Year 2000 deadline was immovable.
Appendix 1
Overview of Consultant’s Report

Purpose of Review:

• To analyze the general usage of the Banner HR system, from a payroll perspective, and provide a “go-forward” plan in order for the University to migrate to the current version and take advantage of the newer functions available.

Overall Findings:

• Laurier is not able to take advantage of newly released system enhancements and functionality due to the inordinate amount of customization to forms and reports, adapted during the original implementation. Any changes made by Banner must be manually analyzed and applied by Laurier analysts. This is time consuming and presents risk to the University with regard to proper payroll reporting.

• The IS staff must continue to maintain a separate accounting interface process for all of the Banner applications.

• Laurier staff maintain a number of redundant systems as compared with data represented in Banner HR. This redundancy not only requires duplication of data entry, but more important, mismatches in data occur when reports are drawn from these systems.

• A specific comment heard from all parties was that it was difficult to respond to ad hoc query and reporting from the Banner database. Whenever a report request is made, it must be preformed by the IS staff in SQL or C programming languages and it takes time to respond to and coordinate these requests. It is clear that a reporting tool-set strategy needs to be implemented to allow users to respond to their own needs.

Planning Considerations:

A. Banner HR and release compliance

• Laurier is currently operating on a 2.0.x version of Banner HR and must migrate forward to at least 2.1.11 version by the late fall, as the 2.0.x versions will no longer be maintained by SCT. If no action is taken in migrating forward, the University could risk being unsupported in software problems and not be able to react to regulatory compliance.

B. “Back to base” consideration

• While the effort is being put forth to come current with Banner HR, it will be an important project objective to analyze and dispose of as many of the initial modifications as possible in an effort to make system maintenance much easier. This will also allow users access to new functionality incorporated in the current release, as well as new items becoming available in the future. Available today in HR are electronic approvals, web access for employees, auto hire and termination functions, mass redistribution, object access report writing, faculty and committee data capture, Stats Canada reporting, Health & Safety capture and reporting, Labour Relations tracking.

C. Migration project

• With the migration of the software and other project objectives established and discussed in this document, this effort will be a major project for the University.
D. User ownership

- In the initial implementation, the project was driven by the IT staff. During the migration, the project should be driven by the users and project decisions should be measured against functionality and productivity of these end-users. This core project team should stay in touch with the Executive Steering Committee for policy issues and resources budgeting.

E. Business practices and reengineering

- An important success factor in adopting the system’s functionality is to study and make appropriate revisions to the institution’s business practices. By mapping and reviewing functional work flow, the user team will be able to determine how best to engage the Banner application and embed the processes into their work flow.

F. Institutional training

- Banner systems require an ongoing commitment to staff development and training. This is particularly true as more users take advantage of distributed access to data and in the new GUI screen presentations through workstation software and operations. It is therefore recommended that the institution appoint a proactive teacher of these technologies to assist the users in understanding their various roles in the application and to coordinate ongoing staff development as new Banner releases and technical components are brought together.

G. Other Banner systems considerations

- While planning migration of Banner HR, it is important to evaluate the system requirements for the other Banner applications that are in production. It is important that they migrate in a specified time frame. Many of the project issues described in this document apply to those applications as well. In addition, a study of the internally developed Finance and Budget System needs to be performed in order to determine ongoing Laurier maintenance of the financial interfaces.

SCT Recommended Services for Migration:

- Project Management and review (10 days)
- Banner HR functional training (18 days)
- Modification review and system set-up consulting (15 days)
- Technical assistance (10 days)
- Business process re-engineering (5 days)

Critical Success Factors:

To support the proposed objectives, the following factors should be considered:

1. Overall migration project should be accomplished by next summer to get back to base systems for ease of maintenance and reduce risk;
2. Reporting productivity tools should be available for end users by next summer;
3. Ongoing professional training and documentation coordinator needs to be appointed for staff development;
4. Intensive project planning and preparation should be accomplished over the next three months;
5. Business operations analysis should begin in the next three months and continue throughout the project;
6. The technical environment should be established within the next two months to begin many of the formal user project tasks;
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7. A formal reporting structure should be established immediately by project management to keep the executive sponsors informed of progress;

8. A communication program is essential for user information and acceptance;

9. Core user teams need to drive this project to foster acceptance of process and methodology and it is critical that key, progressive users are chosen to lead the project;

10. Project decisions should be measured under a standard set of migration objectives.