*Karl J. Beeler and Pamela J. Moehl*

*In good times, most universities worry little about the systematic processes they have developed for admitting, advising, and retaining students. When enrollments decline, there may be more than a demographic explanation. One metropolitan university has discovered the value of continuous quality improvement methods in upgrading its core student-related administrative processes. As a result, it is increasing efficiency and personalizing a traditionally bureaucratic system of student service. This description of change in progress at the University of Missouri-St. Louis can assist other universities with similar interests in improving the student experience. Concurrent goals are to increase retention and decrease time to degree attainment.*

# Continuous Improvement:

## *A Way of Integrating Student Enrollment, Advising, and Retention Systems in a Metropolitan University*

Metropolitan universities are increasingly being forced to face new demands with limited resources. As pressure to reduce government spending builds, they depend more on revenue raised from student tuition and fees. It is becoming more important than ever to build and maintain an administrative infrastructure that is efficient in enrolling, advising, and retaining capable students.

Enrollments in public urban universities are particularly susceptible to demographic changes and market-driven, local labor needs. Unfortunately, many institutions pay little attention to the manner in which students are recruited and supported, or the extent to which they are retained, until enrollments actually begin to decline. This not only affects the current revenue base, but in the long run can have a detrimental impact on the development of future alumni, corporate, and foundation support.

In these times, it is always tempting simply to turn up the heat on recruitment, pouring more dollars into marketing and advertising. In an urban setting, however, where cost-sensitive students are known to

choose the local public university primarily for its reasonable cost and convenient location, it also makes sense to "check under the hood" to see how the administrative engine is running. What areas are causing students dissatisfaction? Are there identifiable pockets of attrition? What reasons do students give for their disaffection, and is there anything that can be done to address them?

## A Study in Change

Like many young metropolitan universities, the University of Missouri-St. Louis (UMSL) experienced considerable early success. Founded in 1963, it now enrolls 15,000 students and employs more than 900 faculty members. The institutional Carnegie designation has reached Doctorate Granting II status. Several academic departments and programs have achieved national prominence, and the faculty are remarkably productive in terms of their research and public service.

The University experienced about a 10 percent decline in enrollment in the early 1990s, as measured by student credit hours. Faculty, students, and administrative staff quickly recognized that tuition and fee revenues—and therefore enrollment and retention—are vital to the health and productivity of even state-supported universities. Task forces and committees were appointed to address the situation and to recommend actions.

After careful analysis of problems noted over time by students, faculty, and staff, clear patterns of dissatisfaction with administrative practices were identified. Student surveys rated financial aid, registration, advising, and career counseling among the top areas of student dissatisfaction. Staff members were using outdated systems and processes for collecting and using student information. They were also operating without timely access to information regarding students' previous academic work, financial need, academic progress, or degree requirements.

Another obstacle confronting the University's continued growth was the absence of a coherent organizational framework or the communications and processes required to positively influence student enrollment and retention. An integrated system of academic advising and student services needed to be developed. In its effort to improve the delivery of student services in these areas, the University faced three major challenges. First, the University needed to place a higher premium on understanding and improving the *student experience*. Second, it needed an effective way to evaluate and improve enroll-

ment and advising practices. Finally, it required a significant source of funding to provide seed money to update technology and training.

Fortunately, the University had recently been informed that it had been granted eligibility to apply for developmental grant funding under the Title III Strengthening Institutions Program, a unique federal program originally established under the Higher Education Act of 1965. This program is designed to allow relatively underfunded colleges and universities with a significant role in the education of minority citizens to strengthen their programs and services. It offers successful recipients the opportunity to address their own problems with a high degree of local control and flexibility, if they commit themselves to institutionalizing the improvements they have pledged to make with the grant dollars.

In the summer of 1994, UMSL received notification that its Strengthening Institution proposal to "improve academic programs through integrated enrollment, advising, and retention systems" had been approved for funding in the amount of approximately $1.4 million.

## Grant Project Goals

The overarching goals of the developmental activities funded by the grant are to increase the retention and graduation rates of all degree-seeking students—particularly African-American students—and to decrease the average time it takes them to complete their degree requirements.

In order to improve the student experience and thereby increase student retention, two primary activities are funded. The first is the development of computer-assisted enrollment, advising, and retention systems. The second is improving academic and student service advising. These two activities have interrelated timelines and purposes, because the proposed technological solutions cannot be fully designed or implemented without the involvement and retraining of the persons whose administrative practices are also in need of change.

### *The Model*

The decision was made early on to adopt a Continuous Quality Improvement (CQI) approach to carry out the activities outlined in the grant proposal. Continuous improvement involves everyone in the organization in the search for incremental improvements; provides everyone with training, techniques, and authority to identify and fix problems; sets high performance

targets and ways to measure results; and focuses the organization's strategic vision on the needs of the people it serves.

By directing resources toward analyzing and improving organizational processes, upgrading systems and technology, and developing the knowledge, skills, and abilities of people, it was thought that the University would have the best chance of renewing its organizational infrastructure for the long term. Figure 1 below was developed to help others to envision this general approach.

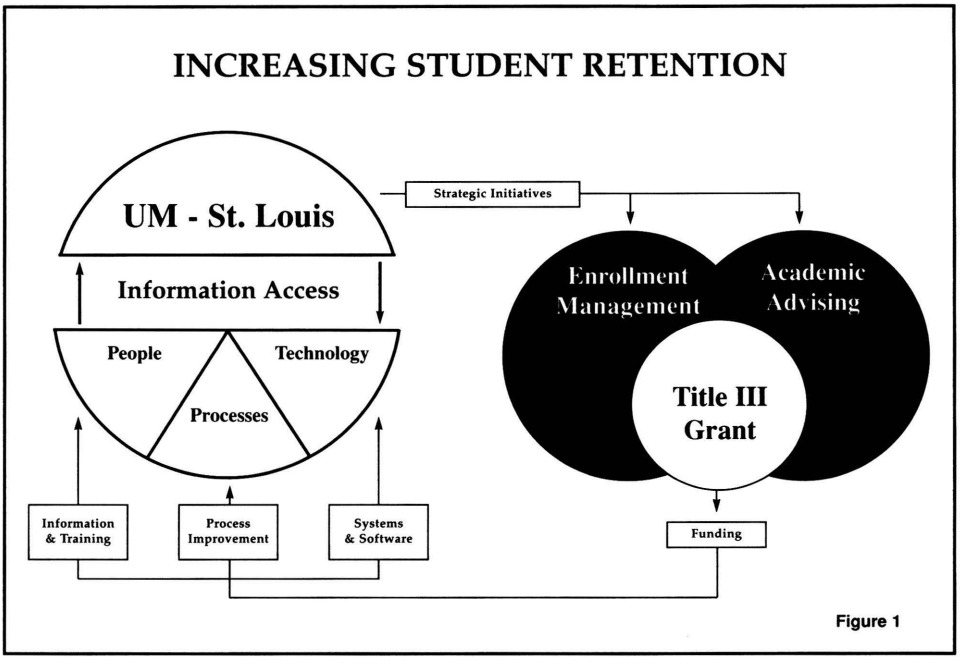


Figure 1

### *Using Continuous Improvement Methods*

The use of continuous improvement methods to encourage change in colleges and universities is sometimes viewed with skepticism, because CQI was first identified with the for-profit sector. However, many institutions of higher learning have used both Total Quality Management (TQM) and CQI methods with success in recent years, as described in several books listed at the end of this article.

The popularity of the enrollment management paradigm is a clear indication that college and university presidents are concerned about internal management issues and, like it or not, students are increasingly viewed as cus-

tomers. Attracting and retaining a student body that fits the mission and the selectivity of the institution are overarching concerns in an era of sustained competition for academically prepared students.

Twelve steps for promoting continuous improvement were approved and followed by the grant leadership team and cross-functional team members. They are listed here along with a short explication of how they were carried out.

*1. Conducting Needs Assessment and Gathering Customer Requirements.* The University collected and analyzed a good deal of information prior to designing the grant proposal. This information included historic data on student retention and graduate rates, surveys of student experiences and satisfaction, task force and committee reports, and focus group data. In addition, the largest and most comprehensive internal survey of undergraduate needs for information and advising was completed, in conjunction with the University's Public Policy Research Center. A total of 1,247 students provided information that could be used to guide new student orientation, academic advising, personal counseling, and the development of a campus-based advising. Selected categories of students (e.g., African Americans, freshmen, and students who had withdrawn from the University) were over sampled to ensure that their group response sizes were adequate for generalization of the findings; their response data were later statistically weighted to represent their true proportion in relation to the overall student body. The data were analyzed for group comparisons among: first-time freshmen, first-time transfers, and continuing students; withdrawing versus persisting students, and; minority versus nonminority students. As a result, we were able to pinpoint many of the areas of need expressed by students in accordance with their classifications or level of experience.

The information that we considered in various forms led us to conclude that many of the problems associated with student dissatisfaction, attrition, or protracted time to degree attainment could reasonably be associated with unexamined University administrative practices, mysterious processes, poor communication, and a comparatively low regard for student service.

*2. Creating a Measurable Goal Statement.* The goals and objectives of the funded grant project were defined at the outset, during preparation of the proposal design. These were to increase student retention and graduation rates, and to decrease time to degree attainment. The systemic changes necessary to achieve these goals were to develop integrated, computer-assisted

enrollment, advising, and retention systems and to improve academic and student service advising. Developmental components in need of systemic change had been identified. Now they needed to be examined and understood from a *process* perspective (i.e., exactly how they functioned at this point in time).

***3. Forming Continuous Improvement Teams.*** Ongoing, effective communication is a paramount requirement in efforts to achieve institutional (and cultural) change. Acknowledging that team-based activities (e.g., process improvement, systems and software development, information access, and personnel training) were key to the success of the project, the leadership team turned its attention to communicating the benefits of a team-based approach. After explaining the goals of the grant, the coordinator stressed that, in team-based change, staff members are given the opportunity to:

- develop a comprehensive understanding of the total process; define a set of boundaries for what the team will focus its time and energy on;
- identify internal "customer/supplier" relationships;
- locate areas of unintended variation, inefficiency, duplication, and low value;
- identify unnecessary dependencies, tasks, or sequences;
- see the difference between present practices and what should be done (improved);
- view first-hand how the actions in one unit impact the results obtained in another; and
- learn from one another and share creative ideas.

The goals of the project made it easy to decide which administrative and advising units needed to be represented on the continuous improvement teams. Generally, they included all of the enrollment service units (Admissions, Financial Aid, Registration, and the Cashier), as well as six academic advising units within the undergraduate colleges and schools (Arts and Sciences, Business, Education, Engineering, Evening, and Nursing). Teams were established within the units (comprising everyone who "touches" a process) and across the functional boundaries of the units (representatives from each unit appointed to form a cross-functional team).

***4. Identifying Processes to be Examined.*** After considering the possibilities, the cross-functional team decided it would be most helpful to focus

on thirteen core processes. These were chosen for their importance to students as customers, for their potential to function as needed infrastructure for an "enrollment management" paradigm, and for their overall power to influence student degree attainment. The core processes examined were:

- handling inquiries from prospective students;
- processing applications and transcripts;
- making admissions decisions;
- advising students;
- processing student financial aid;
- registering for courses;
- processing payment of tuition and fees;
- processing wait lists;
- adding/dropping courses;
- completing prerequisite checks;
- evaluating transfer credits;
- making course equivalency decisions, and
- completing graduation checks.

By plotting and examining precisely how current core processes look on paper, it is possible to eliminate unnecessary steps and to automate and streamline many of the remaining ones. This frees more time for staff members to spend with students. Failing to streamline before automating functions increases the probability that, rather than improving the process, the team will unwittingly "automate dysfunction" and thereby exacerbate problems.

*5. Establish Ground Rules, Constraints, and Parameters.* The continuous improvement teams within each unit were about to undertake the painstaking chore of charting each step involved in a current administrative process. They knew that, in essence, they would be looking back on these charts for evidence of inefficiency, redundancy, or unnecessary practices. Under these potentially threatening conditions, it was important to establish some ground rules for proceeding in order to encourage patience, understanding, and endurance. With this is mind, the teams were instructed to:

- focus on the process, not the people;
- document the process as it currently exists;
- ensure that every member has an equal opportunity to participate; and
- suppress the urge to jump to solutions.

• refrain from blaming other people, departments, or units.

*6. Diagramming the Current Processes and Sub-Processes.* By completing flowcharts, persons in supervisory positions with the authority to work on the system were forced to look hard at the process. As Seymour has pointed out, "It also allows the others—those who work within the system—to get a better understanding of the notion of internal customers by being able to see 'upstream' and 'downstream'." (Seymour, p. 87) Flow charts reveal redundancy, inefficiency, and possible sources of misunderstanding and miscommunication.

In preparing for the flow charting exercises, which involved two to four hours of team meeting time per week for about six weeks, staff members and unit managers were frequently heard to ask, "When will we find the time? We're so busy trying to keep up with the flow of paper as it is now!" Never having attempted such an exercise, many had a difficult time believing that a comparatively small amount of time invested in examining current processes and practices could result in considerable efficiencies gained. Many viewed "reengineering" as a buzzword for downsizing and dismissing staff, especially because their units had undergone budget cuts in each of the previous four years. The grant leadership team spent considerable time in assuring staff members that the object of the exercise was to cut out red tape, introduce automation, and free up some of their time for more value-added tasks or personal availability to students.

Teams members were advised that anyone who in any way touched an administrative process had to participate in mapping out the process. This is the only way to arrive at a complete understanding of the process. Teams are sometimes overly concerned that they will not flow chart each step correctly the first time, or that they will not be able to capture on paper the essence of a complex, multi-treed activity. Therefore a common technique was used to enable the teams to chart and edit the flow of processes before signing off on them. This involved rolling out several feet of brown paper on a long table top, using stick on notes to describe each step, and drawing lines between and among steps. It is easy to remove or relocate these little yellow papers as needed in order to more accurately describe the process. When the team is generally satisfied that the documented process represents actual practice, the flow chart on the brown paper is entered into a flow charting software program on computer, then printed out for examination to be edited one last

time.

*7. Identifying Process Problems and Probable Causes.* When the flow charting exercises were completed and printed out, more than 220 pages of process steps had been produced. Unit teams and cross-functional teams examined the information, asking questions such as "Why do we do this?" "Is this essential?" "Is this related to University policy or just historical practice?" "Where are there redundancies and 'loops' in the process?" "What can we cut out?" "Is there a simpler way of doing it?"

Each of the teams found that the flow charting exercises were helpful even in the short term. By listening to each other and observing the ground rules noted above, team members began to realize that they had previously enjoyed only a limited understanding of full processes. Hearing and seeing how processes played out from the beginning to the end, and focusing on how a student would experience the process, they began to make comments such as "I never understood why you did that in your department!" or "Well, if you're doing that, I don't know why we're doing it, too. Maybe we can eliminate or streamline some of these steps."

While flow charts describe a process, a cause-and-effect or "fishbone" diagram examines factors that may influence a specific situation. Figure 2 was developed to help team members focus on the important issues, limiting irrelevant discussion and reducing the urge to blame others.

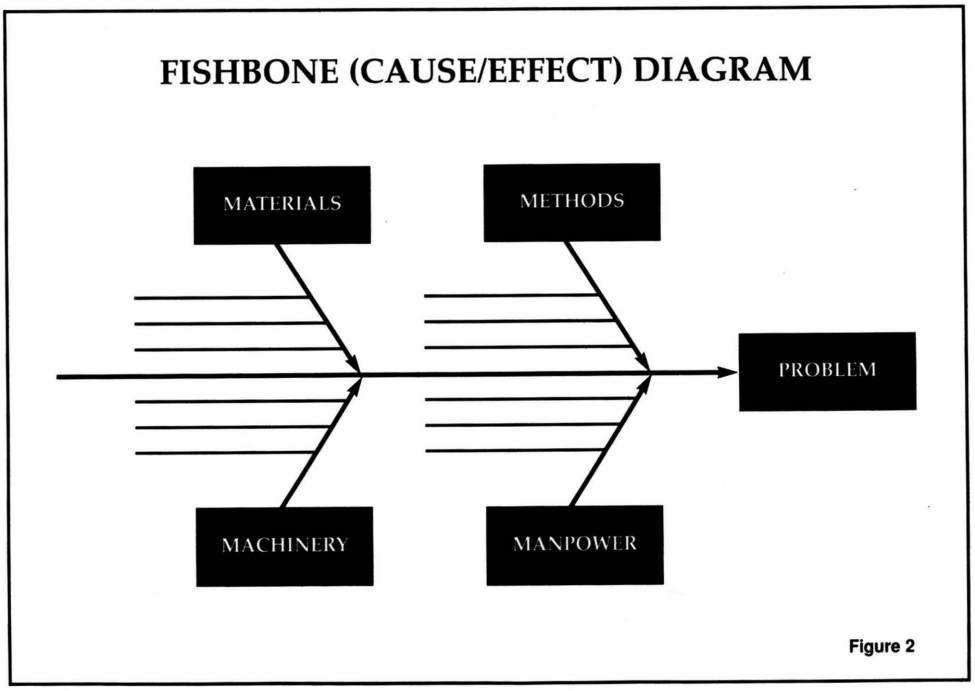


Figure 2

*8. Brainstorming Potential Solutions.* During the flow charting exercises, the participants were beginning to see how excessive and unnecessary control led to self-perpetuating bureaucracy, involving extra paper handling, copying and distribution, unnecessary filing and storage, excessive mailings, and all the human labor involved in these non-value-added tasks. They also began to realize that they have the power to illuminate the process, to criticize it, to be a part of a new solution, and to control some of their own destiny. In short, they were beginning to take ownership; an important step in forming a continuous improvement mind set.

After the flow charting, then, it was easy to obtain suggestions for streamlining and improving the way things are done. Unit managers and the cross-functional team took an especially hard look at how they were processing student-related business, and how the actions in one department were affecting the business of other units. These cross-functional meetings were an excellent way to drive home the concept that reengineering is about rethinking and redesigning processes to enhance quality and service.

The appropriate time to brainstorm new solutions is *after* the old process has been completely and accurately mapped. New solutions can be formulated or suggested by anyone who thinks she or he has a good idea. They can take the form of reduced steps, eliminated paperwork, technological assistance, or a whole new way of handling things. They may be the result of benchmarking (comparing the cost and effectiveness of one university's operations with those at other institutions), or choosing the best practice (the most effective methods for carrying out processes or providing services). They may indeed involve downsizing or right sizing (reducing the number of employees through attrition or layoffs, in order to operate within budget) or outsourcing (hiring external vendors for selected tasks in hopes of getting better service for lower cost).

Often, restructuring or reorganizing means consolidating jobs and duties. However, it may also mean upgrading or adding jobs if the value added or the importance of the service is likely to result in clear cut advantages for students, impact their retention, increase their graduation rates, or help them to graduate on time. By eliminating non-value-added activities, the time and energy of individuals can be released to take on new challenges which add higher value to the organization.

*9. Selecting the Optimum Solution.* After solutions have been considered for their potential to achieve stated goals, the best of these should be

chosen. Care should be taken to achieve consensus in the selection or development of a solution. Short of consensus, extra efforts should be made to foster team commitment to the success of the new manner of doing business. Employees who have not bought in to the solution are potential detractors, and in the worst case they may simply choose to ignore or even subvert the changes.

New solutions must be shared with and considered by the stakeholders who will be impacted when they are implemented. For example, if the academic deans or faculty members have no input into the nature and elements of distributed student information that will be used in advising, they are less likely to be satisfied with the solution or to actively implement it. They, too, must feel a sense of responsibility and ownership for the choice and development of solutions.

***10. Pilot-Testing the Solution.*** Failure to test solutions surely is where the maxim about the road to hell being paved with good intentions originated. Over the years, we have all experienced the maddening confusion created when untested processes or, more recently, inadequately tested computer solutions are rolled out for general implementation. Nothing is worse than replacing poor practices with new but equally ineffective ones. In our haste to do better, we risk creating an atmosphere of cynicism, accompanied by comments like "I told you so. They should have just left well enough alone."

When developing technological solutions, it is important to be aware of:

- other institutional priorities (are we in the cue and what is the anticipated timeline for installing computers or testing new software programming?),
- systems integration issues (will these changes impact other programs or ways of doing business in other units?),
- systems support demands (have we gained the interest and commitment of others on whom we will depend for these changes?), and
- education and training needs (when we roll out these new technological solutions, are we prepared to assist those with whom and for whom they have been designed?).

All new solutions should be piloted in steps with test groups or under simulated conditions that parallel but do not replace old systems until they

are working reasonably. This requires that students and other stakeholders be involved in the testing; they must be asked whether they understand the new process, whether it makes sense to them, and whether any related output, printed reports, or computer screens can be made more user-friendly.

***11. Making Necessary Adjustments and Implementing the Solution at Full Scale.*** After the pilot process has produced enough feedback and formative data, the designers and developers of the improved process or service must make any needed changes and test again with the stakeholders who contributed their criticisms and feedback.

***12. Checking the Results and Repeating the Cycle.*** The term continuous improvement should not be viewed as a fashionable, passing trend in the management of student services. It is in fact a set of principles and guidelines for doing what makes sense to all of us—operating with flexibility and awareness in a changing university environment that seeks to optimize the student experience. Just when we think we've got it right, it is probably time to rethink it again. We can usually time these things with some accuracy when we're tuned in to the voices of our customers.

## Results

The number of improvements made in the first few months of this project as a result of the flow charting exercises alone was astounding. First, the teams within most units displayed a remarkable degree of understanding and excitement about applying continuous improvement methods and techniques to their work. Several units requested their own copies of the flow charting software in order to continue the exercises on their own.

Almost immediately, easy changes were made to close loopholes. For example, the Cashiering unit discovered a loophole whereby students could avoid paying tuition and still obtain complete course work and obtain credit. Fortunately, there was no evidence that anyone had yet discovered or exploited the loophole; the team was quick to modify processes before any financial liabilities were incurred.

Within the School of Education, staff merged three labor-intensive processes into one streamlined process that resulted in time savings for both faculty and staff. After automating a number of paper-intensive processes and eliminating several non-valued-added activities in Arts and Sciences, the Director of Advising was able to reallocate some staff to take on new student-oriented challenges, resulting in the reclassification of one staff member

and the promotion of another. Numerous incremental improvements that required no financial outlay were made within and across the units resulting in improved service to students.

***Handling Inquiries from Prospective Students.***

Many initial inquiries from prospective students originate in the academic units, as well as in the admissions office. After the process for handling inquiries from prospective students was documented in each of these units, it was clear that nearly all of them lacked a system for effectively tracking and following up with interested prospects. A new automated system for tracking inquiries was developed. The system was first piloted in Admissions, then refined and installed in each of the academic advising units. Training on how to use the system included on-the-job training supplemented by the distribution of a written user-friendly instructional guide.

***Producing Accurate, Timely, and Useful Degree Audit Reports.***

Nearly a decade ago, the University had purchased the Degree Audit Reporting System (DARS) software designed and supported by Miami University (Ohio). Despite the fact that thousands of dollars in programming assistance and staff support had been allocated to the production of degree audits, the system was never fully implemented. The importance of this system cannot be understated; it serves as a student's roadmap through the curriculum, comparing the individual's academic progress with all degree requirements. This system can also be used by students to model the impact of changing their majors, or to choose courses for the next enrollment period. For advisors and students alike, it eliminates the need to continually thumb through the University catalog. It has many other potential uses, including course demand analysis, which is a critical exercise for department chairs. For heretofore mysterious reasons, the degree audit system was not producing as expected. Much blame was placed on administrators, faculty, and even the software itself (although it was known to function perfectly at any number of other universities).

In this case, a benchmarking approach was undertaken to address the problem. Consultants who used the DARS software with success at another university were brought in to conduct a two-day evaluation of the processes being used. They were able to point out the flaws in the way the University was handling, coding, and storing course descriptions that need to be ac-

cessed by the DARS software to produce a correct report. They recommended restructuring the manner in which the software encoding experts, the course equivalency staff, and the Registrar's office worked together across functions and a new team was established that has streamlined the process and recoded the appropriate databases. For example, data from incoming transcripts are now entered in the student information system within 24 hours of receipt, making it possible for advisors to view transcripts for new and prospective students online the very next day.

The change has eliminated the need to copy and mail hard copies of the transcripts from unit to unit, resulting in significant efficiencies in time, cost, energy, and materials. In many cases, course equivalency decisions are made within the next 48 hours. For transfer students, who comprise 75 percent of the University's new students, the result is immensely improved service. Now, when they want to know how their transfer coursework will apply toward a degree, the answer is usually available within three days of the arrival of their academic transcripts. Currently enrolled students will now be able to use the degree audit report as a guide to registration for the following semester. A new goal is the development of the course demand analysis component of DARS to enable better planning of course offerings in the academic units.

### *Information Access*

As improvements were made in speeding up transcript data input and course equivalency decision making, it became apparent that many of the advisors had never received formal training in the use of CICS (the student information system), nor were there written instructions. Therefore, a CICS user's guide, describing the most commonly used CICS computer screens, was developed and distributed to staff members and faculty advisors. Through the development of technology and the improvement of existing systems, advisors have more access to student data, improving the quality and consistency of critical information provided to the student. The elimination of excess paperwork and automating manual processes, makes it more likely that advisors will be able to expand the quantity and quality of time spent with individual students.

Arrangements were also made to purchase and install new technology costing nearly $225,000 in the enrollment and advising units, consisting primarily of Pentium standard computer workstations, supporting equipment, and software integrated (by function), with the University mainframe serving

as a primary server. The speed and multitasking capabilities of these computers have made it easier to serve students quickly and efficiently. Basic training on the use of these new computers, which in many cases replaced single function dumb terminals, was provided.

***Processing Student Financial Aid.***

The Financial Aid office was undergoing considerable change even during the flow charting exercises. Lacking a director at the time, staff members were working on a conversion to Direct Lending. Rather than documenting existing processes that would soon be abandoned, they pulled together to redefine processes in support of Direct Lending, and purchased and installed necessary equipment in time for the arrival of the new director. The conversion was accomplished with minimal upset to students or staff. As a result, lines at the financial aid office are shorter, students are happier, and a service-oriented approach now exists throughout the office.

## The Challenges Ahead

These are but a few examples of the work in progress that is transforming the way students experience the administrative and advising aspects of the University of Missouri-St. Louis. This year, more energy will be directed toward implementation and training issues. The unit and cross-functional teams will continue to work together to find areas of common concern and need for improvement.

In addition, we are in the process of benchmarking advising processes at other universities that have already successfully implemented the degree audit software and experienced how it changes the advising. To anticipate changes resulting from full implementation of the improved degree audit system, a comprehensive review of the research on developmental advising was recently completed. This work is a key preliminary component in designing new ways to move the advisors away from a predominantly "prescriptive" approach ("here are the courses you should take if you know what's good for you") to a form of advising that is concerned with the development of the whole student.

During the second year, efforts will be directed to establishing programs for the continued professional development of staff members, in order to enhance their knowledge, skills, and abilities. Some of the needs for training and development have been expressed by the employees themselves, who no

longer seem afraid that the University is trying to eliminate their positions.

Gaining and sustaining the interest and involvement of the campus community in this project has required more than a few new strategies for communicating. At times, we all give in to rumors, pettiness, jealousy, or the temptation to stop analyzing what we do and just do it. Often, people who have pledged support to the concept of team approaches to decision making make unilateral decisions anyway, redistributing tasks or personnel without considering the impact on students or co-workers. Working closely with stakeholders, then, will continue to demand that the coordinator and other members of the leadership team spend time with deans, students, support staff, professional advisors, faculty members, department chairs, enrollment unit managers, and senior administrators.

The leadership team must also continue to try to lead by example, modeling the behaviors that are being promoted to achieve the goals of the project. They must resist blaming others or jumping to conclusions. They must continue to work out the details and to remain fluid in their approaches to problem solving.

In the midst of such detailed work, the leadership team must also be cognizant of changing political environments, the need to communicate the goals of the grant to new employees at all levels, and the importance of attending to the unintended outcomes of change. They must continue to encourage and promote the use of continuous improvement methods, the use of appropriate data for applied purposes, the improved flow of appropriate student information, and the concept of a team orientation.

It is sometimes daunting to realize that the work of continuous improvement is never done. Applied to the fluid world of student services, however, continuous improvement is proving to be just the paradigm we need to remain fresh and responsive to the ever-changing experience of being a student.

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# Declaration of Metropolitan Universities

***We, the leaders of metropolitan universities and colleges . . .***

• reaffirm that the creation, interpretation, dissemination, and application of knowledge are the fundamental functions of our institutions;
• accept a broad responsibility to bring these functions to bear on our metropolitan regions;
• commit our institutions to be responsive to the needs of our communities by seeking new ways of using resources to provide leadership in addressing metropolitan problems through teaching, research, and service.

***Our teaching must:***
• educate students to be informed and effective citizens, as well as capable practitioners of professions and occupations;
• be adapted to the diverse needs of metropolitan students, including minorities and underserved groups, adults of all ages, and the place-bound;
• combine research-based knowledge with practical application and experience, using the best current technology and pedagogical techniques.

***Our research must:***
• seek and exploit opportunities for linking basic investigation with practical application, and for creating interdisciplinary partnerships for attacking complex metropolitan problems, while meeting the highest standards of the academic community.

***Our professional service must:***
• develop creative partnerships with public and private enterprises that ensure the intellectual resources of our institutions are fully engaged in mutually beneficial ways;
• include close working relationships with elementary and secondary schools aimed at maximizing the effectiveness of the entire metropolitan education system;
• make the fullest possible contribution to the cultural life and general quality of life of our metropolitan regions.