

Key Findings

Good Enough! IT Investment and Business Process Performance in Higher Education

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In the current environment of tight budgets and high customer expectations, higher education institutions have been under more pressure than ever to improve the ways they do business. Institutions have expended significant time and resources on process improvement in order to realize cost savings, to improve services to their clients, to reduce business risk, and to attain overall greater accountability. It is rare to find an institution that has not engaged in some effort to improve business processes. The improvements include localized process improvements, formal reengineering initiatives, enterprise resource planning (ERP)-enabled process improvements, and post-ERP process improvements such as Web self-service. What return has higher education received from its investments?

This ECAR study was designed with the hope of improving our understanding of the complex set of issues surrounding: 1) the performance of higher education business processes in higher education; and 2) the influence of information technology (IT), leadership, culture, and other factors on process performance. The fundamental questions that framed ECAR's curiosity in this domain were:

- Are higher education business processes performing well?
- Does investment in IT enhance the performance of these processes?
- What roles do culture, leadership, and other factors play in process performance?
- In sum, in their business aspects, do colleges and universities behave like businesses?

The state of business process performance in higher education across three broad areas was evaluated in this study. The research reviewed the status of higher education's major administrative processes assessed predominantly by chief information officers (CIOs), evaluated the roles that IT has played in contributing to high performing processes, and examined the factors that separate those institutions that achieve higher levels of business process performance from those that do not. A study of all higher education processes was deemed too broad. Instead, the investigators selected to study the higher education processes that:

- Have been a significant recipient of process improvement attention;
- Have been impacted by higher education's investment in ERP, the Web, and other enabling technologies; and
- Are used by most if not all higher education institutions.

The resulting ECAR study, *Good Enough! IT Investment and Business Process Performance in Higher Education* (Kvavik, Goldstein, with Voloudakis, 2005), includes the major processes in financial management, human resources, student, and grants management. These processes have been the focus of the majority of process reengineering projects, have been impacted entirely or in part by major ERP implementations, and have been the areas in which institutions aggressively used the Web to promote self-service for faculty, students, and staff. The management information and analysis area was also studied because institutions improve management information and analysis to reap the benefits of their technology investments.

The investigators on this study based much of their analysis on a comparison of perceived process performance against performance that would be predicted based on a two-factor model of institutional change. The logic of this model or framework is intuitive. Colleges and universities are political organizations that feature high managerial ambiguity, unclear goals, and complex decision-making processes that most resemble stakeholder politics. (Cohen and March, 1974) The authors surmised that process performance would prosper chiefly under two conditions:

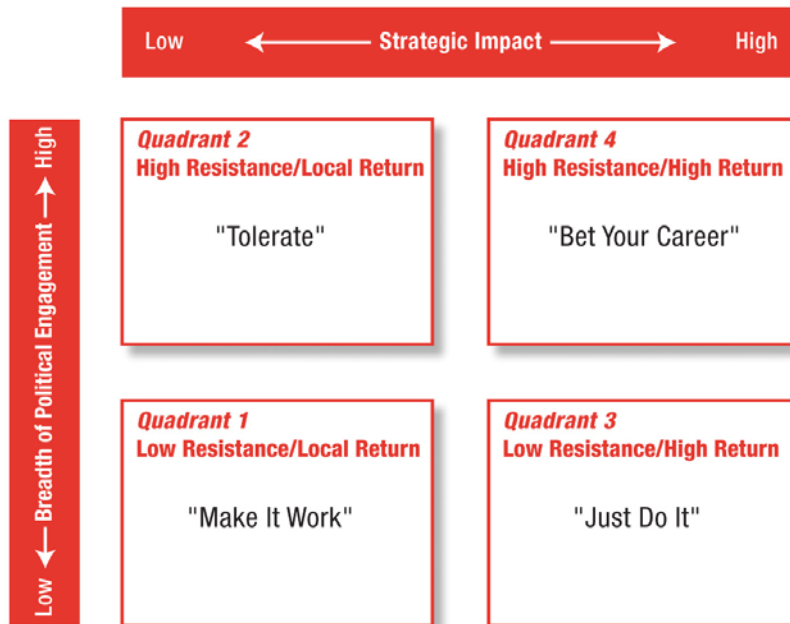
- Where processes are of *narrow political concern* (low breadth of political engagement) and where the *strategic impact of processes is high*. This category can be characterized as “low resistance, high return.” Change to processes like these is relatively easy. “Just do it!” (Quadrant 3)
- Where processes are of *widespread concern* (high breadth of political engagement) and where the *strategic importance is high*. This category can be characterized as “high resistance, high return.” Change to processes in this category are often “bet your career” opportunities. (Quadrant 4)

Two other conditions make it less likely to find high process performance:

- Change to processes that are of *focused concern* (low breadth of political engagement) and of *low strategic impact* (local return) depends to a great extent on local “championship.” The unspoken thought is, “unless someone makes a stand here, there are likely to be bigger fish to fry.” In other words, in the absence of strong leadership, the owners of institutional processes like these are predicted to make things work as they are. (Quadrant 1)
- Processes with a *low strategic impact* that nevertheless engaged the *broad attention* of the institution are rarely perceived to be worth the effort. These are processes whose adequate performance can be tolerated and for which reform “could wait another day.” (Quadrant 2)

This conceptual framework is summarized in Figure 1:

Figure 1. Business Process Taxonomy



Methodology and Study Participants

The study consists of three data collection and analytical initiatives:

- A literature review to identify and clarify the study's major elements and create a working set of hypotheses to test.
- A quantitative Web-based survey of EDUCAUSE member higher education institutions that elicited responses from 335 institutions. The respondents were senior college and university administrators, most of them CIOs.
- Interviews of 32 senior administrators and IT leaders from 29 institutions, who identified their institutions in the quantitative survey as being leaders or exemplars of business process performance improvement, as undergoing significant business process change, as having business processes that are performing unsatisfactorily, and/or as using employee suggestions to improve business processes.

Respondents to the Web-based survey were largely from public institutions (60 percent) and almost two-thirds (63.5 percent) were from institutions with enrollments of 8,000 or fewer. More than 70 percent of the respondents are CIOs or equivalent, and 79 percent indicate that they are involved with process performance improvement efforts at their institutions.

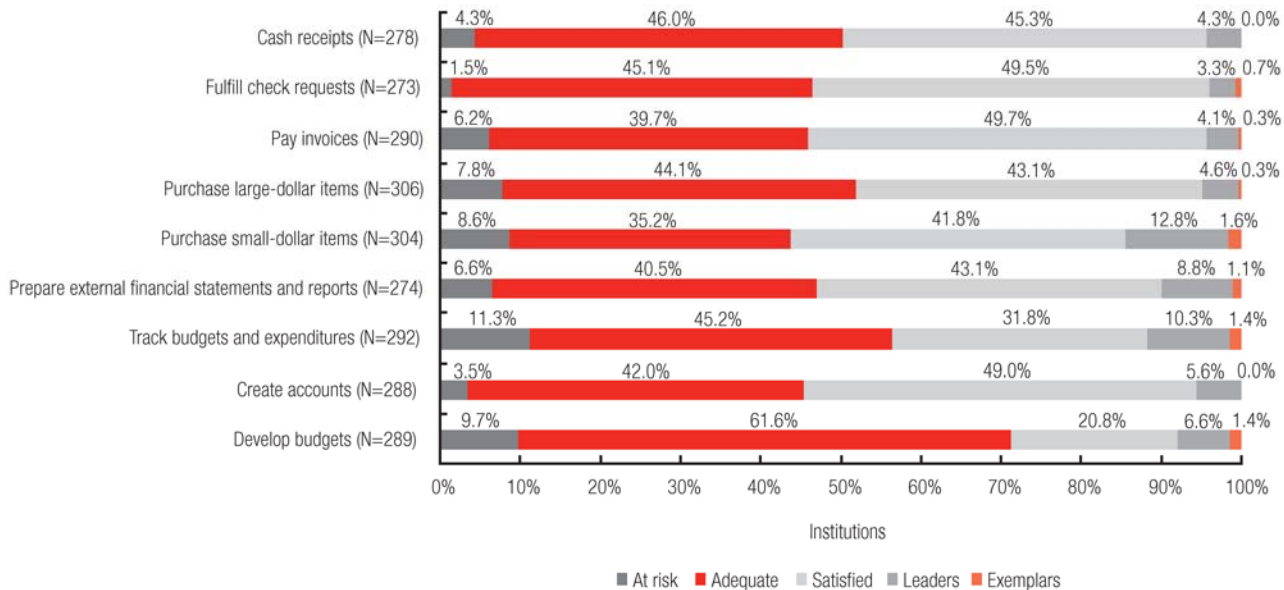
Significant Findings

Following are some of the important findings of *Good Enough! IT Investment and Business Process Performance in Higher Education*.

Financial Processes

Institutions were asked to assess the level of business process performance they had achieved for nine financial processes (see Figure 2). The choices were: 1) We are at risk. 2) We are adequate. 3) We are satisfied. Our process works for now but needs to be changed. 4) We are leaders. 5) We are exemplars. Half of the institutions indicate that they are satisfied or better and half that they are in the process of change or recognize a need to change.

Figure 2. Status of Financial Processes



Consistent with our a priori formulation, respondents describe higher levels of performance with transactional processes than with monitoring processes or managerial processes. One explanation, of course, is that transactional processes, in many cases, imbed good practice in the software of the institution's enterprise systems.

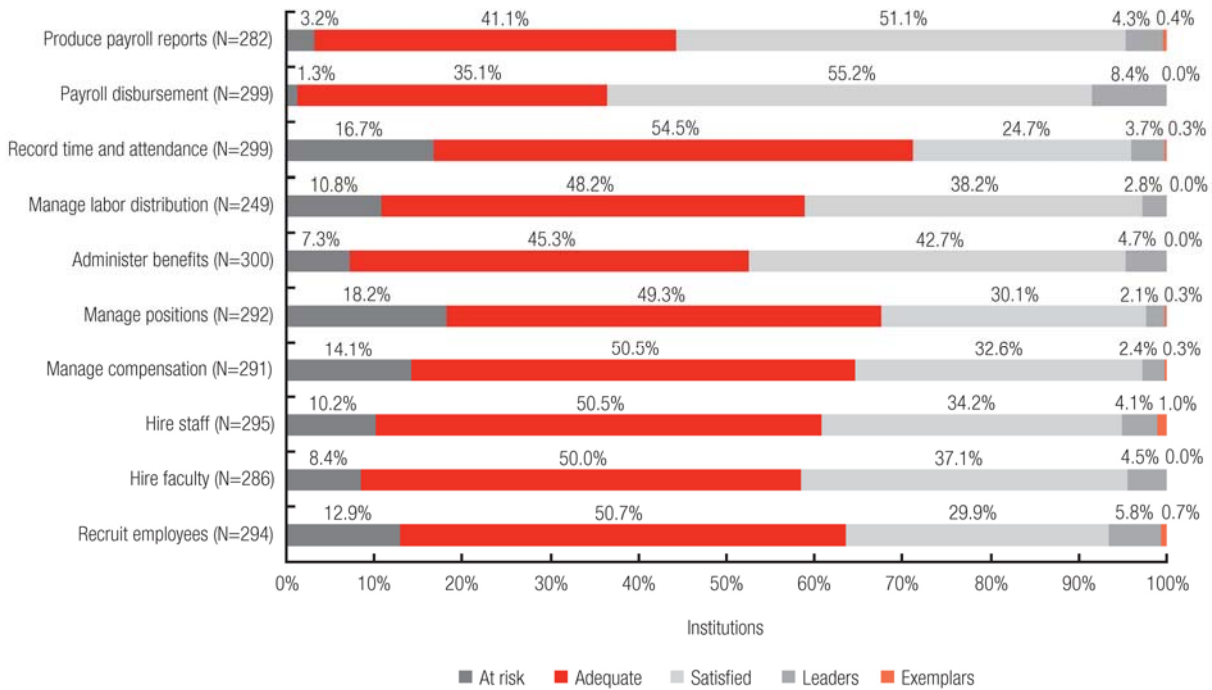
Human Resource Processes

The human resources (HR) processes are a mix of centralized transaction processes and distributed processes that have a strategic impact on the institution. Centrally managed commodity processes include benefits administration, payroll disbursement, payroll reporting, and recording time and attendance. As with the finance area, these are processes that are largely rule driven and generally controlled by the central HR or finance organization.

HR also includes highly decentralized processes such as faculty and staff hiring. These processes are of greater strategic importance and are less centrally controlled. Finally, the category includes the processes called manage compensation and manage positions, which are similar to the budget development process in that they reflect both sets of work steps and policies.

On the whole, institutions ranked their HR processes as adequate. The HR area appears to be very similar to finance. As with finance, HR processes that are transactional in nature score higher than managerial or monitoring processes. Also similar to finance, HR processes that are highly distributed, such as hiring, are, as predicted, more difficult to change. This is evidenced by lower respondent ratings of performance and levels of satisfaction. Figure 3 details HR process performance.

Figure 3. Status of HR Processes

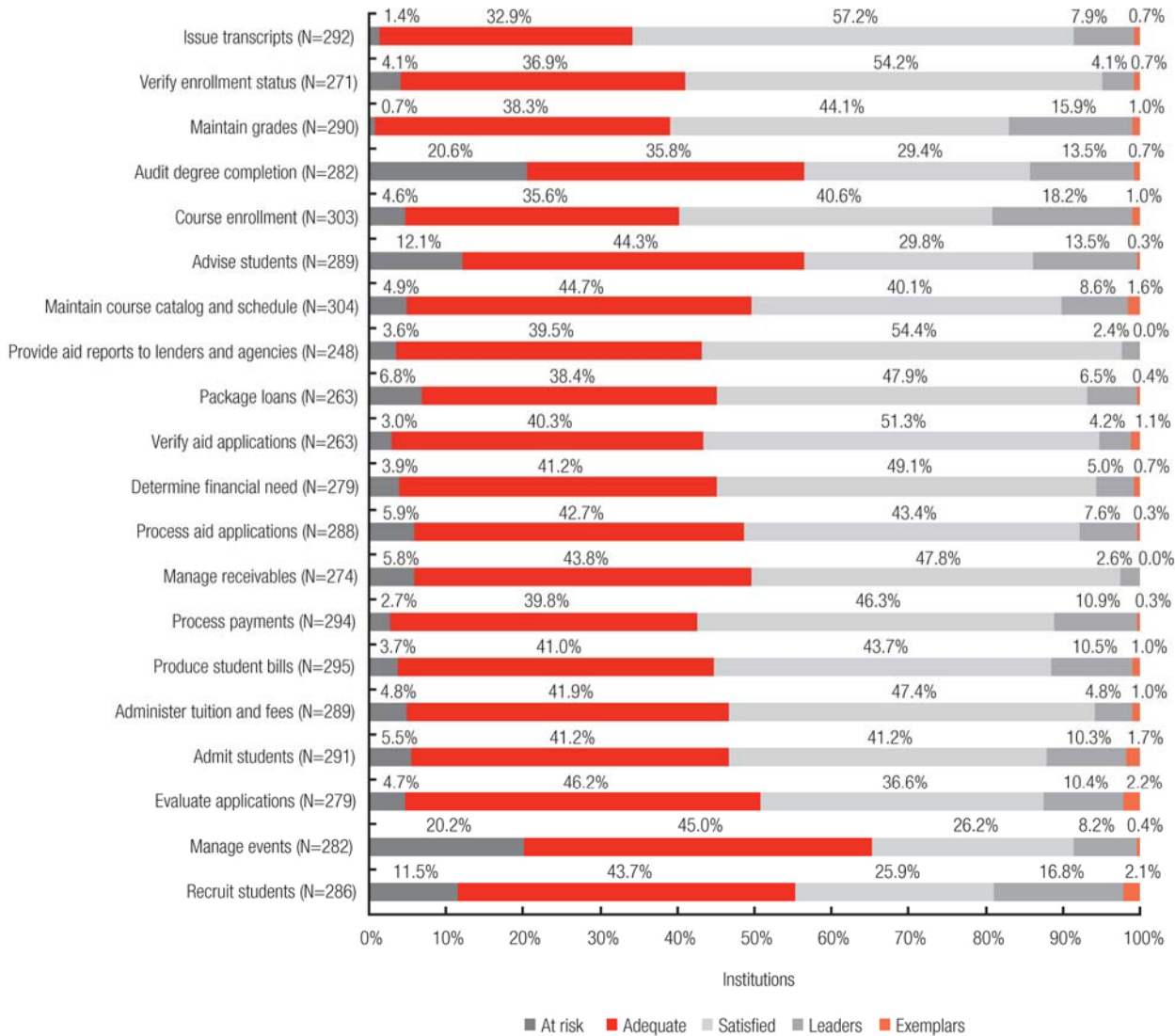


Student Processes

The student area encompasses a broad range of processes that include recruiting and admitting students, processing financial aid, billing and collecting student accounts, administering student records, and class registration. Like the other areas, the student processes include typically centrally controlled transactional processes as well as highly distributed processes and strategic processes.

Institutions were asked to assess the level of performance they had achieved for 20 student processes (see Figure 4). For a slight majority of the respondents, these processes are viewed as satisfactory or better.

Figure 4. Status of Student Processes



Overall, student processes are the most highly rated in the study, consistent with the prediction that strategic “customer serving” processes, even when hard to improve, would receive attention. As with HR and financial processes, student transactional processes score higher than managerial or monitoring processes. Institutions report more progress improving transactional processes like maintaining grades, registering students for courses, issuing transcripts, and processing payments. More strategic managerial processes such as advising students score lower. When respondents were asked about processes in which they rate themselves as leaders or exemplar, at least 10 percent reported nine student subprocesses as leading processes.

In some student areas, a few processes produced unexpected results. For example, the expectation was that institutions would be more satisfied with audit degree completion than the results indicate.

The process is rule-based and therefore might be expected to behave like a transaction process. However, its score is among the lowest of the processes. This may reflect the complexity of how degree audit is integrated into the curriculum development and management processes, as well as the changing rules over transfers of credit and articulation.

Respondents indicate that they are attempting to improve processes that are directly related to revenue and quality. Three of the top five processes for which institutions say they are leaders directly relate to student recruitment and retention.

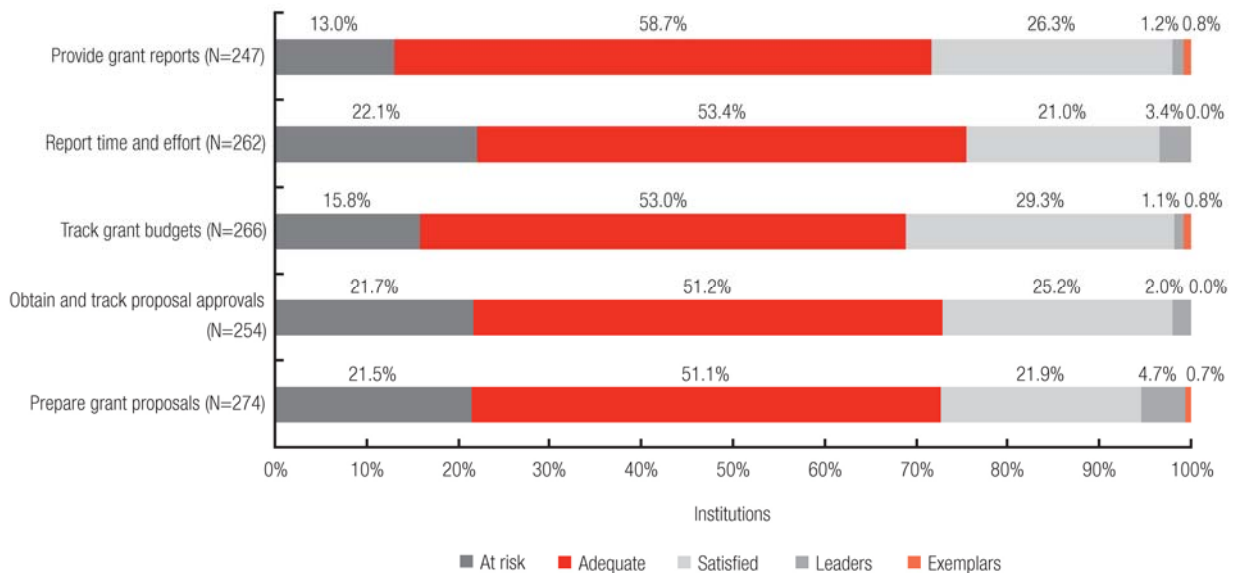
Many respondents view student as a strategic process area. The benefits of process improvements are immediately apparent to students and play a key role in their success and satisfaction. Active engagement by students, in informal and formal settings, provides institutions with considerable information about what is needed and what works, which may facilitate innovation.

Grants Management Processes

The grants management area includes both pre- and post-award grants management processes. It includes both highly rule-driven commodity processes such as reporting time and effort and providing grant reports. This category also contains processes that are relatively more strategic and idiosyncratic such as preparing grant proposals, tracking grant budgets, and approving grant proposals.

The results suggest that institutions may just be gearing up to attempt more changes in this area. In fact, a significant majority of the institutions are in the process of change or recognize a need for change. Three grants management processes are reported at risk by more than 20 percent of respondents (see Figure 5).

Figure 5. Status of Grants Management Processes



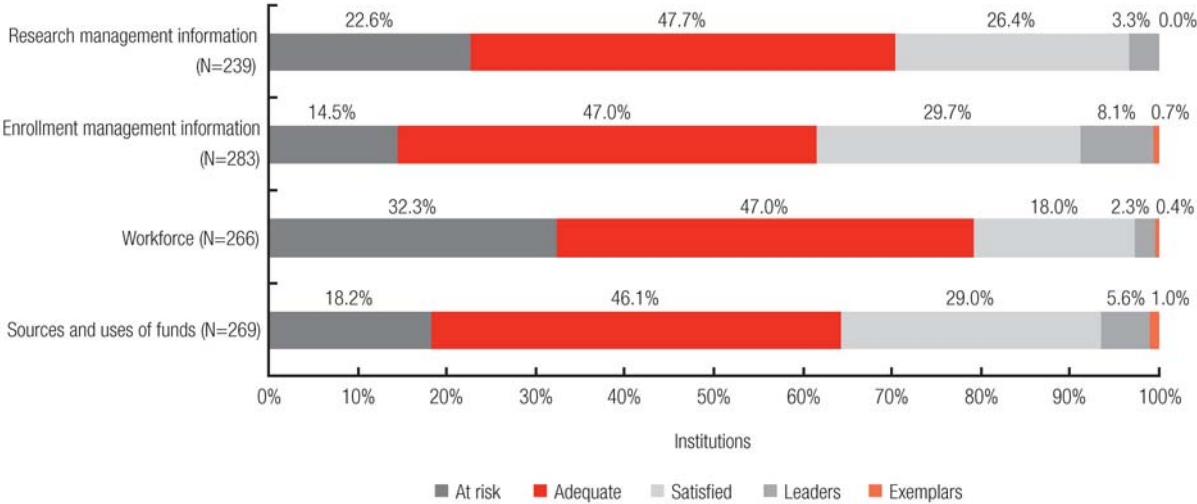
Grants management has been and still is a difficult area in which to achieve process improvement. The few pioneers who focused early reengineering efforts on grants management experienced strong cultural resistance to change. While many institutions recognized the need for improvement, it appears that they had difficulty forging a consensus among deans, researchers, departmental business administrators, and the central administration. In some institutions, there were (and in some cases still are) administrators who derive significant authority and security from their ability to navigate the grants management processes on behalf of faculty. In contrast, some institutions have managed to establish ownership of the grants management process in an office of grants and contracts.

Management Information and Analysis Processes

The management information and analysis category is somewhat different from the others in this study. The processes chosen are not processes per se. Rather, they represent managerial capabilities. However, like processes they require both strong technology and skilled people to perform them well. Also, like processes, they rely on people learning new skills and approaches, and changing attitudes to work in order to achieve higher levels of performance. And like the processes in the study, the ease and difficulty of change varies significantly.

Institutions were asked to assess the level of performance they had achieved for four management information and analysis processes (see Figure 6). As with grants management, in this category the majority of institutions view themselves at risk or needing change. In this study, management information and analysis is collectively the most problematic functional area for respondents.

Figure 6. Status of Management Information and Analysis Processes



Enrollment management information has the highest percentage of satisfied institutions and analysis of workforce has the lowest. It is likely that the enrollment management area has better analytical and reporting capacity because of its strategic nature.

Research management information is the area of least satisfaction. This corresponds with the results of the grants management process area. Institutions are struggling to improve even the transactional level services in grants management.

Cross Business Area Performance

When comparing the business area processes, it is clear that institutions look at business process areas differently. For most business processes, institutions report that their performance is somewhere between adequate and satisfactory. Very few report overall process performance that is exemplary. Institutions differentiate between the processes that provide strategic differentiation for their institution and require significant process improvement. Most institutions appear to be engaging in what Nobel Prize winner Herbert Simon calls satisficing. Simon used the concept of satisficing to explain the behavior of decision makers who settled for outcomes that were “good enough” rather than optimal (Simon, 1965). Decision makers who operate in this way settle for good enough in the belief that the higher costs of optimizing are not justified. Satisficing behavior is both rational and expected.

Assuming that higher education decision makers are satisficing leads to predictions that closely follow much of the data: strategic processes such as admissions, enrollment management, and others that directly impact revenue and/or reputation often go beyond satisficing. For many other processes, operating “in compliance” is good enough, as those processes will not differentiate the institution and, more important, marginal investments in those processes subtract from investments that could be made in teaching and research activities closer to the institutional core.

When examining differences between institutions, student processes have both the highest performance ratings and the greatest variability among institutions. Of the 11 processes in which more than 10 percent of institutions rate themselves as leaders, nine are student processes and two are financial processes.

The analysis of transaction processes versus management processes in financial, human resources, student, and grants management areas does indicate some differences. Transactional processes especially in HR and finance had the least variability among respondents. The management processes, however, are undergoing the greatest amount of change at the responding institutions.

Overall business process performance within the five functional areas had similar patterns, especially between management processes (least satisfaction) and transactional processes (most satisfaction). But overall, the variation within each functional area is small. There is much greater variation across functional areas. The performance of grants management and management information and analysis processes lags behind that of financial, HR, and student processes.

Table 1 shows that six of the 10 processes at risk at the greatest number of institutions are in the areas of management information and analysis and grants management. Sixty percent of the grants management processes and 50 percent of the management information and analysis processes are reported as at risk by over 15 percent of the respondents. This compares with zero percent for finance, 10 percent for HR, and 5 percent for student areas.

Table 1. Processes Deemed at Risk at More Than 15 Percent of Institutions

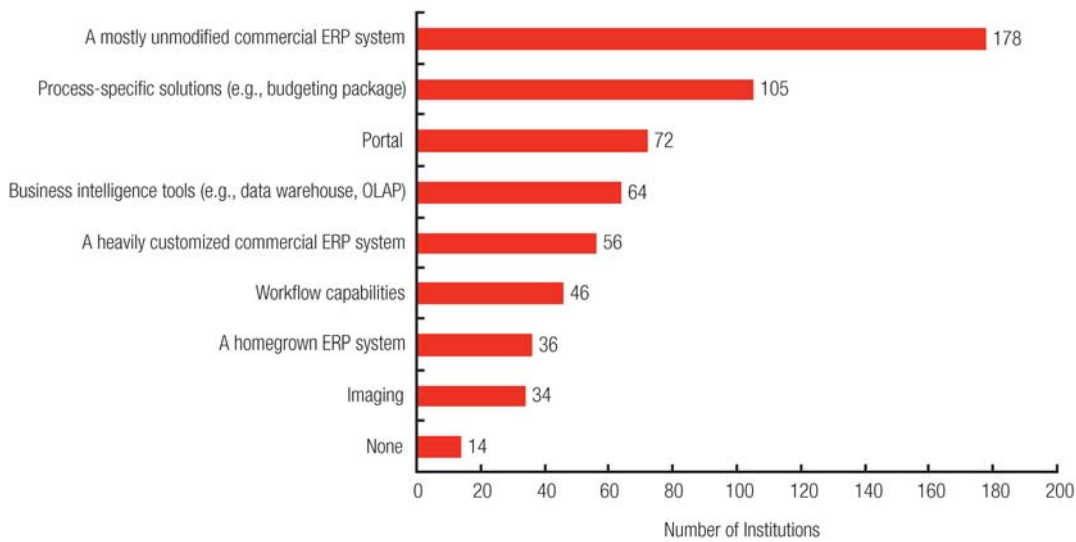
Process	Percent at Risk	Area
Workforce	30.4%	Management information and analysis
Research management information	22.0%	Management information and analysis
Report time and effort	20.9%	Grants management
Prepare grant proposals	20.5%	Grants management
Obtain and track proposal approvals	20.4%	Grants management
Manage events	19.1%	Student
Audit degree completion	19.0%	Student
Sources and uses of funds	17.4%	Management information and analysis
Manage positions	17.0%	HR
Record time and attendance	15.9%	HR

The student process area dominates the leadership category. Of the 11 processes in which institutions indicated that 10 percent or more of them were leaders or exemplars, nine are in the student area and two are in the financial area. All involve transactional processes. The majority of the processes are strategic processes that offer a high return (such as advise students and degree audit) or commodity processes that offer significant opportunities to improve the satisfaction of a large number of users (such as course enrollments and maintain grades). Conversely, processes that have the fewest leaders and exemplars are management reporting processes regardless of business area.

The Impact of Information Technology

The study asked respondents about the impact of technology on their process improvement efforts. Figure 7 details the use of technology to improve process performance. An ERP system, commercially vended or homegrown (80.5 percent) and Web self-service (68.1 percent) are the technologies most frequently used by institutions that report themselves to be leaders in improving process performance.

Figure 7. Technologies Used to Improve Process Performance



When looking at the technologies used by business processes, ERP systems were found to be used most often to improve business processes for finance (more than 33 percent), followed by HR (27.7 percent), and student (27.5 percent). The Web was used most often to improve student processes followed closely by grants management and HR processes.

The results suggest that ERP technology is a foundation technology. Institutions that are achieving the highest levels of process performance use more than just the ERP implementations to improve their business processes. They are achieving above-average results by combining the functionality of ERP with the analytical capabilities of business intelligence tools and the self-service capabilities of the Web. And they are using these technologies to link transactions end-to-end and across departments.

Process Improvement Factors

Respondents were asked to identify up to three factors that contributed most to business innovation at their institution. When grouping the responses into the categories of leadership, technology, and environment (including the institution's culture), leadership scores the highest. One hundred and sixty-one respondents indicate the importance of the president or provost, 96 mention department leaders, 60 respondents note the importance of the board of trustees, and 39 attribute business process improvement to a change in leadership.

Technology is the next highest factor with 152 respondents ranking it among the top three factors. For many, the purchase of an ERP system is a catalyst to improving process performance. It is linked to rethinking business processes either because business processes are deliberately reviewed or because the system implementation leads to or requires change.

Other contributing factors are environmental or contextual. Those factors include regulation (74 respondents), economic pressures (60 respondents), enrollment pressures (55 respondents), constituent demands (52 respondents), negative publicity (33 respondents), and reaction to other external events (15 respondents).

Future of Business Process Improvement

This study reports that higher education institutions have not fully optimized their business processes and concludes that this is a rational decision today for institutions of higher learning. Most institutions report that their processes are satisfactory, not exemplary. Respondents' initiatives at improving business processes have yielded mixed results. In general, process improvement programs yield encouraging results, but when implemented without accompanying technology improvements, these results can be difficult to sustain over time. Also, when a technology-based approach is used, it can introduce an overwhelming degree of change to the organization as well as be expensive and time-consuming. Even when the technology change is successful, it can be difficult to introduce additional change later without significant time and expense.

Some institutions have implemented alternative organizational models in order to improve business processes. One of these models is "shared services," merging operations into a single center for providing customer services. While shared services can be an effective way to reduce costs, share risk, and provide services that might be unattainable for an individual department or institution, it has some problems primarily around the need for various business units to reach consensus on the business and financial models, the support technologies, and the staffing. Another alternative is outsourcing business functions to an external provider. Higher education has done less of this than other business sectors.

Higher education institutions have implemented a number of technologies in an effort to improve business processes. The most significant of these is ERP systems, which provide efficient transactional business processes but cannot be easily or inexpensively modified. Also, while many institutions have realized that ERP systems provide a useful foundation, the value is not in the transactions themselves, but in the information provided by the transactions. These institutions have also deployed a number of business intelligence systems including data warehouses, reporting packages, and online analytical processing (OLAP) tools.

All these efforts have improved business processes at the institutions but according to the participants in this study, the business process performance is nevertheless only satisfactory, not exemplary.

There is more pressure to change business processes than in the past. These pressures include the need for long-term cost reductions, increased customer demands, increased competition for students, and potentially, more governmental regulations. While some short-term cost reductions such as hiring freezes and budget reductions have been implemented, institutions will need long-term strategies to control costs. Student expectations for level of service is driven by their experiences with other businesses, including 24 x 7 availability and ready access to personal data from anywhere. The

increasing number of educational choices may require some colleges and universities to make significant changes to remain competitive. If government regulatory control over higher education increases, such as with Sarbanes-Oxley–type legislation, institutions will need to change existing systems to comply.

In order to meet these pressures, higher educational institutions need to find more flexible technologies that enable them to change business processes quickly as needed. One such technology is the business process management system (BPMS). A BPMS is designed for easy creation, operation, and modification of a process-driven business. Relatively new to the market and still unused in higher education, the BPMS offers the ability to abstract the business process out of the application system and run it at a higher level inside the BPMS. It also has a standards-based way of describing and executing a business process, enabling portability across technology platforms.

Some industries have begun to implement BPMS. For example, a major financial institution was able to reduce the amount of time required to develop new products for its wholesale customers from an average of 28 days to less than five minutes. (Lombardi Software). As methodologies improve, it may be possible for colleges and universities to raise the bar of “good enough” without diverting precious resources from the core mission. It may be time for higher education to consider BPMS as the next step in its business process improvement efforts.

Conclusion

In recent years, higher educational institutions have taken steps to improve their business processes. This study examined finance, human resources, student, grants management, and management information and analysis functions. Of these, respondents report least satisfaction with their grants management and management information and analysis functions. They also report greater satisfaction with their transactional processes than with their managerial processes, regardless of functional area. Processes where institutions are most likely to identify themselves as leaders or exemplars are processes that are perceived as strategic to the institution, such as those impacting student recruitment and retention. IT used by these institutions to improve their business processes are primarily implementation of ERP systems and Web-based self-service capabilities. Leadership at the institution is identified as the factor that most contributes to business innovation. As institutions look to future business process improvement initiatives, the BPMS offers the flexibility required to respond quickly to the necessary changes.

References

Cohen, M. D. & March, J. G. (1974). *Leadership and ambiguity: The american college president*. New York: McGraw-Hill.

Kvavik, R. B., Goldstein, P. J., with Voloudakis, J. (2005). *Good Enough! IT investment and business process performance in higher education*. ECAR research study. Boulder CO: EDUCAUSE Center for Applied Research, Vol. 4. Available from <<http://www.educause.edu/LibraryDetailPage/666?ID=ERS0504>>

Simon, H. A. (1965). *Administrative behavior* (2nd ed.), New York: Free Press.

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A copy of the full study referenced above will be available via subscription or purchase through the EDUCAUSE Center for Applied Research (www.educause.edu/ecar/).
