9
Perceptions of IT Effectiveness

The universe rearranges itself to accommodate your picture of reality.
—Bumper sticker

This chapter explores our respondents' perceptions about IT's effectiveness both within the central IT units and at the institution as a whole. The ECAR survey asked respondents' opinions on 41 questions that we call *IT effectiveness markers*. We developed these markers from the body of research on IT leadership and its impact on organizations. They cover a wide range of IT topics, including governance, strategic alignment and planning, general management, change management, technology, and measurement. We asked respondents to rate each marker using a Likert scale (from 1 = strongly disagree to 5 = strongly agree). We present their opinions in this chapter and discuss

- how we derived our IT effectiveness markers;
- an overview of results—specifically, how distance from the executive suite matters; and
- specific IT effectiveness markers.

Key Findings

- Perceptions of IT effectiveness become less positive the farther away from the executive suite you get. Indeed, where you stand depends on where you sit.
- Perceptions of IT effectiveness about IT strategic alignment also become less positive the farther away from the executive suite you get.
- Perceptions of IT effectiveness involving communication processes are comparatively low.
- Perceptions of IT effectiveness for IT governance, strategic alignment, and measurement are higher among respondents from institutions that have a formal IT planning process.

Developing IT Effectiveness Markers

Since the emergence of the CIO, there has been keen interest in the nature of this position—what makes a successful CIO, what roles is this person called upon to play, what are the most important skills and competencies for success, and what effect does a successful CIO have on his or her organization? These questions have captured the imagination of academicians, research and consulting organizations, and IT leaders themselves. In turn, numerous frameworks, models, scoring systems, and classification systems have arisen to guide CIOs and help define the top IT leadership position. We used a subset of this research to generate a set of Likert questions about IT effectiveness for the survey, and we reviewed three frameworks.

Arenas: Business, Human Relations, and Technology

Nelson and Green[1] conducted a study based on the recurring idea that CIOs need

expertise in three major areas: business, human relations, and technology. They surveyed CIOs to determine what factors in each area were perceived as the most critical to success and found that, indeed, all three areas are highly important. Specifically, a CIO needs to understand

- the institution and its cultures;
- major issues of concern such as resources, politics, and perceived needs;
- a broad set of technologies, perhaps more from the perspective of their impact on constituencies than their nuts and bolts;
- both the centralized and decentralized IT staff;
- the major influence groups across the institution; and
- the institution's executives.

Thus, our IT effectiveness markers covered these areas.

IT Strategic Planning and Alignment

Another recurring theme is the CIO's critical role in IT strategic planning and alignment of IT with institutional goals. Effectively aligning and managing IT resources to meet institutions' strategic needs has been shown to improve both IT success and organizational performance within academic institutions.[2] Therefore, we used a planning framework[3] to derive questions that looked at how successfully IT initiatives align with institutional strategies throughout the organization. We also asked respondents about their institutions' IT planning and governance practices.

CIO Competencies, Roles, and Habits

Finally, we looked at descriptive frameworks focusing on recommended CIO competencies and their link to outcomes for the IT organization as well as the overall institution. Primary sources included "The Role of the CIO in a Transforming World,"[4] the framework for understanding leadership,[5] the IS lite framework,[6] the nine core IT capabilities and six skills,[7] and the CIO executive success cycle,[8] discussed in chapter 8. These frameworks and classification schemes provided a breadth of issues and topics related to how IT leadership impacts the organization.

Distance from the Executive Suite Matters

Looking at respondents' overall perceptions about IT effectiveness, a striking pattern emerged that is generally consistent across the full set of 41 statements: distance from the executive suite matters. We present two illustrative effectiveness markers, "The IT organization delivers high-quality services" (Figure 9-1) and "The IT governance process is effective" (Figure 9-2). The bottom line: senior-most IT leaders consistently rated IT effectiveness markers higher than their followers did. Furthermore, the low standard deviations indicate substantial agreement among these senior-most leaders. Taking these stair-steps down, we found that central IT staff rated these IT effectiveness markers somewhat lower, followed by the IT staff respondents in administrative units. Finally, IT professionals in the academic units rated IT effectiveness markers the lowest of all. Indeed, where you sit in the organization affects where you stand on issues of IT effectiveness.[9]

Why is this so? Do senior-most IT leaders have a clearer picture of reality because they have better access to information? … more involvement in key administrative issues? … an overall broader perspective? Or is this phenomenon better explained by staff's familiar complaint that their leaders are "out of touch" or, as one survey respondent commented, "too far from the action"?

Respondents from noncentral IT administrative and academic units had varying

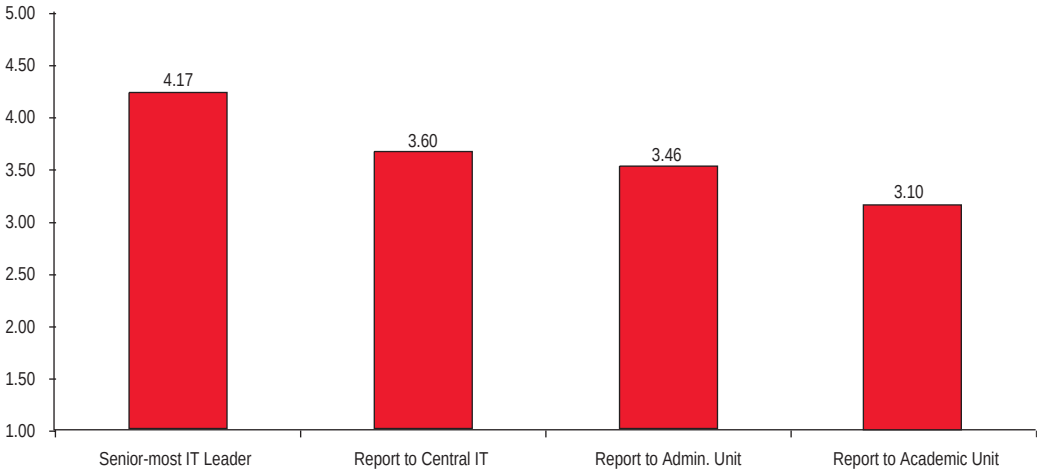

Figure 9-1. Central IT Organization Delivers High-Quality Services: Mean Score

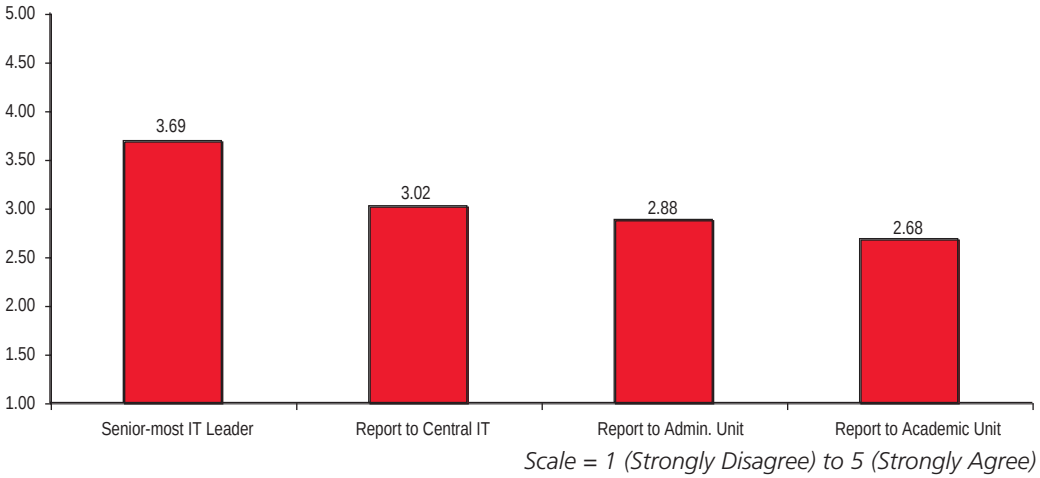

Figure 9-2. IT Governance Process Is Effective: Mean Score

opinions. Some did feel they were too far from central IT to give accurate answers. One respondent said, "I am shielded from central campus IT to a large extent, which may be one reason why I enjoy my job so much. We are very decentralized—hopefully others higher up in the organization can tell you more about central IT." Others were sensitive to the complexities of decentralization, including coordination of activities, differences in mission and goals, and proximity to the customer. One respondent perceived that "too often policy decisions are made by people who are too far removed from the front lines of user support. They don't know what is really useful and implementable and what is not." Another summed up the problem by saying, "The most insurmountable challenge is the inability of IT professionals, administrators, and end users to understand (or care about) each other's needs, objectives, and constraints."

Widely differing views among the non-central IT professionals are typical and corroborate the data. In addition to their overall lower ratings on IT effectiveness markers, their opinions varied widely among themselves. Tables 9-1 through 9-7 show that although many effectiveness markers' "mean" rating scores may suggest mild agreement, the often large standard deviations indicate a substantial contingent that disagrees or strongly disagrees.

IT Effectiveness Markers and CIO Role

A framework developed by the IBM Consulting Group and presented in "The Role

of the CIO in a Transforming World"[4] incorporates many ideas and findings from other frameworks. This work sought to guide CIOs in dealing with their organizations' increasingly changing environments—specifically the impact of globalization; economic and political uncertainty; redefinition of enterprises, organizations, work, and jobs; and technology's continuing rapid evolution.

We used part of this work to frame analysis of our IT effectiveness markers. Specifically, the IBM framework defines six primary roles for the CIO: trusted consultant, partner in deployment of IT, visionary, change agent, technology architect, and service provider. Below we discuss these roles and relate them to our IT effectiveness markers.

Trusted Consultant

Other executives and managers recognize the CIO as a "trusted consultant" engaging in meaningful and frequent interactions with other high-level institutional leaders, including academic and administrative executives, department heads, deans, and key faculty. The University of North Carolina System's Robyn Render talked about her strategy to this end. "As you build and develop relationships with your colleagues around the table, the more you can understand the total business. For example, I have attached myself to the CFO—whether he likes it or not. Over the course of two years, we have made tremendous strides. I have done the same with the chief academic officer and the university affairs executive officer to different degrees for different reasons. At the end of my day, my goal is for them to regard me not as a person to call when the network is down, but to think of me as a valuable colleague in sorting through their issues."

This active involvement in the institution's governance and administration facilitates understanding of its political, financial, and cultural environment and its major issues, goals, and strategies.

We asked numerous questions about IT governance (Table 9-1) and found that, overall, the senior-most IT leaders play a large role in establishing the institution's IT governance structure. Just over 80 percent agreed or strongly agreed that they are responsible for the IT governance structure. Further, 69 percent of all respondents agreed or strongly agreed that the IT governance process is effective, although only 47.1 percent of respondents agreed or strongly agreed that this process was well understood. The

Table 9-1. Perceptions About IT Governance

	Senior-most IT Leaders		Other IT Professionals	
IT Effectiveness Marker	**Mean***	**Std. Deviation**	**Mean***	**Std. Deviation**
Top IT leader is responsible for the IT governance structure	4.07	0.864	3.51	1.109
Administration is actively involved in IT governance	3.83	0.832	3.53	0.969
IT governance process is effective	3.69	0.876	2.94	1.044
Faculty are actively involved in IT governance	3.33	1.006	2.91	1.030
IT governance process is well understood	3.32	0.966	2.64	1.014
Deans are actively involved in IT governance	3.10	0.982	2.86	1.022

**Scale = 1 (Strongly Disagree) to 5 (Strongly Agree)*

administrative areas clearly dominate IT governance, with deans and faculty not as involved as administrators. We found little difference across Carnegie class, institution type (public versus private), or institution size regarding these perceptions.

Looking at other factors, we found it interesting that IT governance effectiveness markers were rated significantly higher by those senior-most IT leaders who also reported having a formal institution-wide IT planning process. For example, of those respondents using a formal planning process, 57.8 percent agreed or strongly agreed that faculty were involved in IT governance, compared with 33.6 percent where no planning process was used. This finding held whether or not a single top-level IT committee existed and even if the process did not result in a published plan. Apparently, the process itself is the key.

Stony Brook University's Richard Reeder noted the criticality of the planning process over the planning document. "My primary tool is the president's five-year plan, which the faculty, staff, and task forces develop. Those initiatives that the five-year plan accepts are treated very seriously. The president expects you to do them. I interweave technology into the five-year-plan initiatives to make sure the infrastructure and business processes are in place to make those things happen. I don't create an absolute technology plan for the campus because, by itself, it doesn't mean much. Its value comes from its being applied to solve business, research, or instructional initiatives identified in the plan."

Partner in IT Deployment

Building on the "trusted consultant" relationships, the CIO gains recognition as a "partner" with academic and administrative units in deploying new initiatives and processes. Ideally, the CIO interacts with managers to stimulate new ideas about how to use IT more effectively to benefit the institution and works from the executive suite down through campus units to help align their IT priorities with institutional and central IT strategies and plans. Table 9-2 shows the IT effectiveness markers concerning strategic alignment of IT with institution-wide goals.

One positive finding is that many respondents (71.1 percent) agreed that their "institution has a clearly articulated vision, mission, and strategy." In fact, 78.7 percent of senior-most IT leaders and 69.4 percent of other IT professionals agreed or strongly agreed with this statement. However, existence of a clearly articulated institution-wide strategy may not translate fully into strategic IT alignment as it cascades down through the organizational hierarchy. Once again, distance from the executive suite matters: agreement about the level of alignment of IT plans and priorities diminishes as we move from central IT to administrative units to academic units. Although 71.1 percent agreed or strongly agreed that the institution had clearly articulated strategies, far fewer respondents agreed that there was an effective process for setting IT priorities (39.7 percent), and fewer than half (44.7 percent) perceived that central IT organization priorities were derived from institution-wide priorities. And the trend continues. In fact, respondents ranked the last IT effectiveness marker in Table 9-2, "Deans/department heads look to institutional IT strategic plan when making their own IT investment decisions," lower than any other IT effectiveness marker in the survey.

Looking at the institution as a whole, it seems that publishing an institution-wide planning document does help clarify and communicate the college or university's direction. An overwhelming 90 percent of respondents from such institutions agreed that their institution had a clearly articulated vision and strategies. These respondents also reported more agreement that the central

Table 9-2. Perceptions About IT Strategic Alignment

	Senior-most IT Leaders		Other IT Professionals	
IT Effectiveness Marker	**Mean***	**Std. Deviation**	**Mean***	**Std. Deviation**
Leadership at my institution understands the value of IT	4.07	0.911	3.64	1.083
Institution has a clearly articulated vision, mission, and strategy	4.06	1.004	3.73	1.058
Central IT organization priorities are derived from clearly articulated institutional priorities	3.69	0.988	3.10	1.075
Institution has effective process for setting IT priorities	3.55	0.971	3.00	1.068
Departmental IT plans are aligned with institutional IT plans	3.41	1.031	2.86	1.038
People at institution have clear understanding of how IT projects relate to institutional strategy and goals	3.28	0.886	2.72	0.928
Deans/department heads look to institutional IT strategic plan when making own IT investment decisions	3.00	1.018	2.56	1.021

**Scale = 1 (Strongly Disagree) to 5 (Strongly Agree)*

IT organization priorities were derived from institutional priorities.

Now, looking specifically at IT planning, alignment issues again seem to benefit from a formal planning process. Senior-most IT leaders from institutions with a planning process perceive more strategic alignment than do those from institutions without planning processes. For example, 71.7 percent of respondents from institutions with a formal IT planning process agreed that IT priorities are derived from institutional priorities, compared with 50.4 percent of respondents who reported no planning process. We also noted that the existence of a top-level steering committee did not make a difference; the planning process appears to be a more critical factor.

These results point to the potential value of having both a formal, published institution-wide plan and especially an IT planning process to better align central IT initiatives with institution goals. DePauw University's Dennis Trinkle described the institution-wide initiative designed to integrate and align IT throughout his institution: "Our institution has a fairly focused technical undertaking and strategic plan called 361 degrees to encourage collaboration at every level. IT is not a sideline or add-on; it is pervasive and strategic, so we have used a partnership metaphor. So I work with every VP, and the IT staff works with every area. We need to look at every institutional decision and consider the strategic implications from the technology side."

These perceptions about IT strategic alignment issues did not vary by institution size, institution type, or Carnegie class, with the exception of the community colleges. These colleges had slightly stronger agreement with these effectiveness markers on

alignment of IT initiatives with institution-wide strategies.

Visionary

The CIO's role calls for a visionary, someone who understands what is possible and relevant to the institution and can inspire new and creative uses of IT. This includes responsible innovation and experimentation, which means understanding emerging technologies, how to apply them to further institutional goals, and how to articulate and communicate IT directions and strategies to campus management and staff. These ideas are then translated into the IT strategic planning processes.

Indiana University offers one example of a visionary at work. Brian D. Voss, associate vice president (telecommunications) in the Office of the Vice President for Information Technology at Indiana University, said, "I often refer to the vice president for information technology and CIO, Michael McRobbie, as the straw that stirs the drink. He helped an existing, sound foundation of IT leadership and staff to focus at a different level. He used his excellent relationship with the faculty to draft them into leading the process to develop the strategic plan in less than a year, and his excellent relationship with the president to get it funded and accepted throughout the institution." Vince Sheehan, CIO and associate dean for information technology, Indiana University–Purdue University Indianapolis, agreed and noted that "McRobbie is extremely visionary and has a heck of a track record for accomplishing things. His strategic plan will not end up as a doorstop."

Table 9-3 shows IT effectiveness markers related to the CIO's visionary role. Overall, 65 percent of respondents agreed or strongly agreed that IT is prominent in institution-wide strategic plans, and somewhat fewer (56.5 percent) agreed that the institution is forward-thinking in IT use. As one respondent commented, "True visionary leaders are seldom in abundance, as it takes a very confident, powerful individual willing to risk his or her career to push long-term goals in the face of governing boards looking for short-term, politically correct wins." And if we again look at respondents from institutions with a formal IT planning process, we find that they rate both of these IT effectiveness markers higher.

Table 9-3. Perceptions About IT Planning

	Senior-most IT Leaders		Other IT Professionals	
IT Effectiveness Marker	**Mean***	**Std. Deviation**	**Mean***	**Std. Deviation**
The IT organization is increasingly influential	4.21	0.658	3.71	0.984
The IT organization is proactive in developing vendor partnerships	4.12	0.803	3.78	0.960
IT is a prominent element in institution-wide strategic plans	3.82	1.001	3.60	1.036
Institution has reputation for being forward-thinking in use of IT	3.77	1.021	3.48	1.152
Institution's IT planning process is broadly inclusive and well understood	3.23	0.906	2.60	0.983

**Scale = 1 (Strongly Disagree) to 5 (Strongly Agree)*

Just as we saw that respondents generally don't perceive the governance process as well understood, we see also that they don't universally perceive the IT planning process as "broadly inclusive and well understood," especially the nonsenior IT professionals. Half (50.2 percent) of these respondents disagreed or strongly disagreed with this statement, and another 30.3 percent were neutral. The communications issue surfaces yet again.

Change Agent

The CIO as a change agent empowers the institution through meaningful changes in long-standing business processes and also spearheads creative changes through new initiatives. The change agent works within the context of institutional culture and considers bringing about positive change an essential aspect of IT deployment. Further, some respondents felt increased receptiveness to change was the silver lining in tough economic times. One stated, "In these financially lean times, we can serve as the catalyst for making major organizational changes, reducing duplication, and streamlining business processes."

Table 9-4 shows that senior-most IT leaders agreed or strongly agreed (89.5 percent) that their central IT units foster innovation and that they see their IT initiatives as an opportunity to challenge existing procedures and processes (79.5 percent). Also interesting, one of the most frequent motivations given by those who aspire to CIO positions was to be able to make meaningful change in the institution. As one typical aspirant said, "I want to inspire change and lead higher education to the next level of IT integration."

Are these efforts successful? Does this positive intent translate into actual change? Respondents mildly agreed that IT initiatives do result in such changes. Especially interesting, in light of higher education's cultural tenacity, 53.9 percent of all respondents agreed or strongly agreed that IT initiatives often result in sustainable and positive cultural change. However, some acknowledged difficulties in actually implementing change. Stony Brook University's Reeder spoke of their PeopleSoft implementation: "It has touched every business process at the university and continues to do so. The pressures of having to change business practices should not be underestimated. While we have had a very

Table 9-4. Perceptions About IT and Organizational Change

	Senior-most IT Leaders		Other IT Professionals	
IT Effectiveness Marker	**Mean***	**Std. Deviation**	**Mean***	**Std. Deviation**
IT organization fosters responsible experimentation and innovation	4.20	0.719	3.65	1.035
IT initiatives challenge long-standing procedures and processes	3.98	0.760	3.60	0.967
IT initiatives often result in sustainable and positive cultural change	3.78	0.744	3.36	0.960
IT initiatives result in highly innovative changes in administrative offices	3.57	0.880	3.08	1.024

**Scale = 1 (Strongly Disagree) to 5 (Strongly Agree)*

successful implementation of our ERP [enterprise resource planning] system, we are still several years away from the vision that I have of totally integrating PeopleSoft into our environment."

Numerous respondents expressed serious frustration with their highly change-resistant institutional cultures. One survey respondent warned about his institution, "Whatever you do, I don't think that the institution wants *real* change." Overall, we found little difference in perception between respondents from private and public institutions, smaller and larger institutions, and different Carnegie classes.

In Chapter 7, on the IT innovation climate, we found that respondents who gave their central IT units high marks for supporting innovation also agreed much more with the Table 9-4 IT effectiveness markers about IT-related changes in the institution. Improving the innovation climate in central IT units may actually translate into IT initiatives that result in positive and tangible changes throughout the institution.

Technical Architect

The CIO is the primary architect in setting the technical strategic direction and standards that provide for future growth and flexibility. This requires maintaining current knowledge of emerging technologies and technology issues and controversies. The architect focuses also on issues such as security, financial and technical maintainability, performance, and reliability, among many other things.

The senior-most IT leaders gave some of their highest ratings to IT effectiveness markers involving technical infrastructure issues (see Table 9-5). Most (91.1 percent) agreed or strongly agreed that their IT organization is the final authority on campus-wide infrastructure decisions, and 89.5 percent agreed that the IT organization sets architecture standards and guidelines that guide cam-

Table 9-5. Perceptions About IT Infrastructure

	Senior-most IT Leaders		Other IT Professionals	
IT Effectiveness Marker	**Mean***	**Std. Deviation**	**Mean***	**Std. Deviation**
IT organization is final authority on campus-wide IT infrastructure decisions	4.43	0.720	3.55	1.161
IT organization sets IT architecture and standards that guide independent IT decisions of divisions/departments	4.30	0.747	3.61	1.040
Institution's IT infrastructure is recognized as an important institution-wide asset	4.27	0.801	3.77	0.965
Institution's IT infrastructure is sufficiently flexible to accommodate IT in departmental units in cost-effective manner	4.01	0.844	3.33	1.052
Institution's IT infrastructure easily accommodates new and emerging technologies	4.00	0.859	3.34	1.071
IT organization actively communicates IT architecture to campus	3.83	0.815	3.29	1.052

**Scale = 1 (Strongly Disagree) to 5 (Strongly Agree)*

pus IT decisions. Although this group seems in general agreement (low standard deviations), opinions ranged widely among the other IT professionals. We noted that those out in the academic units have a different picture of reality: only 45.7 percent of these respondents agreed or strongly agreed that the IT organization is the final authority on IT infrastructure decisions. Also, they don't overwhelmingly see the central IT organization as setting architecture and standards (51 percent agreed or strongly agreed).

We might explain part of this discrepancy by communication difficulties, because once again we see the communication-related IT effectiveness marker ("IT organization actively communicates IT architecture to the campus") rated lower. While 71.4 percent of senior-most IT leaders agreed or strongly agreed with this marker, only 36.9 percent of respondents from the academic units agreed or strongly agreed. This difference may also reflect the complex levels of technology architecture, such that senior-most IT leaders see institution-wide architecture in different terms than those in campus units responsible for local networks, databases, and so on. In fact, when survey respondents described varying campus architecture approaches and solutions, views ranged from noting the benefits of highly centralized infrastructures to praising highly decentralized environments. One respondent described "using an artist's coop model in which artists agree on the building, utilities, and advertising and they do their own projects. Thus, we strive to agree on basic network, middleware, and database technologies and then let each department use IT as it sees fit."

With respect to institution size, smaller institutions agreed slightly more with all the infrastructure IT effectiveness markers than did larger institutions, with the exception of "the IT organization actively communicates IT architecture to the campus." And, most likely related to size, AA and BA institutions agreed more often that the IT organization is the final authority on campus-wide infrastructure decisions and sets IT architecture and standards for other campus units.

IT Services Provider

The CIO is recognized as the one who identifies and procures solutions from the best sources (internal and external) to deliver high-quality IT services to the institution. This requires effective general management of IT resources, including solid project and process management, staff and user training, system development and installations, good relations with the user base, and partnerships with vendors and consultants.

Central IT organizations received some of the most positive ratings on issues related to overall management practices (see Table 9-6). Again, the strongest ratings were from the senior-most IT leaders, who are largely responsible for these units. Senior-most IT leaders rated their central IT organizations highest in problem resolution during system implementations (92.8 percent agreeing or strongly agreeing). Other IT professionals showed less agreement (67.6 percent agreeing or strongly agreeing). Instead, these other IT professionals rated staff technical expertise as strongest among these IT effectiveness markers. Differences were slight across Carnegie class, institution type, and institution size.

Again we point back to chapter 7 results concerning IT innovation climate. Respondents who agreed that their IT units support innovation also agreed more with the Table 9-6 IT effectiveness markers than did other respondents. Respondents with higher transformational leadership profiles also rated these IT effectiveness markers somewhat higher. These findings support the notion that central IT units' overall performance may benefit from both improving

Table 9-6. Perceptions About IT Management

	Senior-most IT Leaders		Other IT Professionals	
IT Effectiveness Marker	**Mean***	**Std. Deviation**	**Mean***	**Std. Deviation**
IT organization quickly and effectively resolves problems that arise during campus IT project implementations	4.30	0.627	3.73	1.007
IT organization delivers high-quality services	4.17	0.716	3.51	1.058
IT organization maintains excellent relationships with other units across campus	4.14	0.709	3.38	1.031
IT organization resolves IT vendor software problems and conflicts fairly and promptly	4.14	0.648	3.69	0.884
IT organization has staff members who are well trained in technologies required to do their jobs	4.06	0.782	3.83	0.946
There is an effective management structure for overseeing IT activities	4.06	0.746	3.23	1.088
IT organization makes organizational and personnel changes to accommodate deployment of new technologies	3.96	0.856	3.38	1.085
IT organization has strong project management and process management skills	3.81	0.885	3.19	1.190

**Scale = 1 (Strongly Disagree) to 5 (Strongly Agree)*

the IT innovation climate and developing leaders with more transformational leadership behaviors.

Table 9-7 shows that queries about IT measurement practices received overall low ratings, especially those concerning the regular use of metrics and customer satisfaction measures. Among all respondents, 40.5 percent disagreed or strongly disagreed that metrics were used regularly, and another 28.4 percent were neutral. Customer satisfaction measures fared only slightly better, with 35.9 percent of respondents disagreeing or strongly disagreeing that they were regularly used; another 24.1 percent were neutral. This isn't unexpected, given the historical challenge industry-wide in determining and communicating IT's value and the difficulty of creating meaningful and affordable metrics. These ratings remained consistent across Carnegie class, institution type, and institution size.

However, returning to institutions with a formal IT planning process, we find that their senior-most IT leaders agreed significantly more than other respondents that their institution uses metrics to evaluate IT activities' performance, measures customer satisfaction, and formally reports on IT activities. The IT planning process probably motivates accountability of IT initiatives and the inclusion of reporting and measurement processes.

Table 9-7. Perceptions About IT Measurement

	Senior-most IT Leaders		Other IT Professionals	
IT Effectiveness Marker	**Mean***	**Std. Deviation**	**Mean***	**Std. Deviation**
IT goals and objectives are clearly documented when projects are approved	3.69	0.844	3.02	1.059
Institution reports regularly and formally on IT performance and activities	3.65	0.997	3.18	1.084
IT organization regularly measures customer satisfaction with IT services	3.38	1.081	2.99	1.174
IT organization works with major users to establish measurable service-level agreements	3.27	1.030	3.16	1.069
IT organization regularly uses metrics to evaluate performance of IT activities	3.12	1.048	2.81	1.074

**Scale = 1 (Strongly Disagree) to 5 (Strongly Agree)*

Endnotes

1. M. R. Nelson and M. W. Green, "Study on Higher Education Information Management and Leadership: Questionnaire Results," working paper, Lally School of Management and Technology at Rensselaer Polytechnic Institute, 2003.
2. R. Sabherwal and P. Kirs, "The Alignment Between Organizational Critical Success Factors and IT Capability in Academic Institutions," *Decision Sciences*, Vol. 25, No. 2, Mar./Apr. 1992, pp. 301–330.
3. J. I. Penrod, "Creating a Realistic IT Vision: The Roles and Responsibilities of a Chief Information Officer," *Technology Source*, Mar./Apr. 2003.
4. IBM Consulting Group, "The Role of the CIO in a Transforming World," working paper, fall 1994.
5. Nelson and Green, op. cit.
6. Gartner, Inc., produced in conjunction with Korn/Ferry International as an *EXP Premier Report*, October, 2001. See p. 15 for a diagram.
7. D. F. Feeny and L. P. Willcocks, "Core IS Capabilities for Exploiting Information Technology," *Sloan Management Review*, Article Abstract: Reprint 3931; spring 1998, Vol. 39, No. 3, pp. 9–21.
8. Gartner, Inc., op. cit.
9. The differences in "stair steps" are not always statistically significant, but the general pattern is consistent.