7
IT Investment Decision Making

Let no one say that taking action is hard. Action is aided by courage, by the moment, by impulse, and the hardest thing in the world is making a decision.
—Franz Grillparzar, Austrian author

People outside the IT organization often view IT investment decision making as a form of alchemy. The mystery of what gets funded and why fuels much speculation on many campuses. Some believe only the "squeaky wheel" attracts investment. Others view IT decisions with skepticism, believing that IT investments always overpromise and underdeliver. The skepticism and confusion grow when few at the institution appreciate the need for or understand the technology in question.

Is there an objective way to make IT decisions? Corporations use concepts such as return on investment (ROI) or IT portfolio management (ITPM) to evaluate IT investment opportunities. However, these concepts are relatively new to higher education and are thought to be difficult to apply. The academic culture often resists terms and models employed in private business. Some institutions are applying concepts such as value on investment (VOI)[1] to evaluate and prioritize IT investment decisions, but this approach has only a brief track record in higher education.

Making an investment decision is a familiar concept to institutions. They routinely wrestle with investment decisions about construction projects, real estate ventures, academic programs, or new research centers. Do IT decisions differ fundamentally from these choices?

Key Findings

- Most CIOs believe their institutions do not adequately manage total technology spending.
- Institutions that employ business cases, consistent evaluation criteria, empowered advisory groups, and structured decision-making processes to select IT investments achieve greater value and competitive advantage from technology.
- Alignment with an institutional priority is the most important determinant for an IT project to receive funding.

Anecdotal evidence might suggest that higher education feels more equipped to evaluate these investments than an IT investment. How does higher education make its IT investment decisions?

This chapter examines the following questions:

- Who makes IT investment decisions?
- What processes are used to analyze and evaluate them?
- How effective are business cases for IT investments?
- What practices are most significant in driving effective IT decision making?

The chapter is organized into the following subsections:

- Organization and Governance: The Authority to Spend
- Investment Decisions and Business Cases
- Successful Practices

Organization and Governance: The Authority to Spend

The authority to approve an IT expenditure or investment is rarely vested in a single individual. The consensus-driven nature of higher education decision making and the intrinsic need to partner with a user make almost all technology investments collaborative decisions. Senior IT leaders shape technology investment decisions through positional authority and personal influence.

Positional authority derives from senior IT leaders' control over the central IT budget and their participation in broader institutional governance bodies such as the president's cabinet or budget committee. This is true for about half of the institutions surveyed. At 45.4 percent of responding institutions, the senior IT leader sits on the institutional committee that develops the operating budget, and at 44.8 percent of responding institutions the senior IT leaders sits on the committee that develops the capital budget. A similar percentage of respondents, 44.6 percent, sit on the president's cabinet.

At most responding institutions, the senior IT leader has the authority to approve all but the largest expenditures from the central IT budget. The senior IT leader has day-to-day responsibility for the central IT budget at 60 percent of responding institutions (see Figure 7-1). At 31.8 percent of institutions, the IT leader delegates that responsibility to a financial manager within the IT organization.

A full-time financial manager within IT is more prevalent at institutions with larger central IT budgets. About a third of responding institutions with IT budgets between $3 million and $7 million have a full-time manager. That number jumps to almost 70 percent of institutions with budgets between $7 million and $17 million. A full-time financial manager is present at almost all responding institutions with IT budgets over $17 million. The senior IT leader gives these individuals significant administrative responsibilities to monitor the budget's status and serve as an interface with other campus administrative units.

Although the CIO often controls the central IT budget, he or she must influence other IT investment decisions. Relatively few CIOs have authority to approve all campus IT ex-

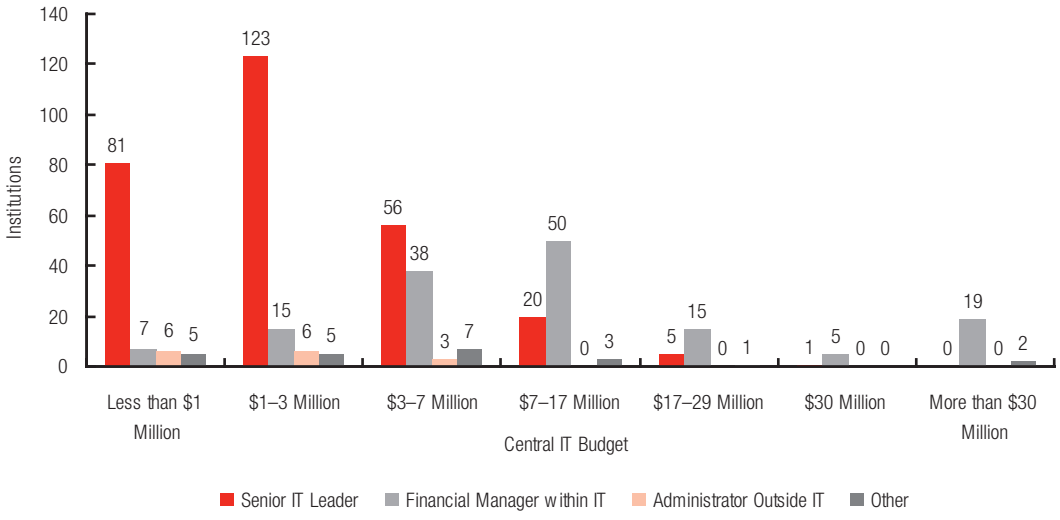


Figure 7-1. Manager of IT Budget, by Budget Size (N = 473)

penditures. Most top IT leaders must influence decisions through advice and consultation. This is especially true at more decentralized institutions, where the IT leader must work with many autonomous constituents to try to keep IT spending aligned with institutional priorities. "You have to place a lot of emphasis on one-on-one conversations with campus thought leaders to have influence," explains Rosario Alvarez, executive director of information technology at the University of Massachusetts Amherst. "At a big campus it is really about a lot of small meetings."

We asked respondents about their senior IT leader's scope of financial authority. As Figure 7-2 illustrates, more than half of respondents (59 percent) reported that the senior IT leader approved all or all significant institutional IT expenditures, 24 percent said the IT leader approved all central IT expenditures regardless of size, and the remainder said their IT leader either had the authority to approve only smaller expenditures or required a more-senior executive's approval.

Most respondents agreed that the senior IT leader had great influence over IT decisions across all investment categories (see Table 7-1). Respondents felt the senior IT leader had the most influence over expenditure decisions regarding data communications (mean

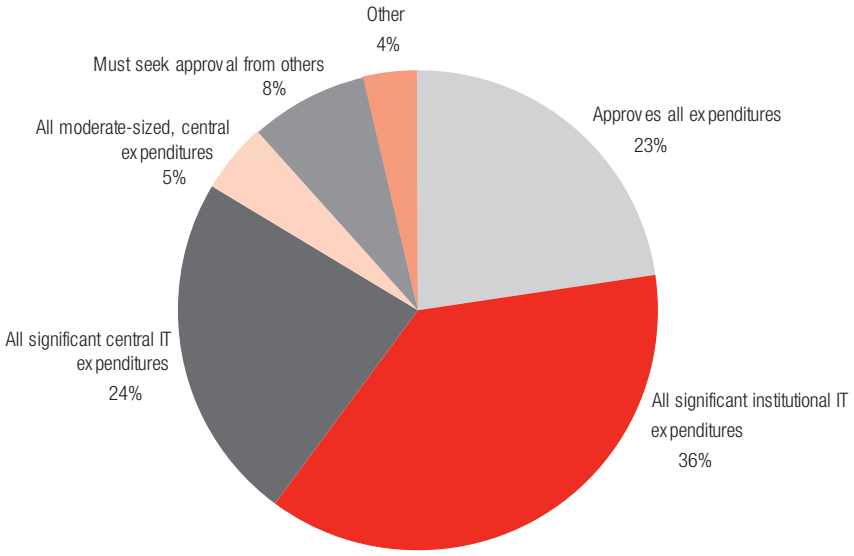


Figure 7-2. Senior IT Leader's Financial Authority (N = 482)

Table 7-1. Influence of Senior IT Leader on Expenditure Decisions

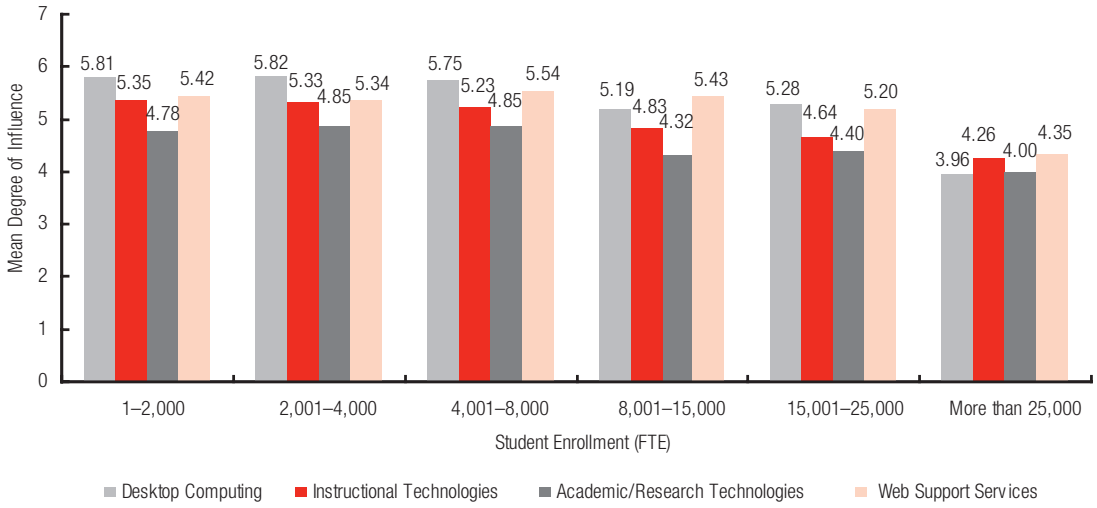
	Administrative Systems (N = 481)	Data Communications (N = 480)	Desktop Computing (N = 479)	Networks within Buildings (N = 479)	Instructional Technologies (N = 479)	Academic/ Research Technologies (N = 476)	Web Support Services (N = 481)
Mean	5.91	6.13	5.52	6.01	5.08	4.63	5.34
Standard Deviation	1.274	1.286	1.429	1.347	1.449	1.503	1.389

Q: *The senior IT leader greatly influences all expenditure decisions for the following technologies. (1=very strongly disagree, 4=neutral, 7=very strongly agree)*

6.13), campus network (6.01), and administrative systems (5.91). The respondents generally felt the senior IT leader had less influence over academic (mean 4.63) and instructional (5.08) technology expenditure decisions.

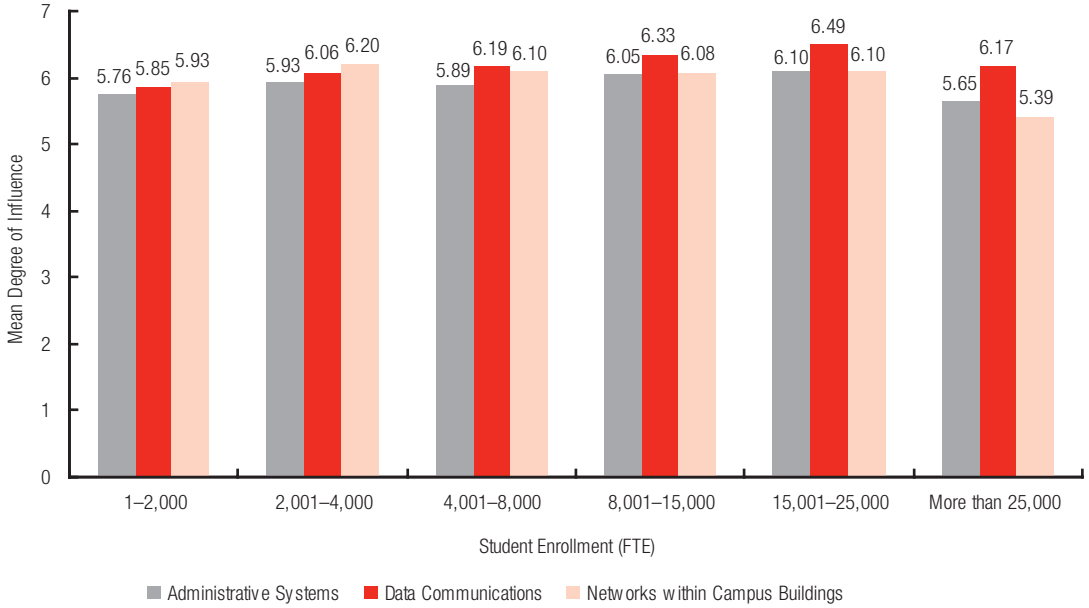
Institution type and size explains some variance in the senior IT leader's authority and influence. At larger and presumably more decentralized institutions, IT leaders have less influence over some decisions than their peers at smaller institutions. Specifically, as Figure 7-3 illustrates, we found an apparent relationship between institution size and the IT leader's influence over decisions about instructional technologies, research technologies, desktop computing, and Web support. This isn't surprising, because IT support staff in individual academic units often manage these technology services. Conversely, we found no significant variance in CIO influence by institution size for infrastructure and enterprise technologies such as administrative systems, data communications, and the network (see Figure 7-4).

Figure 7-3. IT Leader's Influence over Academic Technology Expenditures



1=very strongly disagree, 4=neutral, 7=very strongly agree

Figure 7-4. IT Leader's Influence over Infrastructure Technology Expenditures



1=very strongly disagree, 4=neutral, 7=very strongly agree

Similar relationships appear between influence and Carnegie classification. As Table 7-2 illustrates, senior IT leaders at doctoral institutions reported less influence over expenditure decisions for research and instructional technology. The same respondents reported even less influence over desktop computing and Web support services. This suggests that decision making about these technologies is decentralized to an even greater degree at doctoral institutions.

Investment Decisions and Business Cases

Do institutions approach IT investment decisions differently than other investment decisions? For most, the answer appears to be no. As Figure 7-5 illustrates, only 15 percent of the institutions responding to our survey have created a tailored process for evaluating IT investments. The majority (63 percent) use the same process for IT decisions that they do for any other major funding decision.

Table 7-2. IT Leader's Influence over Technology Expenditures, by Carnegie Class

Carnegie Class	Mean Influence						
	Administrative Systems	Data Communications	Desktop Computing	Networks	Instructional Technology	Academic/ Research Technology	Web Support Services
Associate's	5.85	5.93	5.71	5.99	4.80	4.56	5.33
Bachelor's	5.91	6.06	5.99	6.19	5.55	4.98	5.52
Master's	5.90	6.23	5.61	6.17	5.21	4.78	5.46
Doctoral	5.88	6.21	4.87	5.70	4.67	4.30	4.92
Specialized	6.04	5.96	5.78	6.15	5.44	4.67	5.63

Q: *The senior IT leader greatly influences all expenditure decisions for the following technologies. (1=very little influence, 4=neutral, 7=very significant influence)*

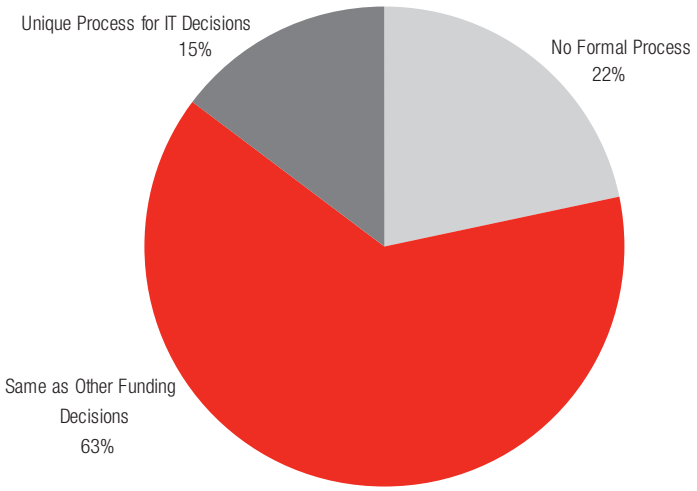


Figure 7-5. Process to Consider IT Projects for Funding (N = 482)

The remaining 22 percent report no formal process for making IT investment decisions. The presence of a formal process appears unrelated to either Carnegie classification or IT budget size.

For most respondents, the decision-making process has three basic elements:

- a business case,
- decision criteria, and
- an advisory committee.

Most institutions use at least one of these elements in their decision-making process. However, the extent to which they are used varies.

Business Cases

Some form of a business case is the most common element of respondents' IT decision-making process. Nearly all institutions surveyed (91.7 percent) reported preparing a business case to support IT investment requests. Institutions differ in what they include in their business cases. Asked to identify the components they include in their IT business cases, respondents most often indicated an implementation budget and a summary of qualitative benefits. About two-thirds of respondents also included an analysis of the technology's full life-cycle costs and an analysis of the potential cost savings (see Table 7-3).

Relatively few institutions include an analysis of the potential new revenue opportunities that a new technology investment would support. An IT investment often has second- or third-order impacts that might be more difficult to estimate or defend. Typically, it is much harder to measure indirect impacts. Therefore, institutions may be struggling to quantify them.

How effective are IT business cases? Most respondents were satisfied with the quality of their cases. We asked respondents to assess four aspects of their business cases:

- Did they project benefits accurately?
- Did they include a strategy to capture projected benefits?
- Were one-time costs projected accurately?
- Were recurring costs projected accurately?

Overall, respondents felt their business cases performed fairly well on each of these factors. As Table 7-4 indicates, the mean response to each was between 4 and 5, indicating that respondents mildly agreed that their business cases performed well against each criterion.

Table 7-3. Elements of IT Business Cases

Component	Number	Percentage of Institutions
Implementation budget	420	87.1
Qualitative benefits	340	70.5
Full life-cycle costs	326	67.6
Funding strategy	322	66.8
Potential cost savings	297	61.6
Analysis of alternatives to the recommended option	288	59.8
Potential revenue opportunities	173	35.9
Other	29	6.0

Respondents also mildly agreed that IT staff collaborated effectively with technology users to prepare business cases (see Table 7-5). This is significant, as most technology investments require collaboration with users to articulate and assess the technology's ultimate benefits. The relatively mild agreement combined with the larger standard deviation suggests that many respondents see significant room for improvement.

Respondents were generally neutral about their IT staff's skills in helping to prepare a business case. Again, the large standard deviation suggests many respondents mildly agreed and many mildly disagreed with this statement. On average, respondents from institutions with small central IT budgets (less than $1 million) disagreed more strongly that their staff had the requisite skills, though the difference is not statistically significant. Practice doesn't appear to make perfect, either; we found no significant relationship between IT staff collaboration and business case development skills with either Carnegie class or the level of technology investment.

We also found no significant variation in respondents' assessment of staff skills either by Carnegie class, enrollment, or budget size. So, the skill of the IT staff doesn't appear to be tied to the size of the IT department or their level of IT investment.

We also analyzed what impact an institution's ERP history had on their assessment of business case quality. Our hypothesis was that institutions that had implemented a full ERP suite would now view business cases more negatively than those that had not. Our hypothesis reflected the perception that business cases for ERP projects generally oversold the potential benefits and understated the costs.

Table 7-4. Assessment of IT Business Cases

	Mean	Standard Deviation
IT business cases effectively identify how to capture the benefits of technology.	4.46	0.921
IT business cases accurately predict the benefits of new technology.	4.34	0.924
IT business cases accurately present the one-time costs of the project.	4.88	0.942
IT business cases accurately present the recurring supporting costs of new technology.	4.51	1.049

1=very strongly disagree, 4=neutral, 7=very strongly agree

Table 7-5. IT Staff Skills

	Mean	Standard Deviation
The IT staff is well skilled at preparing a business case.	4.05	1.205
The IT staff collaborates effectively with individuals outside IT to create a business case for a project.	4.62	1.121

1=very strongly disagree, 4=neutral, 7=very strongly agree

The survey results tell a different story. As Table 7-6 illustrates, we saw no appreciable difference between institutions that had and those that had not implemented a new ERP system.

This is not just a case of CIOs putting a positive spin on past history. In fact, we saw similar assessments of IT business cases from chief business officers (CBOs). Table 7-7 presents business case assessments from the perspective of both CIO survey respondents and those who responded to the companion CBO survey.

At the study's outset, we hypothesized that CBOs would be significantly less satisfied with the quality of IT business cases. Rising IT costs and negative perceptions of ERP projects seemed likely to cause a negative assessment of the quality and credibility of business cases. But the data tell a different story. Table 7-7 reveals little difference in CIO and CBO assessments of IT business cases. The means suggest that respondents to both surveys generally agreed that IT business cases did accurately predict costs and benefits. We did note a slight gap in respondents' perceptions

Table 7-6. Assessment of IT Business Cases, by ERP Status

ERP Status		IT business cases identify how to capture the benefits of technology.	IT business cases accurately predict the benefits of technology.	IT business cases accurately present one-time costs.	IT business cases accurately present recurring costs.
Implemented complete ERP	Mean	4.54	4.35	4.90	4.57
No or partial ERP	Mean	4.43	4.34	4.87	4.49

1=very strongly disagree, 4=neutral, 7=very strongly agree

Table 7-7. CIO and CBO Assessment of Business Case Quality

	CBO		CIO	
	Mean	Standard Deviation	Mean	Standard Deviation
IT business cases effectively identify how to capture the benefits of technology.	4.36	1.131	4.46	0.921
IT business cases accurately predict the benefits of new technology.	4.35	1.117	4.34	0.924
IT business cases accurately present the one-time costs of the project.	4.83	1.238	4.88	0.942
IT business cases accurately present the recurring costs of supporting the new technology.	4.22	1.264	4.51	1.049

1=very strongly disagree, 4=neutral, 7=very strongly agree

of how well business cases predict recurring support costs. Although both groups' mean responses were above neutral, CBOs on average ranked this aspect of business cases lower. We also noted slightly greater variance in the CBO survey responses. The higher standard deviations, and means between 4 and 5, suggest many respondents agree and many disagree with the statement.

The factors that drive CBO perception of business case quality aren't readily apparent. We tested whether institution size, budget, or budget philosophy made a difference and found no statistically significant relationship. Nor is there a relationship between CBO perception of business cases and their feeling about technology's importance to the institution's identity and competitive advantage.

Finally, we hypothesized that an ERP experience could drive a difference in perception of business case quality. Looking at the paired responses from the CIO and CBO surveys lets us assess the comparative views of their institutions' business cases. This enables us to compare not only the perceptions of CIOs versus CBOs, but also the perceptions of those who have and have not implemented an ERP (see Table 7-8).

The results reveal no statistically significant relationship between whether an institution has implemented an ERP solution in the past five years and either the CIO or CBO assessment of IT business cases. Executives whose institutions have implemented an ERP are no more skeptical about the accuracy or veracity of business cases than those from institutions that have not implemented an ERP. There is also no statistically significant difference between CIO and CBO responses by institution. This supports earlier ECAR conclusions that failed ERP projects are in the minority.[2]

Decision Criteria

While the preparation of a business case is almost universal, the application of standard evaluation criteria is not. We asked respondents to tell us what criteria they used

Table 7-8. CIO and CBO Perceptions of IT Business Cases

ERP Status		IT business cases are viewed more skeptically.		IT business cases effectively identify how to capture the benefits of technology.		IT business cases accurately predict benefits.		IT business cases accurately present the one-time costs of the project.		IT business cases accurately present the recurring supporting costs of new technology.	
		CIO	CBO	CIO	CBO	CIO	CBO	CIO	CBO	CIO	CBO
Implemented complete ERP	Mean	3.32	3.45	4.73	4.33	4.45	4.05	4.82	4.55	4.41	3.95
No or partial ERP	Mean	3.54	3.42	4.51	4.32	4.49	4.37	5.02	4.78	4.51	4.43

1=very strongly disagree, 4=neutral, 7=very strongly agree

to evaluate IT funding proposals (see Table 7-9). Almost one-third reported that they had no standard criteria. For those that have criteria, the most frequently used are cost, fit with institutional strategy, and the potential to improve productivity. The least frequently used criteria are potential to improve compliance and risk.

It is interesting that such a relatively small percentage of institutions routinely use risk as a criteria. This suggests that institutions might have difficulty assessing either the risk of doing a project or the opportunity cost or risk of not doing it.

Role of Advisory Committees

Advisory groups are the final element in most institutions' decision-making process. Most institutions use some form of committee to advise the IT leader. Many have multiple groups, each focusing on a particular technology area (such as administrative systems).

Among survey respondents, 60 percent have a senior-level IT advisory committee. The committees most frequently include faculty (48.5 percent of respondents), one or more cabinet-level officers (39.4 percent), the CIO (47.1 percent), and other central IT staff (38.6 percent). The advisory group's chair is most often the institution's senior IT leader (51.4 percent) or a faculty member (17 percent).

These IT advisory groups appear to be most active in proposing and prioritizing IT projects (see Table 7-10). Nearly 40 percent provide feedback on proposed projects. Thirty-six percent recommend projects for funding, and a similar percentage identify or prioritize projects.

Very few of the groups are decision-making bodies. In fact, fewer than 10 percent of respondents indicated that their institution's advisory group had the authority to fund a project.

The decision to approve a significant IT project is most often made by one or more members of the executive leadership. We asked respondents to identify who must approve funding for projects under $1 million, between $1 million and $5 million, and over $5 million. As we might anticipate, the number of approvers grows with the size of projects (see Table 7-11).

Respondents reported that CBOs are frequently involved in approving projects in all three size categories. Presidents and boards of trustees are more often involved for larger projects.

Table 7-9. IT Investment Decision Criteria (N = 482)

Criterion	Percentage Using
Cost	67.0
Fit with institutional strategy	65.6
Potential to improve productivity	64.1
Fit with IT strategy	61.2
Potential cost savings	57.5
Potential to improve compliance	46.3
Risk	45.6

Table 7-10. Authority of IT Advisory Groups

Authority of Advisory Group	Number	Percentage of Institutions
Provide feedback on proposed projects	192	39.8
Recommend projects for funding	173	35.9
Identify potential projects	169	35.1
Prioritize projects	162	33.6
Develop IT strategy	158	32.8
Set IT policy	115	23.9
No authority, just advisory	108	22.4
Authorize funding for projects	44	9.1
Set IT fees	20	4.1
Other	10	2.1

Table 7-11. Required Approvals for Technology Investments, by Project Size

Approvers	Project Size		
	Under $1 Million	$1–5 Million	Over $5 Million
Senior IT leader	88.4%	78.8%	75.5%
Chief business officer	59.5%	68.0%	66.4%
IT advisory committee	18.9%	21.8%	21.0%
Budget committee	18.3%	23.0%	22.8%
Budget director	12.2%	16.2%	15.6%
Board of trustees	21.2%	46.5%	57.3%
Provost	30.9%	40.5%	40.2%
President	45.9%	74.5%	80.1%
Other	7.1%	8.5%	9.8%

Fewer than half of the institutions require their provost to approve funding for projects, regardless of size. Similarly, budget committees and the budget director were required approvers at relatively few institutions, also regardless of project size.

We found it somewhat surprising that provosts aren't more involved in decision making. Perhaps they are consulted but don't have a formal yes or no vote in the decision to make an IT investment. Perhaps it reflects historical IT spending that has focused on infrastructure or administrative applications. As institutions increase their spending on instructional and research technologies, we might expect the provost to become a more frequent decision maker. In addition, the data may suggest that the CIO has more work to do to involve and educate the provost to be an effective advocate of IT investments with the deans and faculty.

Successful Practices

So which decision-making elements are most important to successfully obtaining funding? We asked respondents to evaluate the importance of different aspects of decision making to funding success. Overall, respondents placed the greatest importance on alignment with institutional strategy (see Table 7-12). They agreed most strongly that projects identified in the institution's strategic plan are the easiest to fund.

Susan Foster, CIO at the University of Delaware, explains that the institutional strategic perspective is an embedded part of IT funding decisions. "When you think about IT funding, you have to have a decision-making process that asks what the institution wants to do, how it will be accomplished, and then what IT resources are necessary."

Projects mentioned in the campus IT plan were ranked next in ease of funding. Assuming the campus IT plan was developed to support institutional strategy, this is further evidence of the importance of alignment. Respondents also agreed fairly strongly that it is easier to fund projects that have a business case prepared to support them.

Respondents also agreed that it is easier to obtain funding for an IT project cosponsored by a user. However, the average response was lower and the variance among respondents higher. This is somewhat surprising; we would have anticipated even stronger conviction that a technology project must have a user as its sponsor to receive funding. Respondents did not view this as being as important a factor as alignment with the institutional strategy. It suggests that while a cosponsor is valuable,

Table 7-12. Factors that Make it Easier to Obtain Funding

Factors Influencing Funding	Mean	Standard Deviation
It is easier to obtain funding for an IT project cosponsored by a user.	4.86	1.072
It is easier to obtain funding for an IT project identified in the campus IT plan.	5.23	0.936
It is easier to obtain funding for an IT project identified in the institution's strategic plan.	5.61	0.975
It is easier to obtain funding for an IT project presented with a business case.	5.21	0.973

1=very strongly disagree, 4=neutral, 7=very strongly agree

it is not enough. The project must find a link to a strategic objective.

Does the decision-making process matter? Do institutions get better results if they are more deliberative about their funding decisions? The data seem to suggest that process matters. We found a statistically significant relationship between institutions that have a formalized decision-making process and whether they report deriving a competitive advantage from technology. As Figure 7-6 indicates, institutions that have a process for weighing IT decisions, use advisory groups, and employ decision criteria also feel more strongly that their institutions derive a competitive advantage from technology.

Endnotes

1. D. Norris and M. Olson, *The Business Value Web* (Washington, D.C.: NACUBO, 2003).
2. R. B. Kvavik et al., *The Promise and Performance of Enterprise Systems in Higher Education* (Boulder, Colo.: EDUCAUSE Center for Applied Research, Research Study, Vol. 4, 2002).

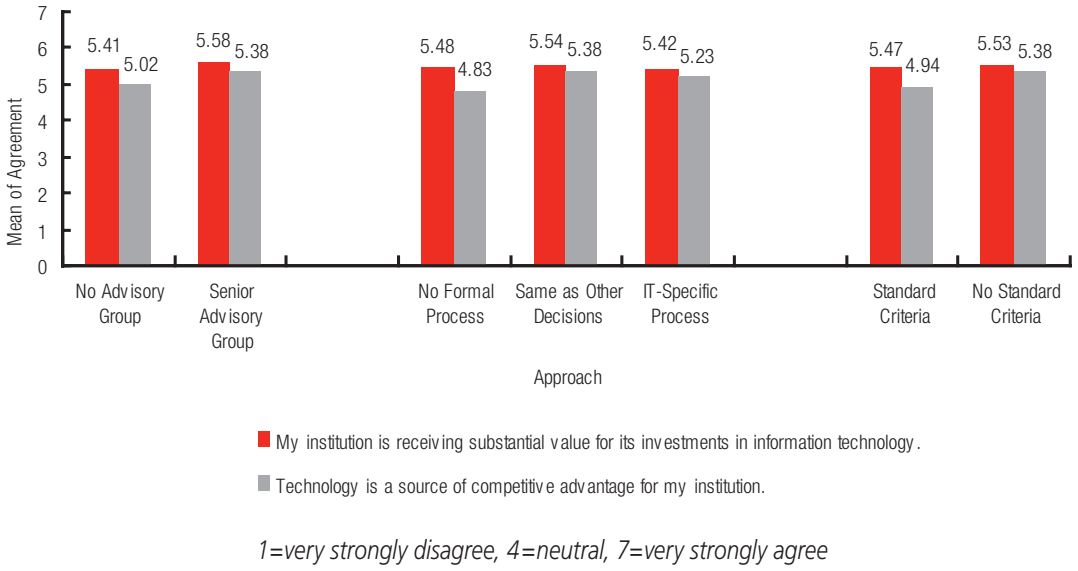


Figure 7-6. Decision Making and IT Effectiveness