

ERP Software Implementation Best Practices

A survey found similarities and differences in CFOs' and CIOs' perceptions of best practices for ERP implementations

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Higher education administrators grapple both with the costs and possibilities afforded by enterprise resource planning (ERP) software, a Sisyphean feat given an ERP software implementation's sustained impact on the academic enterprise. ERP software integrates data processing across the enterprise and automates administrative processes like student registration and financial accounting. An ERP software implementation stresses a campus under the best of circumstances. Depending upon the institution's readiness to embrace change, the implementation creates great turmoil or promotes positive changes that help the institution better achieve its goals.

As an ERP software implementation becomes a way of life rather than a project with a finite ending point, campus leaders need to identify implementation best practices to increase their chances of success. Galpin¹ defined best practices as being what results when qualitative comparisons are made between similar organizations' business processes. How administrators can lead successful implementations — what best practices they should use — was the focus of a

recent study. This article summarizes that survey of higher education chief financial and information (that is, chief technology) officers' perceptions regarding implementation best practices.

Chief financial officers (CFOs) and chief information officers (CIOs) occupy leadership positions that are closely involved with ERP software implementations. CFOs are charged with managing the institution's resources; they also may oversee areas where the software is being implemented (accounting, payroll, human resources) or have to secure funding for implementation in other functional areas. CIOs are responsible for providing the technical infrastructure to support ERP software, including hardware and staff.

Purpose of the Study

The study measured chief financial and information officers' perceptions of ERP software implementation best practices. Some similarities existed between this study and the literature.²⁻⁷ What distinguished this study is that it measured selected higher education administrators' perceptions regarding implementation best practices, as

opposed to reporting anecdotal information. The topic was selected for study because campus leaders face significant challenges providing the financial and human resources required for an ERP software implementation.

Sample and Methodology

Study participants consisted of 308 chief financial and information officers at 170 institutions accredited by the Southern Association of Colleges and Schools and classified as Levels Five and Six. Institutions at these levels offer doctoral degrees in at least three major academic or professional disciplines. An expert panel established the content validity of the instrument we developed to carry out the research. Expert panelists included CFOs, a CIO, and an ERP implementation project manager. The survey instrument consisted of items constructed in question format and a series of statements to which survey participants were asked to respond by indicating their degree of agreement or disagreement using a Likert-type scale. After two mailings, the ultimate return of 163 surveys resulted in a usable sample size of 159 (a 53 percent response rate).

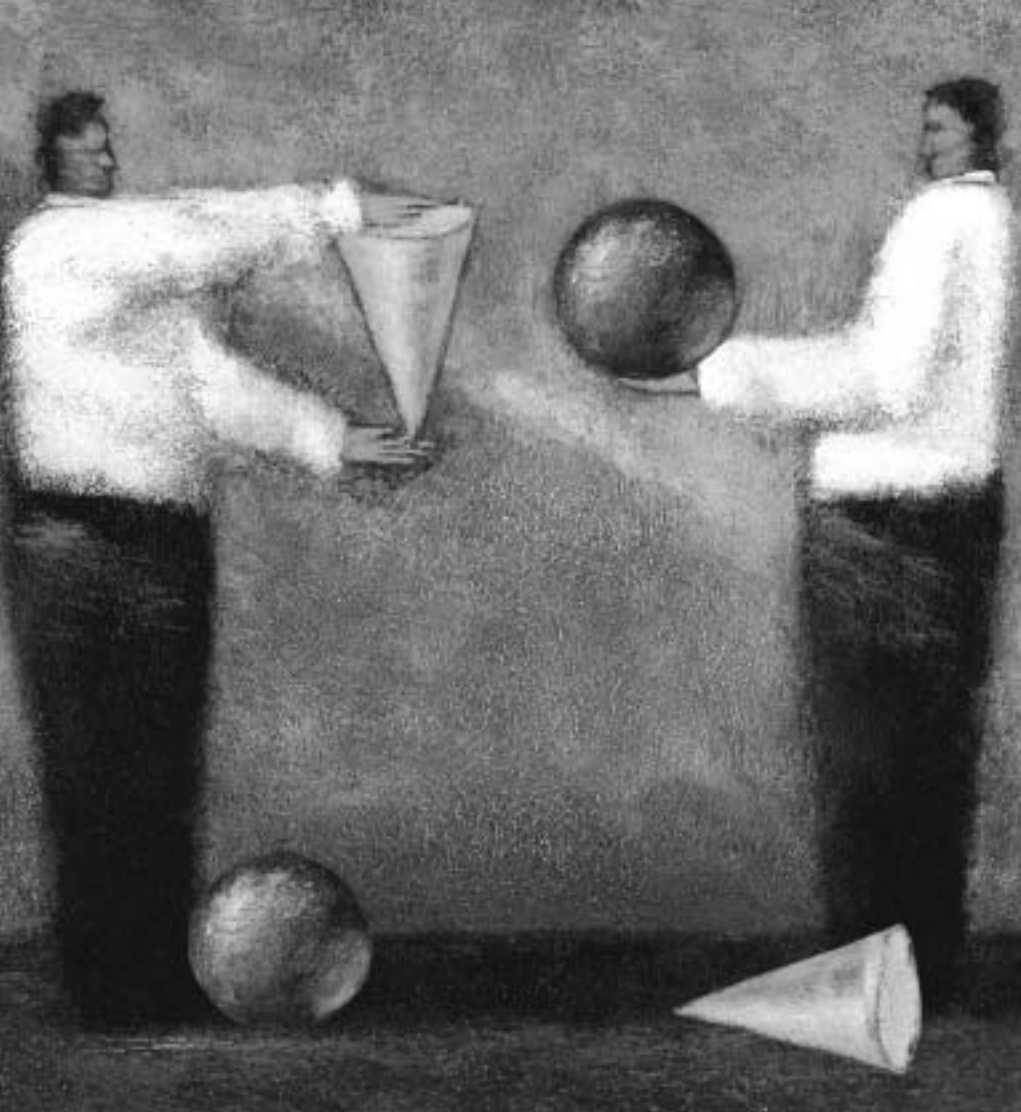


Table 1

Survey Frequencies and Percentages

Variable	Job Title				Total	
	CFO		CIO		CFO and CIO	
	Count	%	Count	%	Count	%
ERP Experience*	46	60.5	58	69.9	104	65.4
No ERP Experience*	30	39.5	25	30.1	55	34.6
ERP Vendor**						
SAP	3	6.5	4	6.9	7	6.7
Oracle	8	17.4	7	12.1	15	14.4
PeopleSoft	14	30.4	18	31.0	32	30.8
SCT/Banner	20	43.5	23	39.7	43	41.3
Other	15	32.6	20	34.5	35	33.7
Project Budget**,+	33	71.7	46	79.3	79	76.0
No Project Budget**	13	28.3	11	19.0	24	23.1

Note: Total frequency value on ERP vendor reflects respondents' ability to select more than one vendor.

* $n = 159$ (CFO $n = 76$, CIO $n = 83$). ** $n = 104$ (CFO $n = 46$, CIO $n = 58$). + One CIO did not answer.

Survey Results

More than 50 percent of the respondents indicated that they had ERP software implementation experience. Several respondents who had no ERP software implementation experience indicated

that their institutions were in the early stages of planning for implementation. The majority had experience either with SCT/Banner or PeopleSoft, suggesting that the products supplied by these vendors have seen widespread adoption by

higher education institutions. Almost 80 percent of the respondents indicated that their institutions had established a separate budget specifically to track implementation project expenditures. Table 1 shows the number of responses to each item and the related percentages.

Best-Practice Rankings

Both chief financial and information officers ranked highest the statement regarding executive management's endorsement of the implementation project, which corroborates other research indicating that senior management's backing is a key project component.⁸⁻¹⁰ Parr, Shanks, and Darke¹¹ described executive management's endorsement and support as an indispensable ingredient for project success, especially when the going got tough: "The role of management in finding a way through the problems and tension was critical."¹² Executive managers should demonstrate sustained leadership and commitment to the project, or they increase the risk of diminishing its importance and wasting resources.

CFOs ranked lowest the statement regarding the reassignment of project team members' normal responsibilities for the project's duration, which is troubling given its prevalence in the literature.¹³⁻¹⁵ Financial constraints often hamper management's ability to backfill positions; some positions' unique natures also discourage temporary staffing. However, not adjusting workloads means that employees juggle multiple priorities. This situation, coupled with extended working hours, may cause staff burnout and position turnover.

CIOs ranked lowest the statement regarding early initiation of the data conversion process from the old software system to the new, which contradicts Feemster's¹⁶ and McCredie and Updegrove's¹⁷ advocacy of early and frequent data conversion. Data conversion is expensive, and financial constraints may prevent realization of this best practice. CIOs likely are reluctant to commit resources to data conversion until later, when system specifications have been finalized. See the sidebar "Ranking of Best-Practice Statements" for high/low rankings.

Discussion of Differences

Taking into account the four previously mentioned best practices over which administrators' perceptions differed, chief financial and information officers generally agree about what constitutes ERP software implementation best practices. The high means for the best-practice statements indicate common ground between the two groups. See Table 2.

CIOs ranked the best-practice statements higher overall than did CFOs, indicating that the former group has had more experience with technology-oriented initiatives. However, the variability that existed in perceptual differences is best viewed within the context of administrative software computing history. Functional areas on campuses traditionally have operated separately from one another, with little or no sharing of data or processes — the functional silo concept. Administrative software packages were chosen based on their functionality for specific processes. The administrative computing path was fairly narrow and predictable, and largely handled by IT personnel.

ERP software travels a much wider path that offers both peril and opportunity. It calls for data integration as opposed to data residing in separate "shadow" systems with no interface capability. Because ERP software has to be implemented rather than simply installed, it requires a paradigm shift for most functional users: "ERP implementations usually require people to

Table 2		
Best-Practice Statements*		
Statement	Mean	
	CFO	CIO
Executive management should endorse the ERP project.	4.85	4.95
ERP software implementation responsibilities should be shared between the information technology department and functional areas where the software is being implemented.	4.70	4.86
Executive management should be cognizant about the institution's ability to adapt to the organizational changes that occur when ERP software is implemented.	4.65	4.67
A project manager should be assigned full-time to the implementation.	4.52	4.76
The project team composition should represent all functional areas where the software will be implemented.	4.61	4.84
The institution should retain ownership of the implementation process.	4.63	4.53
All employees who will use the software should receive thorough training.	4.57	4.83
* With averages above 4.6 on a 5-point scale.		

create new work relationships, share information that once was closely guarded, and make business decisions they were never required to make."¹⁸

CFOs approach business processes from a practical orientation, whereas CIOs tend to be more technically oriented. CFOs focus on accomplishing the task, and function rather than form is the ultimate consideration. CIOs focus on the separate steps taken to complete

the task, and form rather than function is the ultimate consideration, since bad programming will prevent the function from properly performing. CFOs concentrate on the issuance of the pay check and the associated taxation and legal reporting requirements, while CIOs concentrate on technical aspects such as system resources, security and access controls, and backing up data. These contrasting perspectives suggest differences in approaches to ERP software implementations between chief financial and information officers.

Ranking of Best-Practice Statements

In response to the request to rank the best-practice statements, chief financial and information officers selected the following statements as most important and least important.

Given a high ranking by CFOs and CIOs:

- Executive management should endorse the ERP project.

Given a low ranking by CFOs:

- Project team members' normal job responsibilities should be reassigned to other employees for the project duration.

Given a low ranking by CIOs:

- Conversion of data from the old software system to the new should begin early in the implementation process.

Four Best Practices Where CFOs and CIOs Differed

The results of independent samples *t*-tests revealed that CFOs' and CIOs' perceptions differed specifically on four best practices (see the sidebar).

Project Team Composition

CIOs were significantly more likely than CFOs to agree with the best-practice statement that the implementation project team composition should represent all functional areas where the software will be implemented. Researchers advo-

Perceptual Differences Between CFOs and CIOs

The following best-practice statements produced perceptual differences between chief financial and information officers:

- The project team composition should represent all functional areas where the software will be implemented.
- Employees should receive training on how to work as a team on a project before implementation begins.
- A separate, dedicated work environment specifically created for the project team aids implementation efforts.
- All employees who will use the software should receive thorough training.

cate widespread user involvement.¹⁹⁻²² Ryland²³ noted the sensibility of this practice in administrative systems development, pointing out that user involvement in the design phase usually results in a system built to the specifications of those who will use it.

Team Training

Chief financial and information officers' perceptions differed about whether employees should receive training on how to work as a team on a project before implementation begins. CIOs ranked this best practice higher than did CFOs. Jaacks and Kurtz²⁴ recommended six months of intensive employee training, while Schroeder and Bleed²⁵ described the ideal team training as beginning two years before the project. The presence of members on the project team who cannot be trained or reassigned is a factor listed by IBM Skill Dynamics²⁶ as one of the top 10 reasons why projects fail.

War Room

CIOs more so than CFOs agreed that a separate, dedicated work environment specifically created for the project team aids implementation efforts. The "war room" model is widely employed by business, industry, and political parties, and is recommended by McCredie and Updegrave.²⁷ At the heart of the ERP software functionality is its enterprise-wide design, which spans departments and reporting boundaries. Functional users from throughout the enterprise are brought together with technical staff in the war room to build the system. This environment is conducive to the extended discussion and analysis involved with business process redesign. Having a war room eliminates time spent arranging for project team meetings in different locations, and the installation of appropriate equipment provides stable resources.

End-User Training

CIOs also ranked higher than CFOs the best practice of providing thorough training for all employees who will use the software. A number of authors have advocated this best practice.²⁸⁻³¹ Ryland³² pointed out how hindsight often reveals insufficient training as one of the most significant errors made in the implementation. Without thorough training, employees may be limited in their ability to correctly perform administrative processes or extract data from the system at senior management's request.

Project Budget and Administrators' Perceptions

An ERP software implementation often spans several fiscal years and consumes substantial dollars. It is difficult for administrators to make sound, timely decisions if information about available resources is hard to locate. Accurately tracking where the money has gone is impossible without some type of budgeting system that provides a structure for expenditures.

Institutions historically have had trouble tracking information technology costs. Green and Jenkins³³ identified a lack of funding budget models suitable for constantly changing technology as

a major problem. McClure, Smith, and Lockard³⁴ described the difficulty of monitoring technology and personnel costs distributed across several accounts and budget cycles.

An enterprise-wide software implementation is notoriously expensive. Scheer and Habermann³⁵ estimated the ratio between the ERP software implementation phase and the software purchase itself at about 5:1. This sophisticated ERP software, which potentially violates all assumptions about how the institution's business processes should be conducted, has replaced the stand-alone software packages of days past.

ERP software is built according to generic best practices for functional processes, so the institution must reengineer its business processes to fit the software. Examining and revising these processes enterprise-wide is both time-consuming and expensive. The software's complexity spawns unexpected tasks that usually consume additional project dollars. Because of the software's intertwining nature, delays in one area of the project cause other areas to fall behind schedule, necessitating additional funding for consultant fees and project plan realignment.

Significance of Budget Variable on Perceptions

More than 75 percent of the administrators had established a separate budget to track implementation expenditures, an expected result given that a budget is a component of most project management approaches. Falduto³⁶ noted that having a technology financial plan enabled administrators to accurately assess the implementation's impact.

The results of multiple linear regression tests revealed that about 15 percent of the variability in the two groups' rankings of the best-practice statements could be attributed to whether administrators' institutions had established a separate budget specifically to track implementation expenditures. Results of independent samples *t*-tests revealed that the mean for the best-practice

statements overall was higher for those administrators whose institutions had established such a budget than for those whose institutions had not. Results also revealed mean differences in 12 of the 24 best-practice statements for administrators whose institutions had established a separate implementation budget.

The 12 best-practice statements with differences in means between administrators whose institutions had established a separate budget specifically to track implementation expenditures and those whose institutions had not can be grouped into three categories: executive management support, the implementation's impact on the functional areas involved, and issues related to the implementation process itself. In all 12 instances the means were higher for those administrators whose institutions had established such a budget than for those whose institutions had not.

Executive Management Support

Two best-practice statements covered executive management's role:

- Executive management should endorse the ERP project.
- Executive management should remain actively involved throughout the implementation.

The relationship between these two best-practice statements and whether a separate budget existed for expenditures indicates a need for accountability — either executive management looking for someone involved with the project to provide it, or executive management being expected by a higher authority to provide it. Senior administrators can authorize additional spending or, conversely, deny it.

The politics involved in an enterprise-wide implementation require strong leadership for management and resolution when real or perceived inequities crop up regarding funding issues. The absence of an implementation budget may place severe constraints on the project. As a result, administrators may feel that executive management's support and involvement are inadequate for the task.



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Implementation's Impact on the Functional Areas Involved

Five best-practice statements fall in the category of the implementation's impact on the functional areas involved. We address each in turn.

- ERP software implementation responsibilities should be shared between the information technology department and functional areas where the software is being implemented.

Not having a separate budget can impede efforts to quantify the sharing of responsibilities between departments. Inadequate financial planning can make it difficult to monitor monies spent on technical and human resources. Green and Jenkins³⁷ recommended that institutions adopt a holistic view toward technology costs by implementing a total cost model, which considers labor

costs along with all computing costs and enables accurate cost figures to be obtained for analysis.

- The project team composition should represent all functional areas where the software will be implemented.

The appropriate project team composition may be difficult to achieve. However, it is critical to have sustained, constructive dialogue between the technical people writing programming specifications and the functional people who will use the finished product so that the goals of end-user satisfaction and operational efficiency can be achieved.

- Project team members' normal job responsibilities should be reassigned to other employees for the project duration.

Sturdevant³⁸ reported how PC Week Labs worked with executives and functional users at four campuses of the Wisconsin Technical College System during a PeopleSoft implementation. The report described how limited funds necessitated that employees perform double duty — their regular job responsibilities in addition to the work created by the implementation process. Not surprisingly, several staff members recommended that normal job responsibilities be reassigned during the implementation.

- It often is necessary for the institution to change its administrative processes to fit the software.

We surmised that reengineering is not easily separated from other best practices regarding project responsibilities and project team composition, since any successful business process redesign depends on the people involved. The structure is only as strong as the people who occupy and support it.

- Executive management should help employees network with peers at other institutions undergoing similar implementation initiatives.

This best practice is not widely reported in the literature. However, its significance against the budget variable suggests that administrators whose institutions did not have a separate implementation budget also may not have had monies for travel to other institutions or special interest conferences.

Higher education personnel generally are receptive to sharing information with their peers, and several vendors regularly host special interest group conferences for their higher education customers.

Implementation Process Issues

Five of the best-practice statements fall in the category of issues related to the implementation process.

- A project manager should be assigned full-time to the implementation.

Bivins³⁹ considered the selection of and sustained support for the project manager a critical responsibility of executive management. Jaacks and Kurtz⁴⁰ advised against putting one person in charge of the project, since that individual can become the lone target for blame. On the other hand, having a project manager is a generally accepted principle of project management, and the complexity of an ERP software implementation virtually requires that someone be in charge.

- Employees should receive training on how to work as a team on a project before implementation begins.

CFOs' and CIOs' perceptions differed on this statement. In addition, it mattered whether the institution had established a separate implementation budget. Employees trained on how to make decisions as a team may have an advantage in changing business processes.

- Outside consultants can facilitate implementation efforts.
- The institution should retain ownership of the implementation process.

These are closely related practices. Consultants' fees are expensive, but institutions will purchase needed expertise to help the project team configure and install the software. Davenport⁴¹ and Feemster⁴² recommended that consultants' roles be carefully considered and clearly defined, since the project's ownership ultimately resides with the institution long after the consultants have gone.

We theorize that administrators whose institutions did not establish a separate budget to track expenditures did not recognize the consultants' value, perhaps because of role ambiguity. Lack

Statements Yielding Mean Differences with a Separate Implementation Budget

Mean differences appeared in perceptions of 12 best-practice statements for administrators whose institutions had established a separate implementation budget:

- Executive management should endorse the ERP project.
- Executive management should remain actively involved throughout the implementation.
- ERP software implementation responsibilities should be shared between the information technology department and functional areas where the software is being implemented.
- The project team composition should represent all functional areas where the software will be implemented.
- Project team members' normal job responsibilities should be reassigned to other employees for the project duration.
- It often is necessary for the institution to change its administrative processes to fit the software.
- Executive management should help employees network with peers at other institutions undergoing similar implementation initiatives.
- A project manager should be assigned full-time to the implementation.
- Employees should receive training on how to work as a team on a project before implementation begins.
- Outside consultants can facilitate implementation efforts.
- The institution should retain ownership of the implementation process.
- A separate, dedicated work environment specifically created for the project team aids implementation efforts.

of clear direction and authority might have caused administrators to feel that their institutions had lost control of the project and, in doing so, had relinquished ownership.

- A separate, dedicated work environment specifically created for the project team aids implementation efforts.

Providing the appropriate work setting for team members offers several benefits. All team members work in a location away from day-to-day distractions. The semi-permanent nature of the room permits recording project decisions, milestones, and issues and hanging the notes on the walls for easy reference.

See the sidebar showing the 12 best-practice statements with mean differences for administrators whose institutions had established a separate implementation budget.

Conclusion

The 53-percent survey response rate indicates considerable interest in ERP software implementation best practices. The results provided illuminating information about selected administrators' (CFOs and CIOs) perceptions and the relationships between the two groups' perceptions and selected variables. Administrators have validated these best practices, and the study itself establishes a foundation for further research.

Study results showed consensus for the most part among chief financial and information officers. These best practices, then, represent a common ground. The areas where CFOs and CIOs showed significant differences suggest topics for discussion between the two groups. An awareness of perceptual differences can facilitate shared resolution if disputes arise. Furthermore, whether administrators' institutions had

established a separate budget specifically to track implementation expenditures was significant, indicating that those administrators' perceptions were influenced by the existence of such a budget.

There is no shortage of reports about failed ERP software implementations in business and industry. Higher education institutions simply do not have resources to cushion themselves from failed implementations, so administrators would be wise to conduct and support research to discover what works best. This study highlights the importance of campus leaders understanding the complexity of the implementation process and managing the changes that occur.

Higher education institutions choose ERP software for the same reasons as business and industry — to operate more efficiently and effectively in order to remain competitive. Also like business and industry, higher education institutions must be capable of enabling organizational change as part of the reengi-

neering process. The administrators who appreciate, understand, support, and manage the complexities of transforming the enterprise will be leaders of agile and viable campuses. *e*

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