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# An Empirical Investigation of the Effectiveness of ERP Systems As Assessed by Management Accountants

**K. W. VanVuren**

Assistant Professor  
of Accounting  
University of  
Tennessee – Martin  
Martin, TN 38238  
731-881-7397  
vanvuren@utm.edu

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**W. Mark Wilder**

Associate Professor  
of Accounting  
University of Mississippi  
Oxford, MS 38677  
662-915-5757  
acwilder@olemiss.edu

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**Rick Elam**

Reynolds Professor  
of Accountancy  
University of Mississippi  
Oxford, MS 38677  
662-915-5281  
relam@olemiss.edu

*This study examines the benefits and weaknesses of Enterprise Resource Planning (ERP) systems as experienced by organizations. A survey addressing the perceived benefits and weaknesses of their organization's management information system was sent to a random group of 5,000 members of the Institute of Management Accountants. Respondents were asked to complete the survey as either an ERP-User or a NON-ERP-User. A series of MANOVA/ANOVA procedures were conducted, including both between-subjects and within-subjects comparisons. The results of this study indicate that ERP-Users perceive that their systems provide: 1) greater reconciliation of conflicting goals, 2) greater standardization of processes, 3) increased lowering of product costs, 4) quicker decision-making, and 5) better decision-making than do NON-ERP-Users. However, ERP-Users also perceive more complexity in their systems than do NON-ERP-Users, and ERP-Users think that their systems took too long to implement.*

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The ultimate objective of any for-profit business in a capitalistic economy is to maximize the organization's ability to compete and earn profits. The management information system (MIS) is one of the many influences ultimately affecting an organization's profitability. Enterprise Resource Planning (ERP) systems are some of the most advanced, state-of-the-art management information systems in today's business world. It is important to determine the extent to which these systems for organizing and managing data enhance the ability of organizations to compete and maximize profitability.

This question can specifically be addressed in terms of various "best business practices" which aid and enhance the profitability of the organization. This study examines, from the perspective of the management accountant, the extent to which ERP systems are perceived to enable these best business practices. Conversely, ERP systems have been noted to have several potential weaknesses. This study examines those weaknesses as well. Since management accountants are extensively involved in planning and control, they occupy a particularly good vantage point from which to observe and assess the effectiveness of an ERP system in their organizations.

For purposes of this paper an ERP system is deemed to possess at least three common characteristics. Those three are integration of data into a single database, real-time capture and dissemination of data, and on-line availability of relevant information to the level of the firm where it is most needed for decision-making [Davenport, 2000; Kale, 2000]. To operationalize these common characteristics, this study breaks down "availability of relevant information" into two sub-categories: 1) availability of information to "top management" and 2) availability of information to "operations management." These four characteristics we subsequently refer to as the *definitional variables* of an ERP system.

An MIS can enhance the profitability of an organization by helping to achieve 1) reconciliation of conflicting goals, 2) standardization of processes, 3) reduction in cost of products, 4) reduction in maintaining systems costs, 5) better decision-making, and 6) quicker decision-making [Kale, 2000]. We refer to these six characteristics as the *benefits variables* of an ERP system. The effectiveness of an organization's MIS can be examined in terms of the degree to which the information system promotes these benefits. The primary research question addressed by this study is: "Are ERP systems, in the judgment of management accountants, delivering more benefits as compared to NON-ERP systems?"

Although many benefits are claimed for ERP, several possible weaknesses or criticisms have also been cited. These potential weaknesses are that ERP systems 1) are overly complex, 2) are inflexible, 3) promote overly centralized monitoring and control, and 4) take too long to implement [Davenport, 2000]. We refer to these four characteristics as the *weaknesses variables* of an ERP system. Therefore, a secondary research question is: "In the judgment of management accountants, how severe are the purported weaknesses of ERP systems as compared to NON-ERP systems?"

The remainder of the paper is organized as follows: Section II discusses the survey respondent pool, data collection, variable definition, and research methodology. Section III is a discussion of the analysis of the data, including

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hypotheses testing. The final section presents the major conclusions and implications of the study.

## Methodology

### Respondents and Data Collection

This research examines the perceptions of management accountants working for profit seeking organizations. A randomized membership mailing list obtained from the Institute of Management Accountants (IMA) was the source for selecting our sample subjects. The objective was to examine the perceptions of management accountants in executive positions who truly have an interest in the performance of ERP. Therefore, in an attempt to reach respondents with significant knowledge and authority, the mailing list was selected from IMA members with titles such as CFO, Controller, and CIO.

Approximately five thousand survey instruments were mailed. A cover letter explained to the recipients the nature of the research project and solicited their participation. Also included in the mailing were two survey instruments – one for ERP-Users and the other for NON-ERP-Users (See Appendices A and B). The cover letter clearly explained that only one of the two instruments should be filled out and returned. Thus, the choice of membership between the two groups of ERP-Users versus NON-ERP-Users was entirely self-selected.

### Definitional Variables

The definitional variables elicit from the respondent an assessment of their current MIS. If the four definitional variables distinguish an ERP system from a NON-ERP system, then a between-subjects analysis (ERP-Users versus NON-ERP-Users) should produce statistically different means to questions soliciting ratings of the degree of the existence of these characteristics in the MIS of their organization. These definitional variables are described more fully below.

1) *integration of data into a single comprehensive database* - An unfortunate characteristic of NON-ERP information systems is their hetero-geneity, i.e., they tend to be comprised of a disparate mixture of non-integrated processes and databases. From an MIS perspective, they are commonly plagued with problems such as incompatibility among functional sub-systems, differing standards, interfacing issues, limited upgrade paths, costly maintenance, high operating costs, costly training and support activities, and inconsistent documentation [Kale, 2000]. An integrated single comprehensive database ameliorates many of these problems. In an ERP system, functional subsystems are linked, standards are common and consistent, upgrade paths are integrated, system maintenance and operating costs are lessened, and documentation is consistent throughout the system.

2) *real-time dissemination of data* - A characteristic of an ERP system is the immediate updating and posting to relevant master and transaction data files [Kale, 2000]. A true ERP system provides for the immediate dissemination of data, at the time the actual transaction or process is taking place, by the persons who are actually responsible for it.

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3) *availability of relevant information to top management* - Once data has entered the ERP system, it is correct, up-to-date, and accessible electronically at the executive level of the organization, to all authorized personnel.

4) *information made available to the operational level of the firm* - An important improvement in information systems brought by ERP is that it ensures the real-time, accurate data is made available to those who actually need it. The objective is to get the data to the operational level of the firm where many of the firm's day-to-day tactical decisions are actually made.

### **Benefits Variables**

An MIS can enhance the profitability of an organization by providing numerous potential benefits. The following paragraphs provide a description of the benefits variables considered in this research.

1) *reconciliation/optimization of conflicting goals* – In the firm where business functions are not connected via an integrated information system, conflicting goals may occur. For example, purchasing may desire and plan to build safety-stocks while accounting/finance may desire to hold inventory levels to a minimum. Similarly, marketing may have the goal of offering as much product mix variety as possible, whereas manufacturing would like to hold product variety to a minimum [Kale, 2000]. A good MIS will enable reconciliation of such conflicting goals within the organization. An ERP system, by virtue of its single, comprehensive, enterprise-wide database should enhance the ability to reconcile and optimize conflicting goals within the organization.

2) *standardization of business processes* – A “process” in a business context can be defined as the set of resources and activities necessary and sufficient to convert some form of input into some form of output [Kale, 2000]. The modern business organization must deal with internal processes, external processes, and a combination of both. Furthermore, the processes cross functional boundaries and exist at all levels of the organization. For the data of the organization to be managed by one comprehensive enterprise-wide database in an efficient manner, the processes from which the data is derived should be as standardized as possible.

3) *reduction of cost of product* – Because ERP promotes, if not necessitates, a much leaner and more efficient supply chain, costs within the product creation and delivery system should be lower. ERP should enable the organization to make the same product mix, but at lower cost.

4) *reduction of cost of maintaining systems* – Since data is pushed to the operational level of the firm where actual work and decision-making are done, this tends to prevent the problems and the costs associated with collection of voluminous data, preparation, entry, correction of inaccuracies, back-ups, etc. [Kale, 2000].

5) *better decision-making* – A potential outcome of ERP systems is that better decision-making, at least on routine matters, by the front-line operators should result [Kale, 2000].

6) *quicker decision-making* – A fundamental element of ERP systems is that they are real-time. Data is entered into one single, comprehensive database, and

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relevant information is instantly disseminated to interested parties within the organization for decision-making [Kale, 2000]. It follows that with an ERP system, decision-making for the organization should be quicker.

### **Weaknesses Variables**

Although ERP systems have many potential benefits, several possible disadvantages also exist. The following is a discussion of the weaknesses variables considered in this research.

1) *inflexible* – Standardization of processes (one of the purported benefits of ERP) comes with a price. In the process of standardization across the organization, it becomes difficult for any one sub-unit of the organization to deviate from what other units are doing. Furthermore, when evolving business conditions indicate that a sub-unit should change the way it is doing things, it is very difficult to change from established ERP “best practices.” Thus, there is a degree of inflexibility in adapting to change [Davenport, 2000].

2) *too long to implement* – Some studies indicate that a three to five year implementation period is not uncommon to install an ERP system in a large organization [Davenport, 2000]. This is a problem in a rapidly changing environment like the ones that most modern organizations face. Therefore, it is possible that the implementation period for most ERP systems may be too long to be practical.

3) *promote an overly centralized management hierarchy for monitoring and control* – ERP systems, by their nature, are highly centralized and hierarchical in their structure [Davenport, 2000]. With ERP, it is possible for the top tiers of management to have ready access to more of the data within the organization than ever before. Although purportedly a benefit of ERP, this concentration of information could induce management to run the organization from the top with little input from the operational-level personnel. Therefore, it is possible that the centralized monitoring and controlling of the organization, made possible by ERP, is actually a detriment to the organization’s performance.

4) *overly complex* – Extensive integration and coordination is necessary to provide all of an organization’s business needs from one single database [Davenport, 2000]. The end result is an MIS that appears to be rather complex. To the extent that few people can understand the system, this complexity is a potential weakness of the system.

### **Hypotheses**

The primary research question of this study is whether ERP systems, as perceived by management accountants, are delivering purported benefits. The benefits were queried via questions 5 through 10 in each survey instrument. A reasonable presumption is that ERP systems were developed, at least in part, because they were deemed superior to the previous NON-ERP systems that organizations were using. One way to investigate whether ERP systems are delivering superior benefits is to compare perceptions of the benefits in the organizations who claim that they have adopted an ERP system to those in organizations who have not.

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The six following null hypotheses test these perceptions between the two groups.

- H1:** There is no significant difference in perception by management accountants in ERP-User organizations versus NON-ERP-User organizations concerning the degree that the MIS promotes *reconciliation of conflicting goals*.
- H2:** There is no significant difference in perception by management accountants in ERP-User organizations versus NON-ERP-User organizations concerning the degree that the MIS promotes *standardization of processes*.
- H3:** There is no significant difference in perception by management accountants in ERP-User organizations versus NON-ERP-User organizations concerning the degree that the MIS promotes *reduction of product costs*.
- H4:** There is no significant difference in perception by management accountants in ERP-User organizations versus NON-ERP-User organizations concerning the degree that the MIS promotes *reduction in MIS maintenance costs*.
- H5:** There is no significant difference in perception by management accountants in ERP-User organizations versus NON-ERP-User organizations concerning the degree that the MIS promotes *better decision-making*.
- H6:** There is no significant difference in perception by management accountants in ERP-User organizations versus NON-ERP-User organizations concerning the degree that the MIS promotes *quicker decision-making*.

An additional question explored by this research is the degree to which management accountants assess their organization's MIS to possess certain weaknesses. The weaknesses were queried with questions 11 through 14 on each research instrument. The hypotheses tested for purported ERP weaknesses, stated in the null, are as follows:

- H7:** There is no significant difference in perception by management accountants in ERP-User organizations versus NON-ERP-User organizations concerning the degree that the MIS is *inflexible*.
- H8:** There is no significant difference in perception by management accountants in ERP-User organizations versus NON-ERP-User organizations concerning the degree that the MIS takes *too long to implement*.
- H9:** There is no significant difference in perception by management accountants in ERP-User organizations versus NON-ERP-User organizations concerning the degree that the MIS promotes *overly centralized monitoring and control*.
- H10:** There is no significant difference in perception by management accountants in ERP-User organizations versus NON-ERP-User organizations concerning the degree that the MIS is *overly complex*.

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The four definitional dependent variables are included in the model as a means of determining whether there is a general consistency among respondents as to the features that characterize ERP. The first four questions of both survey instruments query the respondents as to the degree their organization's present MIS: 1) consists of a single, comprehensive database, 2) supplies data on a real-time basis, 3) makes relevant information available to top management, and 4) makes relevant information available to operations management.

## Data Analysis

### Characteristics of Respondents

A total of 4,982 surveys were sent to randomly chosen members of the IMA who had previously identified themselves as either accountants, controllers, or CFOs. Of those, 509 were returned with 27 of those deemed unusable due to insufficient response. This leaves a total of 482 usable questionnaires, a 9.7 percent usable response rate. Of the 482 usable responses, 217 identify themselves as ERP-Users, and 265 say that they were not currently using an ERP system.<sup>1</sup>

### Definitional Variables of MIS

Respondents are asked to rate on an eight-point Likert scale, ranging from "0" (not at all) to "7" (entirely), the extent to which their current information system possesses the four stated definitional characteristics. Table 1 presents mean comparisons between ERP-Users and NON-ERP-Users for the four characteristics. For all four characteristics the mean responses of the ERP-Users are greater than those of the NON-ERP-Users. T-tests indicate that the ERP-User responses are significantly greater than those of the NON-ERP-Users on three of the four definitional characteristics. Only "makes relevant information available to top management" fails to indicate a significant difference in means ( $p = .210$ ). This result provides evidence that the definitional characteristics of "single, comprehensive database," "supplies data on a real-time basis," and "makes relevant information available to operations management" are perceived by practicing management accountants as features that distinguish ERP systems from NON-ERP systems.

### Benefits and Weaknesses of the MIS: ERP-Systems Versus NON-ERP Systems

The means for all responses, by treatment level, of the 10 dependent variables are presented in Table 2. The grand mean for the perceived benefits of current ERP-Users is 4.02 while the grand mean for NON-ERP-Users about the benefits of their current NON-ERP systems is 3.42. This indicates that, in general, ERP-Users perceive their current ERP systems to be more effective than do NON-ERP-Users. The same disparity in perceived weaknesses can be observed as well, but interestingly, **not** in a converse direction. The grand mean (4.49) for perceived weakness of the current systems of ERP-Users is greater than the grand means for NON-ERP-Users' current systems (3.78).

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## **Multivariate Tests of Significance**

An initial step in determining whether the use of ERP makes a difference in respondents' perception of the effectiveness of their organization's MIS is to run a MANOVA. This test indicates whether the type of system in use (ERP or NON-ERP) affects respondents' perceptions of the six purported benefits and four potential weaknesses. This is a between-subjects analysis using questions 5 through 14 on each research instrument. Two separate MANOVAs are run – one for the benefits and one for the weaknesses. The independent variable used in this initial test is SYSTEMTYPE (i.e., ERP-User or NON-ERP-User). Both of the MANOVAs produce Wilks' Lambda coefficients that are significant for the benefits [ $F = 8.133$  ( $p < .001$ )], and for the weaknesses [ $F = 14.950$  ( $p < .001$ )]. From this it can be inferred that somewhere among the benefits and weaknesses there is a significant difference in perceptions between the ERP-Users and NON-ERP-Users.

## **Hypotheses Testing: ERP Versus NON-ERP**

The primary research question of this study is whether ERP usage makes a difference in management accountants' perceptions about the benefits and weaknesses of their organization's MIS. Accordingly, the perceptions of ERP-Users about their current systems are compared to the perceptions of NON-ERP-Users about their current systems. Table 3 summarizes the results.

### **Hypothesis One – Reconciliation of Conflicting Goals**

Question 5 on the both surveys asked respondents to rate the degree that their current MIS system facilitates the reconciliation of conflicting goals within the organization. The mean response from ERP-Users is 3.62. The NON-ERP-Users' mean response is 3.02. The ANOVA shows that SYSTEMTYPE is significant ( $F = 13.566$ ,  $p < .001$ ). Therefore, hypothesis one is rejected. Based on the responses from the two groups, ERP does help in reconciling conflicting goals.

### **Hypothesis Two – Standardization of Processes**

When asked to rate the degree that their current MIS system facilitates standardization of businesses processes, ERP-User respondents provided a mean answer of 4.77. NON-ERP-Users' mean response to that same question is 3.72. The difference in means is significant ( $F = 42.700$ ,  $p < .001$ ). Therefore, hypothesis two is rejected. Thus ERP systems do appear to standardize processes.

### **Hypothesis Three – Reduction of Product Costs**

On the degree that their current ERP systems facilitate reduction of product costs, ERP-Users give a mean response of 3.84. NON-ERP-Users' mean response to the same question is 3.10. The difference in means is significant ( $F = 17.640$ ,  $p < .001$ ). Accordingly, hypothesis three is rejected, and ERP systems do appear to help control product costs.

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#### **Hypothesis Four – Reduction of MIS Maintenance Costs**

Concerning the degree that their current ERP systems facilitate reduction of MIS maintenance costs, ERP-User respondents give a mean answer of 3.41. NON-ERP-Users return a mean of 3.29. The ANOVA for question eight indicates that SYSTEMTYPE is not significant ( $F = .404, p = .525$ ). Therefore, hypothesis four fails to be rejected. More research is needed to determine how ERP systems affect MIS maintenance costs.

#### **Hypothesis Five – Better Decision-Making**

On the question related to the degree that their current systems facilitate better decision-making, ERP-Users give a mean answer of 4.36. NON-ERP-Users' mean response to that same question is 3.89. The difference in means is significant ( $F = 9.025, p = .003$ ). Therefore, hypothesis five is rejected. ERP does appear to improve decision-making.

#### **Hypothesis Six – Quicker Decision-Making**

Concerning the degree that their current system facilitates quicker decision-making, the mean response of ERP-Users is 4.12. NON-ERP-Users' mean response to that same question is 3.49. The difference in means is significant ( $F = 13.843, p < .001$ ). Therefore, hypothesis six is rejected, and the conclusion is that ERP shortens the decision-making time frame.

#### **Hypothesis Seven – Too Inflexible**

When rating the degree that their current systems are overly inflexible, ERP-User respondents give a mean answer of 3.99. NON-ERP-Users' mean response to that same question is 3.87. The difference in means is not significant ( $F = 1.192, p = .276$ ). Therefore, hypothesis seven fails to be rejected. Thus, the evidence does not indicate that ERP systems are more inflexible than any other MIS systems.

#### **Hypothesis Eight – Takes Too long To Implement**

When asked to rate the degree that their current systems took too long to implement, ERP-Users give a mean answer of 5.04. NON-ERP-Users' mean response to the same question is 3.83. The difference in means is significant ( $F = 6.173, p = .013$ ). The mean response of ERP-Users is significantly greater than that of NON-ERP-Users. Therefore, hypothesis eight is rejected.

#### **Hypothesis Nine – Overly Centralized**

When rating the degree that their current MIS systems are overly centralized, the resultant mean from ERP-User respondents is 3.96. NON-ERP-Users' mean response to that same question is 3.67. The difference in means is not significant ( $F = .375, p = .540$ ). Therefore, hypothesis nine fails to be rejected.

#### **Hypothesis Ten – Overly Complex**

Question 14 on the ERP-User surveys asked respondents to rate the degree that their current system is overly complex. The mean response from ERP-Users is 4.96.

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The NON-ERP-Users' mean response is 3.75, which is significantly different ( $F = 6.218, p = .013$ ). Therefore, hypothesis ten is rejected. The evidence does indicate that ERP systems are more complex.

## Conclusions and Complications

The primary research question of this study is whether there is a difference in management information system effectiveness as perceived by management accountants who work for organizations that use ERP versus management accountants who work for organizations that do not use ERP. "Effectiveness" is couched in terms of six purported benefits of ERP and four potential weaknesses. Of the six purported ERP benefits, this study supports five as being statistically valid. In a between-subjects comparison, ERP-Users rate the following benefits significantly more strongly than do the NON-ERP-Users: 1) reconciliation of conflicting goals, 2) standardization of processes, 3) reduction of product costs, 4) good decision-making, and 5) quick decision-making. Reduction of MIS maintenance costs, a sixth potential benefit, was directionally valid, but not statistically significant.

The results for the four potential weaknesses of ERP are less definitive than for the benefits. Of the four weaknesses, only too long to implement and over-complexity showed statistical significance in the between-subjects comparisons. The ERP-Users who participated in the study respond very strongly that their current systems took too long to implement and are overly complex. On the other hand, the evidence about the potential weaknesses of inflexibility and over-centralization is not definitive. While in both instances, the mean response was greater for the ERP-Users than for the NON-ERP-Users, the differences were not statistically significant.

In summary, the results of this study indicate that ERP-Users perceive that their systems provide several benefits, including: greater reconciliation of conflicting goals, greater standardization of processes, increased lowering of product costs, quicker decision-making, and better decision-making, than do NON-ERP-Users. However, ERP-Users also perceive more complexity in their systems than do NON-ERP-Users, and ERP-Users think their systems took too long to implement. Thus, it would appear that based on the results of this exploratory study, ERP systems are indeed delivering at least some of their purported benefits while also exhibiting some potential weaknesses

## Footnotes

<sup>1</sup> Responses are considered in terms of "level of reporting entity," i.e., whether the response is in the context of the organization as a whole (24.4 percent of usable responses), a division of the organization (10.8 percent), a single plant (4.8 percent), or no indication (60.0 percent). Two MANOVAs are run (one for benefits and one for weaknesses) with the benefits/weaknesses as dependent variables and reporting level on the predictor side. The resulting Wilks' Lambda from these analyses

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indicate that outcomes (perceptions of benefits/weaknesses) do not vary significantly according to reporting level. Therefore, reporting level is not considered further in the analysis.

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**Table 1**  
**Definitional Characteristics – Mean Responses**

	ERP-User	NON-ERP-User	t-stat	p-value
Single, comprehensive database	4.58	3.38	5.47	.000
Real-time collection and dissemination of data	4.92	3.59	7.22	.000
Relevant info for top management decisions	4.63	4.42	1.23	.210
Relevant info for operations	4.93	4.34	3.67	.000

**Table 2**  
**Mean Responses for Benefits and Weaknesses Variables**

	ERP-User (perceptions of current ERP system)	Non-ERP-User (perceptions of current non-ERP system)
1) Reconciliation of Conflicting Goals	3.62	3.02
2) Standardization of Processes	4.77	3.72
3) Reduction of product costs	3.84	3.10
4) Reduction of MIS maintenance costs	3.41	3.29
5) Good decision-making	4.36	3.89
6) Quick decision-making	4.12	3.49
<b>Total Benefits Means</b>	<b>4.02</b>	<b>3.42</b>
1) Too Inflexible	3.99	3.87
2) Too Long to Implement	5.04	3.83
3) Too Centralized	3.96	3.67
4) Too Complex	4.96	3.75
<b>Total Weaknesses Means</b>	<b>4.49</b>	<b>3.78</b>

**Table 3.**  
**Tests for Significance of ERP – ANOVAS**

	F-Stat	P-Value
1) Reconciliation of Conflicting Goals	13.556	.000**
2) Standardization of Processes	42.700	.000**
3) Reduction of product costs	17.640	.000**
4) Reduction of MIS maintenance costs	.404	.525
5) Good decision-making	9.025	.003**
6) Quick decision-making	13.843	.000**
1) Too Inflexible	1.192	.276
2) Too Long to Implement	6.173	.013**
3) Too Centralized.	.375	.540
4) Too Complex	6.218	.013**

\*\*Significant at  $p < .05$

## Appendix A ERP - User

Please fill out this questionnaire if you ARE CURRENTLY USING an ERP system.

For the following questions, please indicate whether you are answering in the context of the entire company, OR your divisional business unit, OR your plant.

Please check just one:    corporate\_\_\_\_            division\_\_\_\_            specific plant\_\_\_\_

For the following, please circle a number, or (✓) “no opinion” – My organization’s current information system ...

		not at all-----entirely							no opinion
1) consists of a single, comprehensive database .....	0	1	2	3	4	5	6	7	_____
2) supplies data on a real-time basis .....	0	1	2	3	4	5	6	7	_____
3) makes relevant information available to top management .....	0	1	2	3	4	5	6	7	_____
4) makes relevant information available to operations management .....	0	1	2	3	4	5	6	7	_____
		strongly disagree-----					strongly agree		no opinion
5) facilitates reconciliation of conflicting goals .....	0	1	2	3	4	5	6	7	_____
6) facilitates standardization of business processes .....	0	1	2	3	4	5	6	7	_____
7) facilitates reduction of product costs .....	0	1	2	3	4	5	6	7	_____
8) facilitates reduction of MIS maintenance costs .....	0	1	2	3	4	5	6	7	_____
9) facilitates good decision-making .....	0	1	2	3	4	5	6	7	_____
10) facilitates quick decision-making .....	0	1	2	3	4	5	6	7	_____
11) is inflexible .....	0	1	2	3	4	5	6	7	_____
12) required a long time period to implement the system .....	0	1	2	3	4	5	6	7	_____
13) promotes overly centralized monitoring and control .....	0	1	2	3	4	5	6	7	_____
14) is overly complex (no one person understands the entire system) .....	0	1	2	3	4	5	6	7	_____

To what extent do you agree with the following? – My organization’s most recent, prior, NON-ERP information system ...

		strongly disagree-----						strongly agree	no opinion
15) facilitated reconciliation of conflicting goals .....	0	1	2	3	4	5	6	7	_____
16) facilitated standardization of business processes .....	0	1	2	3	4	5	6	7	_____
17) facilitated reduction of product costs .....	0	1	2	3	4	5	6	7	_____
18) facilitated reduction of MIS maintenance costs .....	0	1	2	3	4	5	6	7	_____
19) facilitated good decision-making .....	0	1	2	3	4	5	6	7	_____

Appendix A continued on the next page

**Appendix A, Continued**

		strongly disagree-----							strongly agree no opinion	
20) facilitated quick decision-making .....	0	1	2	3	4	5	6	7	_____	_____
21) was inflexible .....	0	1	2	3	4	5	6	7	_____	_____
22) required a long time period to implement the system .....	0	1	2	3	4	5	6	7	_____	_____
23) promoted overly centralized monitoring and control .....	0	1	2	3	4	5	6	7	_____	_____
24) was overly complex (no one person understood the entire system .....	0	1	2	3	4	5	6	7	_____	_____

**All things considered, how would you rate the CHANGE the current ERP system represents as compared to the most recent NON-ERP system?**

very negative							very positive	no opinion	
-4	-3	-2	-1	0	1	2	3	4	_____

**From which vendors are you currently using ERP modules? (Please check all that apply.)**

Baan     
  SAP     
  J.D.Edwards     
  Oracle     
  PeopleSoft  
 developed in-house     
  other: (specify) \_\_\_\_\_

**(Please circle a number.) Considering your degree of involvement in selecting any part of the ERP package, what was your *greatest* degree of participation in selecting *any* of the ERP modules?**

**I (my team) ...**

had no participation at all-----	selected the module						
0	1	2	3	4	5	6	7

**(Please express your answer in months.) How long has it been since your company/division ...**  
**first began contemplating the move to an ERP system?** \_\_\_\_\_  
**first began implementation of your initial ERP system?** \_\_\_\_\_  
**went operational with your first ERP module?** \_\_\_\_\_

**Please indicate (✓) the nature (products/services of your company/division by indicating its NAICS code.**

- |   |   |
|---|---|
| <input type="checkbox"/> (11) – Agriculture, Forestry, Fishing, & Hunting | <input type="checkbox"/> (53) – Real Estate, Rental and Leasing               |
| <input type="checkbox"/> (21) – Mining                                    | <input type="checkbox"/> (54) – Professional, Scientific & Technical Services |
| <input type="checkbox"/> (22) – Utilities                                 | <input type="checkbox"/> (55) – Management of Companies & Enterprises         |
| <input type="checkbox"/> (23) – Construction                              | <input type="checkbox"/> (56) – Administrative & Support & Waste Management   |
| <input type="checkbox"/> (31-33) – Manufacturing                          | <input type="checkbox"/> (61) – Educational Services                          |
| <input type="checkbox"/> (42) – Wholesale Trade                           | <input type="checkbox"/> (62) – Health Care & Social Assistance               |
| <input type="checkbox"/> (44-45) – Retail Trade                           | <input type="checkbox"/> (71) – Arts, Entertainment & Recreation              |
| <input type="checkbox"/> (48-49) – Transportation & Warehousing           | <input type="checkbox"/> (72) – Accommodation & Food Services                 |

*Appendix A continued on the next page*

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## Appendix A, Continued

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(51) – Information

(81) - Other Services (except Public Administration)

(52) – Finance & Insurance

(92) – Public Administration

**Your job description (title)? Please (✓) one.**

Accountant

Director/Manager

Controller

CFO

CIO

Other (please specify) \_\_\_\_\_

**Your years of business/work experience? Please (✓) one.**

0 - 5

5 - 10

10 - 15

15 - 20

20 - 25

25+

**Your professional designations held? Please (✓) all that apply.**

CMA

CPA

CIA

CISA

CPIM

other (specify) \_\_\_\_\_

**The number of employees in your (check one)**

corporate  division  plant

fewer than 500

500 – 1,999

2,000 – 4,999

5,000 – 9,999

10,000+

**Annual sales volume of your (check one)**

corporate  division  plant

less than \$1 million

\$1 – 99.99 million

\$100 – 499.99 million

\$500 – 999.99 million

\$1 billion+

**THANK YOU FOR PARTICIPATING IN THIS SURVEY.**

*If you would like access to the results, please provide your e-mail address in the space below (\*).*

**Also, would you be willing to participate in a brief telephone interview (at your convenience) to clarify/expand your thoughts on some of the issues addressed by this survey?**

If “yes,” your name, please \_\_\_\_\_

Phone number: \_\_\_\_\_

(\* ) e-mail address: \_\_\_\_\_

If you have any questions or comments regarding this survey, please feel free to contact Ken VanVuren.

E. H. Patterson School of Accountancy

200 Conner Hall

University of Mississippi

University, MS 38677-1848

Phone: 662-915-3982

e-mail: kwvanvur@olemiss.edu

Fax: 662-915-7483

## Appendix B

### NOT - an - ERP - User

Please fill out this questionnaire if you ARE CURRENTLY USING an ERP system.

*For the following questions, please indicate whether you are answering in the context of the entire company, OR your divisional business unit, OR your plant.*

Please check just one: corporate\_\_\_\_ division\_\_\_\_ specific plant\_\_\_\_

**For the following, please circle a number, or (✓) “no opinion” – My organization’s current information system ...**

		not at all-----entirely							no opinion
1) consists of a single, comprehensive database .....	0	1	2	3	4	5	6	7	_____
2) supplies data on a real-time basis .....	0	1	2	3	4	5	6	7	_____
3) makes relevant information available to top management .....	0	1	2	3	4	5	6	7	_____
4) makes relevant information available to operations management .....	0	1	2	3	4	5	6	7	_____
		strongly disagree-----					strongly agree		no opinion
5) facilitates reconciliation of conflicting goals .....	0	1	2	3	4	5	6	7	_____
6) facilitates standardization of business processes .....	0	1	2	3	4	5	6	7	_____
7) facilitates reduction of product costs .....	0	1	2	3	4	5	6	7	_____
8) facilitates reduction of MIS maintenance costs .....	0	1	2	3	4	5	6	7	_____
9) facilitates good decision-making .....	0	1	2	3	4	5	6	7	_____
10) facilitates quick decision-making .....	0	1	2	3	4	5	6	7	_____
11) is inflexible .....	0	1	2	3	4	5	6	7	_____
12) required a long time period to implement the system .....	0	1	2	3	4	5	6	7	_____
13) promotes overly centralized monitoring and control .....	0	1	2	3	4	5	6	7	_____
14) is overly complex (no one person understands the entire system) .....	0	1	2	3	4	5	6	7	_____

**To what extent do you agree with the following? – If my organization would adopt an ERP system in the near future, an ERP system would ...**

		strongly disagree-----							strongly agree	no opinion
15) facilitate reconciliation of conflicting goals .....	0	1	2	3	4	5	6	7	_____	
16) facilitate standardization of business processes .....	0	1	2	3	4	5	6	7	_____	
17) facilitate reduction of product costs .....	0	1	2	3	4	5	6	7	_____	
18) facilitate reduction of MIS maintenance costs .....	0	1	2	3	4	5	6	7	_____	
19) facilitate good decision-making .....	0	1	2	3	4	5	6	7	_____	

*Appendix B continued on the next page*

**Appendix B, Continued**

		strongly disagree-----							strongly agree		no opinion
20) facilitate quick decision-making .....	0	1	2	3	4	5	6	7	_____	_____	
21) be inflexible .....	0	1	2	3	4	5	6	7	_____	_____	
22) require a long time period to implement the system .....	0	1	2	3	4	5	6	7	_____	_____	
23) promote overly centralized monitoring and control .....	0	1	2	3	4	5	6	7	_____	_____	
24) be overly complex (no one person will understand the entire system .....	0	1	2	3	4	5	6	7	_____	_____	

**All things considered, how would you rate the degree that your company/division needs an ERP system?**

<b>not at all</b>										<b>most definitely</b>		<b>no opinion</b>
-4	-3	-2	-1	0	1	2	3	4	_____	_____	_____	_____

**Please indicate which ERP vendors you have heard of (check all that apply.)**

Baan     
  SAP     
  J.D.Edwards     
  Oracle     
  PeopleSoft  
 other: (specify) \_\_\_\_\_

**(Please circle a number.) If your organization would adopt an ERP system, to what extent would you anticipate your involvement to be in selecting the ERP package or any of its modules?**

<b>no participation at all-----</b>								<b>I (my team) will select the module</b>
0	1	2	3	4	5	6	_____	

**(Please express your answer in months – events that have already happened to be expressed as *negative* months ago.) If you anticipate the possibility of your company/division adopting an ERP system, how distant into the future would you estimate your organization will ...**

**begin contemplating the move to an ERP system?** \_\_\_\_\_  
**begin implementation of the initial module(s) of the ERP system?** \_\_\_\_\_  
**go operational with the initial module(s) of the ERP system?** \_\_\_\_\_

**(Please check, IF APPLICABLE) ... I do not anticipate my organization adopting ERP in the foreseeable future.** \_\_\_\_\_

**Please indicate (check the nature (products/services) of your company/division by indicating its NAICS code.**

- |   |   |
|---|---|
| <input type="checkbox"/> (11) – Agriculture, Forestry, Fishing, & Hunting | <input type="checkbox"/> (53) – Real Estate, Rental and Leasing               |
| <input type="checkbox"/> (21) – Mining                                    | <input type="checkbox"/> (54) – Professional, Scientific & Technical Services |
| <input type="checkbox"/> (22) – Utilities                                 | <input type="checkbox"/> (55) – Management of Companies & Enterprises         |

*Appendix B continued on the next page*

**Appendix B, Continued**

- |   |   |
|---|---|
| <input type="checkbox"/> (23) – Construction                    | <input type="checkbox"/> (56) – Administrative & Support & Waste Management   |
| <input type="checkbox"/> (31-33) – Manufacturing                | <input type="checkbox"/> (61) – Educational Services                          |
| <input type="checkbox"/> (42) – Wholesale Trade                 | <input type="checkbox"/> (62) – Health Care & Social Assistance               |
| <input type="checkbox"/> (44-45) – Retail Trade                 | <input type="checkbox"/> (71) – Arts, Entertainment & Recreation              |
| <input type="checkbox"/> (48-49) – Transportation & Warehousing | <input type="checkbox"/> (72) – Accommodation & Food Services                 |
| <input type="checkbox"/> (51) – Information                     | <input type="checkbox"/> (81) – Other Services (except Public Administration) |
| <input type="checkbox"/> (52) – Finance & Insurance             | <input type="checkbox"/> (92) – Public Administration                         |

**Your job description (title)? Please (✓) one.**

- Accountant     Director/Manager     Controller     CFO  
 CIO     Other (please specify) \_\_\_\_\_

**Your years of business/work experience? Please (✓) one.**

- 0 - 5     5 - 10     10 - 15     15 - 20     20 - 25     25+

**Your professional designations held? Please (✓) all that apply.**

- CMA     CPA     CIA     CISA     CPIM     other (specify) \_\_\_\_\_

**The number of employees in your (check one)**

- corporate     division     plant  
 fewer than 500  
 500 – 1,999  
 2,000 – 4,999  
 5,000 – 9,999  
 10,000+

**Annual sales volume of your (check one)**

- corporate     division     plant  
 less than \$1 million  
 \$1 – 99.99 million  
 \$100 – 499.99 million  
 \$500 – 999.99 million  
 \$1 billion+

**THANK YOU FOR PARTICIPATING IN THIS SURVEY.**

*If you would like access to the results, please provide your e-mail address in the space below (\*).*

**Also, would you be willing to participate in a brief telephone interview (at your convenience) to clarify/expand your thoughts on some of the issues addressed by this survey?**

- If “yes,” your name, please \_\_\_\_\_  
 Phone number: \_\_\_\_\_  
 (\*) e-mail address: \_\_\_\_\_

If you have any questions or comments regarding this survey, please feel free to contact Ken VanVuren.

E. H. Patterson School of Accountancy  
 200 Conner Hall  
 University of Mississippi  
 University, MS 38677-1848

Phone: 662-915-3982  
 e-mail: kwvanvur@olemiss.edu  
 Fax: 662-915-7483