



# Managing Information Strategy for Better Organizational Performance

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## ABSTRACT

*IT/IS has become the most value-adding enabler for organizational performance in today's aggressively competitive business. The management of information has become a strategic necessity for better performance. This paper discusses various approaches to information management at strategic level; it also highlights some of the concerns of CEOs. The preliminary results of a survey of US companies are presented to illustrate various strategic information management issues.*

**Keywords:** Information Systems Management, Organizational Performance, IS Strategy, IS Practices



## INTRODUCTION

Information technologies/information systems (IT/IS) support organizations in three vital roles: in improving business processes and operations, in rational decision making by managers and employees, and in strengthening strategies for competitive advantages. Information technologies such as the Internet, WWW, EDI, etc., have already changed, and are changing continuously, the way organizations do business with information technologies today (Mandal and Gunasekaran, 2003; Laha and Mandal, 2007).

Information is now treated as an asset and, like any other asset, information should be managed for strategic advantages. This paper deals with managerial issues relating to the collection, usage and maintenance of information in organizations. It is argued that proper management of this asset (information) will enable businesses to follow best practices and perform optimally.

Business practices and performance are two different things; it could be argued that practices lead to performance. Logically, the best practices should produce the best performance. Researchers have devoted considerable effort in classifying and categorizing various facets of organizational practices and hypothesizing about their impacts on organizational performances. Ungan (2005) classified the best practice context into three elements: best practice factors, organizational factors and environmental factors. Through multiple regression analysis, with a survey data of 93

respondents, he established a positive significant association between management support and organizational resource availability, external pressures, perceived operational benefits, and compatibility.



This paper focuses on how information, as a strategic resource, has been put in practice in US manufacturing companies and to what extent it is important to their financial performance. From organizational practices point of view, managers use information for operational efficiencies which should translate to financial performance. At the top level of organizational hierarchy, CEOs and senior managers set various information strategies for collection, usage and maintenance of information resources. These strategies are referred here as IUM (information usage and measurement) strategy. The top level management also directs the development of organization's knowledge management strategies, referred here as KCM (knowledge creation and management) strategy. KCM strategy is closely related to electronic data management. This research analyzes various IUM and KCM strategies and their impacts on business financial performances. Specifically, the study explores different hypothesis testing to check if there is any significant relationship between IUM and KCM strategies and organizations' financial performance. This enables us to identify the relative merits or potentials of these strategies and thus contributing to long term policy formulation. The data for the analysis is derived from a comprehensive national survey of US manufacturing companies.





**IT AND ORGANIZATIONAL PERFORMANCE**

Managers perceive a huge potential benefits from investing in IT/IS. In 2006, American businesses spent around \$1.8 trillion on IS hardware, software and telecommunications equipment. They also invested another \$1.7 trillion on businesses and management consulting and services in redesigning business operations to take advantage of new technologies (Laudon and Laudon, 2007). Investment in IT and organizational productivity has been a major area of interest among researchers. A study reported by Berndt and Morrison (1992) showed that investments in "high-tech" office and information technology have resulted in reduced costs and increased productivity. The authors used US Bureau of Economic Analysis and the Census and Annual Survey of Manufactures data to examine the relationships between investments in high-tech office and information technology capital, and performance measures such as labor and multifactor productivity, gross returns to capital, real ex-post internal rates of return.

As said in the beginning, IT could support business strategies. There are many usage of IT and accordingly businesses could focus on various strategic directions. Table 1 summarizes the basic business strategies which are facilitated by IT usage.

Significant movement that has occurred relatively recently is the push towards worldwide and national integration of information systems (Dutta, Lanvin and Paua, 2003; Kumar and van Hillegersberg, 2000; Laughlin, 1999; Palaniswamy and Tyler, 2000) for organizations to achieve competitive advantages. Since it has become critical for businesses to be able to get to relevant data and information quickly and easily, large information systems such as enterprise resource planning (ERP) systems, supply chain management (SCM), enterprise resource/relationship management (ERM), enterprise application integration (EAI), Web Services, and Customer Relationship Management (CRM) have grown in importance.

The effects of IT competency on firm performance have been studied by Tippins and Sohi (2003). They considered the payoff of investing heavily in information technology (IT) and propose that organizational learning plays a significant role in determining the outcomes of IT. Using structural equations modeling with data collected from managers in 271 manufacturing firms the authors showed that organizational learning plays a significant role in mediating the effects of IT competency on firm performance. Mandal and Gunasekaran (2003) establishes that significant improvement in efficiency



across organization could be achieved through implementation of large ERP system.

**RESEARCH METHOD**

In this paper we used a sub-set of primary data collected for a comprehensive study of American manufacturing companies and reported elsewhere (Mandal, Venta and El-Houbi, 2008). Empirical data was collected through a questionnaire survey of U.S. manufacturing companies. The survey instrument was very similar to ones used for the UK, Australia, Singapore and Hong Kong surveys (Prajogo and Sohal, 2003), but was modified to incorporate US specific information. The six-part questionnaire (6 pages long) included questions on organizational profile, organizational practices, organizational performance, business environment, organizational strategy, and organizational culture. The

**Table 1: Use of IT in Implementing Basic Business Strategies**

<b>Lower Costs Leadership</b>	<ul style="list-style-type: none"> <li>• Use IT to substantially reduce the cost of business processes</li> <li>• Use IT to lower the costs of customers or suppliers</li> </ul>
<b>Differentiate</b>	<ul style="list-style-type: none"> <li>• Develop new IT features to differentiate products and services</li> <li>• Use IT features to reduce the differentiation advantages of competitors</li> <li>• Use IT features to focus products and services at selected market niches</li> </ul>
<b>Innovate</b>	<ul style="list-style-type: none"> <li>• Create new products and services that include IT components</li> <li>• Develop unique new markets or market niches with the help of IT</li> <li>• Make radical changes to business processes with IT</li> </ul>
<b>Promote Growth</b>	<ul style="list-style-type: none"> <li>• Use IT to manage regional and global business expansion</li> <li>• Use IT to diversity and integrate into other products and services</li> </ul>
<b>Develop Alliances</b>	<ul style="list-style-type: none"> <li>• Use IT to create virtual organizations of business partners</li> <li>• Use IT to develop strategic business relationships with customers, suppliers, subcontractors, and others</li> </ul>

Source: O'Brian, J. A. (2004) Management Information Systems, 6th Edition, McGraw Hill.

organizational practices part was designed to capture detailed input in areas of leadership, strategy and planning process, customer focus, information and analysis, people management, process management, supplier relationships technology management, R&D management, knowledge management, and creativity and idea generation. The organizational performance part asked for detailed input in the areas of product quality, product innovation, process innovation, and financial performance.

Two rounds of mail surveys were conducted. In the first mailing, roughly 1500 letters were posted requesting CEOs or Presidents to respond to the survey. In the second mailing 2200 companies (including many of those approached in the first mailing) were approached. Altogether, 108 responses were received. The data was entered into a SPSS file and analyzed.



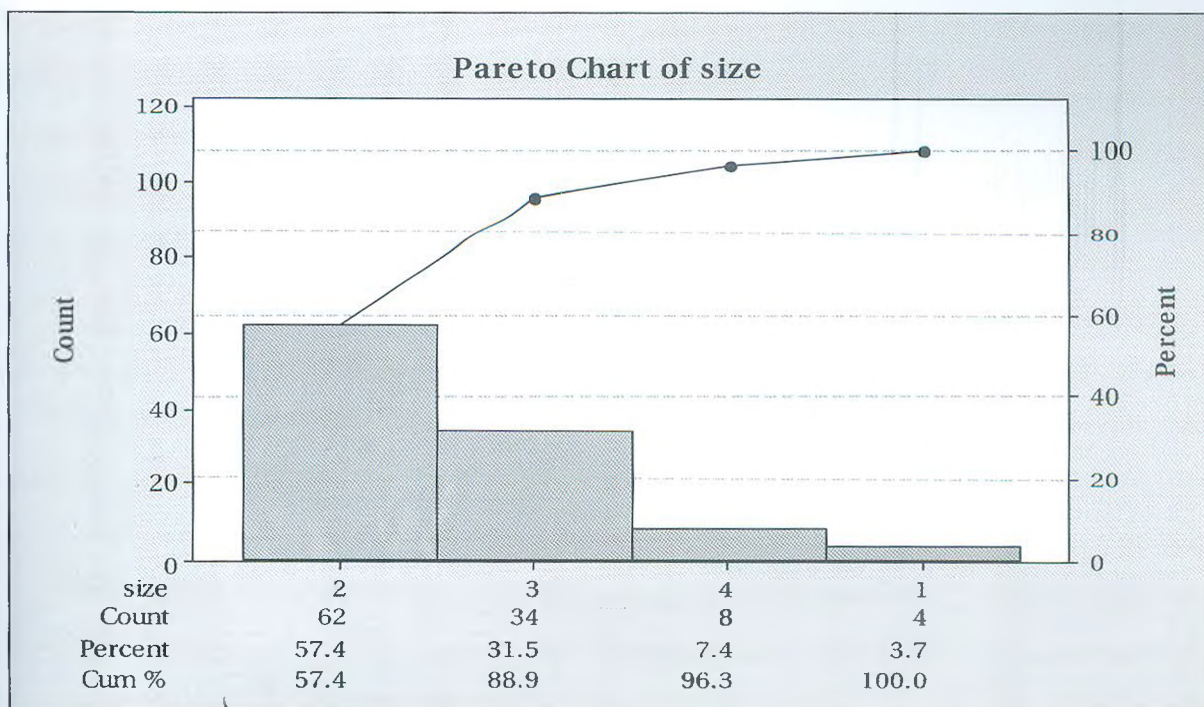
**Company Profile**

Table 2 presents some vital information about the companies that took part in the survey. The data includes a sample size of 108 companies. Out of 108 companies in the sample, the majority (about 57 percent) of the companies employed between 101 and 500 workers. About 32% of the companies employed between 501 and 1000 workers, and about 7.4% of the companies employed 1000 or more workers (see Figure 1). The average annual revenue was \$315 million. About 83.2% of the respondents have stated that their company hold quality system certification (IS9000 series) while 15% stated that did not have it (see Figure 2).

Survey reveals that 80% of the companies had a formal total management or similar quality improvement program while 18% did not (see Figure 3). About 80 percent of the companies were both ISO 9000 certified and had established TQM programs.

**Table 2: Company Profile**

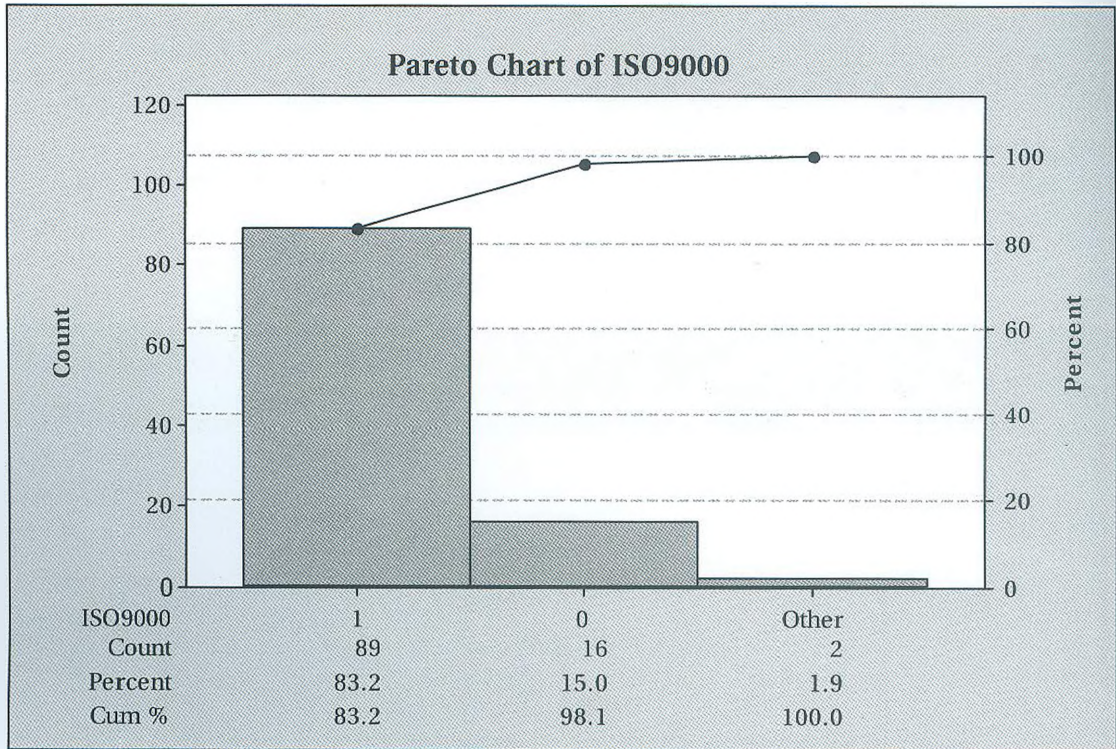
Number of Employees	Frequency	Percent	Average Annual Revenue	ISO 9000 Certification	TQM Program
< 100	4	3.7	\$314.90 million	Certified = 89 companies Not Certified = 16 companies	Has TQM program = 86 No TQM program = 19
101 - 500	62	57.4			
501 - 1000	34	31.5			
> 1000	8	7.4			
Total	108	100.0			



- 1 = company employee is less than 100 people
- 2 = employee is between 101 to 500 people
- 3 = employee is between 501 to 1000 people
- 4 = employee is 1001 or more



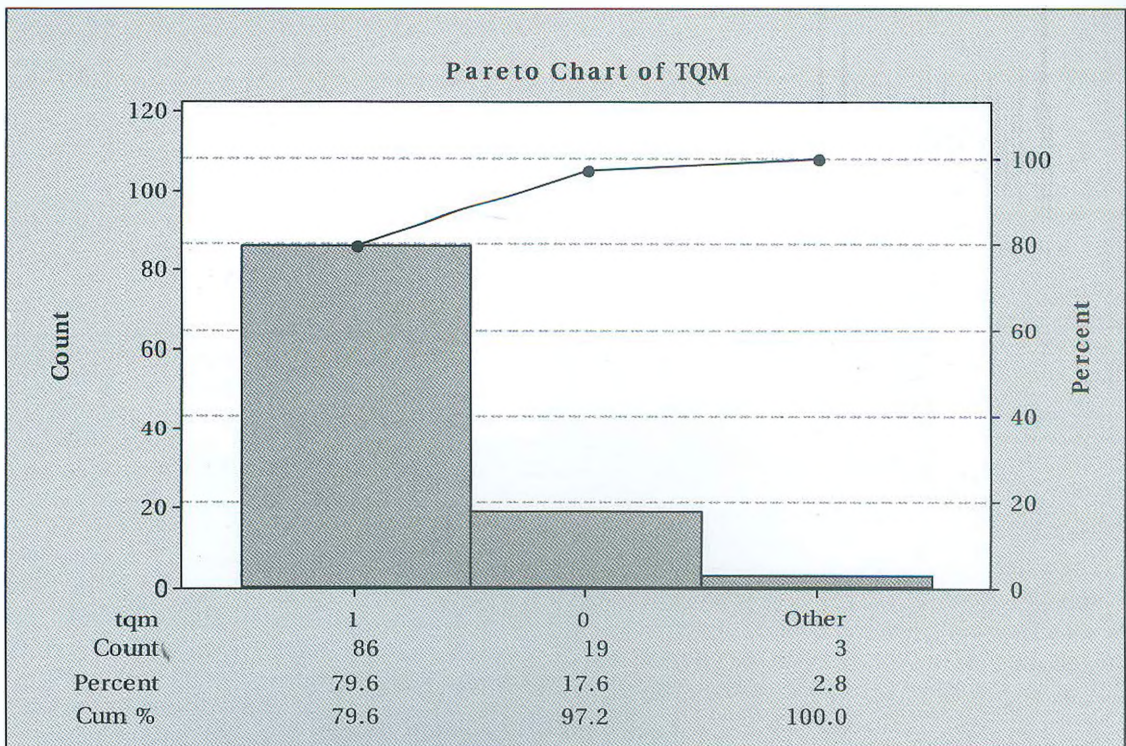
Figure 1: Pareto Chart for the company Size



1 = company holds quality system certification

0 = company does not hold quality system certification

Figure 2: Pareto Chart for the company ISO9000



1 = organization has engaged in a formal total quality management

0 = not engaged in a formal TQM or a similar quality improvement

Figure 3: Pareto Chart for the company TQM





**ANALYSIS**

From the survey responses, we segregated information related to practices into two categories: (i) strategies focusing on information usage and measurement (IUM Strategy), and (ii) strategies relating to knowledge creation and management (KCM Strategy).

**Practice of IUM Strategy**

Four factors (info\_a, info\_b, info\_c, info\_d) identifying this group of practices at strategic level is listed below:

1. Company has an effective performance measurement system that incorporates a number of measurements and indicators to track overall organizational performance (info\_a). This is essentially a data measurement strategy.
2. Up-to-date data and information of company performance is always available for those who need it (info\_b). The strategic focus here is on data availability.
3. Senior management regularly use information as a basis for decision-making (info\_c). Data usage is the focus of this strategy.
4. Company engages in active competitive benchmarking to measure performance against "best practice" in the industry (info\_d). The strategic direction here is benchmarking.

**Practice of KCM Strategy**

Four factors in this category are:

1. Build-up of intellectual capital is of strategic importance to management to gain competitive advantage (know\_a); knowledge creation strategy.
2. Company always upgrade employees' knowledge and skills profiles (know\_b); knowledge upgrade strategy.
3. Company maintains virtual and physical channels for sharing and disseminating information (know\_c); knowledge dissemination strategy.

**Financial Performance Factors**

The survey measures financial performance of organizations qualitatively. The respondent is asked to rate the financial performance of his/her company on a scale of five (1= worst in industry .... 5= best in industry) in relation to the major competitors. The specific performance measures are:

1. Relative to the major competitors in industry our sales growth is .. (finan\_a) - sales growth outcome;
2. Relative to the major competitors in industry our market share is .. (finan\_b) - market share outcome;
3. Relative to the major competitors in industry our company profitability is...(finan\_c)-profitability outcome.

**Information Strategy Practices and Financial Performance**

Tables 3 and 4 present the descriptive statistics and correlation matrix, respectively, for IS strategic practices and financial performance. The results obtained in Table 4 are shown graphically (in Matrix Plot) in Figure 4.

**Table 3: Descriptive Statistics: info\_a, info\_b, info\_c, info\_d, finan\_a, finan\_b, ...**

Variable		Median	Q1	Q3
info_a	108	4	4	5
info_b	108	4	4	5
info_c	108	4.5	4	5
info_d	107	4	3	5
finan_a	108	4	3	4
finan_b	108	4	3	5
finan_c	108	4	3	5

Median =4 (above the AVG) for info\_a, info\_b, info\_d, finan\_a, finan\_c, and Median=4.50 for info\_c.

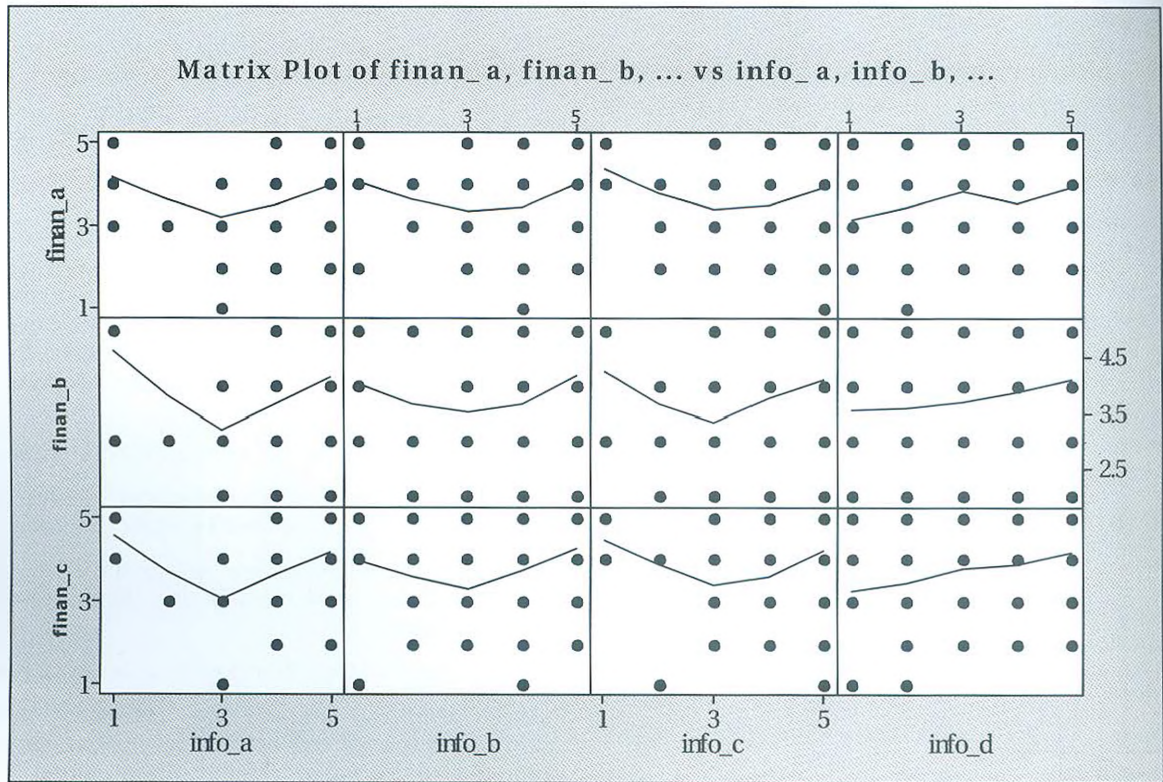
**Table 4: Correlation Matrix between Information and Analysis and Financial Performance**

Correlations: info\_a, info\_b, info\_c, info\_d, finan\_a, finan\_b, finan\_c

	info_a	info_b	info_c	info_d	finan_a	finan_b
info_b	0.735 (0.000)					
info_c	0.751 (0.000)	0.734 (0.000)				
info_d	0.573 (0.000)	0.527 (0.000)	0.669 (0.000)			
finan_a	0.113 (0.246)	0.182 (0.059)	0.085 (0.384)	0.186 (0.056)		
finan_b	0.082 (0.398)	0.160 (0.098)	0.182 (0.060)	0.200 (0.039)	0.601 (0.000)	
finan_c	0.118 (0.225)	0.251 (0.009)	0.180 (0.062)	0.264 (0.006)	0.681 (0.000)	0.439 (0.000)

Cell Contents: Pearson correlation P - Value

Figure 4: Matrix plot between IUM Strategies and Financial Performances.



The results imply that:

- 1) There is a statistically significant relationship between info\_d (benchmarking) and finan\_b (market share) at the 0.05 level of significance
- 2) There is a statistically significant relationship between info\_b (information availability) and finan\_c (profitability) at the 0.01 level of significance, and
- 3) There is a statistically significant relationship between info\_d (benchmarking) and finan\_c (profitability) at the

0.01 level of significance

**Knowledge Management Practices and Financial Performance**

Table 5 shows the descriptive statistics and Table 6 presents the correlation coefficients between practice and performance variables. The matrix plot in Figure 5 shows relationships between KCM strategies and financial outcomes.

Table 5: Descriptive Statistics:

Variable	N	Median	Q1	Q3
Know_a	108	4	3	4
Know_b	108	3	2.25	4
Know_c	108	4	3	4
Know_d	108	4	3	5

Median =4 (above the AVG) for know\_a, know\_c, and know\_d), and Median=3 for know\_b



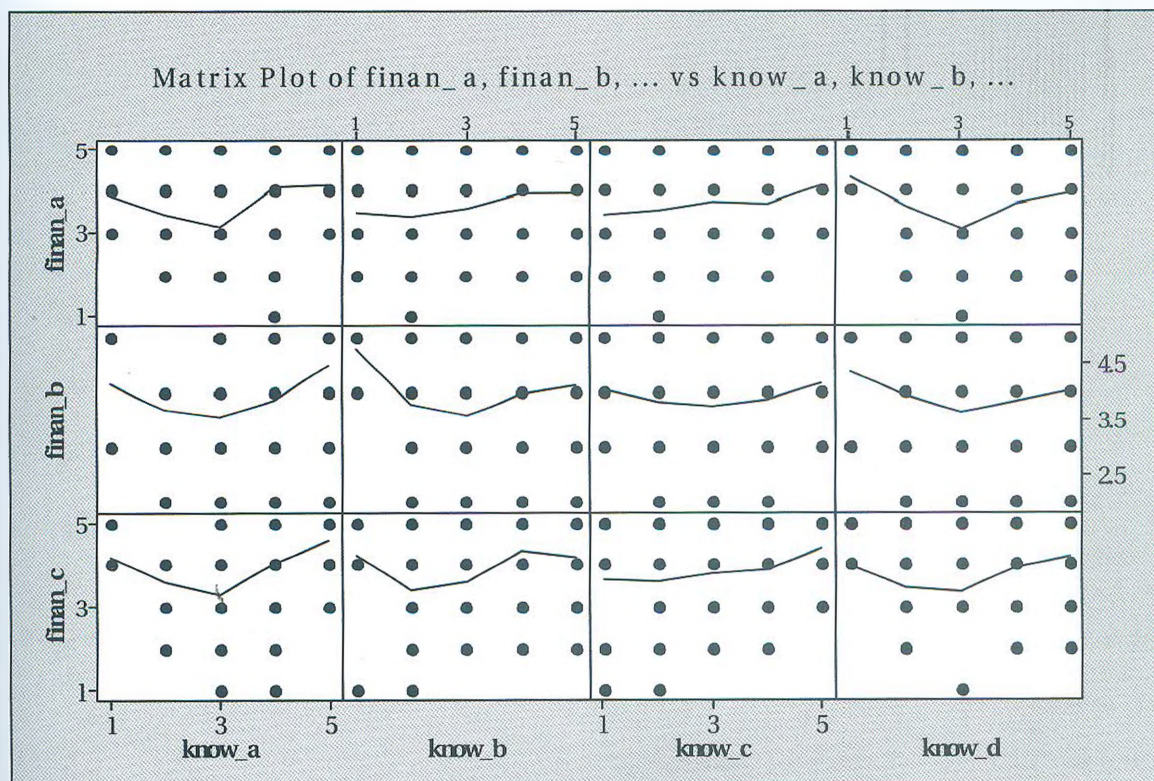
**Table 6: Correlation Matrix between Information and Knowledge Management and Financial Performance**

Correlations: know\_a, know\_b, know\_c, know\_d, finan\_a, finan\_b, finan\_c

	know_a	know_b	know_c	know_d	finan_a	finan_b
know_b	0.633 (0.000)					
know_c	0.610 (0.000)	0.727 (0.000)				
know_d	0.589 (0.000)	0.635 (0.000)	0.626 (0.000)			
finan_a	0.247 (0.010)	0.215 (0.026)	0.170 (0.078)	0.094 (0.332)		
finan_b	0.228 (0.018)	0.033 (0.733)	0.062 (0.522)	0.027 (0.784)	0.601 (0.000)	
finan_c	0.306 (0.001)	0.280 (0.003)	0.234 (0.015)	0.216 (0.025)	0.681 (0.000)	0.439 (0.000)

Cell Contents: Pearson correlation  
P -Value

**Figure 5: Matrix plot between KCM strategies and Financial Performances.**





The analysis implies the following:

- 1) Statistically significant relationship exists between know\_b (knowledge upgrade) and finan\_a (sales growth) at the 0.01 level of significance
- 2) Statistically significant relationship exists between know\_a (knowledge creation) and finan\_b (market share) at the 0.05 level of significance
- 3) Statistically significant relationship exists between know\_a (knowledge creation) and finan\_c (profitability) at the 0.01 level of significance
- 4) Statistically significant relationship exists between know\_b (knowledge upgrade) and finan\_c (profitability) at the 0.01 level of significance
- 5) Statistically significant relationship exists between know\_c (knowledge dissemination) and finan\_c (profitability) at the 0.05 level of significance.



**CONCLUSION**

Information use and measurement strategies (IUM) show strong influence on company financial performance. The following three relations (in order of significance) are of particular interest-

- The practice of benchmarking has a strong influence on business profitability.
- The availability of up-to-date data and information has strong association with business profitability.
- The practice of benchmarking has an influence on company market share.

Similarly, knowledge creation and management strategies (KCM) show significant influence on business financial performance. The following five correlations are in the order of significance-

- knowledge creation vs company profitability
- knowledge upgrade vs company profitability
- knowledge creation vs company sales growth
- knowledge dissemination vs company profitability
- knowledge creation vs company market share

As stated in the beginning, IT/IS provides businesses with an opportunity to become more competitive by improving sales growth, market share, profitability and other aspects of business. This study provided clear evidences that the performances of the US manufacturing companies were strongly influenced by various information management related strategic practices. Clearly, some strategies were more effective than the others.

In summary, this paper addressed information management issues and company performances at strategic level in the US

manufacturing companies. The survey analysis leads to several important findings which could be useful to the top level management in framing long term improvement strategies.

Further statistical analysis could be beneficial to reveal strengths and weaknesses of various relationships with this data set. One may use more powerful statistical techniques such as logistic regression (Hosmer and Lemeshow 2000, Agresti, 1996, and Tabachnick, et.al. 1996) and discriminate analysis to study the relationship between the response variables and several set of explanatory variables. Logistic regression is powerful statistical technique for modeling the relationship between a categorical outcome and set of independent variables such as organizational practices. Logistic regression allows us to predict the probability of a particular categorical response variable. In contrast to linear regression which predicts the actual values of the response variable, the logistic regression models the probability associated with each level of the response variable by finding a linear relationship between predictor variables and a link function of these probabilities. Different link functions present different goodness-of-fit for the data.



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