THE VALUE OF CORPORATE INFORMATION AND ALLIED TECHNOLOGIES AS PERCEIVED BY EXECUTIVES

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ABSTRACT

This study attempts to promote a better understanding of how IT and allied resources are valued by senior management of the firms that deploy them. To achieve the objective, individuals - usually a director or a vice president-level person such as a Chief Information Officer (CIO) to whom the IT managers report were surveyed. By focusing on executives and managers charged with providing corporate "cover" for the IS function, we expected to report an informed yet objective assessment and gain knowledge about the value of their corporate information technology and allied resources. Moreover, the results can help provide meaningful input into annual information technology plans as well as in better focusing limited organizational resources.

Keywords: Information Technology (IT) Value, Corporate Information and Communications Technologies (ICTs), Chief Information Officers (CIOs), IT Plans

INTRODUCTION

The study of how CIOs and senior management normatively assess the value of their organizations' information and allied technologies is a relatively new phenomenon in the information systems literature [1, 17]. With the growing interest in leveraging information and communication technologies to gain competitive advantage, understanding the real worth and value of same, from management's perspective, should assume and attract more focused attention. The purpose of this research is twofold: (1) To gain some understanding of how senior management in information-intensive organizations value their Information and Communication Technologies (ICTs), and (2) to improve our understanding of a host of complex issues involved in determining payoffs from investments in information technology. Consistent with these objectives, this research combines a value-added processes perspective of information systems based on Robert Taylor's [19] user-centric theory, with a non-standardized measure of information based on works by Black and Marchand [3]. Data gathered in a recently completed survey was used to produce a model of management perception and to gauge the changing intrinsic value of corporate information and allied technologies. As the remote objective of this study was to assess the level of contribution of information technology to the overall economic health of the organization as judged by senior management, the main research question was: To what extent do ICTs boost company performance in the different functional areas of the firm?

PRIOR RESEARCH AND LITERATURE REVIEW

There are not many known reported studies in the MIS literature that have dealt with how CIOs and executives in the business world actually perceive their ICTs in terms of value added attributes [1, 3, 4, 7, 11, 14, 15, 16]. In the search to truly understand the extent to which CIOs and business executives value their ICTs, related research conducted over the past several years was reviewed. The purpose of the review was to survey the extant literature to identify what factors might be relevant to study and to provide a perspective for analyzing the issues and factors deemed important by business leaders in relation to the value-addition of ICTs to businesses.

Traditionally, information and its generating technology have been viewed as organizational resources; a form of capital which has both benefits and costs [3, 5]. Many reviews of organizational information and communications technology conclude that they make a difference -- and for the better [6, 13, 19]. For example, Beverly and Steensma [2] and other authors [9, 12, 20, 21] have argued persuasively that integrated office systems would change nearly every aspect of how organizational members conduct their work, service clients, and think about the relationships among office activities as well as social organization of work itself. The fact that ICTs have had tremendous impacts on contemporary businesses therefore has never been in doubt. At this point, one area of possible impact still remains primarily speculative -- whether leaders of business actually believe and appreciate the value-added attributes of ICTs to business.

The calibration of how CIOs perceive their organizational information implements have been known to be fluid depending on the specific aspect and issue under consideration. For example, Earl and Feeny [6] have been able to posit the asset and liability arguments of IT based on its different dimensions. More specifically, they demonstrated (as shown in Table 1 below) that IT can be perceived as either value-adding or otherwise. For each issue and dimension, the argument for IT as a liability or an asset is enumerated. It is interesting to note that the perception of IT by CIOs is driven primarily by factors related to the personalities of the CIOs. Such factors include CIO's basic education, professional experience, business environment and type (manufacturing, retailing, service, etc.), industry infrastructure, CIOs business management predisposition and whether or not the particular CIO is a technology champion or laggard. Moreover, researchers have only begun to provide explanations of how top executives' experiences and perceptions influence organizational decisions related to IT development and implementation. Drawing from a broad theoretical base, the study by Beveryly and Steensma [2] tested the contentions that top executives' personal attibutes (e.g. age, educational background, and work experience), affect their perceptions and attitudes toward technology and accompanying risk, and (2) their perceptions of their firms' past success with collaborative technological development, which ultimately, influence their cognitive assessments of potential technological alliances. Results from the study suggest that top executives with a technical education place more weight on the opportunities provided by technology and technological initiatives than those with other types of education. There is no reason not to expect similar results on their perception of information and allied technologies.

The table below further attempts to shed more light on the subject by providing a subjective yet complementary data from personal interviews of CIOs. The responses and anecdotes as summarized are quite representative and generalizable of CIOs' perceptions of salient and contemporary issues related to managing organizational IT resources. The breakdown of the issues with their corresponding responses follow:

Table 1. Perception of IT by CIOs

Issue	IT is a Liability	IT is an Asset
Are we getting value for our money?	ROI is difficult to measure, and the organization is notably unhappy with IS as a whole.	ROI is difficult to measure, but the organization believes IS is making an important contribution.
How important is IT?	Stories of strategic use of IT are dismissed as irrelevant to our Business.	Stories of strategic use of IT are seen as interesting and instructive.
How do we plan for IT?	IT plans are made by specialists or missionary zealots.	IT thinking is subsumed within business thinking.
Is the IS function doing a good job?	There is general cynicism about the track record of IS.	The IS portfolio is no longer an agenda item.
What is the IT strategy?	Many IT applications are under development.	IS efforts are focused on a few key initiatives.
What is the CEO's vision for the role of IT?	The CEO sees a limited role for IT within the business.	The CEO sees IT as having a role in the transformation of the Business.
What do we expect of the CIO?	The CIO is positioned as a specialist functional manager.	The CIO is valued as a contributor to business thinking and business operations.

METHODOLOGY

The methodology for assessing the Value of Information (VI) has enjoyed a long tradition in Decision Sciences and Information Systems literature and there is a plethora of evidence that such approach is proven [3, 8, 10, 19]. This common body of knowledge should obviously have implications for deriving the value of adjunct information and communication technologies.

In this study, an attempt was made to better understand how ICTs and allied technologies are valued by CIOs and business leaders in the US alone. To achieve this goal, the opinions of corporate CIOs and business executives, usually a director or vice-president level person to which the IT manager reports, were sought. By focusing on those managers charged with providing corporate "cover" for the organizational IT function, this paper expects to report an informed yet objective assessment of contemporary ICT. We chose a large, diverse sample of corporate America, with the main bias toward larger than smaller firms' tradition of relying heavily on their IT support function.

DATA

The data gathering method used in the study is a cross-sectional field survey. The main data gathering tools were questionnaires, the advantage being the ability to administer them economically. Personal interviews were used to supplement the data gathering effort. More than anything else, the personal interview approach enabled the researcher to converse with numerous individuals pertinent to the study. It helped to assess their attitudes, roles as well as clarifying and validating data from the survey; that is, it primarily served as a diagnostic and illustrative aid. A random sample of participating organizations was drawn from the Internet, trade directories and registers that collectively constituted the sample frame. The organizations span seven (7) industries, covering financial, automobile, publishing, transportation, insurance, and communications as well as the medical industry. The industries were selected because of their track record and leadership for deploying advanced, state-of-the-art ICTs. Since most databases that provided relevant data are established by law, one would expect the entries to be fairly exhaustive and up-to-date. An initial administrative phase involving establishing contact with key individuals within the firms was carried out. The purpose was to encourage a high response rate, which in turn, was to guarantee a high degree of variability among organizations.

The study used an adapted form of a standardized instrument and IT Business Value as a basis [18]. It is conceivable that the results should be of interest for what they would reveal about CIOs and business executives' perception of the value of ICTs in the business world, as well as, their general implications for management information systems research. The data were collected by surveying CIOs and corporate executives at each of the Fortune 500 companies surveyed. Two hundred and sixty eight usable questionnaires representing a response rate of 30%, were used. Missing data further reduced the effective number of responses for certain analyses, but the number was never less than 200.

DATA ANALYSIS

The raw data was first assembled, grouped and tallied by business sector. The various total frequency counts by different categories were collated. To estimate the spread of the variables, descriptive summary statistics were generated. Results of personal interviews which gave latitude for opinion expression aided further data analysis and interpretation of results. In terms of the Office of Information Technology (OIT) unit staff, the majority of firms surveyed have a fairly small IT staff relative to other units in the organizations. Sixty-two percent have staffs of 100 employees or fewer. A comparison of respondents and non-respondents on firm size or IT budget allocation did not reveal any significant difference between the two groups.

CIOs were asked to elaborate on the ICT cost-benefit metric in their specific situations. The consensus in terms of what constituted a good IT investment was the extent to which IT produced a higher level of productivity, and more importantly, how quickly it can pay for itself. That is, the shortness of the break-even point and the overall return on investment. The derivation of tangible benefits was reported as a strong factor. The IT budgets of surveyed companies were found to be quite revealing. Even though corporate OITs tend to be small in terms of personnel, their budgets seem to be disproportionately huge and growing by leaps and bounds. This is particularly true for those who are purely online, web-way types, and information-intensive firms.

In the survey, CIOs and corresponding business leaders were asked to indicate their judgment on the overall value and quality (as 'Good,' 'Fair,' or 'Poor') of 11 different items as relevant to their company's ICTs. Such items included current goals

for IT investments, management support for IT, the extent to which IT strategy supports business strategy, and the extent to which IT boosts company performance in a variety of business processes and areas. Moreover, data was gathered in the areas of the company's information architecture, infrastructure, data-handling and professional expertise. Overall, and more than any other item, the strengthening of the firm's strategic planning had the highest rating of 55 percent as "good." Forty-two percent thought the streamlining of business processes was fair, while only 3 percent thought it was poor.

Of note is the fact that organizations that deploy state-of-the-art information and communications technologies are believed to be on the cutting edge of modern management. The application of such implements to support necessary organizational activities and easily rationalizable tasks has brought about incredible business results and successes. Impacted organizations have developed systematically different, more forward looking structures and working processes than organizations that still rely on more conventional media such as memos, telephony and face-to-face meetings. As expected, CIOs and senior management in digitally-oriented firms seem to be more satisfied and appreciative of their IT arsenal than those in middle-of-the-road, click-and-mortar organizations.

Finally, respondents were asked to provide recommendations for better and improved measurable outcomes for ICTs. The suggestions appear to fall into various broad categories covering impacts on customer relations (outbound logistics), sales and marketing support, product and service enhancement where clearer and more objective measures are being called for.

CONCLUSION

Based on data analysis and results, and to the extent that preliminary inferences can be gleaned from the sample, the characterization of the relationship between the level of deployment of ICT and the strategic direction of the firm is interesting. The mere fact that two-thirds of most senior managers thought that ICT was contributing to the formulation of business strategy in some way, by providing information valuable to the process was particularly striking and instructive. The value of ICTs to the overall economic health of the firm, as adjudged by business executives, is therefore significant.

REFERENCES

1. Barua, A., Kriebel, C. H., & Mukhopadhyay, T. (1995). Information Technologies and Business value: an analytic and empirical investigation. *Information Systems Research, 6*(1), 3-23.
2. Beverly, B. T. & Steensma, H. K. (1998). The effects of executives' experiences and perceptions on their assessment of potential technological alliances, *Strategic Management Journal, 19*(10), 939-956.
3. Black, S. H. & Marchand, D. A. (1982). Assessing the value of information in organizations: A challenge for the Eighties. *The Information Society, 1*(3), 191-225.
4. Chandler, J. S. (1982). A Multiple Criteria Approach for Evaluating Information Systems, *MIS Quarterly, 6* (2)**,** 61-74.
5. Cronin, B. & Gudim, M. (1986). Information and Productivity, *International Journal of Information Management, (6)*, 85-101.
6. Earl, M. J. & Feeny, D. F. (1995). Is your CIO Adding Value? *The McKINSEY QUARTERLY*, (2), 17-24.
7. Goldberg, R. & Lorin, H. (1982). *The Economics of Information Processing, Volumes 1and 2,* New York: John Wily & Sons.
8. Hilton, R. W. (1981). The determinants of cost information value: Synthesizing some general results, *Management Science, (27)*, 57-64.
9. Jarvenpaa, S. L., & Ives, B. (1991). Executive involvement and participation in the management of IT. *MIS Quarterly, 15*(2), 205-227.
10. Jeffrey, M. & Leliveld I. (Spring 2004). Best practices in IT portfolio management, *MIT Sloan Management Review, 45*(3), 41-50.
11. Kauffman, R. J., & Kriebel, C. H. (1988). Modeling and measuring the business value of information technologies, 150-178, In P. Strassmann, P. Berger, B. Swanson, C. Kriebel, & R. Kaufmann (Eds.), *Measuring the Business Value of IT.* Washington, DC: ICIT Press.
12. Lucas, H.C. (1999). *Information Technology and the Productivity Paradox: Assessing the Value of Investing in IT.* New York: Oxford University Press.
13. Livingston, M., Starta D., & Hagen, C. (Dec 2004). Bridging the CEO-CIO Disconnect, *Optimize, 14*(7) 34-42.
14. Mason, R. M. (1979) A study of the perceived benefits of information analysis center services. *(Final Report National Science Foundation Contract No. DSI-7718035).* Atlanta, GA: METRICS.

15. Mukhopadhyay, T., Kekre, S., & Kalathur, S. (1995). Business value of information technology: A study of electronic data interchange. *MIS Quarterly*, *19*(2), 137-156.

16. Schell, G. P. (1986). Establishing the value of information systems, *Interfaces*, *17*(2), 11-21.

17. Stabell, C., & Fjeldstad, O. (1998). Configuring value for competitive advantage: on Chains, shops and networks. *Strategic Management Journal, 19*(5), 413-437.

18. Tallon, P. P., Kraemer, K. L., & Gurbaxani V. (Spring 2000). Executives' perceptions of the business value of information technology: A process-oriented approach, *Journal of Management Information Systems*, *16*, 4.

19. Taylor, R. S. (1986). *Value-added Processes in Information Systems.* Norwood, NJ: Ablex Publishing.

20. Violino, R. (June 30, 1997). Measuring value: return on investment. *Information Week*, 36-44.

21. Watson, R. T. (1990). Influences on the IS manager's perceptions of key issues: Information scanning and the relationship with the CEO. *MIS Quarterly*, *14*(2), 217-231.