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End User Computing Management Practices in Taiwan and the U.S.

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Abstract

This study examines the management of end user computing in both Taiwan and the Pacific Northwest Region of the United States.

Questionnaire-based surveys were conducted to determine how information systems staff members and end users perceive the status of, support for, and control of end user computing activities in both countries. Information systems staff members view the advantages and disadvantages of end user computing activities somewhat differently from end users themselves. End users in the R.O.C. are younger, have slightly less formal education, and significantly less computer-related experience than their counterparts in the U.S. With a couple of exceptions, end users seem more willing to give end user computing higher marks than do members of the I.S. staff.

INTRODUCTION

Historically, until the 1980s, computing in support of business processes and management activities in business organizations has taken place in a centralized, organizational unit, the information systems department. These departments were staffed with programming, operating, and analytical experts whose responsibilities included the development of information systems for virtually all functional areas of the business.

During the 1980s, computing hardware became very inexpensive and computing software became much easier to use than it had been previously. These events, coupled with a sizeable amount of frustration on the part of end users and an increasing ability on the part of end users to work with computers, caused these users to acquire the necessary resources to "take (computing) matters into their own hands."

One senior information systems manager of the authors' acquaintance has summarized the resulting changes in information systems management thusly: "We (in I.S.) used to make

them (the end users) stand in line to ask for our services, now we have to beg them to let us help them."

PRIOR RESEARCH

The management of end user computing has attracted the attention of both practitioners and researchers for much of the last decade. It was addressed by Benson [1983], Guimaraes and Ramanujam [1986], and Leitheiser and Wetherbe [1986]. It began appearing in lists of important information systems issues in Dickson's study of I.S. managers [1984]. By 1987, management of end user computing had become important, enough to cause it to be ranked sixth in Brancheau and Wetherbe's study [1987] and represented within several issues in Harrison [1988].

Prior research by Harrison and Farn [1990] found several issues surrounding the management of end user computing to be important in both current and future rankings of important information management issues in both the U.S. and the R.O.C. In the U.S. at least, its importance seems to be dropping, as reflected by the most recent work by Janz et al [1994].

A number of advantages are presumed to accrue from effective end user computing, and these advantages would then constitute arguments for engaging in effective end user computing management. Some of these advantages are reported to be: 1) an increase in organizational productivity, 2) a decrease in the information systems department's applications development backlog, and 3) an enhancement of the efficiency of organizational decision making [Keen, et al 1984]. Other possible advantages include 1) systems which more closely meet the users' needs, 2) more flexible user requirements, and 3) more successful systems implementations.

On the other hand, there are some potential problem areas in end user computing management. These include 1) inadequate development of EUC applications due to the lack

of a global information architecture, 2) poor applications portability due to software and hardware incompatibilities, 3) applications of low technical quality, 4) inefficient usage of corporate computing resources, 5) flawed solutions due to poor software quality assurance procedures, 6) inadequate documentation and testing due to the lack of a systematic design process, 7) data security and data integrity problems, and 8) private, as opposed to shared, computing resources. For further details see Leitheiser and Wetherbe [1986], O'Donnell and March [1987], and Bergeron and Berube [1988].

The purpose of this paper is to extend the work that has been done to include the study of management control (or encouragement) of end user computing. One might expect to manage end user computing in order to 1) facilitate activities which can improve the organization's performance and 2) minimize the downside risks associated with poor end user computing management.

EUC MANAGEMENT STRATEGIES

Leitheiser and Wetherbe [1986] described four possible EUC management strategies: the stick approach, the carrot approach, the sink-or-swim approach, and the support approach. Gerrity and Rockart [1986], on the other hand, chose only three categories: the Laissez-Faire approach, the monopolistic approach, and the information center approach. Alavi et al. [1987-88] introduced five categories: Laissez-Faire, monopolist, acceleration, marketing, and operations-based. Clearly there is overlap between these sets of categories with some authors choosing to use more (or less) "granularity." Perhaps a brief application of some definitions to the categories would be useful:

Laissez-Faire: in the free market approach, management does not try to either promote or discourage end user computing.

Monopolist or Stick: in this approach management tries to effect total control through the use of regulations and policies, with sanctions for non-compliance.

Marketing: a supportive approach which encourages end user computing through the use of incentives and support staff.

Operations: an approach that puts the organization in the position of organizing and integrating all end user computing resources. Standards and control procedures are important.

Acceleration: a pro-active approach designed to increase end user computing activities. Characteristics include the establishment of an information center, training classes, support, and consulting. No control over the direction of EUC activities is employed.

RESEARCH QUESTIONS

The authors used questionnaires to find answers to the following questions:

1. To what extent are end users engaged in developing their own applications?
2. When end users do develop their own applications, what tools do they use?
3. How is end user computing viewed by information systems staff members? ...by end users?

RESEARCH METHODOLOGY

In Taiwan, questionnaires were sent to 174 companies. End users received one version of the questionnaire while members of the information systems staff received another. The response rates were low: 21% for information systems staff and 19% for end users. In the United States questionnaires were sent to 100 companies, with (also low) response rates of 24% for information systems staff and 17% for end users. Firms of all types were included in both samples. Firm size was, on the average, much larger in the U.S. sample than in the Taiwan sample.

DISCUSSION OF RESULTS

The standard disclaimers apply. Survey research is always suspect and survey research across two cultures is particularly so. Harrison and Farn [1990] pointed out some of the pitfalls in their work. One can never be sure that a respondent attaches the same meaning to a question as the researchers intended, or indeed, as the other respondents. Even with translation and re-translation one can never be sure the questions mean the same thing in English as they do in Chinese, or vice versa. That said, the results might still be interesting.

Cursory analysis of the results indicate that firms in the U.S. have done more through organizational structure to provide support for end user computing activities than have firms in Taiwan. This is probably due to two factors. One factor is firm size. Firms are larger in the U.S. and formal organizational structures are probably more likely to be found in larger organizations than in smaller ones. The second factor is probably related to the findings of Harrison and Farn [1990] that indicated that, at least early on, firms in Taiwan lagged behind firms in the U.S. in introducing computing technology and being faced with the resulting issues.

Taiwan end user respondents were younger, had fewer years of formal education beyond high school, and fewer years of experience with computers than did their U.S. counterparts. The data indicate that "hands-on" use of computers is somewhat greater in the U.S. than in the R.O.C. All end user respondents from the U.S. claimed to use both word processing and spreadsheet software regularly.

More end users in the R.O.C. seem to use packaged software to develop applications than do their counterparts in the U.S. A relatively small number of end users in the U.S. use fourth generation tools. Corresponding data from the R.O.C. is not available.

Overwhelmingly, end users and information systems staff members in both countries believe that end user computing has made positive or very positive impacts on their companies. There are, however some interesting differences of opinion with respect to the advantages and disadvantages of end user computing

In the U.S., end users are much more likely (than are I.S. staff members) to cite the advantages of end user computing: more effective use of computing resources, reduced workload in I.S., and quicker response to user needs. They also fail to see that there is a significant increase in systems integration problems.

In the R.O.C. data, one would seem to find evidence that the I.S. staff members think more highly of end user computing in terms of reducing the I.S. workload and providing quicker response to user needs. They also believe there are more systems integration problems than do their end users.

FURTHER STUDY

End user computing seems to be positive contributions to firms in both the R.O.C. and the U.S. Use of word processing and spreadsheet software has become commonplace. Fourth Generation tools have not made significant inroads into the end user community. A surprising number of end users seem to use programming languages in their applications development efforts.

Further research is needed to provide more precise answers to interesting research questions. However, the playing field changes rapidly. New applications development tools and methodologies will make much of the older data obsolete. As the tools get easier and easier to use, end users will take on even more computer-related work.

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