

CHAPTER TWO

LITERATURE REVIEW

This section discusses the literature most relevant to the major constructs addressed in this study.

2.1 An Introduction - End-User Computing (EUC)

Advances in technology, increased user literacy and the inability of traditional centralized methods to deliver information adequately are the major factors that have contributed to the rapid expansion of the concept of end-user computing (EUC). EUC is a global phenomenon where end users or non-information system (IS) personnel involve directly in the using of microcomputer and information technology. EUC has been a striking change in organizational computing since 1990. It is apparent that most organizations will continue to increased their EUC expenditures (Burrows, 1994).

In many organizations, the effective management of EUC has been consistently identified as a top management issue (Brancheau, 1994). If properly managed, EUC is believed to improve users' productivity and, in turn the effectiveness of the organization. For instance, EUC has decreased the user system request backlog problem facing by IS departments through user development of some applications. Moreover, EUC has also provided users with a sense of control over their working environment by enabling them to set their own priorities and satisfy their own information requirements (Guimaraes, T. et al 1999). Thus, EUC is receiving much attention in the MIS field, from both practitioners and researchers (McCracken, 1980).

On the other hand, EUC entails risks and concerns. Most organizations have not yet developed strategies to ensure that EUC meet organizational objectives or

meet quality assurance standards (Laudon and Laudon, 2000). As a result, the provision of a support infrastructure that maximizes the benefits and minimizes the risks of EUC can be critical to the achievement of organizational goals.

2.2 Critical Success Factors (CSFs) Reviewed

Critical success factors (CSFs) are the conditions that need to be met in order to assure success of the IS. They are also the critical areas that management must constantly monitor to ensure successful performance by the organization. Therefore, if organizations manage the information system according to IS critical success factors, then IS performance should improve and the company should derive greater benefits from EUC (Guimaraes, 1996).

The following eight composite critical success factors of IS were synthesized from prior research and literature (please refer Appendix 1 for the references):

- Quality of user-developed applications
- User self-sufficiency
- Organizational commitment
- Quality of staff
- Variety of services
- Quality of services
- Facilitation of EUC
- IS role definition

Each of these factors, along with the specific measurements items used for each determinant, is described below.

2.2.1 Quality of User-Developed Applications

One of the major contributions to IS success is the quality of the information obtained through applications developed primarily by the user (Magal, 1991). Users who are unhappy with their applications tend to consider the IS at fault for not providing appropriate support. It should be realized that allowing users to develop and operate low-quality applications, even if they are done quickly and cost effectively, is counterproductive for the organization since users are not getting optimal information to support their needs. Successful IS managers, thus, must be concerned with the quality of user-developed applications by monitoring and coaching end-users on the more technical aspects of application development, i.e. the design and testing phases.

Important aspects of information quality have been identified as content, accuracy, format, ease of use, and timeliness (Doll & Torkzadeh, 1988), as well as precision, reliability, and completeness (Magal, 1991). Thus, quality of user-developed applications consists of the following list of components:

- Accuracy
- Format
- Ease of use
- Timeliness
- Precision
- Reliability
- Completeness

2.2.2 User self-sufficiency

User self-sufficiency has shown to be a major factor that helps to merge user development and IS development into true corporate information management

system (UA Workshop, 1987). In an ideal EUC environment, users would be completely self-reliant and would not have to depend on IS experts for advice or support. While this degree of self-sufficiency is unlikely to be realized, IS personnel can strive to minimize the end user's dependence. Independence from the IS function has been found to be the most important factor affecting user satisfaction with application development (Rivard & Huff, 1988).

Users' understanding of the IS concept and services which have been identified by Magal (1991) as one of the components of self-sufficiency is extended in this study to include the notions of mastering tools and understanding applications (Mirani & King, 1994). The item is rephrased as users' understanding of information technology.

Finally, an additional component of user self-sufficiency is the ability to set up a small system using IS tools (Bergeron et al, 1990). This ability enhances user autonomy and, ultimately, user satisfaction. Thus, the following four components define the user self-sufficiency dimension:

- User's feeling of control
- User's independence from the IS department
- User's understandings of information technology
- User's ability to develop a small system

2.2.3 Organizational Commitment

Obtaining top management support and commitment are crucial. A management that has no first-hand participation in IS will have difficulty appreciating its potential. In the long run, it will be more damaging to the attitude of management toward the value of IS.

Commitment to the IS concept includes promoting IS services, obtaining top management support, end-user commitment, and overall organizational acceptance of the IS concept. Other variables identified in the literature that are related to organizational commitment include the existence of an adequate budget (Bergeron et al, 1990), the rank of the IS executive (Cheney, 1986), the monitoring and tracking of IS successes (Leitheiser & Wetherbe, 1991) and active promotion of IS services (Magal et al, 1988).

Satisfaction with coworkers and promotion procedures also has a direct influence on employees' commitment to the organization and their intention to leave. Therefore, perhaps management could introduce a mentor system and/ or employ a team approach to problem solving to improve the outlook for promotion and image problems associated with IS roles (Guimaraes & Igbaria, 1992).

Organizational and top management support may result in increased commitment to the IS concept, which in turn, may lead to a decline in problems faced by IS (Igbaria et al., 1995). Igbaria and Chakrabarti (1990) suggested that organizational and top management support for IS in general is an important determinant for its success. Lack of organizational support is considered as a critical barrier to the effective utilization of personal computers (Lee, 1986; Guimaraes, 1996).

All the seven components that are related to the third factor, organizational commitment, are listed below:

- Top management support
- Organizational acceptance of the IS concept
- End-user commitment to the IS concept
- Existence of sufficient budget
- Rank of the IS executive
- Monitoring and tracking of IS successes

- Promotion of IS services

2.2.4 Quality of Staff

The quality of the staff that support an IS is important. For instance, the project manager should have technical as well as business knowledge, and the ability to communicate with senior management. Support staff must be sophisticated enough to interact with the top management and be able to master the technologies required for the system.

"If end users develop their own applications, they need to understand more than just the application, things like backup and recovery, program maintenance manuals, user documentation, etc." (From the University of Arizona, MIS Department, Workshop on Information Systems, May 1987) So, management should develop training programs to keep support personnel abreast of new computing tools, methods, and applications. Other aspects of education may include encouraging people with common problems to get together and provide ways to help them develop their own skills and knowledge about tools, methods, and applications that meet individual and organizational needs.

Variables that relate to the staff's ability to provide quality services include technical competency (Bergeron et al., 1990), staff training (Magal et al., 1988) and knowledge of changes in technology (Oglesby, 1987). In addition, an ability to understand and relate to the end users is necessary for high-quality services. For this, the IS staff must be able to communicate with users (Leitheiser & Wetherbe, 1991) and must have a good understanding of the users' business tasks and problems (Leitheiser & Wetherbe, 1991). Finally, the availability of future career paths to attract and retain competent staff members (Magal et al., 1988) and the number of IS employees (Bergeron et al., 1990) are deemed to be important.

Thus, the items used to define quality of staff are:

- Technical competency of IS staff
- Training for IS staff
- Knowledge of rapid changes in technology
- Communication with users of all levels
- Knowledge of the users' business and problems
- Career paths for IS staff
- Number of IS employees

2.2.5 Variety of Services

Brancheau et al. (1985) found that an emphasis on service was important for an IS. The variety of services offered helps determine the success of the IS (Bergeron et al., 1990) and one of the IS manager's biggest challenges is to satisfy the extremely diverse needs of many end users within the constraints of limited resources. The factor variety of services includes the following five areas:

- Variety of hardware support
- Variety of software tools
- Variety of data support
- Variety of functional support
- Variety of end-user training

2.2.6 Quality of Services

Merely offering a wide enough variety of services to meet any user requirement is not enough to satisfy the users if the quality of those services is poor (Bergeron et al., 1990). Accordingly, quality attributes corresponding to each of

the five categories in variety of services mentioned above are placed in this factor. In addition, the timely response of IS personnel to various requests for service is also assigned to this determinant (Bergeron et al., 1990). Accordingly, the list of components defining quality of services includes:

- Quality of hardware support
- Quality of software support
- Quality of data support
- Quality of functional support
- Quality of end-user training
- Timeliness of service response

2.2.7 Facilitation of End-User Computing (EUC)

Facilitation of EUC can be viewed as an extension of the commitment factor in that, once commitment is established, the IS should make maintenance of that commitment easy for users and management alike. Prior research suggests that continuing commitment is encouraged when the IS has a friendly atmosphere, so that users believe that the IS will help find cost-effective solutions to their problems and the users will not hesitate to seek answers. Management of end-user expectations, so that all have a clear understanding of the limits of IS and technology resources, also has been shown to be important (Leitheiser & Wetherbe, 1991).

Hands-on demonstration of new tools, methods, and applications by IS staff and vendors on a regular basis can also be quite helpful in facilitating EUC. IS managers should also establish priority criteria for application development (Magal, 1993). Further, in successful EUC environments, user-developed applications are monitored and coordinated to reduce duplication of organizational efforts (Magal, 1993).

The literature, thus, provides the following five components for the facilitation of end-user computing factor:

- Maintenance of user-friendly atmosphere
- Offering of cost-effective solutions
- Management of end-user expectations
- Establishment of priority criteria for application development
- Coordination of organization's user-developed applications

2.2.8 IS Role Definition

IS role definition encompasses several issues, such as defining the IS mission, establishing control procedures to ensure standards and policies, developing charge back criteria, and making provisions to provide services to distributed sites. It requires management to change from the traditional bureaucratic view on the use and management of computer technology.

The IS's strategy should correspond with and support the organization's strategy (Oglesby, 1987). If the responsibilities of the IS are well defined, many problems related to the appropriate variety of services, commitment of the organization, and the facilitation of EUC may be avoided. Besides, the mission of IS should be a clear link to business objectives and clear benefits in using technology. They must also provide something that would not otherwise be available and add value to the data.

Besides clearly defining the IS mission and improving user understanding of the corporate IS perspective, an organization can also improve role clarity by establishing a charge back mechanism for EUC support activities. Carr (1987) indicated that in some cases, charge back for IS services was avoided to encourage the usage of IS services. However, with the wide proliferation of EUC,

the use of charge back systems seems more appropriate today, as long as end users and user department managers clearly see the benefits derived by requesting such service.

Role conflict and role ambiguity were reported to be two of the most important factors causing dissatisfaction among IS staff (Igbaria et al, 1990). Thus, unclear definition of the IS mission is likely to produce less-motivated and less-effective IS staff and, ultimately, a less-successful user support group. Further, not only is it important for the IS to have a defined mission, but management must ensure that the users understand their own and the IS's responsibilities with respect to EUC (Magal, 1991).

Based on the above studies, IS role definition was comprised of the following variables:

- Alignment of IS strategy to organizational strategy
- Clearly define IS mission
- Users' understanding of the IS concept
- Appropriate charge back criteria
- Effective EUC control procedures