End-User Computing Success Measurement

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INTRODUCTION

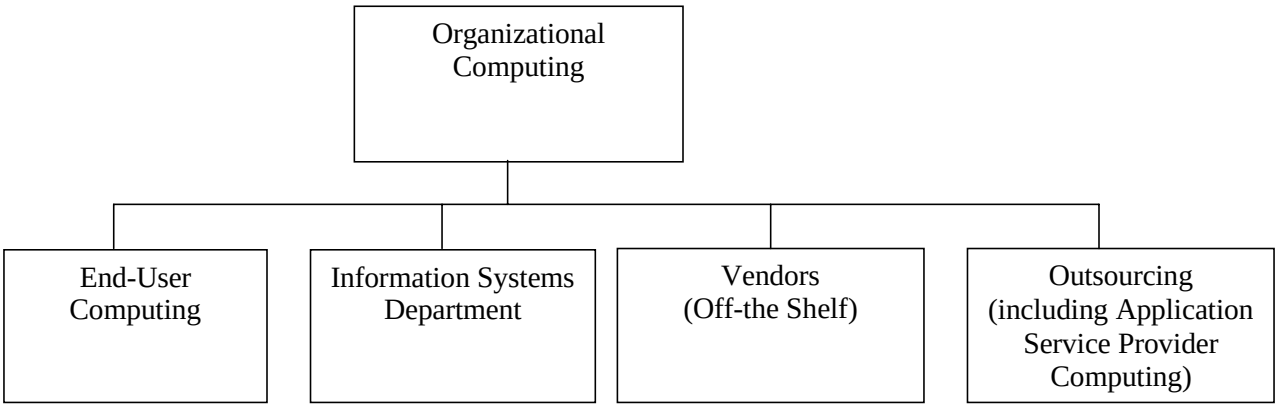
End-user computing (EUC) is the optional development of computer applications and models by personnel (individuals or groups) outside the MIS department. The emergence of EUC in the 80s and early 90s can be traced to the proliferation of computers, increased organizational computing needs, more sophisticated user application development tools coupled with higher computer and information literacy among staff and professional workers. Prior to the arrival of personal computers and graphical user interfaces, end users relied on data processing (now information technology) personnel to assist in meeting their information needs (Inman, 1986). Programming a mainframe was beyond the skills of most workers. Problems identified during this era of computing include:

- Failure to meet end-user needs.
- Cost of developing end-user applications was high.
- Large backlog of end-user applications made the development very slow.

As users required more information for decision making and highly user-friendly applications became available, end users began developing customized solutions to the needs that the data processing departments could not (Ahituv, Neumann & Riley, 1994). Today, EUC has become commonplace. Small, customized applications with spreadsheets and databases are commonplace in end-user departments. At present, EUC is just one contributor to overall organizational computing. As shown in Figure 1, the other sources of computing include applications developed by the information systems department (ISD), applications developed by vendors (off-the-shelf), and outsourcing—including application service providers (ASPs). EUC success is therefore just one contribution to overall organizational computing success. For our purposes, we define EUC success as the degree to which the organizational EUC strategy contributes to individual, group, and organizational computing success in an environment that includes applications developed by the information system department (ISD), application service providers, outsourcing parties, and of-the-shelf vendors. This means EUC complements the other components of organizational computing.

The type of applications developed by end users include transaction processing systems, manufacturing systems, expert systems, executive information systems, decision support systems, and online application processing systems (McLean, Kappelman & Thompson,

Figure 1. Components of organizational computing success



1993). There are problems, however: although end-user developed applications are low risk, localized and quickly meet user needs, unlike applications developed by the ISD or vendors, they lack integration, standardization, documentation and quality control. They also lack security, data consistency, and may result in duplication of effort. Table 1 compares the characteristics one would find in the different types of organizational computing.

In this article, we review the major research studies on EUC success measurement focusing on what has been accomplished and what remains to be done. We conclude that the measurement of EUC success seems to be an intractable problem. For example, we identified among others that there is shortage of longitudinal EUC measurement studies. There is lack of studies that have controlled for task, technology and work context. Also, there is lack of research about the relationship between EUC and other forms of organizational computing.

BACKGROUND

Measuring the Elements of EUC Success

Figure 1 indicates that EUC success should be measured as an embedded unit of organizational computing success. One problem is that the specific objectives of EUC are often invisible to the end user and to the company. The extent to which the objectives are attained is also unknown because end users often develop applications without knowledge of how their actions impact the other embedded units of organizational computing. End-user developed applications are rarely tracked by organizations. At the same time, it is not difficult to find organizations where an end- user developed application (e.g., DSS) is critical to daily operations. Furthermore, end users may be unwilling to allow objective measurement of the

Table 1. Characteristics of types of organizational computing

	End-User Computing	**Information Systems Department**	**Vendors (Off-the-Shelf)**	**Outsourcing**
Cost	Low/None	Moderate	Moderate	High
Schedule	Immediate	Slow	Fast	Slow
Size	Small	Moderate	Large	Moderate/Large
Control	Low	High	High	High
Risk	Low	Moderate	Low	High
Influence	Local	Local to Organizational Levels	Local to Organizational Levels	Local to Organizational Levels
Fit to User Task	High	Moderate	Low	Moderate
Support (help desk, documentation, training)	Low/None	Moderate	Moderate	Moderate
Integration	Low	Moderate	Low	High
Security	Low	High	High	High
Data Quality and Integrity	Questionable, Sometimes higher quality than corporate systems	High	Moderate	High
Duplication of Effort	High	Low/None	Low/None	Low/None
Acceptance	High	Low	Moderate	Moderate