Towards User-Oriented Control of End-User Computing in Large Organizations

NEIL McBRIDE, De Montfort University, UK
A. TREVOR WOOD-HARPER, University of Salford, UK, & University of South Australia, Australia

Control is a major issue in end-user computing. The migration of responsibility, resources and authority from IT departments to user departments is frequently seen as a loss of power by the IT departments and an erosion of cost control by senior management. Reactions to this situation tend to focus on technology and formal control mechanisms. This paper contrasts such an IT-oriented view with a proposed, alternative user-oriented view. An IT-oriented view of EUC focuses on the problems it causes, the technology it requires, the methods that should be used and the means of limiting, controlling and standardizing. An user-oriented view of EUC focuses on the problems it solves, the user’s task and the organizational environment. The paper advocates a shift in EUC research away from the technology and the IT issues towards the political, social and cultural issues associated with the users. EUC problems are, in the main, organizational problems requiring a research approach which addresses dynamic issues emerging over a period of time. As a basis for such research, the paper proposes a dynamic model for EUC in which the progression of EUC within an organization is visualized as a series of inference loops.

INTRODUCTION

The advent of end-user computing (EUC) catalyzed by increasingly simple technology and increasingly sophisticated users has brought with it both solutions to problems within the information technology (IT) departments and new problems. While providing one solution to the so-called applications backlog, it has created new problems of control for the IT department, which, in some cases, has led IT departments to avoid supporting EUC, and consider outsourcing end-user training, the support of PCs and networks and the help desk. EUC has led to an increase in the workload of the IT department, a growing application backlog as EUC systems require repair and support from the IT department, and increasing conflict between users and the IT department as the IT department seeks to rein in the uncontrollable proliferation of EUC.

At the heart of these problems lies the issue of control of EUC. Robson (1997, p. 382) refers to EUC as user-controlled computing. Responsibility, resources and authority over IS move away from IT departments into user departments. EUC within the organization is affected by politics, culture and power within the organization. Reasons for the proliferation of EUC may include the wish to wrest control of IT from the IT department and to concentrate power within particular departments. The shift of control over IT resources to user departments has been associated with the duplication of computer applications, incompatibility and lack of integration, and low quality systems (Taylor et al., 1998). However, over-control of EUC by the IT department leads to alienation of end-users and conflict (Beheshtian & Van Wert, 1987). Many organizations consider the solution to the lack of control of EUC to be the exertion of more control from the center. This IT-centered view of EUC sees EUC as a problem to be solved through standards, auditing, and financial control mechanisms which seek to make end users behave like IT professionals. Literature within the EUC field emphasizes the need for management of EUC by the IT department through the use of restrictions on users (Alavi, Nelson and Weiss, 1988; Beheshtian and Van Wert, 1987; Ngwenyama, 1993; Taylor et al., 1998).

This paper firstly defines the IT-oriented approach to EUC control based on published research (Taylor et al., 1998). This is then contrasted with a user-oriented approach to EUC. A research agenda for studying EUC development from a user-oriented point of view is developed and supported by a model. It is concluded that research in EUC needs to address user motivations and the dynamics of end-user development within an organization.

AN IT-ORIENTED APPROACH TO EUC

If inadequately managed, EUC may become a source of problems. Valuable resources within IT are diverted to support amateur users who produce badly-written systems of no strategic value. There is a constant battle to halt the prolifera-
The case study described in Figure 1 illustrates some of the problems. An IT department focused on mainframe and large systems alienates the individual end-user whose needs are not being met. The availability of cheap PC technology provides a means for those users to take control of their computing needs. Through word-of-mouth and by example, the use of small packages spreads throughout the organization. IT finds itself faced with needs for support from a whole class of users who were previously excluded from organizational computing. The IT department is ill-prepared to meet the needs of the changing customer base. End-users consequently seek support elsewhere, including non-IT departments and informal networks (Govindarajulu and Reithel, 1998).

The response of IT to such loss of control may be to adopt an authoritarian attitude by creating organizational rules for the use of PCs; for example, removing hard disks from PCs on client-server networks so that users must store applications on a central server; placing restrictions on the purchasing of computers; blocking access to organizational databases unless the EUC applications which may derive data from these databases have been audited and approved; and refusing to support nonstandard systems and software. Such IT-oriented solutions arise from the perception that the control of EUC is an IT problem. It is not seen that the IT department’s problem may be the user’s solution. Discussion of an EUC research study will further illustrate this.

The questions addressed in Taylor et al. (1998) concern some of the problems of EUC and conclude that part of the solution lies in the adoption of a systems development methodology by the end users. Based on case studies of 34 organizations, they identify duplication of effort, low quality of end-user developed systems, and the lack of training of end-user developers as key problems. The research focused on IT departments and interviewing IT staff about EUC. This work provided a widespread and intensive survey of EUC within UK organizations from an IT viewpoint. It highlights the IT-oriented focus of EUC research.

The questions addressed in this work concerned the nature of EUC development and included:

- How is the development and maintenance of end-user computing applications carried out?
- How is the quality of end-user computing projects assured?
- How are end-user computing projects supported by the IT department?

These questions reflect the concerns of the IT professionals which may not be those of the users. The researchers used the case study material to identify several strategies for using information systems methodologies in the development of end-user computing projects: End-users should develop and maintain systems to the same standards as IT departments. They should adopt a ‘cut-down’ version of the IT department’s methodology, tailored with the help of IT advisors to be contingent with the end-user department’s needs. There is an underlying assumption that the solution to EUC problems is the same as that for IT department computing problems, namely the application of methods and standards; EUC problems will be solved if end-users become closet IT professionals. The advantages given for the adoption of methodologies in EUC are the reduction of duplication of effort and maintenance problems, the improving of quality, security and recovery, and the aligning of IT department and EUC systems (Taylor et al., p93). These may have been seen as advantages from the point of view of IT who are.

Figure 1: Case Study: BIS Health Care

BIS Health Care is a wholly owned subsidiary of BIS UK. Based at Swindon, it is the European center for pharmaceutical manufacturing, employing 600 people on four sites. The IT Department consists of three sections:

1. Operations. Deals with running of the mainframe, management of user authorizations, and support of mainframe applications.
2. Database. Manages the Health care customer and product databases.
3. Information Center. Provides user support for in-house mainframe applications and user-programmed mainframe applications, particularly user-programmed database queries. Limited support of some PCs for technical users in the Research and Development areas has been provided in the past.

IT operations centered around the support of a mainframe running DOS /VSE.

In the last year as a result of the reorganization of European operations of BIS, the mainframe has been moved to Reading. This has catalyzed a move towards increasing use of PCs, which is causing serious problems for the Information Center. The nature of the average user has changed. Rather than in-depth technical support for a few specialist packages, broad support is now required for users with limited computer knowledge. The number of calls to the Information Center has increased dramatically, leaving the staff over-stretched.

The number of PCs within BIS Health Care is unknown. Many departments have purchased PCs for staff on internal capital budgets without the knowledge of the IT department. Requests by the IT department for information on numbers of PCs have been ignored, and new PC users are ‘emerging from the woodwork almost daily’.

Relationships between users and the IT department are difficult. One user described the IT Department as ‘a bunch of user unfriendly, customer un-focused techno-freaks.’