Using End User Characteristics to Facilitate Effective Management of End User Computing

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The End-User Characteristics Matrix, a mapping of user characteristics onto four end-user taxonomies, provides a more detailed perspective on the end user as developer/operator of computer-based information systems. Understanding individual end users is probably the most critical element to effectively managing end-user computing in organizations. Yet many managers do not really understand the end user they are attempting to manage. The purpose of this paper is to develop a framework which will allow the manager of end users to identify and describe user characteristics which differentiate, define, and help us better understand the end user. Previous literature on end users is discussed where four end-user taxonomies were presented, categorizing end users according to one or more characteristics, along with empirical research which utilized those taxonomies. The Rockart and Flannery end-user taxonomy has been the most widely used framework since 1983. The most comprehensive taxonomy, Cotterman and Kumar’s User Cube, was used as the basis for definitions in this research. The end user located in the developer/operator plane, identified as the fastest growing category of end users, was investigated in depth. Empirical research in end-user computing was examined to identify the set of user characteristics. Researchers studying end-user computing can use the matrix as a starting point to visualize how past research taxonomies and empirical studies are interrelated. Practitioners, anxious to develop policies to manage EUC, can concentrate their efforts on certain user characteristics they observe to be problematic.

After a decade of wild and rampant growth in end-user computing (EUC), we are still searching for a set of principles which will allow us to more effectively manage it. A significant phenomenon of the 1980’s, EUC continues to be an important issue for managers of tomorrow’s organization. The increase in EUC literature provides evidence of this trend. Basically, managing end-user computing can only be more effective when we learn how to manage individual end users. We will only be able to take great leaps ahead when we have a better understanding of the end users we are managing.

Despite the growth of EUC, practitioners, academicians, and vendors have different understandings of the term “end-user computing”. This term is often substituted for “user” or the person that “uses” the reports generated by a computer. In addition to different definitions and assumptions, there is a variety of end-user classification schemes from which to organize research designs. A research base which does not share common definitions from which to investigate end-user computing creates a number of difficulties. First, the results are not comparable because the same language is not spoken. We simply do not understand the end users we are studying. Second, some study findings, using different definitions, are contradictory and inconclusive. Surely we do not want to recommend to managers that...
they establish corporate policies from inconclusive research results? Third, some researchers fail to utilize existing theoretical definitions in their variable operationalizations. As each of the frameworks offer differing perspectives on the end user, researchers in the end-user computing area have either been forced to choose one framework or create a new one in which to work.

Rockart and Flannery, early investigators of end-user computing, felt that top managers must understand their end users before they can even start to develop a strategy for effectively managing their EUC environment (Rockart and Flannery, 1983). Since 1982, several researchers have attempted to develop a categorization of end users in order to investigate a firm’s EUC environment (Davis, 1985; Lefovitz, 1979; Martin, 1985; McLean, 1979; Rivard and Huff, 1985; Rockart and Flannery, 1983). A framework is necessary to provide researchers and practicing managers with a common way of comparing the results of investigative research. Further, it creates a relevant context for readers of the research to evaluate and interpret the results. Finally, a framework promotes commonly used definitions. Unfortunately, the characteristics classifying end users vary significantly in the literature. Frankly, another new typology is not needed; rather we simply need a better understanding of the end user using existing ones. In this research then, we will use the Cotterman and Kumar three-dimensional taxonomy of end users as a vehicle for our discussion in order to provide consistency of terminology (Cotterman and Kumar, 1989).

The purpose of this paper is to identify and describe user characteristics which differentiate, define, and help us better understand the end user. We will review the relevant literature on end-user computing in order to lay the groundwork for discussing those characteristics. Derived from the literature, four end-user taxonomies and ten user characteristics will be used to develop an End-User Characteristics Matrix. The diversity of the end-user community lends even more evidence for differentiated training, support, and software tools.

**Review of the Literature**

The MIS literature has portrayed the user in many different ways. Churchman and Schainblatt (1965) were the first to present a user/manager and analyst dichotomy (Churchman and Schainblatt, 1965). This dichotomy prompted the recommendation of the concept of “mutual understanding” between the user and the analyst. Users were categorized early in the MIS literature by the way they interacted with the computer in order to obtain outputs. In this section, several end user taxonomies are presented along with empirical studies which utilized those taxonomies.

**The CODASYL End-User Taxonomy**

In 1979, the CODASYL End-User Facilities Committee, commissioned the study of the explosive growth in end-user computing, initially classifying users as direct or indirect, and later adding the category of the intermediary user (Lefkovitz, 1979). A direct user is one who interacts with a computer-based information system (IS) in either the batch or interactive mode to receive periodic computer reports. In contrast, an indirect user does not interface directly with the computer, but rather uses the outputs from the system to make decisions or perform tasks. An intermediary user interacts directly with the computer but does not utilize the output. Later, Joseph Davis (1985) developed a taxonomy of general MIS users from previous studies. He identified potential differences among the three CODASYL end-user categories which include direct, indirect, and autonomous users. An autonomous user is one who acts on his/her own behalf to interact with the computer. It was found that most end users categorized in previous studies fall into Davis’ autonomous users category.

Three early attempts to classify end users illustrate the interest among IS practitioners and academicians alike in deriving a working definition of the MIS user. The CODASYL report was the first effort to classify the growing subset of end users. From that report, McLean (1979) and Martin (1982) developed basic classification schemes which included level of training, type of application, and level of technical understanding (Martin, 1985; McLean, 1979). Hackathorn and Keen (1981) describe an end user as computer users who have exercise direct, personal control over all aspects of information technology including equipment selection, software selection, software development, customization of applications, and data management. Hackathorn and Keen state, “...emphasis is on the end user of the technology, acting as programmer, analyst, etc. - without role differentiation”. The emphasis of this research was on identifying user characteristics which focused on the relationship between the user and the technology. Differences were observed to occur both in the system usage and in the system development process.

**The Rockart & Flannery End-User Taxonomy**

Rockart and Flannery (1983) took a broader view of end-user computing than previous research studies when
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