THE IMPACT OF LOCAL AREA NETWORKS ON USERS AND THEIR WORK: A FIELD STUDY

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Local area networks (LANs) have gained popularity and are becoming an integral part of end-user computing strategies in an increasing number of firms. Therefore, from the firm’s management perspective, it becomes important to ascertain their impact on the users and their work environment. This research attempts to do this by collecting data from 107 local area network (LAN) users and 14 LAN managers in 14 organizations. The purpose of the research was to investigate users’ perceptions of the impact of LANs on their jobs and work. By factor analyzing the data, four key underlying areas emerged where the users perceived LANs had impact. They were: enhanced quality-of-work, improvements in work efficiency, job enrichment, and data/information shareability. The significance of these findings is discussed in the context of the management of end-user computing environment.

Personal computers (PCs) have changed the way organizations design and manage their information systems infrastructures. The phenomenon of end-user computing (EUC) - users designing, writing and implementing their own programs, has been dramatically affected by the introduction and proliferation of PCs. While on the one hand, it has moved the computing power to where it is needed giving users the flexibility to perform analyses not possible before. But on the other, it has raised some significant issues regarding the security and integrity of the user generated data and programs. There exists a vast body of literature dealing with the various EUC issues (Alavi, 1985; Alavi, Nelson, & Weiss, 1987-88; Benson, 1985; Cheney, Mann, & Amoroso, 1986; Henderson & Treacy, 1986).

Having experienced the utility of a stand-alone PC, users and managers alike are looking for ways to share data bases, applications software and expensive peripherals in a PC environment. One way to achieve this is to use the concept of a local area network (LAN). According to Marucheck and Sulek (1987), a LAN is...

"a system of communication equipment, including computers, printers and data storage devices linked together in a network to serve a community of users confined to a small geographical..."
area.” The number of LANs installed worldwide is steadily increasing. According to a recent study, nearly 41% of all work stations users are connected to a LAN (Hodges, 1989). Also, according to some estimates, in some firms, this number will climb fairly close to 100% (Stanton, 1989). Therefore, as LANs become an integral part of the information systems infrastructure, an understanding of their impact on users, their work and organizations is critical to both information systems and general managers. A clear understanding of these issues can serve as a guide to organizations during the planning and implementation phases of networking and end-user computing systems. This typically leads to a better and efficient management of information and human resources.

To seek answers to the aforementioned questions, a survey of LAN users at fourteen sites was conducted. Data for the study were captured by administering a questionnaire instrument and by personally interviewing LAN managers. The user part of the study elicited their perceptions regarding 1) impact of LANs on their work environment, 2) the amount of computer-related training received, and 3) the various activities performed on the LAN. Personal structured interviews with LAN managers solicited responses to issues such as: reasons for installing the LAN; LANs impact on users and work environment; and, the type and amount of LAN and PC-related training provided to users.

The paper is organized as follows: first, the design and administration of the questionnaires and interviews is briefly discussed. Second, a summary of the type of activities LANs are used to perform is given. Third, the impact of LANs on users and their work environment as perceived by users and managers is discussed. Finally, results are summarized and the managerial implications are discussed.

**Research Methodology**

To measure user’s perceptions, a 13-item instrument was designed. Each item was measured using a 5-point Likert scales (1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree). The thirteen items were extracted from prior studies which identified areas possibly affected by LANs (Credibility Problems, 1982; Stallings, 1987). The methodology employed by these studies to pinpoint areas of impact was subjective in nature and not based upon any empirical investigation. Furthermore, the instrument elicited information regarding the type of activities a user performed via the LAN, and certain demographic variables.

Each LAN manager also completed a similar questionnaire. It contained all the user-questionnaire items and a few additional items. The purpose of the additional items was to elicit managers’ opinions on LAN justification and management policies. To seek further information, each manager was personally interviewed using a structured-interview approach. The following three questions were asked:

1. How did you train your employees and what was their reaction to it?
2. Why did you decide to install a LAN?
3. How has the LAN affected users and their work environment?

To collect data for this study, a sample of fourteen LANs in sixteen organizations was selected. The sample was not random but it was assured that a variety of organizations were included. Of the 227 questionnaires distributed to users, 107 were returned resulting in a response rate of 47 (107/227) percent. Tables 1 and 2 profile the sampled LANs and users. According to this information, the average LAN had 15 PCs - the minimum number being 4 and the maximum being 37. The average length of operational time for a LAN was 18 months. The longest operational time being 28 months and the shortest being 10 months.
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