Local Area Network Adoption: An Empirical Assessment

ROBERT W. ELLIS
William Carey College

MARY C. JONES
Mississippi State University

KIRK P. ARNETT
Mississippi State University

Local area networks (LANs) fill organizations’ need to efficiently and quickly transfer information within their boundaries. There are a variety of factors firms consider when adopting LANs such as characteristics of the LAN (e.g., operating speed and cost of operation), ease of installation, and vendor provided support during and after the LAN installation. Not all firms adopt LANs for the same reasons, thus the importance placed on these dimensions varies from firm to firm. This study examines the relationship between the importance placed on dimensions of the adoption process and organizational characteristics such as size, degree of centralization, complexity, and information systems maturity. Results indicate that the extent of information systems maturity in a firm has the most influence on the priority placed on various adoption dimensions. For example, more mature firms place a greater priority on tangible LAN characteristics than do less mature firms. Findings provide a framework in which to begin to understand the organizational nature of the LAN adoption decision.

Local area networks (LANs) provide groups of users the ability to share hardware, software, and files with less physical effort and greater file integrity in a relatively inexpensive and easily managed environment (Kasson and Kagan, 1985; Potter, 1985). LAN operating systems currently provide integration capabilities with DOS, Windows, and UNIX based computers, thus expanding the spectrum of operating environments available to system users. LANs have become readily accessible to both IS naive and IS mature organizations, and installation is within the reach of most organizations.

Marketing and IS adoption research provide empirical evidence of various reasons for adopting microcomputers, a major network component, but little research focuses on LAN adoption. Because microcomputers are an integral part of most LANs, microcomputer adoption research partially forms the basis for assessing LAN adoption. Organizational constructs that affect microcomputer adoption include size, centrality, complexity, and information processing maturity (Lind et al., 1989; Yap, 1990; Mascarenhas, 1991; Hall, 1992).

Our assessment of LAN adoption is also based on user satisfaction with information technology. There is evidence that the more satisfied users are with a technological innovation the more likely they are to use it (Lyytinen, 1987; Lyytinen, 1988). Thus, it is reasonable that the criteria used to evaluate satisfaction with a product after adoption is also used to determine whether to adopt in the first place. The purpose of this study is to examine the relationship between key dimensions of the LAN adoption process and various organizational characteristics (See Figure 1).

Theoretical Background

Innovation is defined as the adoption of an internally generated or purchased device, system, policy, program, process, product, or service that is new to the adopting organization (Daft, 1989; Damanpour and Evan, 1990). There are key...
dimensions common to most technical innovations (Moore and Benbasat, 1991), the more salient of which are addressed in this study. These are characteristics of the LAN system; assistance provided by the LAN vendor; the extent to which the LAN connects its user group to external entities; and the ease of installation.

**Dimensions of LAN Adoption**

Dimensions of the LAN adoption process include deliverables that will make the user satisfied with the product. Although there is little conclusive evidence about the appropriate measures of user satisfaction (Davis, Bagozzi, and Warshaw, 1989), the measures do seem to fall into several distinct categories. For example, Mahmood and Becker (1985) found that three of the most important criteria for deciding whether to use a particular piece of software were the product’s characteristics, services and support offered by the IS staff, and the overall level of individual satisfaction.

Key system characteristics are ease of use, quality, increased sharing of files/data between departments, and faster processing (Davis, Bagozzi, and Warshaw, 1989). Others include reliability, accuracy, faster response times, and convenience (Davis, et al., 1989; Bailey and Pearson, 1983). Operating speed, access to shared peripherals (e.g., printers), shared software, and compatibility with existing software and hardware are also important system characteristics (Huff and Munro, 1985; Bailey and Pearson, 1983). This relates to compatibility of the LAN with the existing IS infrastructure.

Ives, Olson, and Baroudi (1983) indicate that key elements of IS support include relationship with the IS staff, communication with the staff, vendor support, technical competence of the IS staff, and training provided. Because of the reliance on vendors to provide information about LANs, knowledge of the vendor or of the vendor’s reputation are important components of vendor support. In addition, vendor assisted installation and training are also important to some firms. Because the vendor often plays a greater role in LAN adoption than in adoption of software or the installation of a new IS, perceptions of LAN vendor characteristics are more appropriate indicators of technical support than traits of the IS staff. Vendor characteristics examined include training, installation assistance, vendor knowledge, and vendor provided advice and support.

A third dimension of LAN adoption is ease of installation, which is important to many firms, particularly when adopting a radically different innovation (Brooke, 1984). Inter-organizational communication capabilities are also important to firms when adopting networks (Huff and Munro, 1985). Thus, the ability to interface with external entities is the fourth dimension of LAN adoption examined.

**Organizational Characteristics**

Four organizational influences on LAN adoption are addressed — organizational size, organizational centralization, organizational complexity, and organizational information processing maturity (Franz and Robey, 1986; Lind et al, 1989; Yap, 1990; Jackson and Palvia, 1990; Stair, 1992). The general hypotheses addressed are:

**H1:** Larger organizations place a different emphasis on dimensions of LAN adoption than smaller firms.

**H2:** Decentralized organizations place a different emphasis on dimensions of LAN adoption than centralized firms.

**H3:** Complex organizations place a different emphasis on dimensions of LAN adoption than less complex firms.

**H4:** IS mature organizations place a different emphasis on dimensions of LAN adoption than less IS mature firms.

**Organizational Size**

Large organizations frequently exhibit different innovation adoption behaviors than small organizations (Kimberly and Evanisko, 1981; Ettlie, 1983; Dewar and Dutton, 1986; Meyer and Goes, 1988; Mascarenhas, 1991). Larger organizations can often invest more resources in experimentation with new products, and they can generally afford to take more risks than smaller firms (Dewar and Dutton, 1986; Davis and Olson, 1985). Because of greater access to resources, larger firms are expected to be able to better assess the characteristics of the LAN than smaller firms. They are also expected to more actively assess their external environments, and thus be more interested in using LANs to interface with entities external to the workgroup and using the LAN to compete operationally with other firms.

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### Table: Proposed Relationships Among Constructs

<table>
<thead>
<tr>
<th>System Characteristics</th>
<th>External Interfacing</th>
<th>Vendor Assistance</th>
<th>Ease of Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Decentralization</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Complexity</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>IS Maturity</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*A ‘+’ indicates that a positive relationship is expected between two constructs and a ‘-’ indicates that an inverse relationship is expected. For example, the larger the organization, the more important system characteristics are expected to be in the adoption decision.*

**Figure 1: Proposed Relationships Among Constructs**
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