Effects of LAN and Manager Characteristics on Perceived Issues of Concern for LAN Managers: The Distinctive Impact of Budget

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This paper reports the perceived problems, issues, or concerns of eighty-one LAN managers surveyed in as many U.S. corporations. The most frequently perceived issues were: managing LAN capacity or coordinating LAN users, setting up access rights or user accounts, planning LAN growth, ensuring LAN reliability and uptime, ensuring good LAN performance and response time, and training and educating users. For individual managers, the total number of issues they perceived was not influenced by their job-related characteristics. It was, however, strongly and positively influenced by annual LAN budget. In turn, LAN budget was very strongly dependent on LAN size. However, the association between LAN size and number of issues perceived, although significant, was not as strong. The paper concludes that there exists a causal chain wherein only annual LAN budget directly affects the perceived issues of LAN managers. The implications for information systems executives and top management are discussed.

The future of end-user computing (EUC) depends on the abilities of functional managers to manage various EUC resources efficiently. Of these resources, local area networks (LANs) are an important and rapidly growing component. It is estimated that the worldwide market for all data communications products and services grew by 16 percent in 1992 despite the recession (Wilde, 1992). Further, LAN downtime now greatly affects business revenues in many organizations (Tittel, 1991).

There is an abundance of technical literature on LANs. However, there is scant research focusing on the problems, concerns, or issues perceived by LAN managers. The importance of LAN management is underscored by a recent Datamation survey (Marion, 1992) which revealed that LAN management applications were the most popular of all applications among IS professionals nationwide. Its importance is also evidenced by the exploding industry demand for LAN managers (Winkler, 1989).

Despite the abundance of technical literature on LANs, not much is known about the problems, concerns, and issues perceived by LAN managers. The activities involved in LAN management can be so numerous and complex that many network administrators these days barely have time to perform day-to-day maintenance activities (Sloman, 1991). A notable study in this regard was conducted by Nath (1988), who interviewed and surveyed thirteen LAN managers to identify, among other aspects, the perceived benefits and problems of
LAN managers. In a later paper, the same author reported the impact of LANs on users and their work (Nath, 1990).

However, much of the other published literature on network management consists of prescriptive papers (e.g., Buerger, 1988; Liang, 1988; Barrett, 1989; Janssens and Boone, 1989), anecdotal case studies of LANs in a few organizations (e.g., White, 1986; Bucker, 1987; Fersko-Weiss, 1987; Musich, 1987), or empirically unvalidated inferences about network administration (e.g., Durr 1985).

The goals of this research were to acquire a better understanding of the activities and problems, issues, or concerns of LAN managers by surveying a large cross-section of organizations, and to examine whether the number of problems, issues, or concerns perceived is dependent on the characteristics of LANs or those of LAN managers.

**Methodology**

Data collection for this study was conducted by means of a questionnaire survey designed for LAN managers. The instructions for the questionnaire requested the respondents to answer all questions in the context of the LAN managed by them. If their responsibilities included the management of more than one LAN, they were requested to answer all questions in the context of the largest LAN they managed.

Of the several questions included in the questionnaire, one set of questions was designed to assess characteristics pertaining to the LAN such as the LAN's age, number of users, applications used, existence of chargeback to users for LAN usage, annual LAN budget, and the provision of formal LAN training by the LAN manager to users.

A second set of questions was designed to assess various characteristics of the LAN manager, such as duration of tenure in current organizational position, annual salary, nature of the job (full-time vs. part-time), formal LAN management training/certification, internal or external assistance provided in LAN management, and involvement in planning/installation of the LAN.

A separate question asked LAN managers to list the "most important problems/concerns/issues that you perceive in managing this LAN."

One questionnaire was mailed to each senior-most IS executive of 509 of the top 1000 U.S. corpora-

<table>
<thead>
<tr>
<th>Percentile</th>
<th>No. of Users</th>
<th>No. of Nodes</th>
<th>Budget ($ thousand)</th>
<th>Age (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>366.65</td>
<td>319.31</td>
<td>255.26</td>
<td>34.82</td>
</tr>
<tr>
<td>Percentiles:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>5.00</td>
<td>7.00</td>
<td>2.50</td>
<td>0.00</td>
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<tr>
<td>25</td>
<td>45.00</td>
<td>32.50</td>
<td>17.50</td>
<td>17.25</td>
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<tr>
<td>50</td>
<td>120.00</td>
<td>65.00</td>
<td>61.00</td>
<td>33.00</td>
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<tr>
<td>75</td>
<td>324.50</td>
<td>291.50</td>
<td>302.25</td>
<td>48.00</td>
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<tr>
<td>100</td>
<td>4000.00</td>
<td>4000.00</td>
<td>1000.00</td>
<td>102.00</td>
</tr>
</tbody>
</table>

**Table 1: LAN Characteristics**

<table>
<thead>
<tr>
<th>Application</th>
<th>Percentage of LANs Running Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Processing</td>
<td>86.42 %</td>
</tr>
<tr>
<td>Spreadsheets</td>
<td>83.95 %</td>
</tr>
<tr>
<td>Electronic Mail</td>
<td>66.67 %</td>
</tr>
<tr>
<td>Graphics</td>
<td>65.43 %</td>
</tr>
<tr>
<td>File Transfer</td>
<td>65.43 %</td>
</tr>
<tr>
<td>Databases/Inquiry-Response</td>
<td>55.56 %</td>
</tr>
<tr>
<td>Data Entry</td>
<td>55.56 %</td>
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<tr>
<td>Transaction Processing</td>
<td>53.09 %</td>
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<tr>
<td>Mainframe Communication</td>
<td>12.35 %</td>
</tr>
<tr>
<td>Applications development</td>
<td>3.70 %</td>
</tr>
<tr>
<td>Project Management</td>
<td>3.70 %</td>
</tr>
<tr>
<td>Other</td>
<td>3.70 %</td>
</tr>
</tbody>
</table>

**Table 2: Applications Used on LANs**