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Abstract

Internet use by business has grown dramatically in the past two years, but little serious research has yet been published on this phenomenon. This paper reports on an exploratory study of 35 persons who are knowledgeable of the Internet use in their organizations. It was found that Internet use was fairly widespread and used predominantly for marketing applications. While security was viewed as a serious concern, business need and cost were perceived to be more important in deciding to use the Internet.

Introduction

The Internet has been a major means of data communication for government agencies and universities for many years, with only a limited number of businesses connecting to it. However, that scenario is changing rapidly. Currently, the commercial domain is the fastest growing Internet group with more than 1,500 new companies connecting each month (Ellsworth, 1995). In the past the major use of the Internet by business was for email. Now, however, it is becoming an almost essential business tool for communications, research, marketing, and public relations. Employee training is also a new feature being used, where employees can enroll in classes taught by community colleges right at their own site (Zeiger, 1995).

This commercial rush to the Internet is extending corporate information systems to virtual global information systems. However, this phenomenon has occurred so fast that MIS research has lagged in its efforts to study Internet issues, such as security (Anthes, 1994), employee use, and business effectiveness. This exploratory study addresses some of these issues and attempts to discover if industry's use of the Internet is as wide-spread as we are led to believe, if companies are aware of the security danger, and what, if anything, they are doing about it. It is our belief that Internet use is not as prevalent, especially among smaller companies, and that there is relatively little attempt to defuse the security danger.

Methodology

The instrument utilized was a four-page questionnaire consisting of three parts: 1) identification, 2) organizational characteristics, and 3) internet issues. The questionnaire contained a mixture of open-ended and close-ended items. In the process of developing this instrument, it was critiqued by several colleagues and managers in information technology.

The subjects in this study consisted of 147 persons who had previously responded (non-anonymously) to another survey regarding curriculum needs for undergraduate information systems majors. That previous curriculum survey had been sent to approximately 2,000 persons who belonged to at least one of three groups: 1) the local Chamber of Commerce, 2) the local chapter of DPMA, and 3) the alumni of the IS program located at the institution where the authors are employed. It should be noted that this telephone area code has the highest number of internet connections of any area code in the United States. It was anticipated that by using respondents from a previous survey, a fairly high response rate would be achieved in the current study. The cover letter for this survey indicated that the questionnaire should be forwarded to the person most knowledgeable about internet use in the organization. A total of 35 responses was received, yielding a response rate of 24%.

The distribution of organization sizes was reasonably balanced with a median organization size in the range of $10 to $100 million in total annual revenue. Of the twenty business types listed on the questionnaire, all but six were represented in the respondents. The only obvious bias was a disproportionate number of responses from computer software development companies (23%).

Results

More than two-thirds (69%) of the respondents indicated that their organizations currently use the Internet. Of the eleven organizations that were not using the Internet, only three had plans to use it within the next twelve months.

Fourteen Internet users provided descriptions of their business uses of the Internet. The seventeen uses indicated fell into four general categories: marketing, product development, personnel, and administration. The overwhelming majority of uses fell in the marketing category and included such things as product promotion, product/customer support, and product distribution (software and data).

Of the 24 companies that used the internet, twenty indicated they provided access to their employees. Of these twenty companies, the majority indicated that most or all their employees had access. The most commonly used Internet features were electronic mail, World Wide Web browsers, and File Transfer Protocol (FTP). The vast majority of these companies indicated that they did not place Internet access and use restrictions on their employees in the form of time limits, time of day, type of program accessible, number of simultaneous users, or size of file to download.

The Internet users were asked to list up to five security risks they perceived for their organizations. Of the seventeen persons who responded, two indicated that they did not perceive any security risks. The other 15 respondents provided 36 risks which were categorized "after the fact" into the categories: hackers/unauthorized access, theft of proprietary/confidential information, viruses, other damage, and software piracy. Unauthorized access, theft, and viruses were all widely viewed as being security risks. In order to prevent unauthorized external access, all the Internet users utilized one or more of the standard prevention methods. Seventeen used passwords, twelve used firewalls, and four used encryption.

The respondents were asked to assess the future prospects of Internet for five strategic business uses:

a. a competitive weapon for their company

b. a source of information about their competitors

c. a way to promote their organization's products and services

d. an intra-organizational communications medium

e. an inter-organizational communications medium

Frequency distributions comparing users to non-users of Internet for each of these five uses suggested that the two groups see these issues very differently. In order to investigate these potential differences further, ordinal values were assigned to the responses (none = 0, low = 1, ..., very high = 4). The two groups were then compared using the non-parametric Mann-Whitney/Wilcoxon (MWW) test. This tests the null hypothesis that the two populations are identical. A statistically significant result would indicate that: 1) the two means were not identical, 2) the two standard deviations were not identical, 3) the shapes of the distributions were not identical, or 4) any combination of the other three. Within each group of questionnaire items, the mean item responses were then rank ordered for each sample group. (Anderson, Sweeney, and Williams, 1994; Norusis, 1993.) Table 1 shows the results of these tests. Significant differences between the two groups were found for all five of the issues. Although the MWW test does not indicate how the responses were different, additional analysis has provided some interesting insights. F-tests were used to compare the means of the responses for the two sample groups. While such parametric tests are not considered "appropriate" for such ordinal data, they do give a very strong suggestion of what the differences might be. In all five cases, the variances were not significantly different for the two groups, but the means were; and in all cases the users had a higher mean than the non-users. This would suggest

that the MWW test is particularly sensitive to differences in sample means and that it is the means which are different in this study.

A Spearman rank-correlation coefficient was then used to test to see if the two sample groups were consistent with each other in the ranking of their means. (Anderson, Sweeney, and Williams, 1994; Norusis, 1993.) Table 1 shows the results of these tests. The Spearman rank correlation coefficient for the rank ordered means was 0.32 and was not statistically significant. This would suggest that the two groups may not view the relative importance of these five issues in the same way (however, a sample size of five is not sufficient to draw such an inference).

In an open-ended question, the non-users of Internet were asked to list up to five reasons why their organizations did not provide Internet access to their employees. The 33 responses were categorized "after the fact" into seven categories: 1) cost, 2) lack of business need, 3) security, 4) ignorance, 5) organization not ready, 6) unstable technology, and 7) organizational inertia. "Lack of business need" and "cost" were the two dominant reasons, accounting for nearly two-thirds of the responses.

Ten respondents provided information for how much their organizations paid annually (direct cost) for their internet access. These annual costs ranged from $200 to $35,000 with a median of $3,250.

Summary and Conclusion

This study suggests that business use of the Internet is relatively widespread and will continue to grow in the near future. The predominant use would appear to be for marketing applications. It is a common practice to give employees Internet access and with no restrictions. Security is considered to be a major issue, but may not be as important as cost and business need in determining whether to utilize the Internet as a part of business strategy. Compared to organizations not using the Internet, those who did perceived a significantly higher strategic value for five different aspects.

The next phase in this ongoing project will be to modify and restructure the instrument to reduce the open-ended questions and incorporate Davis's Technological Acceptance Model (1989). The revised instrument will be sent to a much larger sample domain.

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Table 1. Comparison of the Future Prospects of Internet

STRATEGIC ISSUE	Group:	MEAN U	MEAN N	STD DEV U	STD DEV N	MWW SIGNIF	RANK OF MEAN U	RANK OF MEAN N
Competitive weapon for company		2.5	1.0	1.2	1.5	**	3	2
Source of info about competitors		2.1	1.0	1.2	1.3	*	5	2
Promote products and services		3.1	1.2	0.9	1.4	***	1	1
Intra-organization communication		2.6	0.9	1.2	1.3	**	2	4
Inter-organization communication		2.3	0.9	1.1	1.3	**	4	4
Average		2.5	1.0	1.1	1.4			

Spearman Rank Correlation = 0.3162

Two-tailed significance: * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

[A longer version of this paper is available from mawhinnc@mscd.edu.]