

# **THE IMPORTANCE OF TELECOMMUNICATIONS: A COMPARISON OF THE VIEWPOINTS OF INFORMATION SYSTEMS MANAGERS IN SMALL BUSINESSES AND HOSPITALS**

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## **ABSTRACT**

*This paper compares the results of two studies of information systems (IS) managers. Both studies questioned the respondents about the importance of thirty telecommunications issues. The first study targeted small businesses, while the second targeted hospitals. Four factors were found: 1) standard applications, 2) advanced or emerging applications, 3) technical issues, and 4) managerial issues. Both groups rated managerial issues and standard applications as more important than the technical issues or advanced/emerging applications. Surprisingly, the advanced/emerging applications were rated the lowest in importance. It appeared that the IS managers were focusing on the short-term by emphasizing the standard applications rather than focusing on the future by emphasizing the advanced/emerging applications. This can be partially explained by the fact that approximately 50% of the IS managers in both surveys acknowledged that their organizations did not have a telecommunications plan.*

**Keywords:** Telecommunications, Small Businesses, Hospitals, Planning

## **INTRODUCTION**

Information technologies have a profound impact on a variety of business applications and help improve the quality of service and lower the costs. Technology has changed the nature of competition in all businesses (1). The use of technology can give an organization a competitive advantage. In addition, technology is an essential ingredient in the strategic plan of the organization.

The remainder of the paper will report on surveys of 106 information systems managers in small organizations and 154 information systems managers in hospitals about their viewpoints on the importance of telecommunications. A review of the literature is presented in the next section. The methodology of both surveys is included in the third section, and the analysis of the results is presented in the fourth section. The last section contains conclusions about the importance of telecommunications from information system managers in small organizations and hospitals.

## **LITERATURE REVIEW**

New information systems have a powerful potential to improve the functioning of all organizations. However, that potential can only be realized if information systems can be successfully developed and implemented. Hersher (4) recommends that management treat IT as a corporate resource and conduct typical analyses (such as cost-benefit analysis) for IT decisions.

In a study of 308 small business executives, "staying current and keeping up with changing information technology" was the most important thing they had learned about managing the use

of IT in the firms. The training/education of end users, the ability to get information quickly and data accuracy were also highly rated (7).

Healthcare organizations are implementing electronic medical records, upgrading hospital information systems, setting up intranets for sharing information, using public networks to distribute health-related information, and providing remote diagnostics via telemedicine. Other potential applications include electronic systems for claims processing, imaging systems to scan documents, and multimedia technology for remote diagnostics and education and training of physicians and patients (6).

Telemedicine has the potential to increase the quality of healthcare and access to healthcare while lowering costs. However, Paul (5) found that the technical training of end users is a major barrier to its successful implementation. In addition, he noted that patient confidentiality and privacy issues are also major concerns.

Security concerns continue to impede widespread adoption of new information technologies and telemedicine in healthcare organizations (3). In addition, the healthcare industry is faced with new privacy and security standards (2). Along with new technologies come new ways of violating security and privacy. For example, a computer savvy individual could identify himself as a physician on the internet to gain access to confidential medical records or to prescribe a controlled substance (8).

## METHODOLOGY

The questionnaire, which utilized many of the issues included in a telecommunications study by Torzadeh and Xia (9), was utilized in 1) a pilot test, 2) the survey of small businesses, and 3) the survey of healthcare organizations. Although the questionnaire was slightly revised between the latter two surveys, the questionnaires used in the two studies were almost identical.

The questionnaire sought the viewpoint of the respondents on the importance of thirty telecommunications issues. The responses ranged from "1" indicating no importance to "5" indicating extreme importance. The questionnaire also solicited information about the formation and implementation of the organizational telecommunications plan. In addition, the questionnaire requested information about the respondents and their organizations.

The names of the organizations included in the survey of IS managers in small organizations were obtained from the Disclosure Database. This database contains financial and management information on over 12,000 public companies. However, when the organizations with the smallest sales were obtained, the researchers discovered that many of the organizations were no longer in business or had moved and left no forwarding information. In order to minimize this problem, 1753 organizations with sales between 10 million and 40 million were selected for the survey of IS managers in small organizations. In addition to the six organizations with a policy of not responding to questionnaires, 342 organizations had changed their names or moved. Of the remaining 1411 surveys, 106 usable forms (7.5% rate of return) were received.

The second study targeted IS managers in hospitals. Mailing addresses for 6606 members of the American Hospital Association were obtained through PPS Medical Marketing Group, Inc. (<http://www.ppsmed.com>). These labels were matched with information derived from the PPS-VI data files published by the Health Care Financing Administration (HCFA). The healthcare organizations were screened in two ways:

1. Specialty and long-term care facilities were excluded from the study. Only hospitals classified as short-term general service hospitals were included.
2. Teaching hospitals were excluded. The questionnaire did seek financial information about the hospitals. Since teaching hospitals often have third-party payers supporting the costs of medical education, these hospitals were removed from the survey.

As a result of the screening, 2400 surveys were mailed to the IS manager of healthcare organizations. The researchers were pleased with the quality of the mailing addresses received from PPS Medical Marketing Group. Only two questionnaires were returned as undeliverable. The researchers received 154 usable responses for a 6.4% rate of return.

One reason for the low rate of return was the fact that both surveys were mailed to the "Information Systems Manager" as opposed to an individual by name.

## **Hypotheses**

The researchers formulated three hypotheses:

1. IS managers at both small organizations and hospitals will rate emerging applications and managerial issues as more important than standard applications or technical issues.
2. IS managers at hospitals will rate the importance of video conferencing and telecommuting higher than the IS managers in small organizations.
3. Hospitals will be further along in the development and implementation of a telecommunications plan than the small businesses.

The researchers surmised that due to the growing importance of staying on the cutting edge both groups would rate highly the importance of the advanced/emerging applications. It is with these applications that organizations can ensure their survival. The managerial issues would be rated highly by both groups as this category contains the issues related to data security and business strategy that are very important for the long term continued existence of organizations.

The IS managers at hospitals will rate video conferencing and telecommuting as more important than the IS managers at small organizations, as it is these issues which most directly influence the ability of the hospital to practice telemedicine.

The researchers expected that hospitals would be further along in the process of developing and implementing a telecommunications plan than small businesses because they are expected to be larger in size. The researchers believed that larger organizations would better recognize the importance of telecommunications planning and would thereby be more willing to devote the resources needed to ensure its completion than would smaller organizations.

## ANALYSIS OF THE RESULTS

### Demographic Data

In the survey of IS managers of small organizations, the average number of employees in the company was roughly 687. The average number of employees in the IS area was about 20 while the average number of employees in the telecommunications area was approximately five. Thus, while about 3% of the organization's employees are located in the IS department, approximately 1% are assigned to the telecommunications area

The researchers were surprised by how small the IS and telecommunications areas were in the majority of the hospitals. While the average number of employees in the hospital was nearly 1769, about 34 employees were in the IS function. The average number of employees in the telecommunications area was approximately six. Only about 2% of the hospital's employees are located in the IS area and substantially less than 1% are assigned to the telecommunications function. The researchers believed that many hospitals were utilizing outsourcing.

### Telecommunications Results

Although the thirty telecommunications issues were listed in no particular order, they fell into four categories based on a factor analysis: 1) standard applications, 2) advanced or emerging applications, 3) managerial issues, and 4) technical issues. A listing of the factors and their variables can be found in table 1.

### Hypothesis One

The first hypothesis was: IS managers at both small organizations and hospitals will rate the emerging applications and the managerial issues as more important than the standard applications or technical issues. The researchers were pleased that the managerial issues, such as data security and the strategic planning of information technology, were rated as more important than the other factors according to an ANOVA and Duncan *post-hoc* test for each of the two groups (Hospitals:  $F = 40.89$ ,  $p < 0.0001$ ; Small Businesses:  $F = 48.99$ ,  $p < 0.0001$ ). Five out of the nine highest rated issues were from the managerial issues category for small business while six of the nine highest rated issues were from the managerial issues category for hospitals. Managerial issues are clearly important for the long-term survival of all organizations.

The researchers were surprised that emerging applications were statistically rated the lowest in importance. Five of the seven lowest rated issues were in the emerging issues category for both surveys. Many of these issues were related to the internet, including conducting business on the internet and web page development. This is alarming considering the growth of e-healthcare and e-business. It is the emerging applications to which many organizations are turning to get a competitive advantage. Yet, both groups gave this factor a low importance rating. It appears that organizations are focusing in the short term and are failing to look at long-range plans.

Table 1 contains the means of the four factors, the averages of the 30 individual applications, t-statistics and probability values of this analysis.

Table 1: Importance of Telecommunications Issues: A Comparison of Viewpoints

Telecommunication Issue	IS Managers Means		t statistic	probability
	Small Businesses	Hospitals		
<b>Standard Applications</b>				
Voice mail	3.98	4.04	-0.49	0.6217*
Electronic mail	4.17	4.32	-1.39	0.1662
Voice teleconferencing	3.24	3.47	-1.69	0.0919
Facsimile devices	4.17	3.92	2.22	0.0276
Telephony	3.45	3.61	-1.31	0.1928
<b>Group Average</b>	<b>3.82</b>	<b>3.87</b>	<b>-0.66</b>	<b>0.5122</b>
<b>Advanced/Emerging Applications</b>				
Video teleconferencing	2.62	3.22	-4.21	<0.0001
Telemarketing	2.61	2.51	0.71	0.4776
Telecommuting	3.02	3.32	-2.43	0.0159
Surfing the Internet	3.13	3.52	-3.34	0.0010
Conducting business on the Internet	3.42	3.24	1.25	0.2136
Web page development	3.23	3.28	-0.41	0.6803
<b>Group Average</b>	<b>2.99</b>	<b>3.21</b>	<b>-2.51</b>	<b>0.0126</b>
<b>Technical Issues</b>				
Telecommunications terminology	3.23	3.37	-1.31	0.1903
Telecom software availability	3.53	3.73	-1.78	0.0775*
Equipment capability	3.79	3.93	-1.23	0.2190*
Environmental restrictions	3.11	3.37	-2.08	0.0388
Vendor Selection	3.57	3.67	-0.82	0.4142
Voice/Data integration	3.49	3.70	-1.65	0.1008
Electronic Data Interchange (EDI)	3.44	3.96	-3.97	0.0001*
Local Area Networks (LAN)	4.27	4.22	0.56	0.5785*
File Transfer Protocol (FTP)	3.58	3.68	-0.79	0.4317
<b>Group Average</b>	<b>3.55</b>	<b>3.74</b>	<b>-2.17</b>	<b>0.0306</b>
<b>Managerial Issues</b>				
Network management and control	4.23	4.09	1.33	0.1836*
Data security	4.65	4.67	-0.28	0.7788
Data integrity	4.37	4.44	-0.74	0.4622
Strategic planning of telecom	3.96	4.09	-1.14	0.2542
Managing innovation & technology	4.04	3.98	0.53	0.5994
Telecom for competitive advantage	3.88	3.73	1.20	0.2305
End user telecommunications needs	3.52	3.70	-1.61	0.1080
Data transmission management	3.73	3.84	-1.05	0.2932
Use of PC for telecommunications	3.80	3.93	-1.01	0.3157
Info management of telecom	3.77	3.98	-1.91	0.0576
<b>Group Average</b>	<b>3.99</b>	<b>4.04</b>	<b>-0.63</b>	<b>0.5303*</b>

\*unequal variances

### Hypothesis Two

The second hypothesis was: IS managers at hospitals will rate the importance of video teleconferencing and telecommuting higher than the IS managers in small organizations. As expected, the IS managers in hospitals rated video teleconferencing ( $t=-4.21$ ,  $p<0.0001$ ) and telecommuting ( $t=-2.43$ ,  $p=0.0159$ ) more highly than the IS managers in small businesses. However, these issues were included in the seven lowest rated issues in importance by both groups. This is especially alarming for hospitals given the importance placed on telemedicine.

### Hypothesis Three

The third hypothesis was: Hospitals will have a more fully developed and implemented telecommunications plan than small businesses. Sadly, there was no difference between the responses of the IS managers of small businesses and hospitals ( $\chi^2=4.179$ ,  $p=0.5240$ ). It was alarming that approximately fifty percent of the organizations in both surveys do not have a telecommunications plan. They appear to be stressing the day-to-day operations as opposed to analyzing ways of achieving a competitive advantage in the future.

Table 2: Implementation of a Telecommunication Plan

<u>Implementation of a Telecommunication Plan</u>	<u>IS Managers Percent</u>	
	<u>Small Businesses</u>	<u>Hospitals</u>
Organization does not have a telecommunication plan	49.52%	51.30%
The company does have a telecommunication plan, but none of the plan has been implemented	1.90%	1.30%
The company does have a telecommunication plan, and approximately 25% of the plan has been implemented	16.19%	8.44%
The company does have a telecommunication plan, and approximately half of the plan has been implemented	14.29%	17.53%
The company does have a telecommunication plan, and approximately 75% of the plan has been implemented	15.24%	18.18%
The company does have a telecommunication plan, and all or nearly all of it has been implemented	2.86%	3.25%

## CONCLUSIONS

The analysis of the top nine telecommunications issues of importance to the IS managers of small organizations and hospitals was enlightening. There is remarkable similarity. Table 3 lists these issues. While the top nine issues are intermixed with basic/existing applications and one technical issue (LAN), there are several managerial issues with a future focus, such as managing innovation and technology, and strategic planning of telecommunications.

Table 3: Top Nine Issues in Importance to IS Managers in Small Businesses and Hospitals

<u>Information Systems Managers</u>	
<u>Small Businesses</u>	<u>Hospitals</u>
1. Data Security	1. Data Security
2. Data Integrity	2. Data Integrity
3. Local Area Networks (LAN)	3. Electronic Mail
4. Network management and control	4. Local Area Networks (LAN)
5. Electronic Mail	5. Network Management and Control
Facsimile Devices	Strategic planning of telecom
7. Managing innovation and technology	7. Voice Mail
8. Voice Mail	8. Managing innovation and technology
9. Strategic planning of telecom	Information management of telecom

Similarities noted in the current analysis include:

1. The IS managers of small organizations and hospitals both stress the importance of managerial issues and existing applications in telecommunications.
2. The IS managers of small organizations and hospitals both gave low ratings to the importance of the emerging applications.
3. The IS managers of small organizations and hospitals both expressed a lack of telecommunications planning.

It is the latter two similarities that are of the greatest concerns. Without a future orientation, the organization may never achieve its potential. Organizations need to plan for the future.

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