An Exploratory Investigation of the Antecedents and Impact of Internet Usage: An Individual Perspective

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Abstract

Internet usage in the American workplace is increasing at a phenomenal rate. This exploratory study examines factors influencing employee Internet usage and individual perceptions of the consequences of such usage. Using the Theory of Reasoned Behavior, a questionnaire was designed and administered to MBA students in the northeast sector of the United States. The results of this preliminary study indicate that personal and organizational variables are associated with beliefs and attitudes about the Internet, and that beliefs and attitudes are related to Internet usage. For someone who perceives the Internet as intimidating, Internet usefulness, time and frequency on the Internet, and business activity usage decreases. In contrast, for someone who perceives the Internet as useful, there is an increase in Internet use, and frequency. Additionally, Internet usage is related to several indicators measuring Internet impact. Time on the Internet is positively associated with enhanced job characteristics, job satisfaction, overall productivity, but also inefficiency.

Introduction

The Internet, the network of networks, is having a dramatic impact on the scope of business applications and has become the foundation for the world's new information infrastructure. This impact could be attributed to the Internet's universal access to information as well as its ability to help businesses reduce costs, shorten product cycle times, and market its products and services more effectively.

Realizing the enormous potential of the Internet, many businesses have embraced it as a tool to help them achieve a competitive advantage. For instance, recent surveys [24] report that over 30 million users have access to the Internet and this rate is growing at approximately 20% per month. In addition, the commercial use of the Internet is growing at a phenomenal rate and presently accounts for approximately two thirds of all Internet usage [23]. Accompanying this rapid growth are contradictory reports about the impact of Internet usage on such issues as productivity, and information system security. For instance, a study conducted in a manufacturing firm found that in a typical eight hour working day, over 250,000 Internet sites were accessed by a work force of 386 employees. Of particular concern to the organization was that approximately 90% of the accessed sites were non-work related [19]. In a more positive light, there have been numerous reports on how the use of the Internet has improved employee productivity in terms of customer service and information gathering.

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Organizations are now attempting to come to grips with Internet related issues such as, employee productivity, security, and policy, and are examining a wide spectrum of strategies for managing this technology.

This study examines the phenomenon of Internet usage. Although Internet and microcomputer usage are related because of similar technological media (i.e. microcomputers), Internet usage intensifies productivity issues for an organization because Internet access creates an interactive, open system with direct contact between an organization and its external environment. Microcomputer usage, however, is a more closed system, with usage usually confined within the organization. While there have been many studies on the antecedent factors of microcomputers usage [11, 14, 15, 16, 17, 25], understanding the antecedent influences and impact of Internet usage is still in its infancy. This study begins to address this gap.

Theoretical Framework

This empirical study is one of the early attempts to examine the factors which influence an employee to use the Internet and the impact of such usage. The study investigates the antecedent factors leading to the use of the Internet, its usage, as well as the impact of the Internet. The theoretical basis for this study stems from the research by Fishbein and Ajzen [8]. The Theory of Reasoned Action (TRA) indicates that the behavior, in this instance Internet usage, is influenced by individual perceptions and attitudes as well as social influences. The TRA was extended by the Technology Acceptance Model (TAM) which focuses on the perceived usefulness of computer technology. In the TAM an individual's motivating factors to use computer technology can be categorized into two groups, namely, extrinsic motivators, such as perceived benefits and social pressure, and intrinsic motivators such as enjoyment and fun.

The research model examined in this study is illustrated in Figure 1. The model is comprised of four multi-dimensional sets of variables. The antecedent factors are grouped by individual and organizational factors. Individual factors are: age, gender, Internet skills, and Internet playfulness [25]. Organizational factors are: social pressure, organizational support, and task characteristics. A second set of factors, representing beliefs and attitudes about the Internet are: Internet self-efficacy, Internet attitudes, and Internet satisfaction. The third factor set in the model is Internet usage and the fourth set is the impact of the Internet. In summary, the purpose of this exploratory study is two fold: first, to identify the antecedent factors associated with the usage of the Internet, and second, to examine the impact of Internet usage.

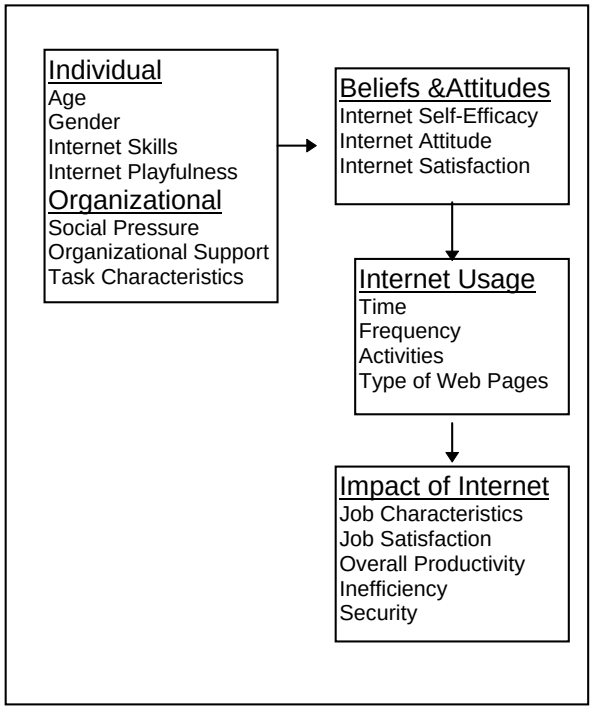

Figure 1. Research Model

Methodology

Sample and Procedure

A research questionnaire was distributed to 95 MBA students at a university in the North-Eastern United States. Of the 80 returned questionnaires, 40 of the respondents had Internet access at their place of employment and completed the entire survey. Participation was voluntary and confidential. Thirty-two (32) of the respondents were men and eight (8) were women. The majority of the respondents (82%) were between the ages of 26 and 38 years. Finance/Insurance/Real Estate organizations had the largest representation with 32%. Half of the respondents were either professionals (27%) or middle level managers (23%).

Measuring the Variables

Internet Impact. Five self-reported indicators were used to measure the impact of Internet usage: (i) changes in current job characteristics, (ii) job satisfaction, and (iii) overall productivity, (iv) changes in efficiency, and (v) threats to organizational security.

Job Characteristics. Respondents were asked to evaluate how the use of the Internet had changed their current job characteristics. The seven items used to construct changes in job characteristics were based on prior work of Hackman and Oldham [10]. Each item was measured on a five-point scale ranging from 1 (greatly decreased) to 5 (greatly increased). Examples of job characteristics were: "importance of job;" "autonomy in the job;" and "variety in the job." A factor analysis (with varimax rotation) of the five items produced one factor that accounted for 73.3 percent of the total variance. The five items were averaged to produce an overall index of changes in job characteristics. The internal consistency reliability (Cronbach's alpha) of the five-item scale was 0.94. High scores indicated enhancements in job characteristics.

Job Satisfaction and Productivity: Changes in job satisfaction and productivity were assessed with single item questions. Respondents were asked to evaluate how the Internet had changed their job satisfaction and overall productivity on a scale of 1 (greatly decreased) to 5 (greatly increased).

Changes in Efficiency: Changes in efficiency were measured by a four item scale developed for this study. The four items were averaged to create a scale that measured changes in efficiency. The individuals were asked to evaluate how Internet usage affected 1) time to complete work, 2) wasted time, 3) amount of re-work, and 4) weeding through extraneous material on a scale ranging from 1 (greatly decreased) to 5 (greatly increased). High scores indicating inefficiency. Cronbach's alpha reliability coefficient was 0.78.

Organizational Security: Security is a major concern of information system managers whose organizations have Internet access [20]. The measure of organizational security, developed for this study, assesses Internet impact on system viruses, unsecured web sites, and competitive intelligence. Individuals were asked to give their opinions of the following three statements, using a five-point scale ranging from 1 (strongly agree) to 5 (strongly disagree): "Internet access increases the risk of importing viruses into my organization's system;" "Unsecure web sites are a potential danger to my organization;" and "Competitive spying is easier with Internet access."

A principal components analysis showed the three items loaded on one factor (68.9% of variance explained). The mean of the three items was used as an index of organizational security. Cronbach's alpha reliability coefficient of the three item scale was 0.74. High scores represented higher organizational security.

Internet Usage. Four indicators of Internet usage were used in this study. They are: (i) actual daily use of the Internet at work; (ii) frequency of use; (iii) the extent of using the Internet for a variety of business activities; and (iv) the likelihood of accessing different types of web pages while at work. Daily usage and frequency of usage were adapted from previous studies of microcomputer usage [4, 15, 16, 17, 18]. Activities and accessing different types of web pages were indicators of Internet usage created for this study, and suggested by Cronin [6].

Time on the Internet was ascertained by asking individuals to indicate the amount of time spent on the Internet per day, using a six-point scale ranging from 1 (almost never) to 6 (more than three hours per day).

Frequency of use was measured on a six-point scale ranging from 1(less than once a month) to 6 (several times a day).

Business Activities: The Internet can be used to perform various business activities. An assessment of the extent of usage for different kinds of activities can offer a good indicator of overall Internet usage (LaPlante, 1997). Respondents were asked to indicate, on a scale of 1 (not at all) to 5 (very extensive), the extent to which they used the Internet to perform eight different business activities: marketing, sales, purchasing, customer service, administrative, communicating, information gathering, and recruiting. The responses for each item were totaled over the eight activities to get a composite score of the extent of usage. The scores could range from a high score of 40, representing very extensive use, to a low score of 8, representing no usage for any of the listed activities.

Web Page Access: The likelihood of accessing different types of web pages while at work was also an indicator of Internet usage. Individuals were asked to indicate how likely they were to access 14 different types of web pages while at work, on a scale ranging from 1 (very likely) to 5 (very unlikely). The items were reversed coded so that high scores reflected high likelihood of access. A principal

components factor analysis (with varimax rotation) of the 14 items produced three factors with eigenvalues of one or higher that accounted for 72.9 percent of the total variance. The first factor, containing five types of web sites: general, arts and entertainment, travel and leisure, living/consumer, and sports, accounted for 40 percent of the total variance. The mean of these items was used to create a scale that was labeled as "personal web." Cronbach's alpha reliability coefficient of the five item scale was 0.91. The second factor, explained 23.5 percent of the common variance and contained four types of web pages: competitor's, government/research, business/financial, and magazine or news. The mean of these items was used to create a scale reflecting accessing of work-related pages, and was labeled, "work web." Cronbach's alpha was 0.78. The third factor contained two items: supplier's and customer's web pages. The mean of the two items was labeled "value chain web", and resulted in Cronbach's internal consistency reliability coefficient of 0.63. This factor contributed marginally to explaining the common variance (9.4 percent) reflecting lessened importance in Internet usage. Educational, free software, and computer web pages did not clearly load on any factor and were deleted.

Beliefs and Attitudes. User Satisfaction: This measure was adapted from a measure originally designed to measure microcomputer user satisfaction [7, 14, 15]. The measure was modified to provide a measure of the degree of satisfaction in the way the Internet meet the user's requirements for information content, accuracy, output, format, ease of use, and timeliness. Each of the nine items was measured on a five-point Likert scale ranging from 1 (not at all) to 5 (most often). This scale was designed to measure user satisfaction as a single construct, but a principal components factor analysis (with varimax rotation) revealed two independent factors with eigenvalues in excess of one. Factor one, labeled "usefulness", contained seven items. The usefulness factor, based on the mean of the seven items, included questions such as: "Does the Internet provide the precise information you need?;" "Is the Internet accurate?;" "Does the Internet provide up-to-date information?" Cronbach's alpha for this factor was 0.91. The second factor embedded in user satisfaction, labeled "ease of use", consisted of two items: "Is the Internet user friendly?;" and "Is the Internet easy to use?." The two items were averaged as an indicator of ease of use and the scale had an internal consistency reliability coefficient of 0.93.

Internet Attitudes: This measure assesses a person's general beliefs about the Internet [28]. The scale was modified from a twenty-item scale used to operationalize computer attitudes [21], by substituting "the Internet" for "computer." Individuals were asked to evaluate how they felt about the Internet using a five-point scale ranging from 1 (strongly agree) to 5 (strongly disagree). According to the work of Harrison and Rainer [11] the computer attitudes scale was found to have three embedded factors. These factors were labeled: pessimism (belief that computers are dominating and controlling humans), intimidation (belief that computers are threatening), and optimism (belief that computers are helpful and useful). A principal components analysis, with varimax rotation, was used on the Internet attitude scale, and yielded three independent factors. The twenty items were reduced to eleven (with the highest and less ambiguous loadings), and were reverse coded such that high scores reflected pessimism, optimism, or intimidation. Factor one, called pessimism consisted of five items and included such statements as: "Soon our lives will be controlled by the Internet." and "The Internet turns people into just another number." The mean of the five items was used to create a pessimism score and Cronbach's alpha was 0.84. Intimidation, consisting of three items, was the second factor. The items were: (i) "I feel intimidated by the Internet." (ii) "The Internet intimidates me because it seems so complex." and (iii) "The Internet is difficult to understand and frustrating to work with." The three items were averaged for an intimidation indicator and the alpha reliability coefficient was 0.80. Factor three, labeled optimism, comprised three items: (i) "The Internet is bringing us into a bright new era" (ii) "The use of the Internet is enhancing our standard of living." and (iii) "Life will be easier and faster with the Internet" The three items were averaged to produce an optimism index and the Cronbach's internal consistency reliability coefficient was 0.71.

Internet Self-Efficacy: This measure is defined as an individual's beliefs about his/her abilities to competently use the Internet. It is derived from the self-efficacy literature [1], as well as more recent work on computer self-efficacy [5, 9]. Computer self efficacy perceptions have been found to be associated with performance in software training [9, 25, 26], adoption of computers [12], and innovations [3]. Internet self-efficacy was measured using a six-item scale adapted form Hollenbeck and Brief [13]. Responses were rated on a five-point scale ranging

from 1 (strongly agree) to 5 (strongly disagree) and were reverse coded so that high scores indicated high self-efficacy. Principal components analysis yielded a one factor solution, and Cronbach's alpha reliability coefficient was 0.89.

Organizational Factors. Task characteristics: refer to the amount of structure and variety in the job itself and was operationalized using a instrument from the Withey, Daft, and Cooper [27]. The instrument assesses the degree of structure and variety of the work task situation. Individuals were asked to indicate how well eight statements described their jobs on a five-point Likert type scale ranging from 1 (none at all) to 5 (to a very large extent). A factor analysis (with varimax rotation) produced two factors with eigenvalues greater than one that accounted for 68.4% of the total variance. Responses on the four items in factor one were averaged to produce a measure of task structure, so that high scores represented a highly structured job. Sample questions in this measure were: "To what extent is there a clearly known way to do the major types of work you normally encounter." and "To what extent can you actually rely on established procedures and practices to do your work." Responses on the four items in factor two were averaged to produce a measure of task variability such that high scores measured low variability in the job. Sample items were: "To what extent would you say that your work is routine?" and "Do you do about the same work in the same way most of the time?" Cronbach's alpha reliability coefficients for the structure and variability measures were 0.81 and 0.85 respectively.

Organizational Support: The measure of organizational support assessed general support, which included top management encouragement and allocation of adequate resources. Individuals were asked to indicate the extent of agreement or disagreements with four statements concerning organizational support on a five-point scale ranging from 1 (strongly agree) to 5 (strongly disagree). One example of the items was: "Management has provided the necessary help and resources to get me used to the Internet quickly." Items were reverse coded such that high scores reflected high organizational support. A principal components analysis yielded a one factor solution, explaining 70.9 percent of the variance. The mean of the four items was used as an index of organizational support and Cronbach's alpha reliability coefficient was 0.86.

Social Pressure was operationalized by a single item question modified by substituting "Internet" for "microcomputer." The original item was suggested by Fishbein and Ajzen [8] and used in examining microcomputer usage [17]. Individuals indicated their agreement or disagreement with the following statement: "Most people who are important to me in my job think I should be using the Internet regularly in my job." The response options were anchored in a five-point scale, ranging from 1 (strongly agree) to 5 (strongly disagree) and were reversed coded so high scores showed strong social pressure.

Individual Characteristics. Internet Playfulness was an extension of work on microcomputer playfulness [25]. It represented a type of intellectual playfulness and was defined as an individual characteristic that described an individual's tendency to interact spontaneously, inventively, and imaginatively with the Internet. The measure was based on a seven item scale developed by Webster and Martocchio [25]. Individuals were asked to characterize themselves when they used the Internet. For seven adjectives they were to indicate their level of agreement on five-point scales ranging from 1 (strongly agree) to 5 (strongly disagree). Four of the items were reverse coded such that high scores indicated high playfulness. A factor analysis yielded one factor, explaining 58.9 percent of the variance. The mean of the seven items was used to create a playfulness measure, and Cronbach's internal consistency reliability was 0.87.

Internet Skills were defined as a combination of users' experience with the Internet and the training they obtained. Prior research on computer skills indicated a delineation between experience and training [15, 16, 17]. However, in this study, Internet skills were divided into three indicators: 1) web page skills; 2) general Internet skills, self-taught; and 3) formal training. Participants were asked to indicate the extent of their experience using the Internet on a five point scale from 1 (none) to 5 (very extensive). The six areas were: (i) accessing the Internet (ii) using Internet search engines, such as Yahoo, Infoseek (iii) downloading files from the Internet (iv) creating web pages, (v) programming in hypertext, and (vi) maintaining web pages.

Individuals were also asked to report, on the same five-point scale (as above) the extent of training in the Internet they had received from four sources: college courses; vendor training; in-house training; and self-training. A principal components analysis (with varimax rotation) on the ten-item scale revealed three independent factors with eigenvalues greater than one.

Factor one, labeled "web page", contained three items. It included creating web pages, programming in hypertext based software, and maintaining web pages. The mean of the three items was used to create an index of web page skills with a Cronbach internal consistency reliability alpha of 0.96.

The second factor embedded in the Internet Skills Scale, labeled "general," consisted of four items. These were: accessing the Internet; using Internet search engines, downloading files from the Internet, and self-taught training. The mean was used as a measure of general Internet skills, gained through self-taught, informal training. The internal consistency reliability was 0.80.

The third factor relates to formal training from college courses, vendors or outside consultants, and in-house company courses, and was labeled, "formal." The scale, based on the mean of the three items, had a Cronbach's alpha reliability coefficient of 0.79.

Single item questions were used to ascertain respondents' gender and age. Gender was assessed with a fixed response item (1 = male; 2 = female). Age consisted of seven levels from (1) under 25 to (7) over 66. Demographic variables were included in the background section of the survey.

Self-report indicators are often used to operationalize system use and impact, particularly where objective use metrics are not readily available. Since participants in this study accessed the Internet from a variety of organizations, objective logs were not obtainable. Self-reported usage and impact are not precise measures, but prior research suggests they are suitable as relative measures [2].

Data Analyses

The relationships among the study variables depicted in Figure 1 were examined by means of bivariate correlations. Bivariate correlations assesses the degree of relationship between two variables, with no inherent distinction between the independent and dependent variables. A more complete analysis of the data would have included path analysis techniques such as: hierarchical multiple regression, or structural equation modeling. Both of these methods would have identified the relationships among the model variables. However, because of the exploratory nature of this study, and the small sample size, use of these tests was precluded.

Results

Descriptive analyses, and bivariate correlations were conducted to examine the antecedents and impact of Internet usage. Table 1 summarizes the variables used in the model with the means, standard deviations, and Cronbach's reliability coefficients where applicable.

The data show that the measures of constructs examined in this study are robust in terms of their internal consistency reliability as indexed by Cronbach's coefficient alphas. The reliabilities of the constructs included are greater than 0.70 with one exception (value chain web pages - 0.63), and are within the guidelines recommended by Nunnally [22].

Summary results of the bivariate correlations are shown in Table 2 (the actual correlation coefficients are available from the authors). Age is positively related to optimism, accessing work web pages, and overall productivity and is negatively related to pessimism about the Internet. Women are associated with less ease of use, less frequency and fewer Internet activities. Having higher web page skills and more general Internet skills is negatively related to self-efficacy. However, web page skills are positively associated with both dimensions (usefulness and ease of use) of Internet satisfaction, as well as with two indicators of Internet usage: time and frequency on the Internet. Web skills and general Internet skills are also positively correlated with enhanced job characteristics. Additionally, general Internet skills are associated with inefficiency ($r = .33$, $p < .05$). Formal Internet training is marginally associated Internet activities ($r = .26$, $p < .10$)

Table 1
Study Variables Means, Standard Deviations and Reliability Coefficients

Variable	Mean	Standard Deviation	Reliability Coefficient
ANTECEDENTS			
Age	2.56	0.91	
Gender			
Internet Skills:			
Web	1.34	0.92	0.96
General	3.64	0.75	0.80
Training	1.59	0.89	0.79
Internet Playfulness	3.77	1.00	0.87
Social Pressure	2.98	1.23	
Organizational Support	2.90	1.10	0.86
Task Characteristics:			
Structure	3.29	0.82	0.81
Variability	2.61	0.91	0.85
Internet Self-Efficacy	3.60	1.01	0.89
Internet Attitudes:			
Pessimism	2.39	0.86	0.84

Intimidation	1.78	0.69	0.80
Optimism	2.10	0.50	0.71
User Satisfaction:			
Usefulness	3.25	0.69	0.91
Ease of Use	3.56	0.79	0.93
INTERNET USAGE			
Time on the Internet	2.75	1.03	
Frequency	4.05	1.45	
Activities	18.25	5.88	
Web Page Access:			
Personal	3.08	1.28	0.91
Work	3.10	1.12	0.78
Value-chain	3.05	1.32	0.63
INTERNET IMPACT			
Job Characteristics	3.17	0.62	0.94
Job Satisfaction	3.30	0.76	
Overall Productivity	3.50	0.82	
Inefficiency	3.06	0.58	0.78
Security	3.40	0.89	0.74

As Internet playfulness increases, optimism about the Internet and Internet usefulness increases. Internet playfulness is also positively related to enhanced job characteristics ($r = .37$, $p < .05$), job satisfaction ($r = .32$, $p < .05$), and overall productivity ($r = .30$, $p < .05$). However, it is also positively associated with inefficiency ($r = .57$, $p < .01$).

With the organizational related antecedents of Internet usage (social pressure, organizational support, task structure, and task variability), social pressure and organizational support are associated with intimidation, and organizational support with less usage, specifically the dimensions of : a) time on the Internet ($r = -.36$, $p < .05$); b) frequency ($r = -.29$, $p < .10$); and c) activities ($r = -.39$, $p < .05$). Social pressure is associated with less ease of use, fewer activities, and less job satisfaction. Both structure and variability are related to less pessimism about the Internet. The more structure, the less personal web page usage ($r = -.53$, $p < .01$), and the less the variability in task characteristics, the less extensive are Internet activities ($r = -.27$, $p < .10$).

Belief in one's ability to use the Internet (Internet self-efficacy) is positively associated with the likelihood of accessing value chain type web pages. Pessimism and intimidation are positively related with accessing personal types of web pages. As intimidation increases, time on the Internet, frequency of usage, activities, and overall productivity decreases. Perceived usefulness of the Internet is positively related to time of use, frequency of use, enhanced job characteristics, job satisfaction, and overall productivity. It is also strongly related to inefficiency ($r = .73$, $p < .000$). Ease of use is associated with increased frequency of use as well as more extensive use.

Internet usage has several relationships with the indicators measuring Internet impact. Time on the Internet is positively associated with enhanced job characteristics, job satisfaction, overall productivity, but also inefficiency. Frequency is positively related to all of the above impact variables, with the exception of inefficiency. Accessing value chain web pages (supplier and customer web pages) is marginally related to perceived increased security ($r = .27$, $p < .10$).

Discussion And Summary

The use of the Internet within organizations in the United States is growing at a phenomenal rate. Accompanying this rapid growth are contradictory reports about the impact of Internet usage on such issues as improving employee productivity, efficiency, and effectiveness in performing tasks. Many organizations are coming to grips with productivity and security issues and are attempting to implement a wide spectrum of strategies for managing this technology. These strategies range from blocking and restricting access to the Internet versus total freedom Examination of the information systems literature show a dearth of empirical research in the understanding of the factors which influence employee Internet access and the individual and organizational consequences of such usage. This exploratory study attempts to empirically examines some of these issues. The most obvious limitation of this study is the sample size. The small number of responses ($n = 40$) restricted the types of data analyses we were able to use. In addition, many of the statistically significant correlations were rather weak, in large part because of the small sample size. Despite the limitations, the results of this exploratory study were encouraging enough to launch a more extensive project that will allow a robust testing of the research model.

Table 2
Summary Results

Variables	Positive	Negative
1.Age	-Optimism -Frequency -Work Pages -Productivity	-Pessimism
2.Gender	-Social Pressure	-Ease of Use -Frequency -Activities
3.Web Skills	-Usefulness -Ease of Use -Time -Frequency -Activities	-Self-Efficacy

	-Enhanced Job	
4.General	-Ease of Use -Frequency -Enhanced Job -Inefficiency	-Self-Efficacy
5.FormalTraining	-Activities -Work Pages	
6. Playfulness	-Optimism -Usefulness -Enhanced Job -Job Satisfaction - Productivity -Inefficiency	
7.Social Pressure	-Intimidation	-Pessimism -Optimism -Ease of Use -Activities -Job Satisfaction
8.Support	-Intimidation	-Time -Frequency -Activities
9.Structure		-Self-Efficacy -Pessimism -Personal Pages -Productivity
10.Variability		-Pessimism -Time -Activities
11.Self-Efficacy	-Pessimism -Value Chain Pages	
12.Pessimism	-Personal Pages	
13.Intimidation	-Personal	-Time -Frequency -Activities -Enhanced Job -Productivity
15.Usefulness	-Time -Frequency -Enhanced Job -Job Satisfaction -Productivity -Inefficiency	-Security
16.Ease of Use	-Frequency -Activities -Enhanced Job	-
17.Time Internet	-Enhanced Job -Job Satisfaction -Productivity -Inefficiency	
18.Frequency	Enhanced Job -Job Satisfaction -Productivity	-
19.Activities	-Productivity	-
20.Personal Pages		
21.Work Pages		
22.Value-chain Pages	-Security	-Inefficiency

The results indicate that men used the Internet more frequently, with greater ease of use for a wider variety of activities than women. This finding was consistent with previous research on computer usage. In addition, employees' web skills and Internet skills correlated with perceptions of enhanced job characteristics. This implies that organizations can enhance the work environment by providing training and education to employees to increase their web and Internet skills.

The results also indicate that the individual characteristic of Internet playfulness can lead perceptions of enhanced job characteristics, higher job satisfaction, and more overall productivity. However by enhancing the employee interest in the Internet, the organization faces the risk of employees being involved in personal usage, such as surfing entertainment web sites, or chat rooms. Therefore Internet playfulness can have significant practical consequences for the organization in terms of increased wasted time, need for re-work, and longer time to task completion contributing to inefficiency.

With the organizational related antecedents of Internet, the results indicate that social pressure and organizational support are associated with intimidation, and less usage of the Internet, which suggests that management involvement and support in Internet usage could restrict employees from abusing the Internet during work hours.

Task characteristics and Internet usage were examined as well. Employees who dealt with highly structured tasks, for instance non-managers or lower level manager, were found to be less involved in accessing personal web pages than their counterparts. Similarly employees with low task variability were found to be less involved in Internet activities. This implies that employees with less structured tasks, such as tactical-level managers, may make greater use of the Internet than lower level managers or non-managers.

Positive beliefs and attitudes about the Internet could be a double edged sword. As anticipated, intimidation and pessimism about the Internet were related to decreased usage, and perceived usefulness was positively related to increase usage and positive impacts. However, the more one reported using the Internet, the greater the possibility of rework, and greater time to completion, thus leading to inefficiency.

The findings of this study contribute to a better understanding of the antecedent factors which can lead to Internet usage as well as the impact of such usage. As the Internet becomes an almost indispensable part of work, it is important for all managers, and especially, information technology managers, to be cognizant of both individual and organizational factors associated with Internet usage. It seems that Internet usage can have positive results in terms of enhanced job characteristics, overall job satisfaction, and productivity, but perhaps at the cost

of increasing inefficiency. This particularly challenges information technology managers to formulate policies and procedures that control, but do not discourage, legitimate Internet work usage by all employees.

REFERENCES

1. Bandura, A., Adams, N.E., Beyer, J. 1977. Cognitive processes mediating behavioral change. Journal of Personality and Social Psychology, 35(3): 125-139.
2. Blair, E. & Burton, S. 1987. Cognitive process used by survey respondents to answer behavioral frequency questions. Journal of Consumer Research, 14: 280-288.
3. Burkhardt, M.E. & Brass, D. J. 1990. Changing patterns or patterns of change: The effects of a change in technology on social network stricture and power. Administrative Science Quarterly, 35(1): 104-127.
4. Cheney, P; & Dickson, G. B. 1982. Organizational characteristics and information systems success: An extrapolation investigation. Academy of Management Journal, 25(1): 170-184.
5. Compeau, D.R. & Higgins, C.A. 1995. Computer self-efficacy: Development of a measure and initial test. MIS Quarterly, (June): 189-211.
6. Cronin, M., 1995. Doing More Business on the Internet, Van Nostrand Reinhold, ITP Inc.
7. Doll, W.J. & Torkzadeh, G. 1988. The measurement of end-user computing: An exploratory study. Information Resources Management Journal, 1(Fall): 39-46.
8. Fishbein, M. & Ajzen, I. 1975. Belief, Attitude, Intentions, and Behavior: An Introduction to Theory and Research. Boston: Addison-Wesley.
9. Gist, M.E., Schwoerer, C.E. & Rosen, B. 1989. Effects of alternative training methods on self efficacy and performance in computer software training. Journal of Applied Psychology, 74(6): 884-891.
10. Hackman, J. R. & Oldham, G.R. 1980. Work Redesign. Reading, MA: Addison-Wesley.
11. Harrison, A.W. & Rainer, R.K. 1992. The influence of individual differences on skill in end-user computing. Journal of Management Information Systems., 9(1): 93-11.
12. Hill, T., Smith, N.D., & Mann, M.F. 1987. Role of efficacy expectations in predicting the decision to use advance technologies: The case of computers. Journal of Applied Psychology, 72(2): 307-313.
13. Hollenbeck, J.R. & Brief, A.P. 1987. The effects of individual differences and goal origins on goal setting and performance. Organizational Behavior and Human Decision Performance, 40(3): 392-414.
14. Igbaria, M. 1990. End-user computing effectiveness: A structural equation model. OMEGA, International Journal of Management Science, 18(6): 637-652.
15. Igbaria, M. 1992. An examination of microcomputer usage in Taiwan. Information & Management, 22: 19-28.
16. Igbaria, M. 1993. User acceptance of microcomputer technology: An empirical test. OMEGA International Journal of Management Science, 21(1): 73-90.
17. Igbaria, M., Parasuraman, S., & Baroudi, J. 1996. A motivational model of microcomputer usage. Journal of Management Information Systems, 13(1): 127-143.
18. Igbaria, M., Pavri, F., & Huff, S. 1989. Microcomputer application : An empirical look at usage. Information & Management, 16(4): 187-196.
19. LaPlante, A ., 1997. Start small think infinite, Computerworld, 24-30.
20. Lawton, G., 1996. The Internet: Taking a hard look at performance, Telecommunication, (4) 29-35.
21. Nickell, G.S. & Pinto, J.N. 1986. The computer attitude scale. Computers in Human Behavior, 2: 547-559.
22. Nunnally, J.C. 1978. Psychometric Theory, 2nd ed. New York: McGraw-Hill.
23. Open Market, Inc. "Commercial Sites Index," [http://www.directory.net], September 10, 1996
24. Rebello, K., Armstrong, L., & Cortese, A., Making money on the Internet, Business Week, September 23, 1996.
25. Webster, J. & Martocchio, J.J. 1992. Microcomputer playfulness: Development of a measure of workplace implications. MIS Quarterly, 16(2): 201-226.
26. Webster, J. & Martocchio, J.J. 1995. The differential effects of software training previews on training outcomes. Journal of Management, 21: 757-787.
27. Withey, M., Daft, R.L., and Cooper, W.H., 1983. Measures of Perrow's work unit technology: An empirical assessment and a new scale. Academy of Management Journal, 26, 45-63.
28. Zoltan, E. & Chapanis, A. 1982. What do professional persons think about computers? Behavior and Information Technology 1(1): 55-68.