

EMPIRICAL ANALYSIS FOR THE FACTORS AFFECTING REALIZATION OF PAPERLESS OFFICE

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Abstract

The concept of a paperless office has remained a myth for the past three decades. Paradoxically, advances made in digital technology as well as the diffusion of technology in offices have led to a relative increase in the volumes of paper consumed in offices. This study therefore purposes to investigate the factors that have made paperless office unsuccessful with a focus on employee attitude and behaviors toward accepting and using digital technology in offices. The study adopted a quantitative research approach, and collected data using structured questionnaires. The sample for the study came from administrative and academic staff of Gime American University, selected using stratified random sampling. Data was analyzed quantitatively using frequency/mean, reliability and multiple regression analysis to determine demographic characteristics, reliability of data and to find associations between the variables and on employee willingness to accept and to use digital technology in offices. The findings indicated that IT and management support greatly influenced employee willingness to adopt technology. Employee experience of paperless system had little effect because employees preferred user support and training, which reduced the influence of experience. The study recommends that IT department and the management must play an active role in training and motivating employees when shifting towards a paperless office.

Keywords: *Paperless Office, Technology Acceptance Model, TAM, IT Support, Technology Adoption*

INTRODUCTION

Towards the end of the 20th Century, rampant diffusion of computers into offices might have signaled the beginning of the death of the paper-based office. However, three decades later, the concept of a paperless office has remained largely a mirage (Sellen & Harper, 2002). Paradoxically, advances made in digital technology together with the proliferations of information technology in offices have led to an ever-increasing consumption of paper documents. York (2006) theorizes that the development of a substitute product does not necessarily lead to a reduction or elimination of the consumption of the original product; instead, the substitute product might lead to a greater consumption of the original product. York's observation is consistent with Abdulrahman (2003) argument that the escalating annual volumes of paper consumed in organizations are relative to the escalating use of technology by the same organizations.

While advances made in digital technology have develop tools that offices utilize to reduce the use of paper heralding the shift towards a paperless office (an office where information is stored and retrieved entirely electronically), the need to eliminate inadequacies inherent in the use of paper provides the primary reason for the shift. The inadequacies of paper-based processes are. (a) Paper is symbolic of the old-fashioned past; (b) Paper has unnecessary and wasteful consumption that is associated with enormous costs; (c) Paper occupies a physical space and employees access it locally; and (d) The manufacture and disposal of paper causes a great harm to the environment (Sellen & Harper, 2002). Therefore, a need to reduce to minimum or to eliminate paper consumption in offices altogether would benefit the environment as well as organizations by automating their processes as well as creating efficiencies in information storage and human resources management (York, 2006).

However, a blind need to eliminate inadequacies of paper-based processes, have led to many organizations to mistake that a shift from a paper-based to a paperless office primarily requires the use of information systems such as computer networks, software such as Enterprise Resource Planners (ERP), servers and scanners (York, 2006). This is true to the extent that scanners are important in digitizing outgoing and incoming documents; storing data files; and digitizing notes, while ERPs are vital in computerizing the functions of big organizations or complex organization processes like transport and logistics. However, a shift to a paperless office is a difficult goal, which requires significant organizations changes. In fact, a shift to a paperless office means that certain tasks like office memos and notices that required the use of paper are changed or the shift will be unsuccessful (Sellen & Harper, 2002).

Apart from the requisite organizational changes, other factors still play a significant role in hindering the realization of a paperless office. Most importantly, paper is an integral part of

our everyday culture. Paper is also visually appealing in exercises such as reading a newspaper or printing out a document. Moreover, paper occupies a physical space, which makes it well suited for official documents like certificates, contracts and licenses. Finally, as the price of memory goes up, the costs of data storage also goes up, in which case, paper provides an alternative cheaper means of data storage (York, 2006). This study therefore purposes to investigate the factors that have hindered the adoption of a paperless office in the view of employees' attitude and behaviors.

Background of the Study

The concept of a paperless office began three decades ago with the proliferation of personal computers in organization and in homes (Shah & Tiwari, 2010). During this time, information technology was rapidly diffusing into organizations, such that Andersen and Turner (1994) projected that by the year 2000, organizations would be entirely paperless. The use of electronic communications, data storage, transmission and retrieval, would have entirely replaced paper-based processes. Paradoxically, today, technology is developed and is used as was projected in the early 1990's, yet the situation is practically the opposite (Sellen & Harper, 2002; Carr, 2005). The volumes of paper consumed have escalated more than ten times the volumes used three decades ago (Lyman & Varian, 2000). Even organizations that have adopted highly digitized systems such as Enterprise Resources Systems and Legacy Systems have reached a redundancy stage where their information is stored in both electronic and paper forms (Davis, 2005) that further create enormous costs of maintaining electronic and paper-based systems.

Paper has persisted in offices even after numerous studies have variously indicated several inadequacies associated with too many paper-intensive processes. In the 1990s, paper intensive processes took 60% of productive working time of knowledge workers as they handled daily incoming and outgoing paper traffic; and in addition, in 1995, workers incorrectly filed and lost about 3% and 7.5% of paper documents respectively (Carr, 2005). In early 2000, the executive wasted about three hours weekly searching for misfiled, mislabeled or lost documents, which cost significant losses due to lost business opportunities (Dykstra et al., 2009). Carr (2005) analyzed that in 2005, the U.K. lost an estimated £1 million daily in search of lost files. Moreover, poor filing cost an estimated £1.2 million to business organizations every working day, constituting of an estimated 55% misfiled documents, 48% misplaced files on other employees desks, 13% misplaced on manager's desk and 2% lost forever. Sellen and Harper (2002) owe the persistent of paper in offices to its new function, as a temporary medium for knowledge tasks such as reading and collaboration, which is also the primary reason that waste paper is on the increase.

On the other hand, a paperless office presents numerous advantages to organizations including worker efficiency, higher productivity, profitability and environmental benefits. Distributed databases in an intranet, digitized files, computer programs and the Internet jointly improve office organization. In fact, computer networks have enabled employees to access data remotely or simultaneously, which increases information distribution and sharing (Shah & Tiwari, 2010). Moreover, in paperless office, document storage and retrieval is so efficient that employees may be able to search for and access required documents in relatively shorter times, saving considerable amounts of time that would otherwise have been wasted scanning through cabinets of paper documents (Dykstra et al., 2009). In 2010, organizations lost about 150 hours annually in search for paper documents, and that a growing practice of a majority of offices globally to develop parallel electronic and paper systems have led to greater inefficiencies and increased cost of conducting organizational processes (Sellen & Harper, 2002).

A paperless office also reduces cost of organizational processes. With regard to data storage, a typical computer hard drive with over 100 Gigabytes of storage space could store over two million scanned copies of paper documents, which will save on cost of paper, printing and storage costs. Table 1 below shows a summary of paper and electronic costs associated with creating and storage of information.

Table 1: A Comparison of Costs Electronic Against Paper Documents

Cost: 1 Black Toner Cartridge	Toner Cartridges Required	Cost: 500 Sheets 8.5X11 Printer Paper	Number of Paper Reams Required	Cost: 10 Million Printed Sheets
\$100	\$100	\$5.55	\$20,000	\$121,000
Cost: 100 Optical Discs		Cost: 10 Million Digital (Scanned) Pages		
\$40		\$40		

Source: Yahoo Shopping (2012)

Table 1 indicate that it might cost up to 30,250 times more to print paper than to store the information electronically in optical discs, which becomes even more cheaper when stored on a hard drive. Moreover, storage costs of paper are higher owing to the requirement of large office spaces, cost of acquiring file cabinets. For instance, in Chicago, renting one square-foot of office space costs \$28.30 monthly and \$195.29 to purchase one (Chicago Cook Co., 2012). Considering that, a 26-inch file cabinet costing \$150 occupies about \$400 of premium office space excluding taxes and cost of utilities (OfficeMax, 2012), indicates significant storage costs

associated with paper. This brief analysis indicates costs that a paperless office might save in a typical office in expenses of paper storage alone.

While paperless office presents numerous advantages over paper-based offices, some salient features of paper has made its use persist even in the increasing use of digital technology in offices. Since time immemorial, paper has been a favorite medium for communication and information storage. In most organizations, top management grew up using paper-intensive processes and might have a difficult time adapting to the concept of a paperless office (Sellen and Harper, 2002). Moreover, top management is less likely to learn to use technology effectively, which also reduces the utilization of digital technology in offices.

Another factor is the ease of manipulation of paper documents. It is easy to write, read and comment on information on papers as well as more convenient in carrying out rough calculations and work designs compared to computers ((Montesino, 2008). Moreover, in evidence-based practice such as legal documents in courts and in contracts, paper documents are more acceptable than digital documents because digital documents have not received widespread use and acceptance (Shah & Tiwari, 2010). Additionally, paper-based storage and communications are relatively cheaper in the short run compared to the initial capital required to acquire and implement a digital office as well as introduction of a paperless office might present initial resistance on the part of employees to adapting toward newer ways of carrying out their duties ((Montesino, 2008). Furthermore, paper presents ease in readability. Even with development of digital books such as the Amazon Kindle that presents a paper-like experience, many still consider paper better in readability.

Another fundamental factor that hinders the realization of a paperless office is the actual transition that requires technological changes, behavioral changes and organizational changes to realize the true benefits of a paperless office (Shah & Tiwari, 2010). Further, employee attitudes and perceptions about a paperless office are important to the realization of a paperless office, which may vary according to technology an organization adopts, employees and the context with which the technology is acquired (Fishbein & Ajzen, 1975). This study therefore aims at investigating the reasons that have made the realization of a paperless office to remain a myth for close to three decades while focusing on employee attitudes and perceptions about acceptance and the use of technology.

Rationale of the Study

This study aims to contribute to existing knowledge and to findings of previous studies on the myth of the paperless office. By focusing on employee behavior, this study purposes to investigate whether employee attitude and behavior plays a role in the acceptance and use of

digital technology in offices. The purpose is to enrich previous findings that the costs of acquisition and implementation of a digital system may hinder small and medium sized offices to realize a paperless office (Dykstra et al., 2009). The findings of this study might also be relevant and useful to managers, by providing an understanding of the influence of employee behavior and attitude on acceptance and use of digital technology. The understanding might be useful when formulating policies that guide the shift towards a paperless office.

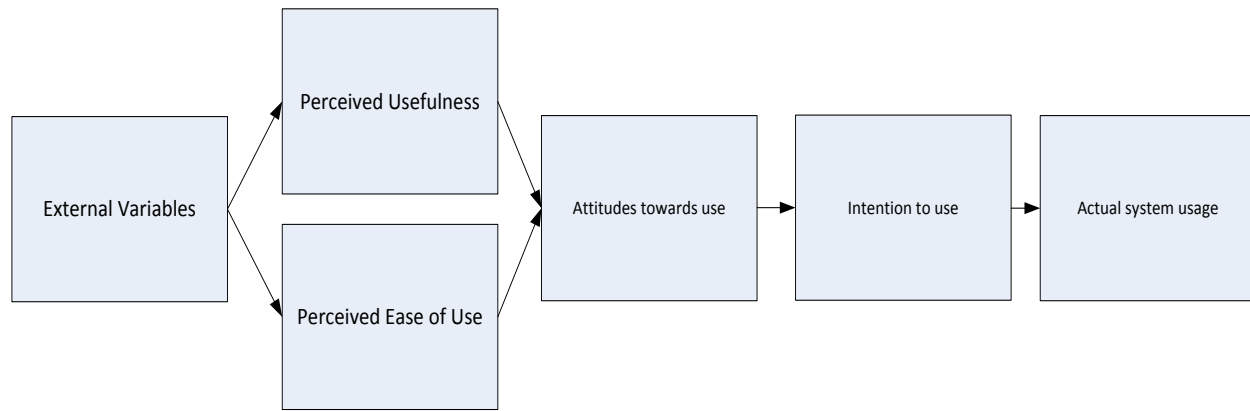
THEORETICAL FRAMEWORK

Several studies based on social psychology have attempted to investigate individual attitudes and behavior towards the adoption and use of technology (Ajzen & Fishbein, 1980; Davis, 1989; Bagozzi & Warshaw, 1989, Crespo et al., 2008). A review of these studies is important to create a broad understanding of employee technology acceptance and the factors that might influence the adoption of technology (Taylor & Todd, 1995). One of the earlier and most used models to measure behavioral intention towards the adoption and use of technology is the Technology Acceptance Model (TAM) developed by Davis (1989). TAM built on the Theory of Reasoned Action (Ajzen & Fishbein, 1980) with a specific focus on the understanding of the reasons that might influence individuals either to accept or to reject the use of information systems. TRA was a generalized theory that provides a theoretical framework that attempts to provide links between the twin beliefs of perceived usefulness and perceived ease of use and their influence on individual attitudes towards adoption of technology. TRA theorizes that an individual behavior is a function of behavioral intention to perform a certain kind of behaviors, which are in turn influenced by individual attitude and the social network the individual belongs (Crespo et al., 2008). Davis, Bagozzi and Warshaw (1989) and Behrens (2005), posit the importance of studying both pre and post technology adoption activities rather than focus on only pre-adoption strategies.

Individual beliefs about technology place great impact on individual decision to adopt technology (Crespo et al., 2008). In addition, individual perception of technology also influences the intention to use a particular technology. According to Crespo et al, (2008) it is also important to study external perceptions that might influence individual and technology perceptions. In this regard, TRA becomes less suitable to study employee attitudes and behavioral intention towards the intention to use technology owing to its silence on external factors. TAM builds on TRA by introducing external factors such as the design of the system, task characteristics, implementation process, political and organizational structure, as crucial to influence individuals' perceptions of usefulness and ease of use of technology. However, TAM did not explicitly study the influence of these external factors rather than mentioned them in conclusion and their

perceived influence on individual perception of technology. External factors are very important in studying acceptance and use of technology in offices (Burton-Jones & Hubona, 2003). Figure 1 presents a schematic illustration of the Technology Acceptance Model

Figure 1: Technology Acceptance Model



Source: Davis (1989)

According to Figure 1, five antecedent variables might influence the intention and actual use of technology. These variables are external factors, perceived usefulness, perceived ease of use, attitude towards use, and intention to use. The model endeavors to link these variables to the actual use of technology, and to explain and forecast user acceptance of information system from observations measured after a short period of user interaction with the system (Davis, 1989). According to TAM, the two employees' individual characteristics of perceived usefulness and perceived ease of use of digital technology in offices are crucial in influencing their intention towards the use of digital technology. These two employee characteristics are directly influenced by external factors such as age and education level. The intention towards the use of digital technology in turn directly influences employees to develop either a positive or a negative intention to use digital technology, which eventually directly influences the actual acceptance and use of digital technology.

This study adopts TAM and makes a few modifications to develop a conceptual model that is in accordance to the purpose of this study. The conceptual model introduces key external variables as indicated by various studies that might influence employee perception towards the intention to use digital technology in an office environment. These new external variables are individual differences (Agarwal & Prasad, 1999; Mahmood et al., 2001), IT support and management support ((Mahmood et al., 2001; Thatcher et al., 2002). The conceptual model further condenses TAM by making individual perceptions on usefulness and ease of use to influence the intention to use digital technology and removes the attitude towards technology

and the actual use of technology. In so doing, the conceptual model assumes that a positive intention to use digital technology might suggest a high probability that an employee might actually use the technology (Chuttur, 2009).

Figure 2 indicates the conceptual model with the relationships among antecedent variables for measuring employee acceptance of digital technology in the office. The model separates the three main external factors, which are the independent variables that might influence employee perception of the usefulness and perceived ease of use of technology as the dependents variables, which have a direct influence on the intention to use digital technology (Burton-Jones & Hubona, 2003).

Research Hypotheses

According to Agarwal and Prasad (1999) and Mahmood et al. (2001), individual differences, such as demographics and prior exposure or experience in using technology, have a direct influence on individual perception on the ease of use and usability of technology. Based on this observation the first research hypotheses would be.

H1: Experience on using digital technology will have a direct positive influence on the perceived usefulness towards adoption of paperless office.

H2: Experience on using digital technology will have a direct positive influence on the perceived ease of use towards adoption of paperless office

In addition to individual characteristics, the support of information technology staff is also crucial in influencing individual perceptions towards ease of use and usability of technology (Mahmood et al., 2001; Thatcher et al., 2002). This is because IT staff provides employees with user support and ways of using technology that may make its use seem less complex as well as explain the importance and benefits technology might bring to employees and the organization in general. This observation conceptualizes the next hypothesis.

H3: IT Support has a direct influence on employee perception of usability of digital technology towards the achievement of a paperless office.

H4: IT Support has a direct influence on employee perception of usability of digital technology towards the achievement of a paperless office.

While individual characteristics and IT support are crucial to influence the perception of ease of use and usability, management support is important to create conducive atmosphere and direction towards the adoption of a paperless office. In fact, communication from management to create a broad understanding of tasks that would change as well as the benefits of paperless

office to the organizations goals are important to create a positive perception of ease of use and usability of technology (Mahmood et al., 2001; Thatcher et al., 2002). This observation informs the fifth hypothesis for the study.

H5: Management support will have a direct positive effect on perceived ease of use towards the paperless office initiative.

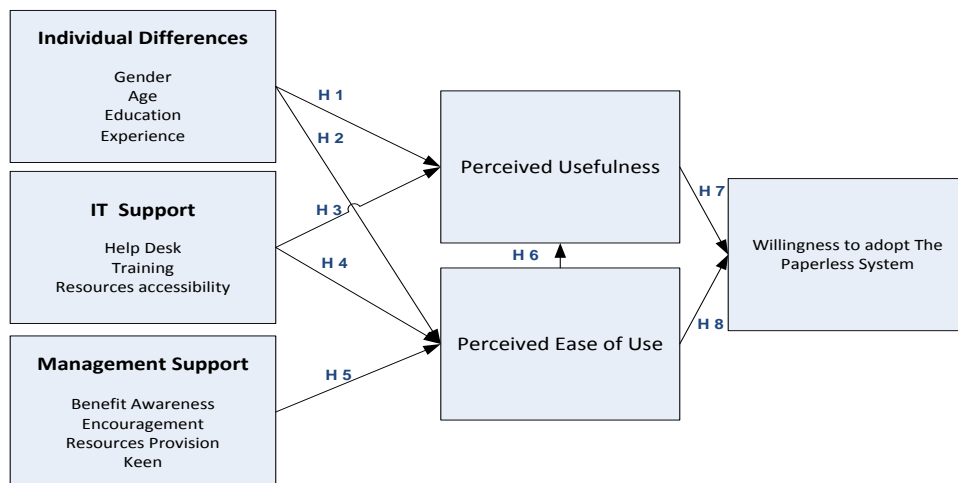
According to the original TAM (Davies, 1898) and Crespo et al. (2008), individual perceptions on the ease of use and usability exert a direct influence on individual intention towards adoption of a paperless office. As such, this study came up with the following two hypotheses.

H6: Perceived ease of use will have direct positive effect on perceived usefulness.

H7: Perceived usefulness will have direct positive effect on willingness to adopt the paperless office initiative.

H8: Perceived ease of use will have direct positive effect on willingness to adopt the paperless office initiative.

Figure 2: Conceptual Model for Employee Digital Technology Acceptance



RESEARCH METHODOLOGY

This study adopted a quantitative research approach. A quantitative approach collects data from observations, quantifies them and applies statistical analysis to realize findings that have empirical support (Creswell, 2009). Additionally, statistical methods in quantitative analysis increase the probability of a study to realize generalizing conclusions (Flick, 2007). These two observations made a quantitative approach well suited for this study since it aimed to carry out objective analysis to realize findings that have empirical support.

Population, Sample and Sampling procedures

The target population of a study into factors affecting adoption of a paperless office would have generally included all employees in offices (Sellen & Harper, 2002). However, this study selected the employees of Girne American University (GAU), since the university uses technology extensively, but still the volumes of paper documents consumed have not reduced in recent years. Additionally, since the university has staff having different demographic characteristics, experience in use of technology and come from different geographical areas, they would represent diversity in demographics and experience as indicated in the study's conceptual model. Therefore, GAU provided a suitable organization to investigate why increasing use of technology has failed to reduce or even eliminate the use of paper. The study population covered both administrative and academic staff spread in all the departments of GAU to ensure diversity of responses as well as sufficient data would be collected.

The sample of the study was 120 participants, which is consistent with previous studies by Crespo et al. (2008) and Thatcher et al. (2002). This sample size depended on the available resources and the need for the study to realize a higher response rate (Helda & Jentoft, 2011). Out of the 120 participants, 96 (80%) were administrative staff and 24 (20%) academic staff. This is because the duties and responsibility of administrative staffs are in offices duties while academic staffs mainly attend to students with minimal office duties. Additionally, academic staffs have usually attained higher levels of education, which might skew the education level of participants.

The study sample was selected using probability sampling procedures. The sampling procedure used was stratified sampling where respondents were selected according to demographic characteristics (age, gender and level of education). Stratified sampling ensured that each employee in GAU had an equal chance for selection, thereby reducing selection bias as well as increasing the sample representation of the study population (Teddle & Yu, 2007). The profile of the respondents who were sampled is summarized in the table below:

Table 2: Respondents' Profile

Title	Number	Company	Experience	Age	Mandatory
Administrative Staff	96	Girne American University	Varied, between 1 and 15 years	Varied, between 24 and 40 years	All voluntary
Academic Staff	24	Girne American University	Varied, between 1 and 10 years	Varied, between 29 and 60	All voluntary

Data Collection Instruments

This study used structured questionnaire to collect data from the sampled participants. Questionnaires were appropriate because they could easily collect data from a large sample in a timely and cost-effective manner (Creswell, 2009). In addition, structured questionnaires provide minimal variations in responses, which make it well suited for self-administration (Terrell, 2012). This study derived the research questions for the survey from previous studies by Davis (1989), Venkatesh (2000), and Venkatesh and Davis (2000), but modified the questions to fit the purpose of this study. The questions were designed using a 5-point Likert scale ranging from “strongly agree” to “strongly disagree”.

Reliability and Validity of data collection instrument

While data validity refers to the correctness, reasonableness and meaningfulness of data (Crowther & Lancaster, 2005), reliability refers to findings that are consistent with previous or repeat studies (Berg, 2007). This study ensured that methods and data adopted were valid and reliable. By selecting participants from administrative and academic staff, the study aimed at collecting data that represents the true situation in the offices. Further, selecting more office staff ensured that comprehensive responses came from actual users of technology in office. In addition, using stratified sampling procedures ensured that selection of participants minimized concerns of selection bias and optimized achieving a representative sample (Teddlie & Yu, 2007). Reliability was further strengthened by guidance from literature review that was important in the development of the conceptual model (Creswell, 2008), which guided modification of survey questions.

Data analysis approach

Data from the survey was be coded and analyzed quantitatively using Statistical Package for Social Sciences (SPSS) version 17.0. The analysis used descriptive statistics such as mean and standard deviation to describe the demographic characteristics of the respondents (Yin, 2009). The analysis further carried out reliability analysis to determine the validity of the study variables using values of Cronbach Alpha and to test the fitness of the conceptual model. Finally, data analysis carried out multiple regression analysis to determine the relationships between independent variable and dependent variables and their influence on the intention or willingness to adopt a paperless office.

ANALYSIS & FINDINGS

Analysis of Demographic Factors

Demographic characteristics of participants were important in determining their influence in the acceptance and use of digital technology in offices. The survey had 120 participants whose demographic characteristics are summarized in Table 3 below.

Table 3: Demographic Characteristic of Participants

Demographic Characteristic	Group	Frequency	Percent (%)
Gender	Male	67	56%
	Female	53	44%
Age	<30	12	10%
	31-40	46	38%
	41-50	41	34%
	51 and above	21	18%
Level of Education	Bachelor	14	12%
	Master	39	33%
	Doctorate	41	34%
	Other	26	21%

Table 3 indicates that participants came from both genders in almost equal measures with 56% male and 44% female. About 48% of the participants are below the age of 40 years and 52% above the age of 40 and 88% have attained master's degree or higher academic levels. These demographics indicate that the participants had varying demographic characteristics, which were important in determining their influence in accepting digital technology in office environment.

Descriptive analysis

Frequency and mean analysis of responses as summarized in Table 4 indicate of all the antecedent variables to employee acceptance of technology in offices. A majority of employees seem to have a greater preference for specialized training in software use at a mean of 3.93 and having designated member of IT staff to handle employee support in the use of technology at a mean of 3.89. A majority of employees (mean = 3.76) are willing to use technology in offices and most of them (mean = 3.72) have at one time or another used digital technology that is available in offices. On the other end, a majority of employee (mean = 2.98) do not trust that they would become proficient users of technology and (mean = 2.96) do not think digital technology would make their jobs easier. In summary, means within the range of 2.98 and 3.93 indicate that a majority of employees are willing to accept the use of technology in offices with a few having contrary perceptions about technology.

Table 4: Frequency and Mean Analysis of Responses

Consumer Behavior Questions	Strongly Agree	Agree	Neither	Dis-agree	Strongly Disagree	Mean
Paperless System Experience						
I have experience to use technology in job related tasks. (<i>office applications, e-mails, to do list, calendar...</i>)	19,8%	55,4%	18,6%	5,1%	2,4%	3.72
I have experience to use paperless fax system	42,1%	17,4%	24,6%	8,2%	1,5%	3.71
I have experience in using document imaging system	56,7%	9,0%	32,1%	1,5%	0, 7%	3.59
Usefulness of Paperless System						
Using Paperless System in my job would enable me to accomplish tasks more quickly.	50,1%	22,3%	12,4%	2,6%	6,0%	3.32
Using Paperless System would improve my job performance.	39,7%	38,8%	9,7%	6,0%	9,4%	3.02
Using Paperless System in my job would increase my productivity.	41,7%	31,2%	11,3%	5,8%	9,1%	2.99
Using Paperless System would enhance my effectiveness on the job.	28,4%	28%	11,6%	5,0%	19,4%	3.02
Using Paperless System would make it easier to do my job.	40,8%	19,3%	21,7%	8,3%	6,9%	2.96
I would find Paperless System useful in my job.	56,7%	9,0%	32,1%	1,5%	0, 7%	3.22
Ease of Use of Paperless System						
Learning to operate Paperless system would be easy for me.	37,3%	26,9%	32,1%	3,0%	0.7%	3.72
I would find it easy to get Paperless System to do what I want it to do.	39,9%	25,3%	7,6%	2,2%	1,4%	3.22
My interaction with Paperless System would be clear and understandable.	36,9%	26,1%	26,9%	5,2%	2,2%	3.03
I would find Paperless System to be flexible to interact with.	22,3%	21,5%	42,1%	11,4 %	12,3%	3.02
It would be easy for me to become skilful at using Paperless System.	22,4%	48,3%	13,4%	9,7%	1,3%	2.98
I would find Paperless System easy to use.						3.01
Management Support						
A specific person (or group) is available for assistance with hardware & software difficulties.	39,6%	21,4%	19,4%	11,7 %	8,1%	3.89
Specialized instruction and training concerning software is available to me.	31.2%	9,0%	45,7%	0,2%	1,0%	3.93
A good access to hardware & software resources is provided when people need them.	21.5%	44,2%	56,7%	2,7%	2,3%	3.11
Intention (Willingness) to Adopt a Paperless Office						
If a paperless system is installed at GAU, I am willing to use it	32.1%	9,3%	47,4%	0,7%	6,6%	3.76
I'm looking forward to use paperless system in the future	37.7%	3,6%	44,2%	0,7%	2,5%	3.21

Frequency and mean analysis are important in the identification of important variables that employees may place greater preference when accepting and using digital technology in the office. However, frequency and mean analysis does not indicate the relationship between the variables nor their influence on the willingness to use paperless system. To understand the associations between the variables and on employee willingness to accept and use technology, multiple regressions analyses were applied on the data (Table 6).

Reliability Analysis

Table 5: Reliability Analysis of Study Variables

Variable	Cronbach Alpha	Mean	Std. Deviation
Experience in Using Paperless System	0.721	3.7102	0.6201
Perceived Ease of Use	0.718	3.3921	0.7998
Perceived Usefulness	0.786	3.7589	0.6601
Management Support	0.671	3.7954	0.5798
IT Support	0.809	3.6232	0.5391
Willingness to Use Paperless System	0.789	3.8213	0.5992

Note: All these variables were based on a 5-point Likert scale “Strongly agree” to “Strongly disagree”.

Table 5 clearly shows that all the variables adopted by the study to investigate their influence on acceptance and use of paperless office system had satisfactory Cronbach Alpha values that ranged from 0.671 to 0.809. This range indicates that all the variables were reliable. On the other hand, values ranging from 3.6232 to 3.8213 for values of mean and values ranging from 0.5391 and 0.7998 for standard deviation also indicate strongly that the variables used were reliable.

Hypotheses Testing

Table 6: Regression Analysis on the Three Study Variables

	R	R ²	Std. error estimate	Sig. F	Durbin Watson
	0.659	0.298	0.52121	0.000	1.5895
	Unstandardized coefficients		Std. coeff.		
	Beta	Std. error	Beta	t	Sig.
Experience Paperless System	0.361	0.121	0.249	3.521	0.539
Perceived Ease of Use	0.098	0.069	0.069	5.887	0.419
Perceived Usefulness	0.419	0.106	0.398	2.729	0.011
Management Support	0.459	0.109	0.427	0.561	0.002
IT Support	0.601	0.101	0.598	2.441	0.099

Dependent variable: Willingness to use paperless office system

Table 6 shows the results of multiple regressions applied on the survey data to find association between experience on paperless office system, perceived usefulness, perceived ease of use, management support and IT support. In overall, the relationships between these variables and willingness to use paperless office system was positive. The 29.8% variance on employee technology acceptance behavior is due to the associations of the variables ($R^2 = 29.8$, p -value, 0.01). The most significant variable that influences employee technology-acceptance behavior is IT Support ($\beta = 0.598$, p -value < 0.01), followed by management support ($\beta = 0.427$, p -value < 0.01) and perceived usefulness ($\beta = 0.398$, p -value < 0.01). These figures indicate that all the hypotheses apart from hypothesis 8 (Perceived ease of use will have direct positive effect on willingness to adopt the paperless office initiative) that had an insignificant influence on employee willingness to adopt and use digital technology in the office.

DISCUSSION OF FINDINGS

The results indicate that all the three external factors: individual characteristics (experience and demographic characteristics), IT support and management support were valid variables and had varying influences on employee perception of the ease of use and usefulness of technology that further influences their willingness to accept and to use digital technology in offices. In H1 and H2, individual experiences on paperless system had little effect on influencing employee perception on the ease of use and usefulness of technology. While experience might be an important external influencing factor, its little effect may be explained by H3 and H4, where IT staff support was the most significant external variable. A majority of employees perceive user support and specialized training are important than prior knowledge because any problem with an IT staff might be around to give assistance. Moreover, since about 52% of participants were aged over 41 years, it is possible that their exposure and interest in technology is limited, which might also explain why experience was a less important influencing factor, which is consistent with Crespo et al. (2008) findings.

In H5 and H6, management was found to play a key role, after IT support in influencing employee perception on the ease of use and usefulness of technology. As Sellen and Harper (2002) indicated, a shift towards a paperless office represents significant organizational changes including resources and employee attitudes. Therefore, this finding is consistent to the extent that it indicates employee need the support and direction of management in training and motivation in the use of technology. Just acquiring the necessary resources without training the end users or making them understand the benefits of a paperless office might influence the concept of paperless office to remain a mirage.

As indicated, IT and management support play key roles in influencing employees to perceive positively the ease of use and usefulness of technology, while experience plays a less important role. However, IT and management support, and employee experience indirectly influence employee willingness to use technology, while the perception of ease of use and usefulness directly influences on employee willingness to use technology (H7 and H8). A positive perception influence employee willingness while a negative influence might influence the adoption of technology.

CONCLUSION

The concept of a paperless office has not been realized for the past three decades when computers begin to diffuse in offices; instead, the volume of paper consumed in office has gone up with increased use of digital technology in offices. While factors such as the physical form of paper document making it useful for legal documents, designing workflows and doing rough work influence the persistence of papers in offices, paper-intensive processes place significant costs in storage and printing, miss-filing and lost documents as well as delayed decision making times (Sellen & Harper, 2002). Even with better and more powerful information systems, a shift towards a paperless office requires much more than IT resources. The shift requires organization support in the form of management and IT department support to train employees, motivate them, and create conducive environment for employees to perceive positively the usefulness and ease of use of technology. A positive perception will positively influence their willingness to accept and to use technology. In summary, a shift towards a paperless office requires organizational support and a positive employee attitude towards their willingness to accept and to use technology.

To ensure the concept of a paperless technology is applicable, organizations should take an active role and include all employees by giving them support, direction and training to ensure they perceive technology useful and easy to use, which will enhance their willingness to adopt and use technology.

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APPENDIX

The Questionnaire

This survey focuses on paperless office systems. You have been identified as an important stakeholder to answer the questions below. It will take approximately 10 minutes to complete the questionnaire and your kind support is greatly appreciated.

Participation is entirely voluntary. While there are no foreseeable risks associated with the project, if you feel either uncomfortable or indifferent, you are free to skip questions or withdraw from the survey at any point; however, it is important to learn about your opinions.

Responses to this survey are strictly confidential, and only aggregated data will be reported. All information will be coded for confidentiality and anonymity. If you have questions at any time about the survey or the procedures, you may contact Moh'd Obeidat by emails: mobeidat@bus.illinois.edu.

Privacy Statement

Purpose: The purpose of the study is to investigate the factors affecting the adoption of Paperless office at GAU. The survey will be used to produce statistical data for research purposes.

Uses: The survey data is for research purposes only. The individual responses are confidential.

Effects of Non-Disclosure: Participation in the survey is voluntary. No penalty will be imposed for failure to respond to any question.

Target Survey Audience: Please respond to the items in the questionnaire based on your experience regarding a paperless office system. All responses will be kept strictly confidential. No one will have access to the returned questionnaire except the researcher.

Reports of Results: Once compiled, the survey findings will be made available to the university community and respondents as requested.

If You Have Any Questions: If you have any questions concerning this survey questionnaire, please feel free to e-mail me at mobeidat@bus.illinois.edu.

Section A: Demographic Information

Mark appropriately in one of the boxes

<u>QA1.</u>	<u>QA2. Age</u>	<u>QA3. Level of Education</u>	<u>QA4. Job Title</u>
<u>Gender:</u>	(In Years)	1. Bachelor	1. Academic
1. (Male)	1. 18-30	2. Masters	2. Administrative
2. (Female)	2. 31-40	3. Doctorate	
	3. 41-50	4. Others	
	4. 51 and above	If	Others
		specify _____	

Section B: The following questions are about your Paperless system experience

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
QB1. I have experience to use technology in job related tasks. (office applications , e-mails, to do list , calendar..)	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QB2. I have experience to use paperless fax system	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QB3. I have experience in using document imaging system	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

Section C: The following questions are about the usefulness of Paperless System.

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
QC1. Using Paperless System in my job would enable me to accomplish tasks more quickly.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QC2. Using Paperless System would improve my job performance.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QC3. Using Paperless System in my job would increase my productivity.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QC4. Using Paperless System would enhance my effectiveness on the job.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QC5. Using Paperless System would make it easier to do my job.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QC6. I would find Paperless System useful in my job.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

Section D: The following questions are about the Ease of use of Paperless System.

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
QC1. Learning to operate Paperless system would be easy for me.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QC2. I would find it easy to get Paperless System to do what I want it to do.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QC3. My interaction with Paperless System would be clear and understandable.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QC4. I would find Paperless System to be flexible to interact with.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QC5. It would be easy for me to become skilful at using	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

Paperless System.

QC6. I would find Paperless System easy to use. 1. ☐ 2. ☐ 3. ☐ 4. ☐ 5. ☐

Section E: The following questions are about the Management support for technology at GAU

Questions	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
QE1. Management is aware of the benefits that can be achieved with the use of technology.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QE2. Management always supports and encourages the use of technology for job related work.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QE3. Management provides most of the necessary help and resources to enable people to use technology.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QE4. Management is really keen to see that people are happy with using technology.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

Section F: The following questions are about the Information Technology department support at GAU

Questions	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
QF1. A specific person (or group) is available for assistance with hardware & software difficulties.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QF2. Specialized instruction and training concerning software is available to me.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QF3. A good access to hardware & software resources is provided when people need them.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

Section G: The following question is about your willingness to adopt paperless system

Questions	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
QG1. If a paperless system is installed at GAU, I am willing to use it	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
QG2. I'm looking forward to use paperless system in the future	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

Thank you very much for your kind cooperation.