Peer Reviewed Article Vol.10(1) March 2008

Combating the corporate paper war: electronic mail abuse

M.M. Bothma
Finance Department
Vaal University of Technology
Vanderbijlpark, South Africa
marelizeb@vut.ac.za

E.C. Hoffmann
Faculty of Management Sciences
Department Office Management and Technology
Tshwane University of Technology
Pretoria, South Africa
HoffmannEC@tut.ac.za

The primary objective of the research was to investigate the mailing practices and filing methods in a computer support or administrative environment involving the resulting abuse of paper. In applied research, an exploratory investigation focused on selected higher education institutions in Gauteng with a structured questionnaire as measuring instrument. In the analysis and interpretations of the findings, correlation and cross-tabulation on all sets of variables determined whether any meaningful associations could be found. The investigation indicated that the war against paper abuse is not over by any means. Perceptions regarding a paperless office and assumptions that technology could assist organisations to combat paper abuse were unfounded, mainly because of a lack of guidance, training interventions and control measures. Consequently, follow-up research is presently conducted whereby models will be designed and implemented concomitant with specified computer software features in order to counteract the abuse of paper and facilitate the effective use of information and communication technology interfaced work processes and procedures. This article focuses only on the electronic mail and filing components of the investigation.

Key words: E-mail, electronic filing, e-filing, paper use, paper abuse, hard copies, soft copies

Received: 20 September 2007; accepted 15 February 2008

Contents

1 Introduction

Managing paper in a corporate administrative environment could be quite cumbersome unless well-structured processes and procedures are designed, implemented and maintained. Traditionally, manual equipment, paper documents, paper folders and filing cabinets were used. These were expensive, required extensive space in corporate offices as well as excessive human resources to maintain them in a well-structured and sustainable process. However, in a contemporary global information and communication technology (ICT) interface in business administration, there is a magnitude of information that needs to be managed in a manner that could exceedingly improve the aforementioned dated, tiresome, expensive and time-consuming processes and procedures. This can only be achieved if the ICT applications are implemented, managed and maintained responsibly and effectively.

Bothma completed an investigation in the field of business administration (2006). She based this research on an overview of traditional mailing and filing systems using the above-mentioned introductory paragraph as the point of departure. In the pilot study (Botha 2006), it was found that subjects exploit and tend to print hard copies of e-mail messages and relevant documentation as opposed to using available soft facilities and e-filing effectively and according to structured policies and training interventions. Therefore, it was decided to establish the use and possible abuse of paper relevant to the application of e-mail, e-filing and printing facilities in administrative environments at higher education institutions (HEIs) in Gauteng.

The primary objective in this article is to focus on mailing and filing practices and the relevant use of hard (paper) copies and folders versus soft (electronic) copies and folders in an administrative cum ICT supported interface. The following specific objectives have been singled out as relevant to this article:

- To investigate the root causes in the use and abuse of paper relevant to the use of e-mail facilities
- To investigate the concurrent effect of the use of an e-mail system on printing and filing facilities
- To investigate the effective use of the e-mail system relevant to combating the abuse of paper
- To investigate the integrated use of e-filing concurrent with the e-mail systems used.

top

2 Theoretical framework

In the literature analysis, an in-depth investigation on traditional mailing and filing systems was used as the point of departure. The origin of paper and the use of manual equipment that produced paper documentation were explored in administrative environments where the documents eventually had to be stored in paper folders. These, in turn, had to be stored in

bulky filing cabinets according to a variety of complicated and hybrid filing systems for ease of retrieval and referencing purposes.

The origin of e-mail is rooted in the Compatible Time Sharing System (CTSS) that originated in 1961. With this system, multiple users could log into the system at a pre-determined time. This was done with remote dial-up terminals that allowed users to store files on disks (Van Vleck 2005). This system allowed information to be shared in a new effective way that saved time, resources and effort. This system became so user-friendly that the recipient could log into CTSS from any other terminal and find or print a required file. In 1965, CTSS mail was introduced whereby Morris envisaged the future of e-mail and Van Vleck improvized the actual code that interfaced with the user (Van Vleck 2005). Since then, the progress of this innovative phenomenon was unstoppable.

ARMA International (2000:8) describes e-mail as 'a system that enables users to compose, transmit, receive, and manage electronic messages and images across networks and through gateways connecting to other local area networks' (LAN). According to SACOD (2002:374), 'e-mail is simply another term for mail'.

Evans (1989:26) asserts that e-mail is an important term that describes the messages that are captured into a computer workstation that is linked to a LAN and that are then transmitted to an intended recipient. A single message may be sent simultaneously to groups of tagged (designated) users, thereby saving much time, effort and resources. Keeling and Kallaus (1996:663) describe e-mail as 'the process of delivering mail by electronic signals over telecommunication lines, thereby eliminating the need for the physical delivery of paper documents'. These e-mail messages are also referred to as soft copies, referring to a *modus operandi* where senders or recipients need not print out hard copies, but can save them exclusively on the computer system in electronic format.

The use of e-mail delivery has extensively changed the way businesses communicate and exchange information. The most important advantages are the ability to transfer ideas, conduct transactions and convey information to a vast number of people easily and instantaneously. E-mail is faster, cheaper and transformable and, in many instances, safer and more reliable than communication *via* hard copies. There is no doubt that e-mail provides highly beneficial opportunities for reliable and effective business communication processes (Anon 2006b).

Despite the fact that e-mail, soft copies and e-filing were expected to minimize the use of hard copies exceedingly, the pilot study indicated that the contrary is presently being experienced. This situation has raised such serious concerns that in this investigation it was compared to 'waging (combating) a war against paper abuse' in administrative environments. 'Combating' refers to a 'fight against; to oppose by force; … to struggle' (Foreman 1959:104), which illustrated the similarity with the seriousness of the situation. Foreman (1959:11) defines the term 'abuse' as 'ill-usage; improper treatment' and a 'corrupt practice'. This clearly represents an appropriate analogy to describe a highly detrimental malpractice in administrative activities in ICT interfaced corporate environments, concurrent with the measures that it would need to eliminate or minimize it.

In terms of environmental digressions associated with the perceived abuse of paper and ineffective use of technology, 'the production of a ton of paper requires 17 trees, 7000 gallons of water and more energy per ton than glass or steel' (Kingwood Green Information 2006). Following are additional detrimental digressions that illustrate the enormous negative impact resulting from paper abuse (Kingwood Green Information 2006):

- In America, so much office paper is thrown away annually that one could build a four

metre high wall that stretches from Los Angeles in the west of the USA to New York City in the opposite east side. This distance covers a two hour time zone difference by air.
- Paper used for junk mail equals up to 100 million trees that are cut down every year while half of the junk mail is thrown away or never read.
- Forests of up to 20 million acres could be saved if half of the world's paper is recycled or the abuse of paper is seriously restricted.
- American businesses generate so much paper per day that it could circle the earth 20 times.
- To produce paper to the mass of one ton, 17 trees have to be felled.

According to Printacom, representing *OKI Drukkers* (Rom 2003:9), the volume of paper used in offices has not decreased in spite of the introduction and implementation of e-mail and e-filing. They assert that employees most often print newly created e-mail messages once as draft copies for scrutiny and then reprint a final copy that is stored in a hard copy folder in a filing cabinet. Printacom conducted a survey whereby they reported that companies spend as much as 3,0% of their annual turnover on printing costs. Despite the promises of contemporary ICTs aiming to establish paperless offices, Van Niekerk (2002) notes that paper consumption continues to increase. Horn (2002:2) adds that the Internet and e-mail has been the cause of a major increase in paper consumption and that e-mail has resulted in a 40,0% increase in the printing of documents. He also reported on the findings of a survey that showed a steady increase in printing costs resulting from the use of the Internet and e-mail. In 2001, the Internet cost USA organizations and users US$75 billion in printing costs alone (Horn 2002:2). Lexmark predicted that 55 trillion pages would be printed in 1995, and this amount increased to 60 trillion pages printed during 2002 (Horn 2002:2).

In a general e-mail to all employees in one of the HEIs sampled, Du Pré (2005) explained that 'some employees then print out this header information for their line managers or other staff. The printout then contains two pages of names of recipients, followed by the message or announcement, which very often is only one line. This is a tremendous waste of paper. Imagine if such a notice is sent to 800 staff members and everyone prints it out, the notice will consume 1600 pages, which is more than three reams of paper also adding printer, ink and lost productivity. Such a notice, if printed at least once a week for a year equals around 100 reams, which is 20 boxes of copy paper. This amounts to more than R4000,00 and finishes off a little forest every year'.

Stroman, Wilson and Wauson (2004:184) state that 'in many offices e-mail has replaced written memos, drop-by office visits, and even phone calls'. It has therefore become standard practice in organizations to adopt modern ICTs such as e-mail increasingly, as opposed to manual, hard copy mailing and filing systems. However, no system can be effective if employees are not trained to use the systems optimally. Wilkinson (2004:134) states that 'the need for training is confirmed by the demand for a formal qualification in office management'.

Patterson (2004:9) asserts that employers should establish well-drafted policies to regulate the use of the Internet and e-mail and make sure that all their employees adhere to it. The policy should stipulate and reflect the rights of the employer and, at the same time, respect the employee's right to privacy. He recommends that it must be made clear to all employees that the company's e-mail system will be inspected from time to time to ensure that only legitimate and lawful communication is taking place. As emphasized by experts on the 'paperless' office, it is clear that this concept could never be a reality unless drastic measures are applied. While electronic systems have become global in offices and the power of software applications have multiplied, the result has not been a paperless office. Indeed, the ability of electronic systems to accommodate information resulted in the use of more paper

in many respects, instead of less (Cooperman 2002:108).

top

3 Research approach, design and methodology

According to Welman and Kruger (2001:46), a 'research design is the plan according to which we obtain research participants (subjects) and collect information from them. In it we describe what we are going to do with the participants, with a view to reaching conclusions about the research problem'. A descriptive study may be used to develop theory, identify problems with current practice, justify current practice, make judgements or identify what others in similar situations may be doing (Anon 2006a). In addition, an applied research approach was followed which concluded that a non-experimental research design would be appropriate, whereby it would be unnecessary to conduct any interventions. Saunders, Lewis and Thornhill (2003:5) describe the term 'applied research' as having direct and immediate relevance to managers, addressing issues that they see as important. Applied research is generally presented in ways that managers understand and process. The descriptive and observational approach also refers to an attempt that is being made to change behaviour or conditions. Things are therefore measured as they are through the ‚direct observation of the subjects without intervening (Hopkins 2000).

3.1 Pilot study

The completed study is a direct result of a pilot observation incorporating convenience sampling that involved informal and unstructured interviews. This approach was followed, based on geographical convenience, to verify the *status quo* on the perceived problem as outlined in the title and specified by the keywords and phrases. This strategy was followed over a period of several weeks in different departments at HEI G (Table 1).

In the pilot study (Table 1), where administrators and academics communicate in cyberspace using the Internet and e-mail, it was observed that employees abuse these facilities for private use in addition to the previously mentioned problem areas. Statistics showed that over a period of five working days, 800 employees having access to e-mail sent and received 231777 external e-mails. This amounts to 289,7 e-mails per employee per five working days. It is important to note that this figure does not include internal e-mails. In the virus scanning process of all incoming and outgoing e-mails, 10000 e-mails were rejected in one working day. The reasons for these rejections included that they were not work-related, attachments were too large or there were virus-related problems (A.P. Naudé, personal communication, 15 June 2005 – attie@vut.ac.za). These statistics leave one with the notion that appropriate training, policies and management processes may be lacking in the effective use of ICTs.

3.2 Population and sampling

A non-probability sampling method was used applying purposive (judgement) sampling concomitant with accidental (convenience or incidental) sampling. The latter was also applied to the pilot study. According to Welman and Kruger (2001:61), the 'advantage of non-probability samples are that they are less complicated and more economical in terms of time and financial expenses than probability samples. Non-probability samples may be especially useful in pilot studies in which a preliminary form of questionnaire has to be tested'. According to Trochim (2005), 'most sampling methods are purposive in nature because we usually approach the sampling problem with a specific plan in mind'. According to Ryerson University (2006), 'in judgement sampling, the researcher or some other "expert" uses his/her judgement in selecting the units from the population for study based on the population's parameters'. Convenience sampling is viewed as 'the most convenient collection

of members of the population (units of analysis) that are near and readily available for research purposes' (Welman and Kruger 2001:62), such as within close proximity or using contacts at similar entities within the specified population.

The samples therefore consisted of 161 (n = 23 each) administrative staff members with N = 7 covering all HEIs in Gauteng inclusively. The subjects purposively consisted of employees from the following departments and faculties: administration, examination, human resources, finance and various faculties at each institution. To protect the identities of participating HEIs, they were numbered alphabetically instead of using their names. Table 1 provides an outline of the sampling and feedback received.

Table 1 Sampling and responses

Participants	Sample frequency	Valid percentage	Cumulative percentage
HEI A	23	15,33%	15,33%
HEI B	19	12,67%	28,00%
HEI C	21	14,00%	42,00%
HEI D	18	12,00%	54,00%
HEI E	23	15,33%	69,33%
HEI F	23	15,33%	84,67%
HEI G	23	15,33%	100,00%
Total	150	100,00%	

A total of 150 respondents (93,2% response rate) from seven HEIs in Gauteng eventually participated, which proves a significantly representative sample of the population.

3.3 Measuring instrument – questionnaire design, method of data collection and processing

Quantitative measurement, using a structured questionnaire, collected primary data on electronic mailing systems and their application in administrative practices. Hopkins (2000) explains that 'in quantitative research your aim is to determine the relationship between one thing (an independent variable) and another (a dependent or outcome variable) in a population. Quantitative research designs are either descriptive (subjects usually measured once) or experimental (subjects measured before and after a treatment)'. Wegner (2000:90) states that 'from a data analysis perspective, structured questionnaires are simple to administer and easy to tabulate and analyse statistically'.

A covering letter accompanied the questionnaire, providing the necessary background information and instructions on how to complete the questionnaire. The physical 'delivery and collection' method was used whereby questionnaires to the different samples were personally delivered (Table 1), at which point the relevant authorities granted permission to distribute the questionnaires. Completed questionnaires were collected on the same day. This process took place over a period of five working days, with the aid of an assistant.

The design of the questionnaire was structured according to the specific objectives of the study and consisted of three categories with two types of questions, namely 'list' and 'category'. For the purpose of this article, the focuses is on one category of the empirical investigation in which information concerning the regular and appropriate use of e-mail and filing and use of paper and printing facilities was elicited. This category had five questions

consisting of four questions in a multiple selection format varying between a four and five point scale, whereby participants had to mark appropriate responses. Only one question required a non-numeric response where subjects had to mark either 'Yes' or 'No'. Relevant variables included, the procedures that are followed when receiving e-mail; a distinction between e-mails that are work-related as opposed to non-work related; how much time subjects spend on reading e-mails; how many e-mails are printed; and the training or guidance that subjects receive in using e-mail facilities.

MS Excel software was used for data capturing. The captured data was exported to the application Statistical Products and Service Solutions (SPSS) for data processing and analysis to generate scientifically reliable interpretations inductively. The assistance of professional statisticians has been valuable in the processing, presentation and analysis of the findings.

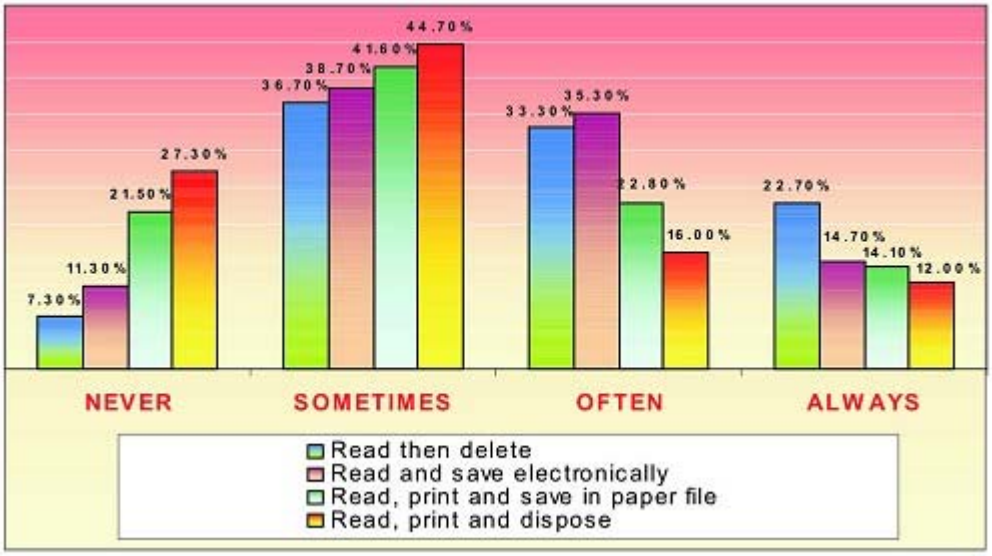
top

4 Findings, analysis and interpretation

It needs to be emphasized that the internal validity of the results has not been jeopardized by any third variable found during the processing of data and analysis of findings. The data sets designed for the purpose of this investigation produced scientifically reliable results with regard to the generalization of findings applied to a corporate population in the education sector. The most significant findings, analyses and interpretations of the study are described below.

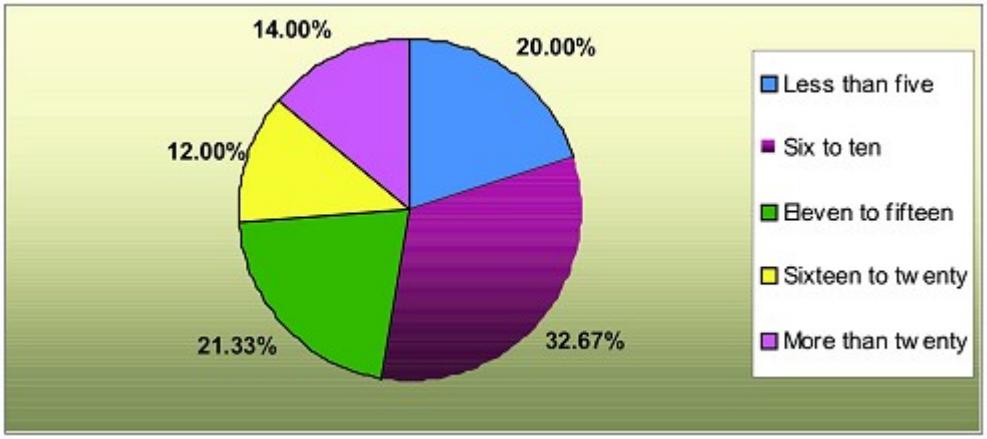
- Only 7,3% of the subjects indicated that they never opened, read and immediately deleted an e-mail, while 36,7% reported that they only sometimes read and immediately deleted it (Figure 1). This cumulative 44,0% might have experienced that they would either respond at a later stage or that the relevant mail did not require their urgent and immediate attention. However, this type of behaviour might have lead to procrastination and congestion of the system. On the other hand, a cumulative 56,0% indicated that they 'often' and 'always' read and then deleted their e-mails. The inferential analysis proves a concern that nearly half of the subjects allowed their e-mail boxes to overflow by not attending to e-mails pro-actively.

Figure 1 How often is e-mail opened, read and deleted?



- On investigating how often subjects read and then saved e-mails electronically after opening them, 11,3% indicated that they 'never' read and then saved e-mails after opening them. A total of 38,7% indicated that they 'sometimes' read and then saved e-mails (Figure 2), amounting to a cumulative 50,0%. Subjects who responded with 'often' (35,3%) and 'always' (14,7%) totalled a cumulative 50,0%. Analysing this result against the background of only a few seconds needed to save (file) e-mails electronically, and technology also allowing users to create folders and sub-folders within a few seconds, reading and then immediately saving e-mails is an efficient practice that saves time and increases productivity. It is therefore inferred that this finding proved that a significant cumulative half of the subjects did not use their e-mail facility effectively.
- With regard to how often subjects opened, read, printedand then saved e-mails in paper files, a positive 21,5% indicated that they never read, printed and then saved e-mails in paper files. It is therefore inferred that only about one quarter of the subjects used e-filing and e-mailing effectively. In further collapsing this result, a cumulative 78,5% (41,6% 'sometimes' + 22,8% 'often' + 'always' 14,1%) read, printed and then saved e-mails in paper files. It is inferred that this proves highly abusive uses of paper, since e-mailing and e-filing were not applied effectively. This not only digressed into unacceptably high levels of paper waste, but also of printing facilities. In addition, it had a negative effect on the environment and productivity, in terms of time wasted on unnecessary manual processes that also extended to increased costs and other areas.

Figure 2 E-mails received during one typical workday



- A total of 20,0% of subjects indicated that they received less than five e-mails per day, while 32,7% indicated that they received six to ten e-mails per day (Table 2). In analysing this result, it shows a relatively ineffective use of the e-mail facility by about half of the subjects. However, analysing the opposite result, a significant cumulative 47,3% indicated that they received anything from 11 up to 20 and more e-mails per day. This analysis therefore infers that e-mail could only be as effective as the user allowed it to be, which clearly was proving the opposite. Potentially, the effective use of e-mail facilities results in well-structured communication channels that in turn will lead to an increase in productivity, allowing employees to spend more time on core business that should be their first priority.

Table 2 Non-work-related e-mails per day

Valid	Frequency	Valid percentage	Cumulative percentage
Less than 5	57	38,00%	38,00%

6 to 10	58	38,67%	76,67%
11 to 15	16	10,67%	87,33%
16 to 20	8	5,33%	92,67%
More than 20	11	7,33%	100,00%
Total	150	100,00%	

- A cumulative 76,6% of subjects reported that they received up to 10 non-work-related e-mails per day, while the remaining 23,3% received 11 and more per day (Table 3). This inferential analysis expounds highly unacceptable volumes of non-work-related e-mails that subjects consequently either replied to and/or printed. This result is therefore interpreted as severe abuse of the corporate e-mail systems, abuse of paper and subsequent counter productivity in addition to the abuse of corporate printing facilities. This finding proves a significant correlation between non-work-related e-mails received and non-work-related e-mails printed per week. Concurrent problems included the unlawful use of e-mail with digressions such as spam and viruses. Many of these illegitimate e-mails contain graphics that are the main cause why organizations are forced to increase efforts to counter and expunge virulent viruses that could cause irreparable damage to vital information.

Table 3 Number of pages of non-work-related e-mails printed per week

Valid	Frequency	Valid percentage	Cumulative percentage
Less than 5	129	86,00%	86,00%
6 to 15	18	12,00%	98,00%
16 to 25	2	1,33%	99,33%
No response	1	0,67%	100,00%
Total	150	100,00%	

- Collapsing this result shows an accumulative 86,0% of subjects who reported that they printed less than five non-work-related e-mails per week and 12,0% indicated that they printed anything from six to 15. A total of 1,33% indicated that they printed 16 to 25 non-work-related e-mails per week. This result indicates a significant increase in paper consumption indicating that the exploitation of e-mail increased the unnecessary printing of documents. This finding infers a severe abuse of paper, printing facilities, systems, company time and funds. In expounding this result by further interpretation and approximation (four weeks per month; 12 months per year, not taking into account public holidays), a multiplication could depict the detrimental impact on relevant resources and loss of productivity.
- No constructive training, e-mailing and e-filing models were available for employees to use as guidance. This was indicated by more than half of the subjects who indicated that they used their own methods. Since it can consequently be inferred that individuals haphazardly devised these methods based on very little accurate knowledge, such a *modus operandi* could result in an ineffective electronic communication facility. This could further digress into a multitude of related damaging processes and procedures that could wind up in detrimental mismanagement. This in turn could involve labour disputes and even legal procedures, to name only a few examples.

Based on the theoretical framework and results as reported, it is clear that the abuse of paper

occurs routinely when using e-mail concurrent with traditional filing methods as opposed to using electronic facilities optimally. Although it is evident that e-mail and paper are abused, electronic communications remain a highly effective and excellent tool for quick and effective global communications. However, the more advanced and innovative abusers become, the more the filtering and countering processes need to be designed, implemented, monitored and maintained.

The following conclusions can therefore be reached:

- It is evident that employees print hard copies unnecessarily.
- E-mail and the Internet have led to a substantial increase in paper consumption.
- Employees abuse their companies' e-mail facilities by transmitting and processing large volumes of personal and non-work-related mail.
- The ineffective use of e-mail facilities is significantly present in all institutions.
- It is evident that electronic communications policies and required training interventions are not provided and progressively monitored by the governing entities.
- There is a clear indication that electronic communication practices are mismanaged in the administrative environments investigated.

top

5 Recommendations

5.1 Recommendations based on findings

The following recommendations could be pivotal in solving, minimizing or eliminating the problems identified by the results of the investigation:

- It remains the responsibility of all users of electronic communications to use them effectively and optimally.
- Employers need to promote and enhance the importance of electronic communications facilities instead of the traditional methods.
- Managers should lead by example and facilitate the effective countering of paper abuse by providing the necessary policies, electronic logistics and infrastructures. These should be closely monitored, maintained and upgraded regularly.
- It is recommended that employees should centralize the sharing of printing facilities, rather than allocate one printer per employee. Such an approach will allow for better control over equipment as well as the consumption of paper.
- In the interest of best practice, it is recommended that all electronic communications users should be subjected to compulsory training interventions regularly.
- Information technology departments should monitor systems, processes and procedures closely and take corrective action where necessary.
- Applicable monitoring departments should strictly regulate the receipt of and responses to personal or non-work-related e-mail.
- Appropriate regulation and corporate awareness campaigns could be valuable to prevent and curtail systems and paper abuse.
- One of the most important aims in the effective use of e-mail should focus on reducing the consumption of paper to structure effective and environmentally friendly communication processes concomitant with effective e-filing.
- A well-structured electronic communications model could prove to be invaluable.

5.2 Recommendations for further research

- Data for the study were collected at HEIs but it could be possible that a similar

scenario exists in other sectors. Therefore, bearing evidence of the external validity of the results, the data sets used could be valuable in the replication and comparative study of an investigation based on different populations and samples such as the private and public sectors. This could follow the approach of a longitudinal replication at regularly scheduled intervals to determine whether the problem under investigation is improving or deteriorating over an extended period.

- This article reports on only two of many features of electronic communication, namely e-mail and e-filing. It is therefore recommended that other e-mail features also be investigated. These could include the use of electronic diaries, voting, calendars, tasks, reminders, lists of contacts, archiving and meeting requests, file properties (date and time stamps), or cellular and computer telephone integration visualizing synchronization.

top

6 References

Anon. 2006a. Ways of approaching research. Quantitative designs. Experimental research designs. Descriptive design. [Online]. Available WWW: http://www.fortunecity.com/greenfield/grizzly/432/rra2.htm (Accessed 12 March 2006).

Anon. 2006b. The effectiveness of electronic mail delivery versus the delivery of written records. [Online]. Available WWW: http://www/consumerlaw.org/comments_electronic_records.shtml (Accessed 2 March 2006).

ARMA International. 2000. *Glossary of records management terms,* 2nd ed. Prairie Village, KS: ARMA International.

Bothma, M.M. 2006. Combating the corporate paper war: optimising electronic mail and electronic filing. Dissertation. Vaal University of Technology, Vanderbijlpark: [Unpublished].

Cooperman, S.H. 2002. *Professional office procedures*, 3rd ed. New Jersey: Prentice Hall.

Du Pré, R. (Dupre@vut.ac.za). 2005. E-mail sent to staff. [E-mail to: VUT internal mailing list]. Vanderbijlpark. 25 January.

Evans, D.W. 1989. *Secretarial procedures in the electronic office: an integrated approach to IT-based and traditional secretarial practice.* London: Pitman Publishing.

Foreman, J.B. 1959. *Collins contemporary dictionary*. Collins Clear-type Press: Great Britain.

Hopkins, W.G. 2000. Sportscience. Perspectives: research resources. Quantitative research design. [Online]. Available WWW: http://www.sportsci.org/jour/0001/wghdesign.html (Accessed 28 February 2006).

Horn, H. 2002. More paper documents created than ever before: e-mail let printout go up with 40%. *Sake-Beeld* 27 August:2.

Keeling, B.L. and Kallaus, N.F. 1996. *Administrative office management,* 11th ed. Cincinnati, Ohio: South-Western Educational Publishers.

Kingwood Green Information. 2006. Recycling facts. Did you know? Paper facts. [Online].

Available WWW: http://www.kingwoodgreeninfo.org/recyclingfacts.html (Accessed 4 September 2006).

Patterson, B. 2004. Stel beleid oor rekenaars op. *Rapport Loopbane* 28 November:9.

PC Technologies. 1988−1999. *Master skill.* Missouri: Wave Technologies International, Inc.

Rom, N. 2003. Moeg van een ou wat sy e-pos oor en oor druk? *Sake-Beeld* 30 January:9.

Ryerson University. 2006. Judgement sampling. [Online]. Available WWW: http://ryerson.ca/~mjoppe/ResearchProcess/JudgementSampling.htm (Accessed 2 March 2006).

SACOD. 2002. *South African Concise Oxford Dictionary.* Cape Town: Oxford University Press.

Saunders, M., Lewis, P. and Thornhill, A. 2003. *Research methods for business students*. Upper Saddle River: Prentice Hall.

Stroman, J., Wilson, K. and Wauson, J. 2004. *Administrative assistant's and secretary's handbook,* 2nd ed. New York: American Management Association.

Trochim, W.M.K. 2005. Non-probability sampling. [Online]. Available WWW: http://www.socialresearchmethods.net/kb/sampnon.htm (Accessed 2 March 2006).

Van Niekerk, R. 2002. Drukkoste heelwat hoër as wat bestuurders dink. *Sake-Beeld* 27 August:2.

Van Niekerk, R. 2002. Meer papierdokumente geskep as ooit tevore. *Sake-Beeld* 27 August:2.

Van Vleck, T. 2005. The history of electronic mail. [Online]. Available WWW: http://www.multicians.org/thvv/mail-history.html (Accessed 16 September 2005).

Von Keyserlingk, C. 2005. Kan gemorspos getem word? *Sake-Rapport* 28 August:4.

Wegner, T. 2000. *Quantitative methods for making decisions.* Kenwyn: Juta.

Welman, J.C. and Kruger, S.J. 2001. *Research methodology for the business and administrative sciences,* 2nd ed. Cape Town: Oxford University Press SA.

Wilkinson, J.E. 2004. Secretary versus office manager: a paradigm shift. MTech Dissertation. Vaal University of Technology, Vanderbijlpark. [Unpublished].

ISSN 1560-683X

Published by InterWord Communications for Department of Information and Knowledge Management, University of Johannesburg