

**ENGAGING AND APPLYING NEW COMMUNICATION
TECHNOLOGY: A CASE STUDY OF THE USAGE OF
INTERNET AS A SEARCH PRACTICE AMONG BERNAMA
JOURNALISTS**

Ramli Mohamed¹

Aini Hayati Khalib²

Given the scenario of change within the journalism profession vis-à-vis new communication technology, how does the Malaysian journalism industry cope and adapt to this change? More specifically (i) how do Malaysian journalists find information on the Internet and what are their favourite search engines for information/news gathering? (ii) What are the characteristics of the Internet that influence journalists' search practices? (iii) What is the attitude of journalists towards Internet usage in their day-to-day work and what are the perceived successes and failures of the Internet as a source of information? (iv) What is the level of knowledge they possess in terms of technology, in general, and the Internet in particular?

This article attempts at finding answers to the above questions in an effort to examine the impact of new media, the Internet in particular, from the standpoint of the diffusion of Internet usage among journalists, especially with their preference for search engines, search practices, search tools, websites and web-based technologies.

Keywords: Computer application, Online search, Search engine, Digital journalism, Knowledge workers

¹ Ramli Mohamed is a Professor of the School of Communication, Universiti Sains Malaysia, Penang. ramli@usainsgroup.com

² Aini Hayati Khalib was a M.A. candidate of the School of Communication, Universiti Sains Malaysia, Penang.

INTRODUCTION

The arrival of New Communication Technology (NCT) has brought forth a set of opportunities and challenges for traditional media professions, such as journalism (Garrison, 1996). Much of the world's information is becoming computerised. This challenging new context includes new technologies to basic communication processes such as human perception, cognition and expression (Garrison, 1998). The explosion in new media forms caught the attention of communication scholars in the latter half of the 1990s. The number of studies is burgeoning and new ones appearing at a steadily accelerating pace (Singer, 1998). The focus has been primarily on the audience for computer based media forms, particularly on the uses and effects of these new media (Lievrouw & Livingstone, 2002). With the boost of users looking for new information in new places, the mass media industry, in general, seems to have moved to keep its audience's attention by increasingly going online to offer news and information. The audience seems divided between a segment which wants headlines and useful information and another which wants in-depth data documents and context reports. Another qualitative aspect is the unique possibility of the Internet to supply links to story sources (Deuze, 1998a).

According to Garrison (2001), the more experience users have with the Internet, the more often they go online. Fifty per cent of users who have four years or more of online experience go online five or more times daily. Garrison also found that since 1999, almost 90 per cent of United States daily newspapers have been actively using online technologies to search for articles and most of them also create their own news websites to reach new markets (Garrison, 2001). Middleberg and Ross (2001) have chronicled journalists' use of the Internet for the past 10 years. These surveys have been the largest to explore the symbiotic relationship between the media and the Internet. Their findings indicated that journalists' use of the Internet is increasing. In the United Kingdom, a recent study reported that all major national newspapers currently provide online versions of some type (Stanyer, 2001). However, as the journalists' use of the Internet increases, concerns among practitioners are being heard. In a longitudinal study of journalists conducted from 1994 to 1998, concern was raised by respondents about verifying facts of online sources, sites containing unreliable information, lack of source

credibility and badly sourced information. In the same study, there was also finding on the need for newsroom training of online research skills (Garrison, 2000a).

THE FRAMEWORK

Base on the above mentioned studies, we duly recognise the penetration of Internet usage in the newspaper industry. Therefore, it is important to have an understanding on how the Internet is used. The diffusion theory is the most appropriate theory to examine this. The theory provides a necessary context for understanding the adoption process for new technologies. Since some of the earliest diffusion research was published in the 1960s, nearly five hundred diffusion studies by communication researchers have been published (Singer, 1998).

Adoption of new ideas, technologies, and practices takes time in any social system, even a small and highly focused professional system such as journalism. Diffusion of technological innovations has been a widely studied process (Rogers & Singhal, 1996). A subset of this research, diffusion of interactive innovations, has grown in importance with the development of the Internet and, more recently, the omnipresent World Wide Web. Rogers, in his classic study of diffusion, identifies four basic components necessary for diffusion to occur. These are existence of an innovation, communication channels, time and a social system. In fact, Rogers states diffusion of innovation is, simply, the process through which an idea is communicated through certain channels over time to the members of a social system (Rogers & Singhal, 1996).

A number of studies has investigated the diffusion of broadcast television, cable and related new mass communication technologies. Numerous other recent projects have also looked at these mass media and the process of adoption and use. Much literature focuses on adoption of computers in various mass communication situations. Other contemporary studies examine computer adoption and use, Internet dissemination and use, corporate website content and home computer effects on the lives of adolescents (Singer, 1998).

Research on newsroom operations, such as computer pagination technologies, provides an example from the world of print journalism (Russial, 1995). Scholars also have begun to trace the use of computers within the newsroom for a variety of information tasks, for example, data analysis and searches of online records (Davenport, Fico & Weinstock, 2002). Studies by Garrison (1996, 1998, 2000a, 2000b) showed an extensive research in the adoption of computer-assisted reporting. Journalists can consider his studies as a forefront in the studies of the use of the Internet and other interactive media. He has documented among others, an increased use of online information sources and strong perception that these sources can be valuable journalistic tools.

A small body of diffusion research has focused on the use of new technologies for news gathering. Garrison (2001) found that the use of personal computers for gathering information for news stories, also commonly known as computer-assisted reporting, was slowly being adopted in newsrooms. He found that computer use varied depending on task complexity in his study of the diffusion process involving the new reporting tools. He also determined that computers are gaining acceptance as an everyday reporting tool. He also reported that newsrooms had passed the early innovator and early adopter stages, and were, in 1998–99, emerging into the early majority stage. The diffusion theory, he concluded, provides a useful framework to assess computer-based news gathering. Diffusion *within* the newsroom hinges on in-house training and other internal support mechanisms designed to develop a critical mass of computer users (Garrison, 2001).

RESEARCH OBJECTIVES

This study examines the utilisation of NCT and the Internet amongst Malaysian journalists with specific reference to search engines, search practices, search tools, websites, web-based technologies, the attitude of journalists towards technology and the level of acceptance by journalists.

The specific objectives to assess were the following:

- the role of the Internet as an information source as well as the most preferred choice of search engines amongst the journalists;
- the factors that influence journalists in their search practices;
- their penetration and adoption of Internet usage;
- their attitude towards the Internet specifically as a tool for gathering information in their daily work; and
- their knowledge on information and communication technology (ICT), in general, and the Internet in particular.

RESEARCH QUESTIONS

There were four research questions to be examined in this study:

- RQ1* How do journalists find information on the Internet? What are the search engines commonly used by journalists for information gathering?
- RQ2* What are the characteristics of the Internet that influence journalists' search practices?
- RQ3* What is the attitude of journalists towards the use of the Internet in their daily work and what are the perceived successes and failures of the Internet as a source of information?
- RQ4* What level of knowledge is possessed by journalists in terms of technology in general and the Internet in particular?

The study was chosen for its relevance in looking into the ways technologies, in general, and the Internet, in particular, are being fully utilised and applied by journalists in Malaysia as compared to their counterparts in other western countries. The outcome of this research can add to the corpus of literature on the adoption of technologies in Malaysia as well will identify the shortcomings of the technological applications within the profession and the industry.

THE RESEARCH DESIGN

This study used an inductive strategy and data was collected by sending self-administered questionnaires to journalists working in the editorial section in BERNAMA. The sample of journalists consisted of those working in general news, economic news, foreign news, online news (www.bernama.com), the Arabic and Mandarin language service. This sample did not include broadcast journalists. 190 questionnaires were sent and 137 completed questionnaires were received.

This study used BERNAMA as a case study. BERNAMA is Malaysia's leading content provider of up-to-the-minute news updates for newspapers, broadcast stations, global wire services and the Internet. It also provides, for subscription, real-time stock quotes and a business database accessed through the personal computer. BERNAMA's provision of direct access to news and information services empowers companies and organisations with up-to-the-minute news updates, information databases on Malaysia and real-time stock market quotes with analyses and online share trading.

BERNAMA supplies the media, business and government a wide range of news and financial information products. They include real-time news, news photographs, live stock market quotes, investment data and an online database of industry reports and statistics. The audio-visual unit produces news videos, documentaries and corporate presentations.

RESULTS

Demography

Out of the 137 respondents interviewed for this study, a majority were female (58.4%), below 30 years of age (54.7%), almost two-thirds were Malays (59.9%) and a majority of them were degree holders (78.8%).

Employment

A majority of the respondents (67.9%) were employed less than 5 years, 9.5% for 6 to 10 years and 10.2% for 11 to 15 years. Only 3.6% had between 16 to 25 years of service and another 8.8% had 25 years.

Almost 57% of the respondents cited BERNAMA as their first employer whilst others worked elsewhere prior to joining this news agency. Almost 62 per cent of the respondents said that they had basic computer training while the remainder did not.

The Internet and Search Engines

Results indicated that Yahoo! was the *most favoured search engines* chosen by journalists with a mean value of 3.8102, followed by Google 3.1460, Alta Vista 1.2190 and Hot Bot 1.0730. Other major search engines like Alta Vista and Hot Bot were not so popular and this was contrary to that found by Garrison (2000a). In his findings, Yahoo! and Alta Vista were dominant search engines used by the journalists he studied.

When asked what *search strategy* they used for the search engines, a majority said "depending on the type of information" with a mean value of 3.6058. This was followed by the following responses: "key in search site" (3.5182), "familiarity" (3.4526) and "start with major search engines" (3.3212). As the data appeared to be wide ranging, they implied that these respondents were somewhat sophisticated and advanced in their search strategy.

It was revealed that "selection of resources" was the *search tool* favoured by journalists with a recorded mean value of 3.6642. Other search tools like "searchability" followed closely with a mean value of 3.5401, "up-to-date sites" (3.4891), "site stability" (3.4526) and "usability" (3.4161). The other two *search tools*, "link description" and "usage fees", recorded a mean value of 2.7372 and 2.4526, respectively. The data indicated that journalists seemed more diverse in their use of search tools as the mean value recorded for all items did not vary much.

The results showed that journalists seemed to prefer "using user defined keyword" options as their *advanced search option* with a recorded mean value of 3.4088. "Search by categories" recorded a mean value of 3.1533, "search by domain" was 2.7445 and "using dates" was 2.5693. "Use of quantitative search parameters" recorded the lowest mean value at 1.7518.

"Local newspaper sites" and "foreign news agency" sites were commonly cited categories for the *types of websites* journalists preferred to use for information gathering (3.6715 and 3.4745, respectively). "Non governmental organisation" sites came in close with a mean value of 3.3139, followed by "federal government" (2.8832), "commercial databases services" (2.4745) and "state government" sites (2.4380). The data showed that there was a considerable dependence on data from the "local newspaper" and "foreign news agency" sites.

In summary, with regard to the Internet and search engines, this study found that the favourite search engines were confined mainly to Yahoo! and Google. Unlike Garrison's (2000) study, Alta Vista and Hot Bot were clearly least favoured. The respondents reported that they selected their search strategy according to the type of information, by keying in the sites, familiarity and using major search engines. This shows that respondents were somehow very advanced in their search for information. The preferred search strategy indicating the respondents' choice emphasises the point that human beings tend to use the most convenient way to do things.

The search tools selected by respondents depended on the resources available, the searchability, stability and usability of the websites. These findings mirror human characteristics which suggest that journalists are always busy, constantly on the run and not techno savvy enough; might find web browsing a time consuming effort and probably feel that they can find information in the Internet by using the obvious tools and not trying to be more adventurous.

In the advanced search options, respondents clearly preferred to use user defined keywords as this is the easiest and most direct way to extract information. Again, this suggests human traits that prefer convenience and ease over unnecessary hassles. The use of quantitative parameters recorded the lowest mean value, probably due to the fact that this option requires extensive input and can be time consuming.

Respondents seemed to prefer usage of local newspaper websites and foreign news agencies, this pattern showing a dependence on data from established sources. This could be due to the limited level of freedom the press has in Malaysia, which is still very much under the scrutiny of the government. Therefore, news produced must not be against the

government policy and the safest places to look for basic groundwork information are news that are already published by local newspapers and other foreign news agencies deemed suitable.

Factors Influencing Search Practices

Journalists evaluated *good quality websites* as being "easy access" to their daily use with a mean value registered at 3.7664. Other *good quality websites* were those provided by "searchable" sites (3.7299), "valid/accurate information" and "speed" similarly at 3.6788. "Reputable sources", "easy to download" and "minimum graphics" had mean values of 3.6569, 3.6277 and 2.8613, in that order. It seemed that journalists were more concerned on getting easily accessible information and less concerned about the graphics displays on the websites. Conversely, *poor quality websites* were said to be "disreputable content" (3.6788), "inaccurate information" (3.5328), "no attribution" (3.5036), "slow" (3.45) and "not searchable" (3.45).

The main problems identified by journalists were "unreliable information" with a mean value of 3.3285, followed by "truthfulness" (3.2920). Other problems included "lack of site credibility", "no verification", "badly sourced information" and "hard to find sites". Journalists seemed to worry less about information from dubious sources and lack of speed in finding a site.

This study also found that journalists have not *taken full advantage of technologies* available for communication through the Internet. The main resource preferred was "e-mail" with a mean value of 3.4964, "file transfer protocol" 2.3431 and the "bulletin board system" 2.2263. Other tools such as audio streaming technology, Internet telephony, video streaming technology, video conferencing, audio conferencing and push technology were not commonly used.

In sum, we found that the factors which influence search practices include accessibility, searchability, availability of valid information, fast access, reputation and ease of downloading process. With regard to their perceived good and poor websites, they clearly do not favour redundant and needless graphics designs. Major problems faced when using the Internet include unreliable or poorly sourced information, questionable

truth and credibility and difficulty in locating websites. Journalists were less concerned on the lack of speed in finding the sites but placed importance on the reliability of information and truthfulness. This was similar to Garrison's findings (2000a). He identified problems which included lack of verification, unreliable information and lack of contact sourcing. However, his findings showed that journalists were less concerned about truthfulness and lack of speed in finding websites.

Similarly, Katz (1999) identified that the main problems expressed by newspaper journalists were verification of information, unreliable information, badly sourced information and lack of website credibility. However, the respondents did not see technical problems like download time or finding website addresses as problematic.

Attitude Towards the Internet as a Source of Information

Our research found that journalists' attitude towards the *use of the Internet* was that they viewed the Internet as "a tool to get information" (3.1753) and as "a source of information" (3.1606). However, they did not prefer the Internet over the manual/traditional mode (i.e., via faxes, mailed documents or information obtained from personal interviews) of news gathering and they also do not really ignore the conventional mode of obtaining information.

On the level of *knowledge on the use of the Internet*, it was found that journalists do have "good fundamental information on the Internet" (mean value of 3.1387). They had an "early exposure to the Internet" (3.0219) and have "an outstanding knowledge on the Internet" (2.9781). Finally, most of them "did not do computer studies as a course at the university" (2.1679).

Although the journalists interviewed did not take *full advantage of the Internet*, they agreed that the "Internet offers a broader range of information as compared to the traditional method" of seeking information (mean value of 3.416). The "use of the Internet based technologies resources" such as the e-mail, file transfer protocol and others amongst them recorded a lower mean value of 3.102. The journalists "did not consider the Internet as their first choice of information source" (2.730) nor were "willing to use the Internet after office hours" (2.854).

Engaging and Applying New Communication Technology

The journalists perceived the Internet as a success in terms of "its ability to retrieve information faster" and "give added depth information" they required. These options had a mean value of 3.431 and 3.307, respectively. Journalists also established that the Internet is able to build a solid background on news and make it easier for them to locate important news items.

Journalists perceived the Internet as failures on the time factor as searching for information by the Internet can be "time consuming" (2.912). "Lack of expertise and training" on the use of the Internet recorded a mean value of 2.8686, whereas "not taking full advantage of online facilities" such as the Internet based technologies had a mean value of 2.8540. "Difficulties in accessing Internet online" recorded a lowest mean value of 2.7883.

In general, the attitude of the journalists toward the Internet is positive. This study clearly showed that they viewed the Internet as an information source and a tool to gather news. However, journalists do not prefer the Internet over the normal method of obtaining information; they will also not totally abandon the normal ways of gathering information.

They do have a strong basic knowledge of the Internet but did not acquire it through formal training. Presumably their knowledge stemmed from their work experiences. They also perceived that the Internet do offer a broader range of information compared to traditional methods and they also use Internet-based technologies. However, they did not view the Internet as the main choice of information sources and these findings correlate with the data obtained for their attitude towards the usage of the Internet.

Generally, journalists perceived the Internet as a success in terms of its ability in retrieving news faster and its capability in providing in-depth information. Nevertheless, browsing through the Internet can be time consuming and journalists perceived this as the Internet's most obvious handicap.

Knowledge on ICT and the Internet

We found that all of the 137 respondents were fully aware of the use of computers in their work place. 63.5% were aware of the number of people using computers as compared to the other 36.5%. More than 50% of the respondents use laptops or notebooks when they are on the field. Almost 97% of the respondents knew what type of computer hardware they are using – 83.9% Pentium, 9.5% Celeron and 2.9% Athelon.

Almost half (49.6%) of the respondents use Window XP as the operating system, 24.8% Window 2000, 23.4% Window 98 and 2.2% indicated that they did not know the type of operating system they are using. On the speed of the modem, 45.3% said Integrated Services Digital Network (ISDN), 27.7% Broadband and 8% Streamyx. Almost 19% did not know the modem speed.

Almost three-quarters of the journalists interviewed used floppy disks as the storage medium, 11.7% digital tape and 4.4% optical disks. Almost 11% did not know the type of storage medium they use. Microsoft Word appeared as the most popular type of word processor used by 88.3% of the respondents while the remainder did not know the type of word processor they are using.

Almost 95% of the respondents use Microsoft Excel as the *spreadsheet software* and 87.6% use Microsoft Access. SPSS was the *statistical package* mostly used by respondents with 83.9% respondents, followed by SPC with 2.2% respondents. The balance of 13.9% implied that they did not know on these kinds of software packages.

On the *personal information manager* software, 92% respondents chose Microsoft Outlook, 2.9% chose Lotus Organiser and 5.1% indicated that they did not know. As for *software programming*, 90.5% chose Microsoft Basic, 4.4% for Borland C++, 2.2% for Borland Delphi and the balance of respondents which represented 2.9% suggested that they did not know.

On the *communication software*, 43.1% of the respondents chose Window Hyperterminal, 31.4% chose pcAnywhere, 16.8% chose Crosstalk, 7.3% for Hyper Access and 1.5% implied that they did not know.

Engaging and Applying New Communication Technology

Respondents seemed to *use the Internet* quite frequently as shown from the table; 91.2% used it daily whereas only 8.8% used it once a month. No respondents recorded other options like "more than once a month" and "never". Almost 54% of the respondents agreed that they knew the *online services* they had *recently* used as compared to the other 46.7% who claimed they did not. In addition, 56.2% agreed that they knew the type of online services they *frequently* used in their daily work as compared to 43.8% of the remaining respondents.

Results revealed that of online services regularly used by journalists, Reuters emerged first with 74.5% chosen by respondents, followed by Associated Press (67.9%), non-government organisation (NGO) websites (63.5%), federal government websites (59.9%), states government websites (41.6%), others (24.8%), Microsoft Network (17.5%), Dow Jones (17.5%) and Lexis/Nexis (1.5%). Data Times and Compuserve were not chosen by any respondent.

In summary, our research found a high level of awareness on ICT and the Internet amongst the journalists interviewed. They are aware of the computerisation of their work place with a large majority using the Internet on a daily basis. On the questions pertaining to the hardware and software programmes used in their work, respondents showed a considerable awareness on the terms used. The questions were not targeted to test the respondents but to gauge their understanding and grasp of computer jargons.

These findings can be linked to the demographic data of this research which found that more than 50% of the respondents were below 30 years of age and nearly 80% of them were degree holders. Youth and higher education level could have contributed to the high level of knowledge of the computer and the Internet.

Online services that were regularly used by respondents were Reuters, Associated Press, NGO websites, federal government and states government websites; all of these online services recorded a high level of frequency usage. There were similarities in these findings compared to data obtained for RQ1, again suggesting the dependency of respondents on existing and already published information.

DISCUSSION

The Internet and Search Engines

The findings in this study indicated that BERNAMA journalists did use online resources extensively. Yahoo! and Google turned out to be the most favoured search engines. This is in contrast to the Garrison (2000b) research of "World Wide Web Use in Newsroom, 1997–1999" which spanned three years of research, showing that Yahoo! and Alta Vista were the most favoured search engines.

It can be conjectured that Yahoo's popularity was probably because of its features that have the best, most detailed web directory, making it an excellent choice for exploring a subject and to find out what is available on the Internet. Yahoo! is also a good place to start when you need general information on a topic, or when you are not quite sure what you are looking for but have a sense that you will recognise it when you see it (Glossbrenner & Glossbrenner, 2001).

Google covers more of the Internet than any other search engines. Since Google's method of ranking websites is based on link popularity (the more links to a particular site, the higher its ranking). It is known for its thoroughness and this works especially well for general searches. Google's database is the largest of all the leading search engines with more than 1.2 billion web pages (Glossbrenner & Glossbrenner, 2001).

Alta Vista is a good search engine for finding obscure facts and figures. It is a favourite professional search because of its large database, powerful search features and search customisation options. It was first launched in 1995, earlier than Google – hence its popularity in Garrison's study. Google was only introduced in 1998 and is the newest search engine in the Internet. Due to its gigantic database, whenever we do a Yahoo! search, we are actually searching both the Yahoo! directory and Google (Glossbrenner & Glossbrenner, 2001). Therefore, it is not surprising that in this research, Yahoo! and Google emerged as the most favoured search engines.

The search strategies used by respondents depend on the type of information, keying in search sites, recognising and starting with a major search engine. These findings described a wide range of personal

approaches. This suggests considerable experimentation and trial-and-error approaches during learning. It also shows that the habit of search strategies practised by the respondents had probably evolved through time and it has made them not totally dependant on any particular strategies.

According to Ward and Hansen (1997), successful searchers must deploy a variety of strategies. Bates (1999) pointed out that curiosity, use of an iterative or repetitive process, personal expertise, analytical abilities and knowledge level are among other factors that can be accredited to the accomplishment of successful searchers. In Garrison's study in 2000, the search strategy pattern also had a wide range of personal approaches but the favourite option was to start the search with a major search engines. However, our research found that the search strategy depends on the type of information as the most favoured search strategy. The results of this study and those of Garrison's indicated that journalists like to use the keyword search strategy in their online research.

According to Glossbrenner & Glossbrenner (2001), to be an effective searcher you need to be quite good at coming up with the right keywords. Therefore, choosing the best keywords is the essence of effective searching. Nevertheless, as mentioned earlier, we cannot deny the human elements of using the easiest way out in performing daily tasks. Starting their search by keying in the exact type of information, journalists prefer the most convenient way of conducting their search.

Paul and Williams (1999) listed the characteristics of the search tools that determine quality: a selection of resources, site stability, currency, usability, searchability, listing, usage fees and link descriptions. Our research on search tools showed a wide range of usage, which suggested that respondents use various search tools when trying to locate information. In this research, journalists chose the selection of resources as their favourite search tool.

The selection of search tools has significant impact in locating information on the Internet (Glossbrenner & Glossbrenner, 2001). The result in this research showed that human elements were evident in the daily work pace of journalists as they preferred to use an obvious means

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of search tools without having to deploy other more adventurous methods. However, the collected data on the wide range use of search tools suggested that journalists might be more exploratory in their searches if time permits.

The absolute capacity and complexity of finding information on the Internet can be frustrating. In this research, the limited uses of certain advanced search options have generated questions about the effect such practices have on news content. Advanced search options are always identified as the way to search for authoritative information as sometimes, the sheer volume of the Internet can be overwhelming (Glossbrenner & Glossbrenner, 2001). Our respondents in this study used advanced search options and they preferred user defined key words; this finding again suggested human behaviour that prefer ease over needless inconvenience. Thus, by not exploring more, journalists might not be producing quality news content. Garrison (2000a) found that advanced search options were not used by all journalists; his other study (2000b) showed that advanced search options were used depending on the role of individuals in a newsroom. In these two studies, Garrison concluded that the lack of usage of advanced search options was probably due to the journalists' unawareness of such procedures or they were satisfied with basic facilities.

The use of local newspaper sites and foreign news agencies as leading sources of information showed that BERNAMA journalists were using the new technologies in the old way – by using credible sources of information faster and in a more comprehensive way. Garrison's study (2000a) showed that the use of government sites was the leading information source. Both of these findings implied that journalists favoured existing news and government data. This is probably due to the fact that information obtained from these sources can give more credence to the news. However, there is no research that indicates that the type of websites can bring in new perspectives of information uses in news reporting. Nevertheless, more research is needed in this area.

Factors Influencing Search Practices

Respondents had indicated concern for basic quality issues in the gathering of information. The BERNAMA journalists were more concerned about accessibility, searchability, validity, speed, reputation

and download possibilities, these being essential characteristics for good quality websites than the display of the graphics on the websites. This correlated with their opinions regarding the poor quality website options; their responses were wide ranging on the given options of disreputable content, inaccurate, slow and not searchable information, no attribution, difficulty of downloading and pointless graphics. These findings were similar to those in a study done in Germany where it was found that journalists sought well structured sites with more information on content rather than graphics (Singer, 1998). The finding also suggested that respondents were concerned about the same quality of information that might have been obtained via normal ways of obtaining information (faxes, mailed documents or information obtained from personal interviews).

The main problems journalists faced when using the Internet included unreliable information, truthfulness, website credibility, verification on website information, badly sourced information and difficulty finding sites. BERNAMA's journalists were less concerned about the lack of speed in finding the sites but emphasised the necessity that of the information gathered from the Internet be reliable and true.

The results corroborated Katz's (1999) study wherein he identified that the leading concerns expressed by newspaper journalists were verification of information, unreliable information, badly sourced information and lack of website credibility, technical problems such as download time or finding site addresses were not perceived to be as critical. Another aspect derived from the findings was the factors identified as the leading problems were similar to the customary features of information sources that were critical to the content of news produced.

BERNAMA's journalists did not take full advantage of the Internet-based technologies since a large majority used it for e-mailing purposes only. According to Pavlik (1999), electronic mail has emerged as a replacement for some communication functions in the public and private sectors. For many users, it has supplemented the telephone, especially for calls that require long distance and international tolls. The findings shared the same result with a study done by Maier (2000). He found that

half of the newspapers represented in his study of computer-assisted reporting trainers used electronic mail in 1999.

In a different study done by Reavy (2001), it was found that electronic mail has become the most important tool of the Internet for journalists. He observed that journalists were learning to take advantage of its speed, low cost, convenience, flexibility, power and security. Despite the equipment and computer literacy requirement, occasional language complication and accessibility problems, Reavy also observed that journalists use electronic mail to locate hard-to-find sources and to reschedule interviews. The popularity of electronic mail was probably due to its features that does not require the recipient party to be available at the time it is sent; it is efficient because it saves time and money in the transfer of information such as texts and attached graphics, formatted documents, software and multimedia contents. It has also encouraged some people who would not have been writers or correspondents, to communicate in written form because of its informal nature, its ability to create recipients and forward messages is also seen as an advantage of its use (Courtright & Perse, 1998).

Attitudes Towards the Internet as a Source of Information

Based on the findings, it can be said that there is a high diffusion of technology among BERNAMA journalists. The high mean value on the attitude, knowledge and awareness on the advantages of the Internet supports this. This strong acceptance of technological use was also found in a survey by Middleberg and Ross (2001) which indicated that journalists appear to enjoy using new technologies.

All BERNAMA journalists were exposed to the technological environment. They agreed that the Internet and computer knowledge are necessary in the area of print journalism. This result was similar to that found in Middleberg and Ross (2001), indicating that journalists who ignore the Internet will not be competitive in the future. A study done in Greece by Veglis et al. (2005) suggested that there was a high diffusion of information technology in the journalistic profession in Greece.

The journalists in this study perceived the Internet as a success based on its ability to retrieve news faster, give added depth information, build a solid background on news and make important facts easier to locate. The

perceived failure of the Internet is wide ranging. Time factor and lack of training top the list, followed by not taking advantage of online facilities and difficulties on the online access. The time factor arises because of lack of training. Those who do not have basic training may find the task of searching the Internet as overwhelming and this can mean that surfing the Internet is time consuming.

The lack of training problem is also a feature in the Middelberg and Ross (2001) study where they reported that most journalists in the United States have only adequate skills. Due to this, journalists seem blind to many of the ethical issues and the dangers that the professional use of the Internet presents. Similar results were also found in a study by Veglis et al. (2005) where the journalists believed that they need training in information technology. Pliakos's (2002) survey also found that 41 per cent of journalists working in national newspapers believed that they need similar training.

Knowledge of ICT and the Internet

The findings showed that all respondents were fully aware of the use of computers and the Internet in their work place. More than half of the respondents were aware of the hardware and software systems available at work. This result is similar to that found in the Middleberg and Ross's (2001) survey whereby journalists appeared to be fully acceptable and enjoying the use of new technologies.

The findings also showed a linkage with the demographic variables; data indicated that age and education correlate highly with knowledge of computers and the Internet. This study found that demographic variables had a significant effect on the adoption of information technology. The result supported Roger's diffusion theory, that computer and the Internet usage grows proportionately with the educational level. Younger journalists seemed to have a penchant for computer and the Internet; therefore, it can be concluded that education enables individuals to be more aware of technological benefits and younger people are more creative in performing their tasks.

Veglis et al. (2005) also found that only journalists who had a degree from technical universities have higher computer and Internet knowledge compared to degree holders from regular universities.

CONCLUSION

Several conclusions can be made from this study. First, the value of NCT and the Internet as an information gathering tool is evident in this study. The adoption rate can be considered as relatively high as all of the respondents use computers and the Internet. Computers are clearly entrenched as news gathering tools and the Internet has become essential in the information resources available to journalists. The high level of adoption rate found in this study indicated that NCT and the Internet are useful sources of information for BERNAMA's journalists but they do not totally abandon the normal methods of acquiring information. The high usage of NCT and the Internet has exposed the research habit of the BERNAMA's journalists. They are better prepared in conducting their own research. While we cannot ascertain their research habits prior to the Internet, it is interesting to note that they do conduct their own basic research for their news. Some respondents in this study could have been venturesome or early adopters and others have higher thresholds; but clearly there was no resistance to innovation. It would be interesting to investigate the same scenario using a longitudinal study. Ultimately, BERNAMA's journalists do trust and are comfortable with technology in order to enhance their work.

Secondly, even though the rate of penetration and adoption can be considered as high, journalists have not adequately exploited the advantages NCT and the Internet offer. For example, the data obtained show a high usage of certain search engines which indicates that journalists are still not adventurous in their search behaviour. However, the data also show that the search strategies and tools deployed by journalists are wide ranging. This indicates that their search habits have evolved through time and this pattern can have a significant impact in locating information they require. This has pinpointed one obvious human characteristic – the sampled journalists seem partial to the visible way of obtaining information and avoid any unnecessary hassles. This trait was also indicated in the advanced search option section, pointing to the dependency journalists have on existing and established

information. Clearly, BERNAMA's journalists favour effortlessness as opposed to difficult and time consuming searches.

Finally, it is obvious that journalists are receptive to the innovative communication technologies. While there is a clear indication of their success and motivation to use the tools because of features such as extended coverage, depth, speed in finding difficult-to-find information and sources, there was evidence of some minor resistance. The resistance posed was in the form of the lack of usage of Internet-based technologies, that is, aside from the electronic mail which is the commonly used tool. The reason was not due to the management's reluctance to lead towards adoption but was probably due to the lack of training. The majority of the journalists in this study agreed that they do not have any basic training in either computer use or the Internet. BERNAMA as the country's main news provider should realise this problem and train its journalists to embrace other forms of Internet technologies.

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