DOCUMENTS ORGANISATION STRATEGIES OF OPEN UNIVERSITY MALAYSIA (OUM) POSTGRADUATE STUDENTS

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ABSTRACT

Students doing research would normally download documents from the Internet on to their desktop for later use. However, these documents are not easily found again as the documents are saved indiscriminately in multiple folders on their desktop. This study aims to investigate students' document organisation strategies on their desktop primarily. The study includes 128 Open University Malaysia (OUM) postgraduate students with personal desktop of at least 10 Portable Documents Format (PDFs) files. Personal Information Management (PIM) is an interesting research field exploring individual's activities of acquisition, organisation, maintenance, retrieval and sharing of information (Lush, 2014). Research has shown that PIM activities have an important influence on the learning processes, particularly university students engaging in many documents from various sources (Jacques & Fastrez, 2014). Data regarding their personal desktop documents were collected using survey method. The questionnaire was administered using Google Form. Two distinct categories of students' organisation strategies were identified in this research, which are piling and filing. A discussion of these results is provided. We will then recommend personal information management organisation strategies for postgraduate students doing their research project. A proper information management organisation strategy will lead to the development of efficient information management skills of the student.

Keywords: *Organisation Strategies, Personal Information Management*

INTRODUCTION

Students doing research would normally download documents from the Internet on to their desktop for later use. However, these documents are not easily found again as the documents are saved indiscriminately in multiple folders. This study aims to investigate student document organisation strategies on their desktop primarily.

Background

Document management involves the process of accessing, managing and maintaining documents in a particular format (Bergman, Boardman, Gwizdka, & Jones, 2004). The most common document management system used by students on their desktops is the hierarchical folder system integrated within their computer operating system. A well-structured hierarchical structure can keep documents organised. Documents are stored in folders and sub-folders. A document can be found by accessing it through a particular path in the hierarchy.

However, this is not an ideal situation for most students, as they are unsure where the document is located as the documents are saved indiscriminately in multiple folders on their desktops. It takes a long time to retrieve a document that they had seen before, or they may not be able to find it in their desktop, and need to search for it on the internet all over again.

Personal Information Management (PIM) is an interesting research field exploring individual's activities of acquisition, organisation, maintenance, retrieval and sharing of documents (Lush, 2014). These PIM activities helps in understanding the students' personal document organisation strategies. Personal documents in this context means documents that have either been created by the students or documents that they have acquired for their research.

Therefore, it is necessary to research how students manage personal documents, and which PIM strategies (if any) they use in doing their research. This research leads to an organisation strategy that is useful in the development of efficient information management skills of the student.

RELATED WORK

To understand the nature of document management, we looked deeply into the literature of personal information management. Bergman, Boardman, Gwizdka and Jones (2004), have defined three main activities for Personal Information Management: keeping, finding/re-finding, and organising. All of these activities affects a different aspect of student's engagement with the documents. Keeping activities affect information input, whereas finding/re-finding activities affect information output. The activity that affects information storage includes information maintenance and organisation, which is the focus of this study.

When doing research, students create new documents, download journal papers in PDF, and manage other documents pertaining their research subject. As the cost and availability of mass storage devices is not an issue nowadays, students can store a lot of documents in their desktops, eventually exceeding their capacity to manage the documents effectively. This results in students having difficulties in the organisation of their documents, and also finding the document that they have seen before (Dumais, Cutrell, Cadiz, Jancke, Sarin & Robbins, 2003). These students now spend a lot of time searching for their document, navigating within their sub-folders (Fitchett, Cockburn & Gutwin, 2013).

Research has shown that PIM activities have an important influence on learning processes and particularly on university students who engage with many documents from various sources (Jacques & Fastrez, 2014). As individuals, improved PIM means better use of precious time (time, money, energy, attention), and in organisations, better PIM improves employee productivity, which leads to better teamwork.

Folder Hierarchies and Document Management

A document is a collection of data or programs stored under a single name, having a format (text, graphic image, audio etc.) and size. A folder or directory refers to a location in the operating system which contains a list of documents or subfolders. Usually a folder name describes the documents within it, and it may contain none for thousands of documents. The folder hierarchy is normally used for the organisation of personal documents in a computer desktop. The hierarchy allows users to create personal classification scheme that is based on their current research interest. For example, a student may create a folder called "literature notes", and another called "interesting". Only that student may have the idea of which document goes into which folder, and why. Also, the hierarchy method requires students to remember the category or location that the document is saved in. There are many studies done on the folder's role in document management (Barreau, & Nardi, 1995). These papers triggered further discussions on users' browsing and searching behaviour in the process of finding documents.

One of the strengths of the hierarchical folders and sub-folders is that students are familiar with it, as most operating systems including Microsoft Windows use the hierarchical file system to manage and organise documents. However, as soon as the number of folders and sub-folders increase, so does the task of managing the hierarchy (Fitchett, Cockburn & Gutwin, 2013). Despite its advantages, the hierarchical structure has some drawbacks, where the documents have to maintained in order to make them relevant to the current need of the research, since the document may get outdated or irrelevant. PIM's activities of document organisation, maintenance and retrieval makes good sense in our research on document management as the problem of document management is essentially the problem of efficient organisation and effective re-finding (Teevan, 2007). In our study, we mainly focus on the process of document organisation using folders hierarchy.

Personal Information Management and Organisation

Personal documents navigation involves a two-phase process. Firstly, students manually traverse the organisational hierarchy until they reach the folder where the document is stored. Secondly, they locate the file within that folder (Bergman, Beyth-Marom, Nachmias, Gradovitch, & Whittaker, 2008). However, before the students can do this process, they will have to use organisational strategies to store the documents. Previous researches have indicated two main organisational strategies for PIM which is Piling and Filing (Malone, 1983), and is shared by other current researchers (Hardof-Jaffe, Hershkovitz, Abu-Kishk, Bergman, & Nachmias, 2009); (Trullemans, & Signer, 2014). Malone (1983) describes piling as documents heaped on top of each other in reverse chronological order, and this pile may or may not have classification or a label. The opposite is for filing, where documents are categorised and stored with labels. Malone (1983) found that piles are useful for smaller collections as the user could remember the location of the document in a certain pile, and document at the top of the pile would remind him/her of some associated task. However, when the piling gets larger, the user could not easily find the documents. Malone's finding of filers doing better than pilers in retrieving the document when the document is filed in folders and directories with labels describing their category, whereby the documents were piled in the My Documents or other such root directory.

PIM literacy (Mioduser, Nachmias, & Forkosh-Baruch, 2008) an integral and centric part of the students' learning process, and having an information archive, students can construct knowledge. This constructive learning approach emphasis to the fact that knowledge is constructed through a process in which students actively integrate new knowledge with previous knowledge (Brooks, & Brooks, 1993). During the process of information seeking, students need to have organisational skills such as naming, sorting and categorizing (Lansdale, 1988).

We start by describing the methodology used in our study and then present the results of the study. This is followed by a discussion of new opportunities and an outline of organisational strategies for postgraduate students at Open University Malaysia.

METHODOLOGY

In our research, we would like to investigate students' document organisation strategies in their desktops primarily by administering a questionnaire, and collecting the results. Our study method consists of an online questionnaire with 13 questions. This questionnaire was administered using Google Forms with the link to the online form sent through email to all students currently enrolled at Open University Malaysia in the Masters and PhD programmes. The participants of our research were informed that the collected data would be used for scientific research as well as in scientific publications. Furthermore, they were ensured that their data would be treated confidentially and be fully anonymised when used in publications.

Data Collection

For the purpose of this research, we have designed an online questionnaire which focuses on investigating students' document organisation strategies in their desktops primarily, especially on their document organisation structure and how they create and use folders. Our online survey allowed us to collect data anonymously from a large number of students currently doing their masters project and PhD research. There were 6 demographic questions which required them to choose an option from a few options provided. Apart from these demographic questions, the survey contained quantitative questions using a 5-point Likert scale. It is worth mentioning that some of the survey questions investigating document organisation and use of folders have already been identified by previous research. The survey conducted using Google Forms contained 3 groups of questions:

(i) Questions related to a participant's demographic information such as the participants age, gender, postgraduate level, number of years using a computer, operating system used and how long they have started their research.

(ii) Questions related to a participant's creation and use of folders.

(iii) Questions related to a participant's document organisation structure.

In the questionnaire, participants are also asked questions regarding their organisation of documents and about creating and using folders. The questions are F1 to F4 for foldering and O1 to O3 for organisation.

Population

The link to the online survey was sent via email to students in the Open University Malaysia's Masters and PhD programmes. Given the focus of our research, we choose to recruit the participants from a population of postgraduate researchers as they represent a group of knowledge workers who frequently use documents and have been using the computer for more than 10 years. It is worth mentioning that other groups such as undergraduate students or staff at Open University Malaysia could also be considered as knowledge workers since they frequently use documents. However, we believe that postgraduate students are more engaged in associating information when reading and writing scientific articles. In total, 128 students completed the 10-minute survey in a span of 7 weeks. Our sample includes Master's students (n = 102), and PhD students (n = 26). The 128 participants consisted of 59 female and 69 male participants, with highest number of participants (n = 38) from the 36–40 age group. Most of the participants (n = 93) have been using the computer for more than 10 years. Participants using Microsoft Windows operating system (n = 118) far exceed the participants using Mac Os (n = 9) while one student is using other types of operating system. It was also important to know how long the participants have started their research to know how many document they would have accumulated. There are 29 participants who have started their research in the past 1–6 months, 62 participants in the 6 to 18 months and 37 participants for more than 18 months. Note that given the population, the results of our research might be generalised for the community of postgraduate students and not necessarily for other knowledge workers.

Data Analysis

The collected quantitative data was analysed using descriptive analysis in SPSS. Data analysis was done with the aim of investigating students' organisation strategies. Table 1 presents the categorisation to the participants as F1 and F2 as foldering and O1 and O2 as organisation.

Table 1: Categorisation of Questions to Participants

Question ID	Question	Category
F1	Folder names are easy to create.	FOLDERING
F2	It is easy to assign my files to the folders that I create.	
O1	I am satisfied with my document organisation structure.	ORGANISATION
O2	My files on the computer are well organised.	

RESULTS

This study aims to describe students' document organisation strategies in their desktops primarily. We were able to collect information about the foldering and organisation students' documents. In this section, we describe the descriptive statistics for the information gained in the questionnaire.

In the first question of the number of folders the students created in their computer related to the research, it was found the percentage of folders were highest for more than 5 which was 39.8, as well as the percentage of folders for 3 – 5 is also high which is 37.5.

The number of files in average a student keeps in the folder that is related to their research is also highest for more than 5, which is 66.4. The lowest percentage for files that are less than 3 per folder which is only 8.6.

When asked to describe where the students kept their documents, giving them three choices which are either to create a new folder, keep the files in the Desktop/ My Documents/ Download and existing folders, most (n = 79) of the students created new folders when saving their documents. This clearly relates to the filing organisational strategy used by the students.

Table 2: Document Organisation Strategies Descriptive Statistics

		Frequency	Percent
How many folders have you created in your computer related to your research?	0 - 2	29	22.7
	3 - 5	48	37.5
	More than 5	51	39.8
How many files in average do you have per folder related to your research?	0 - 2	11	8.6
	3 - 5	32	25.0
	More than 5	85	66.4
Where do you store your documents related to your research?	Create new folder	79	61.7
	Desktop/ My Documents/ Download	32	25.0
	Existing folders	17	13.3

Using crosstab tabulation, and the categories identified in Table 1, we came up with the relationship between those categories in Table 1 and questions in Table 2. This is done by relating questions "How many folders have you created in your computer related to your research?" and "How many files in average do you have per folder related to your research?" with F1 and F2. While question "Where do you store your documents related to your research?" was related to O1 and O2 respectively. It can be

seen that the majority of the participants (n = 32 for F1) and (n = 53 for F2) have created more than five folders in their computer that is related to their research indicating that folder names are easy to create.

Table 3: Number of Folders Created in the Computer Related to the Students' Research for Different Values of F1

		How many folders have your created in your computer related to your research?			Total
		0 – 2	3 – 5	More than 5	
Folder names are easy to create.	1.0	0	0	1	1
	2.0	0	0	1	1
	3.0	2	5	1	8
	4.0	13	19	16	48
	5.0	14	24	32	70
Total		29	48	51	128

Table 4: Number Files in Average Per Folder Related to the Students' Research for Different Values of F2

		How many files in average do you have per folder related to your research?			Total
		0 – 2	3 – 5	More than 5	
Folder names are easy to create.	1.0	0	0	1	1
	2.0	0	0	1	1
	3.0	3	2	3	8
	4.0	5	16	27	48
	5.0	3	14	53	70
Total		11	32	85	128

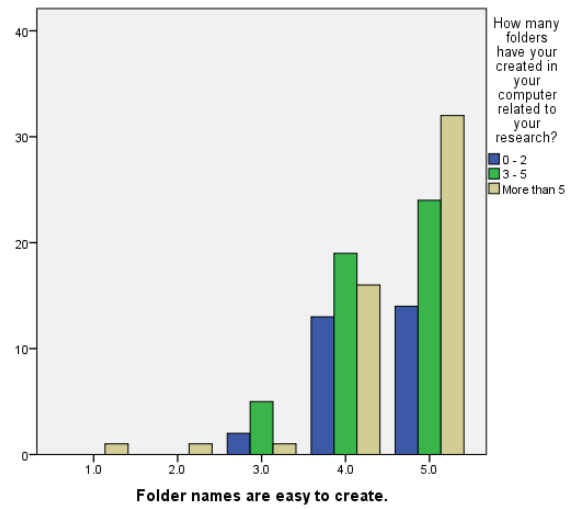

Figure 1: Number of folders created in the computer related to the students' research for different values of F1

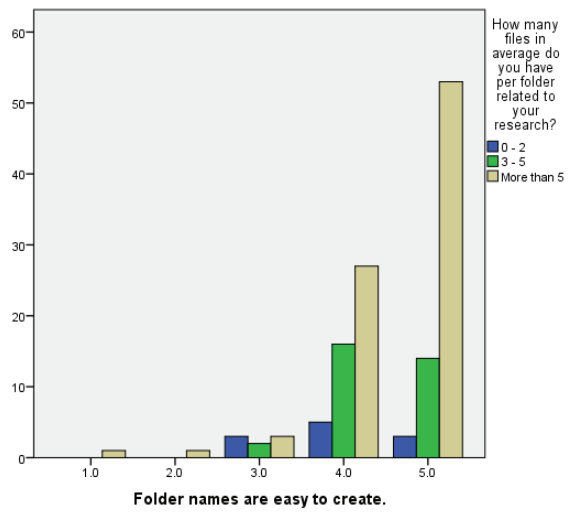

Figure 2: Number files in average per folder related to the students' research for different values of F2

Likewise, the majority of the participants (n = 30 for F1) and (n = 50 for F2) have created more than five folders in their computer that is related to their research as they found it easy to assign files to the folders that they have created.

Table 5: Number of Folders Created in the Computer Related to the Students' Research for Different Values of F1

		How many folders have your created in your computer related to your research?			Total
		0 – 2	3 – 5	More than 5	
It is easy to assign my files to the folders that I create.	1.0	0	0	1	1
	2.0	0	1	2	3
	3.0	3	3	0	6
	4.0	15	22	18	55
	5.0	11	22	30	63
Total		29	48	51	128

Table 6: Number Files in Average Per Folder Related to the Students' Research for Different Values of F2

		How many files in average do you have per folder related to your research?			Total
		0 – 2	3 – 5	More than 5	
It is easy to assign my files to the folders that I create.	1.0	0	0	1	1
	2.0	1	0	2	3
	3.0	3	2	1	6
	4.0	6	18	31	55
	5.0	1	12	50	63
Total		11	32	85	128

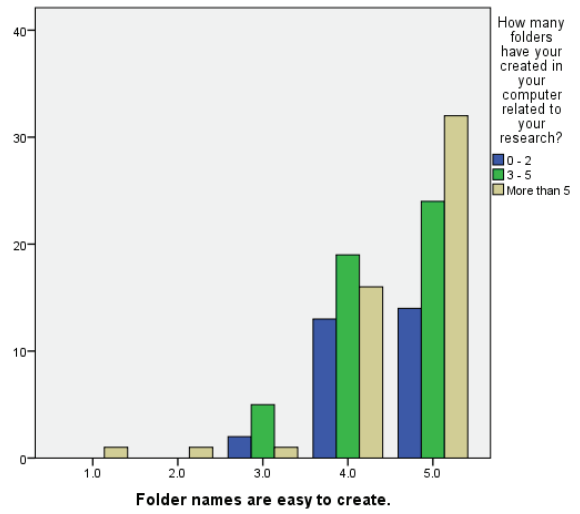

Figure 3: Number of folders created in the computer related to the students' research for different values of F1

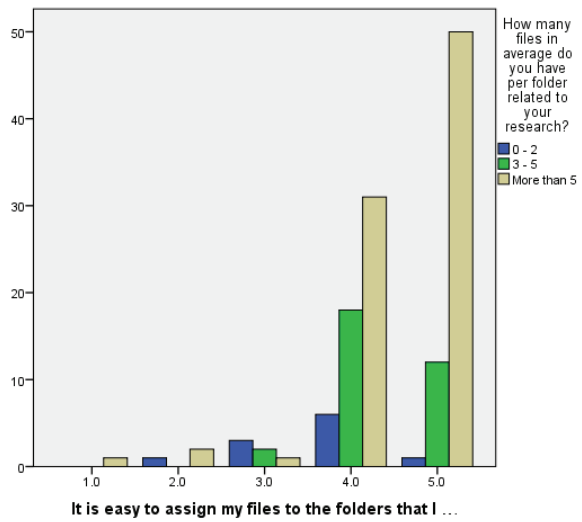

Figure 4: Number files in average per folder related to the students' research for different values of F2

It can be seen that the majority of the participants (n = 58 for O1) and (n = 61 for O2) who have chosen a Likert scale of 4 and 5, chose to create new folder in their computer when saving documents that are related to their research. This signifies that majority of these participants have a proper PIM organisation strategy.

Table 7: Locations of Stored Documents Related to the Students' Research for Different Values of O1

		Where do you store your documents related to your research?			**Total**
		Create New Folder	**Desktop/ My Documents/ Download**	**Existing Folders**	
I am satisfied with my document organisation structure.	1.0	1	0	0	1
	2.0	3	2	1	6
	3.0	17	8	5	30
	4.0	41	17	6	64
	5.0	17	5	5	27
Total		79	32	17	128

Table 8: Locations of Stored Documents Related to the Students' Research for Different Values of O2

		Where do you store your documents related to your research?			**Total**
		Create New Folder	**Desktop/ My Documents/ Download**	**Existing Folders**	
My files on the computer are well organised.	1.0	1	1	0	2
	2.0	5	3	1	9
	3.0	12	7	6	25
	4.0	44	16	7	67
	5.0	17	5	3	25
Total		79	32	17	128

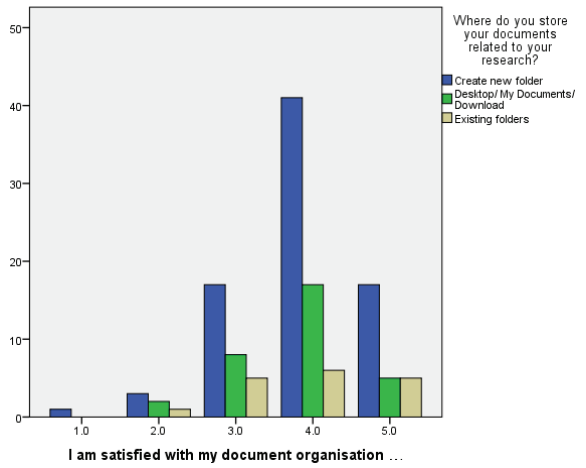

Figure 5: Locations of stored documents related to the students' research for different values of O1

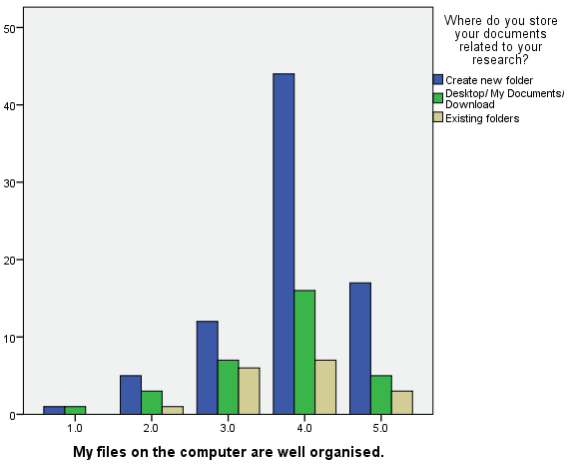

Figure 6: Locations of stored documents related to the students' research for different values of O2

DISCUSSION AND IMPLICATIONS

The main purpose of this study was to investigate students' document organisation strategies in their desktops primarily, and as indicated by the results above, the participants were grouped into two major organisational categories which is piling and filing (see Table 2). The filers were more satisfied in their document organisation in their desktops. Therefore, the more properly organised they were in their document organisation skills, the easier and faster they would retrieve the document when needed later.

CONCLUSION AND RECOMMENDATIONS

Our results show that while there are elements of organisational skills used by students in order to create and use folders to find their documents easily, there is still room for improvement. This study is a preliminary finding for the organisational strategies of postgraduate students at Open University Malaysia. In our next paper, we aim to investigate the number of files and folders in each of the student's desktops in order to enhance our understanding of students' Personal Information Management activities and reveal how student actually manage personal information items in their desktops.

REFERENCES

Barreau, D. K., & Nardi, B.A. (1995). *Finding and Reminding: File Organization from The Desktop*. SIGCHI Bulletin, 27(3), 39–43.

Bergman, O., Beyth-Marom, R., Nachmias, R., Gradovitch, N., & Whittaker, S. (2008). *Improved Search Engines and Navigation Preference in Personal Information Management.* ACM Transactions on Information Systems, 26(4), 1–24. doi:10.1145/1402256.1402259.

Bergman, O., Boardman, R., Gwizdka, J., & Jones, W.P. (2004). *Personal Information Management. In CHI '04 Extended Abstracts on Human Factors in Computing Systems*, *1598–1599*. Vienna: ACM Press.

Brooks, J. G., & Brooks, M.G. (1993). *In Search of Understanding: The Case for Constructivist Classrooms. Alexandria.* VA: Association for Supervision and Curriculum Development.

Dumais, S., Cutrell, E., Cadiz, J.J., Jancke, G., Sarin, R. & Robbins, D.C. (2003). *Stuff I've Seen: A System for Personal Information Retrieval and Re-use, 72–79.* Proceedings of the ACM Conference on Information Retrieval.

Fitchett, S., Cockburn, A., & Gutwin, C. (2013). *Improving Navigation-Based File Retrieval*. In Proc. CHI'13. 2329–2338.

Hardof-Jaffe, S., Hershkovitz, A., Abu-Kishk, H., Bergman, O. & Nachmias, R. (2009). *Student's Organization Strategies of Personal*. Journal of Digital Information, 10(5).

Jacques, J., & Fastrez, P. (2014). *Personal Information Management Competences: A Case Study of Future College Students (February 2018)*. 319-331. DOI: 10.1007/978-3-319-07731-4.

Lansdale, M. (1988). *The Psychology of Personal Information Management. Applied Ergonomics*, 19, 1 (1988), 55–66.

Lush, A. (2014). *Fundamental Personal Information Management Activities – Organisation, Finding and Keeping: A Literature Review*, The Australian Library Journal, 63:1, 45–51, DOI: 10.1080/00049670.2013.875452.

Malone, T. W. (1983). *How Do People Organize Their Desks? Implications for The Design of Office Information Systems.* ACM Transactions on Office Information Systems, 1, 99–112.

Mioduser, D., Nachmias, R., & Forkosh-Baruch, A. (2008). *New Literacies for the Knowledge Society*. In J. Voogt & G. Knezek (Eds.), International Handbook of Information Technology in Primary and Secondary Education, 23–42. New York, NY: Springer.

Teevan, J. (2007). *The Re:Search Engine: Simultaneous Support for Finding and Re-Finding*. In UIST ’07, 23–32.

Trullemans, S., & Signer, B. (2014). *From User Needs to Opportunities in Personal Information Management: A Case Study on Organisational Strategies in Cross-Media Information Spaces.* In Proc. of DL 2014, London, UK.