


INVESTIGATING THE USE OF PERSONAL INFORMATION MANAGEMENT STRATEGIES BY FACULTY MEMBERS OF THREE MEDICAL SCIENCES UNIVERSITIES IN IRAN

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In this study, the purpose was to investigate Personal Information Management (PIM) activity rate regarding four PIM aspects of acquisition, maintenance, organization, and retrieval of faculty members in three universities, i.e., Tehran University of Medical Science (TUMS), Iran University of Medical Sciences (IUMS), and Shahid Beheshti University of Medical Sciences (SBUMS). The relationship between PIM use and workplace, academic rank, and gender factors were also studied. A Persian-language questionnaire was used to measure PIM performance of participants. Data were analysed using statistical tests. Findings showed that most of the participants preferred desktop computers for saving their personal digital information. Also, the percentage of PIM use by the faculty members was reported as 50-75%. However, no significant associations between PIM use by the faculty members and their workplace, academic rank, and gender were found.

KEYWORDS: Personal Information Management, Behaviour, Storage and Retrieval, Medical Faculty, Iran.

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INTRODUCTION

People spend most of their time for searching, sorting, organizing, finding, and sharing information. In this regard, managing information, especially personal information, is an important issue. The personal information mostly includes information an individual collects, saves and organizes into paper-based or digital tools including web pages, emails, address books, etc. (Sedghi et al. 2015). To overcome the challenges in their management, personal information management (PIM) term has been introduced. There are various definitions for PIM. Lansdale (1988) defines personal information management as the method and procedure, by which we handle, categorise and retrieve information on a day-to-day basis. Barreau (1995) defined PIM in terms of the functions provided by a PIM-system: acquisition, organization, maintenance, retrieval and output. PIM is an emerging research field focusing on the activities by which a person keeps, saves and organizes information items in order to retrieve them later (Bergman et al. 2003). According to Boardman (2004), PIM can be defined as the management of personal information as performed by the owning individual. Jones and Teevan (2007) defined PIM as both the practice and the study of the activities people perform to acquire, organize, maintain, retrieve, use, and control the distribution of information items such as documents (paper-based and digital), web pages, and email messages for everyday use to complete tasks (work-related or not) and to fulfil a person's various roles. PIM research can be organized according to the three main PIM activities: finding (searching and retrieving information), keeping (to storage within an information system), and meta-level activities (research in maintenance and organization) (Jones, 2007). Bergman (2013) studied variables that characterize PIM behaviour. He identified 15 variables grouped in five categories: organization related variables (order, redundancy and name meaning), structure variables (collection size, folder depth, folder breadth and folder size), work process variables (attendance time and modality), memory related variables (memory reliance, dominant memory) and retrieval variables (retrieval type, retrieval success, retrieval time and ubiquity).

Faculty members because of their tasks and interaction with colleagues and students are dealing with large volumes of data; these data includes information that should be studied in order to update teaching, those used for research, and those received from students and colleagues or to be shared with them; therefore, PIM is also important for faculty members. The application of PIM by faculty members can bring more discipline, more efficient use of time, lower cost and energy, reminding projects and work in progress, timely and easier access to information and more cooperation with colleagues and students. Considering previous studies, and lack of enough study on PIM behaviour of medical faculty members in Iran, in this study we aim to investigate the PIM activities among faculty members of three universities i.e.

Tehran University of Medical Science, Iran University of Medical Sciences, and Shahid Beheshti University of Medical Sciences regarding its four aspects i.e. acquisition, maintenance, organization, and retrieval.

RESEARCH QUESTIONS

The research questions for the study are:

- Q1. What are the preferred PIM e-tools of medical faculty members and what are their reasons for PIM use?
- Q2. How much do medical faculty members use acquisition, maintenance, organization, and retrieval strategies to save their personal information?
- Q3. Can workplace, academic rank and gender factors significantly affect activities of the medical faculty members?

RESEARCH METHODOLOGY

We used a survey approach to investigate the goals of the study. First, we investigated the preferred PIM tools and the reason for PIM use by subjects. In order to measure the effect of workplace, academic rank and gender on the PIM activities (acquisition, maintenance, organization and retrieval activities) of subjects, following hypotheses were formulated:

- H1. There is a significance relationship between PIM use and workplace of the medical faculty members;
- H2. There is a significance relationship between PIM use and academic rank of the medical faculty members;
- H3. There is a significance relationship between PIM use and gender of the medical faculty members.

Statistical population consists of all paramedical sciences faculty members in three universities i.e. Tehran University of Medical Science (TUMS), Iran University of Medical Sciences (IUMS), and Shahid Beheshti University of Medical Sciences (SBUMS) (n=120). Due to the low number of population, sampling was not conducted and the whole population underwent survey study. For measuring participants, a Persian- language questionnaire was designed: The first part is related to demographic characteristics of participants plus two questions: first question asks about their choice of PIM e-tools (desktop computer, laptop, tablet, and smart phones) for keeping personal information (digital-based), and second question asks their reason/purpose for PIM use (Research/education, office works, and for personal interests). The second part of questionnaires is related to the PIM activities of participants which includes 31 questions divided into 4 sections of storage (7 items),

organization (8 items), maintenance (9 items), and retrieval (7 items). For rating them, Likert scale was applied as 0 = none, 1 = very low, 2 = low, 3 = moderate, 4 = high, and 5 = very high. After distributing questionnaires to participants, only 95 questionnaires were completed and returned. Obtained data were analysed using descriptive statistics (frequency, percent, mean and standard deviation) and inferential statistics using statistical tests such as ANOVA, and t-test in SPSS software. The significance level was set at 0.05.

RESULTS OF THE STUDY

Demographic Characteristics of Participants

Results reported that in our study out of 95 participants, 58 were female and 37 male; 41 were working in SBUMS, 29 in IUMS, and 23 of them were the faculty members of TUMS (two participants did not specify their university). Also, it was reported that the academic rank of most participants was “assistant professor” (n=38), having work experience of 9-20 years (see Table 1).

Table 1

Descriptive Statistics of Study Samples.

Measures	Frequency	%
Workplace (University)		
SBUMS	41	43.2
IUMS	29	30.5
TUMS	23	24.2
Not specified	2	2.1
Total	95	100
Academic Rank		
Assistant professor	38	40
Lecturer	21	22.1
Associate Professor	17	17.9
Professor	10	10.5
Educational expert	5	5.3
Not specified	4	4.2
Total	95	100
Sex Group		
Female	58	61.1
Male	37	38.9
Total	95	100
Work Experience (year)		
<9	19	20
10-19	14	14.7
>20	51	53.7
Not specified	11	11.6
Total	95	100

Preferred PIM e-Tools of Participants and their Reasons for PIM Use

Data reported that 86.3% of participants preferred desktop computer for saving their digital items (n=82) while 64.2% of them reported laptops (n=61), 20% preferred smart mobile phones (n=19) and only 10.5% preferred to use tablet (n=10). Our results showed that most of faculty members use more than one PIM tool for maintaining their personal information. Also results showed that most of participants use PIM for “research/ education-related” purpose (98.9%) while 30.5% reported “personal interests” (n=29), and 25.3% mentioned “work-related” purpose for PIM use (n=24).

Usage of PIM Strategies

It was reported that 39 out of 95 participants used information acquisition strategy more than 75%, while the information acquisition rate of 50 of them was 50-75%, and for six participants it was less than 50%. Fifteen out of 95 participants organized their personal digital items more than 75%, while the organization rate of 58 of them was 50-75%, and for 22 participants it was less than 50%. Results also reported that only four out of 95 participants maintained their personal digital items more than 75%, while the maintenance rate of 58 of them was between 50 and 75%, and for 33 participants it was less than 50%. Finally, results revealed that 74 out of 95 participants use personal information retrieval techniques more than 75%, while the information retrieval rate of 14 members was 50-75%, and for seven participants it was less than 50%.

Relationship Between PIM Use and Workplace of Medical Faculty Members

Mean \pm standard deviation (SD) of acquisition, maintenance, organization and retrieval aspects of PIM based on workplace of participants are presented in Tables 2 to 5. Hypothesis one stated that there was a significant relationship between PIM use and workplace of participants (TUMS, SBUMS, and IUMS). ANOVA test was used to test the relationship between acquisition, organization, and retrieval aspects of PIM and workplace of participants, and for maintenance aspect (since in testing variance equality, p-value was less than 0.05, and variances were not equal), Kruskal-Wallis test was applied. According to the tests results, p-value for acquisition, organization, maintenance, and retrieval aspects of PIM were 0.438, 0.414, 0.803, and 0.534, respectively (see Tables 2 to 5) which are higher than 0.05, so it can be said that there is no significant relationship between the use of PIM by faculty members of TUMS, IUMS, and SBUMS universities and their workplace at a 95% confidence level.

Table 2

Test Results for Personal Information Acquisition Activity of Medical Faculty Members Based on Workplace (Acquisition).

Acquisition	TUMS		SBUMS		IUMS	
	Frequency	%	Frequency	%	Frequency	%
Less than 50%	4	17.4	1	2.4	1	3.4
50-75%	11	47.8	24	58.5	13	44.8
More than 75%	8	34.8	16	39.0	15	51.7
Mean ± SD	70.55 ± 14.98		74 ± 14.96		75.76 ± 13.69	
ANOVA Results	Sig= 0.438, F= 0.832					

Table 3

Test Results for Personal Information Organization Activity of Medical Faculty Members Based on Workplace (Organisation).

Organisation	TUMS		SBUMS		IUMS	
	Frequency	%	Frequency	%	Frequency	%
Less than 50%	6	26.1	7	17.1	8	27.6
50-75%	15	65.2	27	65.9	15	51.7
More than 75%	2	8.7	7	17.1	6	20.7
Mean ± SD	58.89 ± 14.59		64.32 ± 15.22		61.90 ± 17.08	
ANOVA Results	Sig = 0.414 F= 0.892					

Table 4

Test Results for Personal Information Maintenance Activity of Medical Faculty Members Based on Workplace (Maintenance).

Maintenance	TUMS		SBUMS		IUMS	
	Frequency	%	Frequency	%	Frequency	%
Less than 50%	7	30.4	17	41.5	8	27.6
50-75%	15	65.2	21	51.2	21	72.4
More than 75%	1	4.3	3	7.3	0	0.0
Mean ± SD	56.92±11.89		53.70±18.91		53.85±14.86	
Kruskal-Wallis results	Sig. = 0.803 df = 2 $\chi^2 = 0.440$					

Table 5**Test Results for Personal Information Retrieval Activity of Medical Faculty Members Based on Workplace (Retrieval).**

Retrieval	TUMS		SBUMS		IUMS	
	Frequency	%	Frequency	%	Frequency	%
Less than 50%	4	17.4	5	12.2	5	17.2
50-75%	17	73.9	33	80.5	22	75.9
More than 75%	2	8.7	3	7.3	2	6.9
Mean ± SD	59.62±10.70		61.30±11.29		58.22±12.03	
ANOVA results	Sig = 0.534 F= 0.632					

Relationship Between PIM Use and Academic Rank of Medical Faculty Members

Mean ± SD of four PIM aspects based on academic rank of participants are presented in Tables 6 to 9. Hypothesis two stated that there was a significant relationship between PIM use and academic rank of the participants. To test this, ANOVA analysis was conducted. Results for acquisition, organization, maintenance, and retrieval activities showed that p-value were 0.329, 0.488, 0.619, and 0.554, respectively (see Tables 6 to 9) which are higher than significance level ($p > 0.05$); therefore, we can say that there is no significant relationship between use of PIM by of faculty members in TUMS, IUMS, and SBUMS universities and their academic rank at a 95% confidence level.

Table 6**Test Results for Personal Information Acquisition Activity of Medical Faculty Members Based on Academic Rank (Acquisition).**

Acquisition	Educational Expert		Lecturer		Associate Professor		Assistant Professor		Professor	
	N	%	N	%	N	%	N	%	N	%
Less than 50%	1	20.0	1	4.8	0	0.0	3	7.9	1	10.0
50-75%	2	40.0	13	61.9	8	47.1	19	50.0	6	60.0
More than 75%	2	40.0	7	33.3	9	52.9	16	42.1	3	30.0
Mean ± SD	70.85 ± 22.07		73.49 ± 12.13		78.99 ± 12.89		72.91 ± 15.47		66.85 ± 14.76	
ANOVA Results	Sig = 0.329 F= 1.171									

Table 7

Test Results for Personal Information Organization Activity of Medical Faculty Members Based on Academic Rank (Organisation).

Organization	Educational expert		Lecturer		Associate Professor		Assistant professor		Professor	
	N	%	N	%	N	%	N	%	N	%
Less than 50%	2	40.0	3	14.3	3	17.6	11	28.9	3	30.0
50-75%	2	40.0	11	52.4	13	76.5	21	55.3	7	70.0
More than 75%	1	20.0	7	33.3	1	5.9	6	15.8	0	0.0
Mean ± SD	59.71 ± 16.08		66.73 ± 14.04		62.79 ± 15.63		60.52 ± 17.39		56.17 ± 13.10	
ANOVA Results	Sig = 0.488 F= 0.918									

Table 8

Test Results for Personal Information Maintenance Activity of Medical Faculty Members Based on Academic Rank (Maintenance).

Maintenance	Educational expert		Lecturer		Associate Professor		Assistant professor		Professor	
	N	%	N	%	N	%	N	%	N	%
Less than 50%	2	40.0	7	33.3	6	53.3	11	28.9	6	60.0
50-75%	3	60.0	14	66.7	9	52.9	25	65.8	4	40.0
More than 75%	0	0.0	0	0.0	2	11.18	2	5.3	0	0.0
Mean ± SD	49.45±18.33		52.78±15.35		57.21±18.88		55.94±15.96		48.83±14.51	
ANOVA results	Sig. = 0.619 F= 0.663									

Table 9

Test Results for Personal Information Retrieval Activity of Medical Faculty Members Based on Academic Rank (Retrieval).

Retrieval	Educational expert		Lecturer		Associate Professor		Assistant professor		Professor	
	N	%	N	%	N	%	N	%	N	%
Less than 50%	0	0.0	4	19.0	2	11.8	8	21.1	0	0.0
50-75%	4	80.0	17	81.0	12	70.6	28	73.7	9	90.0
More than 75%	1	20.0	0	0.0	3	17.6	2	5.3	1	10.0
Mean ± SD	65.14±10.95		58.47±12.01		62.85±14.46		58.49±10.34		60.57±8.49	
ANOVA results	Sig= 0.554 F= 0.775									

Relationship Between PIM Use and Gender of Medical Faculty Members

Mean ± SD of four PIM aspects based on gender of participants are presented in Tables 10 to 13. Hypothesis three stated that there was a significant relationship between PIM use by the faculty members and their gender. Since an equality of variances assumption of the t-test has been met using Levene's test, independent samples t-test was used to test whether PIM usage by medical faculty members differed based on gender. Results failed to reveal a statistically reliable difference between the mean numbers of PIM use and gender variables:

- For acquisition section, $t(93) = 0.040$, $p\text{-value} = 0.968$, $\alpha = 0.05$
- For organization section, $t(93) = -0.914$, $p\text{-value} = 0.363$, $\alpha = 0.05$
- For maintenance section, $t(93) = -0.417$, $p\text{-value} = 0.678$, $\alpha = 0.05$
- For retrieval section, $t(93) = 0.073$, $p\text{-value} = 0.942$, $\alpha = 0.05$

Therefore, we can say that there is no statistically significant relationship between PIM use and gender of faculty members in TUMS, IUMS, and SBUMS universities ($p > 0.05$).

Table 10

Test Results for Personal Information Acquisition Activity of Medical Faculty Members Based on Gender (Acquisition).

Acquisition	Female		Male	
	Frequency	%	Frequency	%
Less than 50%	3	5.2	3	8.1
50-75%	32	55.2	18	48.6
More than 75%	23	39.7	16	43.2
Mean ± SD	73.54±13.95		73.66±15.38	
t-test results	t= 0.040 df= 93 Sig (2tailed) = 0.968			

Table 11

Test Results for Personal Information Organization Activity of Medical Faculty Members Based on Gender (Organisation).

Organisation	Female		Male	
	Frequency	%	Frequency	%
Less than 50%	12	20.7	10	27.0
50-75%	37	63.8	21	56.8
More than 75%	9	15.5	6	16.2
Mean ± SD	63.29±14.04		60.27±17.93	
t-test results	t= - 0.914, df= 93, Sig. (2tailed) = 0.363			

Table 12

Test Results for Personal Information Maintenance Activity of Medical Faculty Members Based on Gender.

Maintenance	Female		Male	
	Frequency	%	Frequency	%
Less than 50%	19	32.8	14	37.8
50-75%	36	62.1	22	59.5
More than 75%	3	5.2	1	2.7
Mean ± SD	54.95±14.67		53.54±18.01	
t-test results	t= - 0.417 df= 93 Sig (2tailed) =0.678			

Table 13

Test Results for Personal Information Retrieval Activity of Medical Faculty Members Based on Gender.

Retrieval	Female		Male	
	Frequency	%	Frequency	%
Less than 50%	9	15.5	5	13.5
50-75%	46	79.3	28	75.7
More than 75%	3	5.2	4	10.8
Mean ± SD	59.86±9.84		60.03±13.25	
t-test results	t= 0.073 df= 93 Sig (2tailed) = 0.942			

DISCUSSION AND CONCLUSION

Interest in the study of PIM has increased in recent years. Studying, understanding, and practicing PIM can help individuals and organizations work more effectively and efficiently, can help people deal with “information overload”, and can highlight useful strategies for archiving, organizing, and facilitating access to saved information. Several studies have been conducted on PIM showing how and why individuals acquired, stored, organized and retrieve their information. For example, Gwizdka (2000) explored outlined relationships between PIM tools, email and different types of information. He observed some relation between personality styles and the use of email folders. Henderson (2004) performed a study to find out how people manage their personal documents. The results of this research culminated in (1) development

of a conceptual framework highlighting the key personal document management attitudes, behaviours and concerns; (2) model of basic operations that any document management system needs to provide; (3) identification of piling, filing and structuring as three key document management strategies; and (4) guidelines for the development of user interfaces to support document management, including specific guidelines for each document management strategy. Bergman et al.(2006) indicated that users tend to store and retrieve project-related information items based on different formats in one project folder when the interface design encourages it. However, they store and retrieve project- related information items in different folders (documents, emails and favourite Web sites). Khoo et al. (2007) revealed that participants organize their personal folders in a variety of structures, from broad and shallow to narrow and deep hierarchies. One to three levels of folders are common. The labels for first level folders tended to be task-based or project-based. The most common types of folder names are document type, organizational function/structure and miscellaneous/ temporary. The frequency of folders of different types appeared related to the type of occupation. In another study, Blanc-Brude & Scapin (2007) tried to find out which attributes people actually recall about their own documents (electronic and paper). According to them, the recall of certain attributes can depend on the type of user and on the frequency of use of the documents. Capra (2009) surveyed PIM practices of 47 participants from the University of North Carolina. For transferring information among electronic devices such as digital cameras and MP3 players, participants reported using the software and cables that came with the devices to transfer files, or simply using a USB connection. Participants reported that they did not typically transfer files from their cell phone to their other devices or computers. About saving information found on the web, almost all participants reported using bookmarks, and over half sent email with the information to themselves. Majid et al. (2010) in a study tried to understand the usage of different internet services by students (from two public universities in Singapore) for managing their personal information items. It was found that 75% of the respondents were using internet services for storing and managing some of their personal information items. Only a small number of the students were using online storage for maintaining information about their appointments, telephone numbers, draft documents, audio and video recordings, and list of thing to be done. Mizrachi (2011) focused on how undergraduate students apply the digital and physical contents of their academic information spaces to organize and manage their academic information within their environments. Paré (2011) in an explanatory study examined the PIM behaviour of office support staff in a large Canadian university. The findings suggested the existence of several distinct document

spaces within workers' document landscape: a main folder, secondary folders, the operating system desktop, e-mail, paper documents and shared environments. Stewart et al. (2012) conducted a case study on PIM involving undergraduate students at a large Mid-western university in the United States. They found out that the primary ways for managing the information students find online is by using bookmarks, recording information to assist in later retrieval, and by opening new browser tabs. In another study, Otopah & Dadzie (2013) investigated the PIM practices of students at the University of Ghana. The study adopted the PIM framework developed by James and Teevan (2007) and focused on the core activities of PIM namely: keeping, organizing and re-finding. Format, skills, size of collection, memory, and habits were factors for diverse PIM practices among students.

Many international studies have conducted on PIM, but there is less research on PIM behaviour of medical faculty members at national level. In one similar study conducted recently in Iran, Sedghi et al. (2015) examined the PIM activities of faculty members of IUMS by using phenomenology approach. In our study, in addition to IUMS, we investigated PIM behaviour of faculty members in TUMS, SBUMS by using a survey approach. The participants in Ref.1 were clinical and basic sciences faculty members while the participants of our study were paramedical sciences faculty members. Sedghi et al. showed that the use of PIM electronic tools was below expectation. Internal mass memories (in Laptops) and flash memories were the most used e-tools to save information. Most of them preferred paper-based rather than electronic tools to keep their personal information. Results of our study showed that the most used e-tool to save information was desktop computer. Also, the use of PIM tools was acceptable. This shows that the results of our study are not consistent with the results of Sedghi et al, but our study is a study with more generalized findings. The percentage of PIM use by the faculty members in our study was reported as 50-75%. Furthermore, based on statistical results revealed we found no significant association between PIM use by the faculty members and their workplace, academic rank, and gender ($P>0.05$).

In this study, the main objective was to assess the PIM performance of faculty members in TUMS, SBUMS, and IUMS universities of Iran. The researchers concluded that acquisition and organization of personal information by the faculty members were in "good" level while their personal information maintenance and retrieval activities were in "average" level. Overall, we found out that they had acceptable PIM performance, although it is far from a desirable level.

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