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# **Analysis of Digital Information Management Strategies by the Faculties of Higher Education Institutions**

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## **Abstract**

The present study investigated 'Digital Information Management practices pertaining to personal and professional digital information by the faculties of 'Higher Education Institutions'. The study is envisioned to discover the use of Digital Information Management (DIM) and all its multiplicity, degree of usage, form and formats, advantages, and problems encountered while practicing digital preservation and access. This qualitative study used the survey method and questionnaire technique for data accumulation. The study reveals that almost 50% of the faculty members manage their digital content and perceive that they acquired their skills towards DIM from themselves and their colleagues and friends. As the teaching-learning process is the primary objective of digital preservation, Google Drive is a secure medium for digital information storage. Time-saving, storage, and access are the main advantages of DIM and the technicality of digital devices and web services are the main issues. DIM plays an important role in the teaching community as the content preservation system and transition from print to digital content, acquisition, storage, and access are knowledge-intensive processes.

**Keywords:** *DIM, HEI, PIM, PDA, Digital Preservation, Information Management, Content Management.*

## **I. INTRODUCTION**

This study summarises the Digital Information Management (DIM) of graduation and post-graduation level faculty members. In the present study, DIM can be defined as managing the personal and professional information of an individual over a digital platform. DIM aims to support the activities of individuals to manage and organize digital information through the acquisition, storage, organization, consolidation, management, access, and communication of information to complete day-to-day activities (Copeland, 2011; Teevan et al., 2006). DIM and PIM (Personal Information Management) are used synonymously with a very thin layer of differentiation pertaining to professional-related information. DIM, PIM, and ‘Digital Preservation’ are used interchangeably in the digital information environment.

The digital information age has had an impact enormously on research and the teaching-learning process in the teaching community. (Singh, 2013; Zhao et al., 2019) stated that the advancement of Information Communication Technology (ICT) and the internet have revolutionized information and knowledge management in every sphere, personal and academic activities and expeditious continuous changes in the digital environment have become the norms. Digital information resources play a vital role in updating knowledge of day-to-day activities in general, academic and research activities in particular on the platform of the digital environment. In this context, an attempt has been made to examine the DIM practices and patterns among Higher Education Institution (HEI) faculty members working in the MET (Maharaja Education Trust) group of institutions.

MET was formed in 2005 and established educational institutions such as schools, pre-university and university-level colleges, research centers (Ph.D.), and other allied institutions.

This study is limited to ‘Maharaja Institute of Technology Mysore’ (MITM) established in 2007, ‘Maharaja Institute of Technology Thandvapura’ (MITT) established in 2013 and ‘MIT First Grade College’ (MITFGC) established in 2009 under the umbrella of MET®.

## **II. LITERATURE REVIEW**

In the 1980s, DIM came into existence with the phrase “Personal Information Management” (PIM) and also witnessed the advent of PIM tools and techniques to facilitate everyday basic activities. In recent years, PIM has been a technical hot topic and also a significant area of investigation regarding digital data and information management (Teevan et al., 2006).

The definition of PIM (Jones 2007, as cited in Copeland, 2011)

activities a person performs in order to acquire or create, store, organize, maintain, retrieve, use and distribute the information needed to complete tasks (work-related or not) and fulfill various roles and responsibilities (for example as parent, employee, friend, or community member). (p. 453).

Information Communication Technology (ICT) combined with changes in organizational structures and working methods, has led to large amounts of information and the creation of entirely new types of information and formats. The Dutch archivist “Eric Ketelaar invented the word ‘archivalisation’ to describe the phenomenon where more and more material is deemed to be worthy of documenting and archiving”. The archival exercise has long been intertwined with ICT, in terms of the creation, organization, preservation, dissemination, and retrieval of documents using obtainable technology (Asproth, 2005).

(Ramnghahmawia, 2019) stated that digital content preservation is the process of preserving data in digital format to corroborate the usefulness, stability, and intellectual integrity of the digital data. (Sawant, 2014) attempted to understand four kinds of methods or strategies that

are promoted presently for digital preservation. These methods include “refreshing, technology preservation, encapsulation, and migration”.

Digital Information Management in the long term is a key issue that raises crucially challenging issues in the digital atmosphere. These issues cover the extensive technical, social and legal terrain. Technically, it addresses the space, storage, and retrieval of digital documents. Socially, it considers emerging trends and genres over social media platforms and cultural day-to-day life cycles. Legally, consider how personal digital documents interact with the holdings of other web services (Marshall, 2007).

(Sawant, 2014) conducted a study to envisage the preservation practices of information in academic libraries using the survey research method; concerning information resources (Lewis & Mallaiah, 2014) examined the usage of information resources among engineering faculties and research scholars using the survey method. (Copeland, 2011) Contended on digital preservation strategies of public library users considered three major aspects “everyday life information seeking (ELIS), information horizons and information source horizons, and affective issues in information behavior”, the study adopted various techniques metrics, interviews, and horizon maps. (Sonnenwald et al., 2001) attempted to study the information horizons using a mapping technique and survey method for undergraduate students and corporate scientists under an e-mentoring course. In recent years, an emerging area of study pertaining to the DIM is PDA (Personal Digital Archives), many survey method studies have been conducted to examine the behavior, attitude, perspectives, practices, and challenges of individuals towards their PDA practices (Becker & Nogues, 2012; Post, 2017; Zhao et al., 2019).

### **III.OBJECTIVES**

- To assess the frequency of information usage and storage.

- To determine the origin and format of digital information.
- To find out the degree of physical devices and online services used to preserve digital content for long-term safety.
- To identify the purpose and advantages of Digital Information Management.
- To know the issues, challenges, and problems in handling Digital Information Management.

#### **IV. METHODOLOGY**

Assessing the DIM of the teaching community required a certain level of ICT knowledge, with this perception, the researcher selected higher education faculty members from MITM (Engineering stream), MITT (Engineering stream), and MITFGC (Science and Commerce stream). There is no standardized methods or metrics for the study of DIM and many studies have adopted the survey method for DIM, PIM, and PDA studies, preceding that the survey method was designed using structured questionnaires. 183 structured questionnaires were distributed among faculty members, and each of the faculties was personally contacted and distributed the questionnaire for data collection. 153 filled questionnaires were received with a response rate of 83.6%, collected data was stored in MS-Excel application for data process and descriptive statistics has been adopted for data analysis and presented the inferences in the succeeding sections of the paper.

## V. RESULT AND DISCUSSION

### *Age/Gender/Qualification/Designation Cross Tabulation*

**Table 1. Age vs. Gender Cross Tabulation**

S/L	Age	Gender		No. of Responses	Percentage (%)
		Male	Female		
1	21 - 30	49	31	80	52.3
2	31 - 40	36	16	52	34.0
3	41 - 60	13	7	20	13.1
4	Not mentioned	0	1	1	0.7
	<b>Total</b>	<b>98</b>	<b>55</b>	<b>153</b>	<b>100</b>

The age and gender cross-list of faculty members is shown in Table-1. It is seen that 98 (64%) of the faculties are male and 55 (36%) are female. The table shows that the majority of the faculty members including males and females are in the age group of 21 to 30 years. It is clear that most of the faculties are equitably young and followed by the prime age group faculty members. Senior, and experienced faculty members count are fewer in higher education institutions.

**Table 2. Educational Qualification vs. Designation**

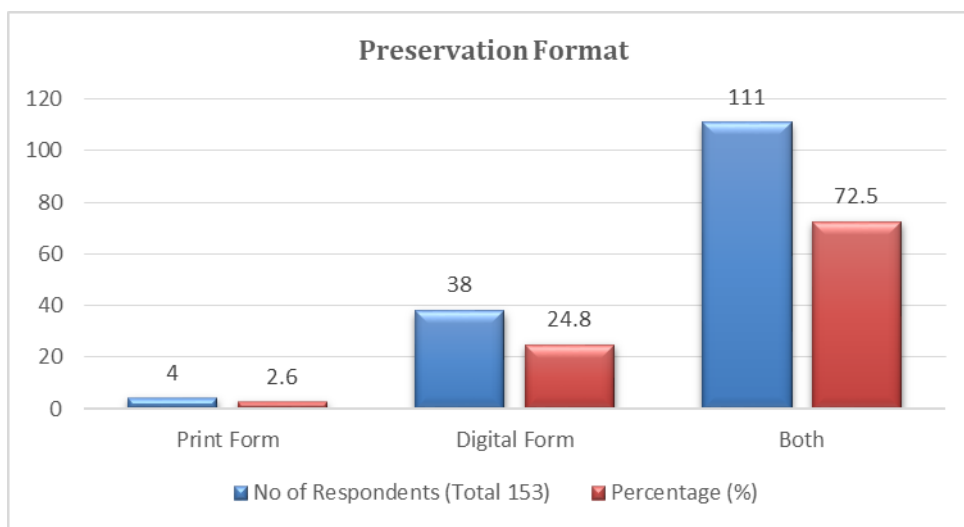
S/L	Designation	Education Qualification			No of Respondents	Percentage (%)
		Bachelor Degree	Master Degree	Ph.D.		
1	Professor	0	0	7	7	4.6
2	Associate Professor	0	2	3	5	3.3
3	Assistant Professor	0	131	2	133	86.9
4	Other Teaching Staff	3	5	0	8	5.2
	<b>Total</b>	<b>3</b>	<b>138</b>	<b>12</b>	<b>153</b>	<b>100</b>

The cross-tabulation of designation vs qualification is shown in Table-2. The table reveals that the majority of the respondents 86.9% are 'Assistant Professors'. The second highest number of respondents falls under the 'Professor' category comprising 4.6% of the total

population, followed by 'Associate Professor' with 3.3%. It can be seen from the table that 90.2% of people have obtained post-graduate degrees such as M.Tech, ME, MS, MSc, M.Com., and MA etc. It is surprising that out of 94.8% of faculties, only 7.9% of the respondents have a Ph.D. in their field of study. Therefore, higher education institutions should promote research and development activities.

***Format and Frequency of Preservation***

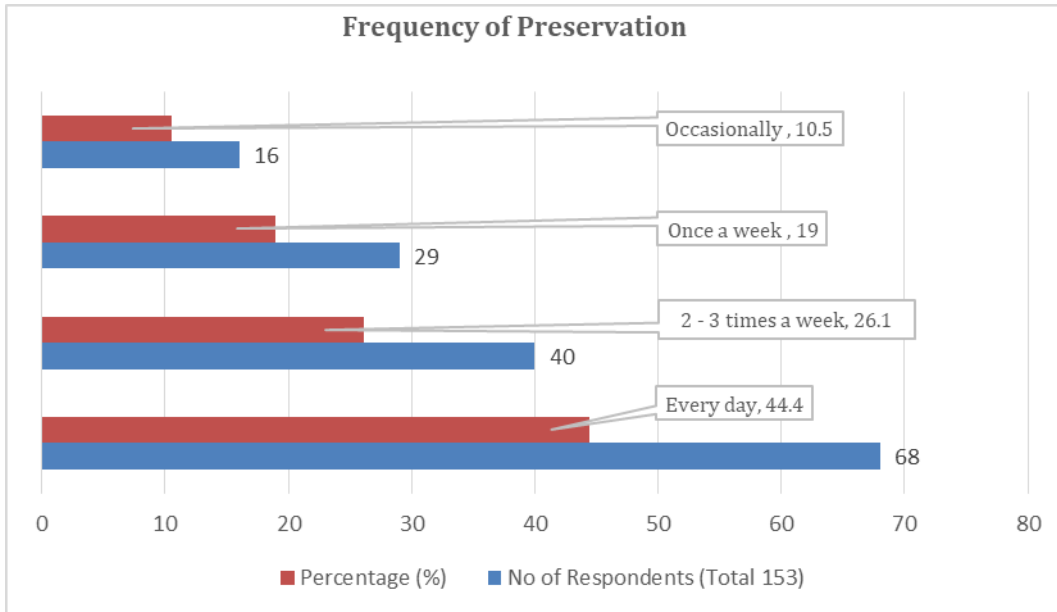
Figure-1 indicates that 72.5% of respondents preferred print and digital formats to preserve their information content. Surprisingly, very few faculty members (2.6%) responded that they preferred only print format to preserve the information, following that some of the faculties (24.8%) preferred only digital format to manage their information content. It can be conceptualised that 93 % of the respondents have experience with ICT and the internet.



***Figure 1. Data Preservation Format***

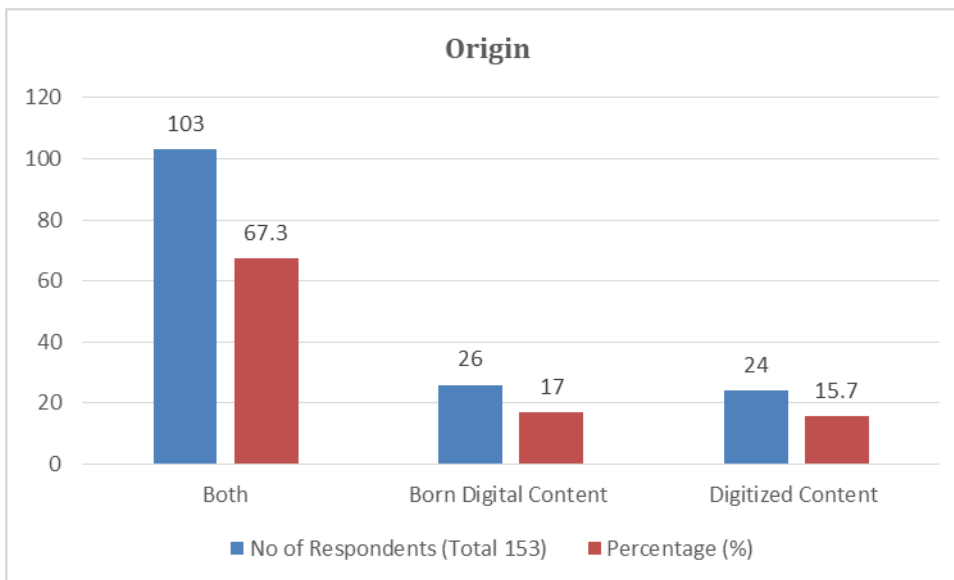
Figure-2 makes it known that 44.4% of faculties used the digital environment to manage digital information, followed by 26.1% of faculties used '2-3 times a week', 'Once a week' (19%), and 'Occasionally' (10.5%). With a large percentage of respondents using digital information frequently to manage their day-day activities, DIM is considered one of the most important aspects of an individual, considering personal and professional activities.





**Figure 2. Frequency of Digital Preservation**

**Origin - File format - Storage Medium**



**Figure 3. Origin of Digital Content**

The preference of faculty towards the origin of digital content is presented in Figure-3, which indicates that most of the faculty members (67.3%) preferred both 'Born Digital' and 'Digitized' content. 'Born Digital Content' (17%) is considered the next most preferred origin

of digital content followed by 'Digitized Content' (15.7%) which is converted from print format to digital format.

**Table 3. File Format of Digital Content Preservation**

S/L	Digital Content Type	Never	Rarely	Occasionally	Frequently	Most Frequently	Total	Mean Score
1	Portable Document Format	9	3	14	52	75	153	<b>3.18</b>
		5.9	2.0	9.2	34.0	49.0	100.0	(1)
2	Images	19	8	32	54	40	153	<b>2.58</b>
		12.4	5.2	20.9	35.3	26.1	100.0	(2)
3	Word Processor	26	14	15	45	53	153	<b>2.56</b>
		17.0	9.2	9.8	29.4	34.6	100.0	(3)
4	PowerPoint Presentation	18	18	30	50	37	153	<b>2.46</b>
		11.8	11.8	19.6	32.7	24.2	100.0	(4)
5	Video	24	20	31	40	38	153	<b>2.31</b>
		15.7	13.1	20.3	26.1	24.8	100.0	(5)
6	Spreadsheet	27	31	31	36	28	153	<b>2.05</b>
		17.6	20.3	20.3	23.5	18.3	100.0	(6)
7	Web Page	24	20	31	40	38	153	<b>1.66</b>
		15.7	13.1	20.3	26.1	24.8	100.0	(7)
8	Notepad	47	36	30	28	12	153	<b>1.49</b>
		30.7	23.5	19.6	18.3	7.8	100.0	(8)
9	WordPad	63	35	17	26	12	153	<b>1.27</b>
		41.2	22.9	11.1	17.0	7.8	100.0	(9)
10	Audio	58	44	24	15	12	153	<b>1.21</b>
		37.9	28.8	15.7	9.8	7.8	100.0	(10)

The file format for digital information preservation preferred by the faculties is shown in Table-3, which indicates that the majority of the faculties (mean=3.18) preferred the 'Portable Document Format (PDF)' file format, which includes professional and personal documents both born-digital and digitized content. 'Images' (mean=2.58) is an important type of file format for preserving personal related digital information, based on memories. 'Word

Processor’ (mean=2.56), ‘PowerPoint Presentation’ (mean=2.46), ‘Video’ (mean=2.31), and ‘Spreadsheet’ (mean=2.05) are the next preferred type of file formats for performing DIM, followed by ‘Webpage’, ‘Notepad, WordPad’, and ‘Audio’.

**Table 4. Preferred storage medium**

S/L	Digital Devices and Tools	Never	Rarely	Occasionally	Frequently	Most Frequently	Total	Mean Score
<b>Devices</b>								
<b>1</b>	Pen Drive	17	5	18	54	59	153	<b>3.87</b>
		11.1	3.3	11.8	35.3	38.6	100.0	(1)
<b>2</b>	Laptop/ Tablet	22	5	12	52	62	153	<b>3.83</b>
		14.4	3.3	7.8	34.0	40.5	100.0	(2)
<b>3</b>	Desktop	27	8	20	50	48	153	<b>3.55</b>
		17.6	5.2	13.1	32.7	31.4	100.0	(3)
<b>4</b>	External Hard Disk	32	10	19	42	50	153	<b>3.44</b>
		20.9	6.5	12.4	27.5	32.7	100.0	(4)
<b>5</b>	Smartphone	30	16	22	42	43	153	<b>3.34</b>
		19.6	10.5	14.4	27.5	28.1	100.0	(5)
<b>Web Tools</b>								
<b>1</b>	E-Mail / Drive	17	6	12	50	68	153	<b>3.95</b>
		37.9	28.8	15.7	9.8	7.8	100.0	(1)
<b>2</b>	Cloud Storage	37	20	32	29	35	153	<b>3.03</b>
		24.2	13.1	20.9	19.0	22.9	100.0	(2)
<b>3</b>	Social Media	56	23	24	27	23	153	<b>2.59</b>
		36.6	15.0	15.7	17.6	15.0	100.0	(3)
<b>4</b>	Personal Web page	73	25	20	24	11	153	<b>2.18</b>
		47.7	16.3	13.1	15.7	7.2	100.0	(4)

Maintaining the digital content requires a digital device and or online services and Table-4 depicts the preferred storage medium of digital information by the faculty members. Considering the hardware and web tool, most of the faculties preferred ‘Pen Drive’

(mean=3.87), and ‘G-mail and G-Drive’ (mean=3.95) as the most important tools for preserving digital information. ‘Laptop/ Tablet’ (mean=3.83) and ‘Cloud Storage’ (mean=3.03) were the next favored device and web tools for faculty members to manage DIM, followed by ‘Desktop’ (mean=3.55), ‘External Hard Disk’ (mean=3.44), ‘Smartphone’ (mean=3.34), ‘Social Media’ (mean=2.59), and ‘Personal Web page’ (mean=2.18).

### ***Purpose and Advantage of Digital preservation***

Table-5 reveals that 89.3% of the faculties used DIM for the ‘Teaching Learning Process (TLP)’ while 82.1% and 75 % of faculties stored digital information for knowledge enhancement of their academic and research field. Though, 65 to 70 % of faculty members perform the DIM activities for ‘Lecture Notes’, and ‘Current and General Information.

**Table 5. Purpose of Storage**

S/L	Purposes	No of Respondents	Percentage (%)
1	Teaching	175	89.3
2	Subject knowledge	161	82.1
3	Research work	147	75.0
4	Lecture notes	136	69.4
5	Current & General Info.	128	65.3

**Table 6. Advantages of Digital Information Storage**

S/L	Advantages	No of Respondents	Percentage (%)
1	Time-saving	142	72.4
2	Information Storage & Transfer	133	67.9
3	Easy to use	123	62.8
4	Remote Access	115	58.7
5	Less expensive	110	56.1
6	User-friendly interface	99	50.5

Table-6 indicates that the advantage of digital content preservation as responded by the faculties ‘Time-saving’ (72.4%) is the most important advantage of handling DIM, further, ‘Information Storage & Transfer’ (67.9%) considered space and communication. Compared to print content, digital content storage has other advantages, such as ‘Easy to use’ (62.8%), ‘Remote Access’(58.7%), ‘Less expensive’ (56.1%), and ‘User-friendly interface’ (50.5%).

### ***Literacy rate and problems of DIM***

As shown in Table-7, most of the faculties (62.8%) have learned the use of the ICT pertaining to DIM by themselves, followed by the assistance of peers and friends (47.4%), The table reveals that the education offered by the institutions (26.0%) and the additional training offered by the training centers (15.8%) were not much contributed to gain the digital literacy.

**Table 7. Literacy of Digital Information**

S/L.	Method	No of Respondents	Percentage (%)
1	Self- Learning	123	62.8
2	Guidance from Colleagues and Friends	93	47.4
3	Formal Education	51	26.0
4	External Course/ Training	31	15.8
5	Others	1	0.5

Table-8 depicts the issues and challenges faced by the faculty members. It was found that ‘Technical problems’ (41.3%) related to handling devices and web tools and their modality is the major problem and also affording digital devices (28.6%) is expensive. It is also observed that ‘Uneasy to read’ (27.6%), ‘No permanency’ (27%), and ‘Lack of Awareness’ (25%) were the challenges in managing digital information. Very few respondents expressed that ‘Time’ (17.3%) and the availability of digital devices are not the major problems.

**Table 8. Problems for Preserving Digital Information**

S/L	Problems encountered	No of Respondents	Percentage (%)
1	Technical problems	81	41.3
2	Expensive	56	28.6
3	Uneasy to read	54	27.6
4	No permanency	53	27.0
5	Lack of Awareness	49	25.0
6	Time	34	17.3
7	Computers Gadgets	27	13.8

***Method of access and Safeguard***

Notably, Browsing (78.43%) is the most popular strategy to retrieve stored digital information by faculties, looking at the stored content as they access the information, in contrast, respondents access the content by searching for the information (50.91%) using keywords.

**Table 9. Access to Stored Digital Information (retrieval strategy)**

S/L	Problems encountered	No of Respondents	Percentage (%)
1	Browsing	120	78.43
2	Keyword Search	78	50.91

**Table 10. Duplication of the Original Document**

S/L	Duplication	No of Respondents	Percentage (%)
1	Only One	57	37.25
2	Two	73	47.7
3	Three	21	13.7
4	None	5	3.26

Keeping duplicate copies of digital content (files) appeared as the only active method of preservation. The majority of respondents (47.7%) have copied their digital information to two devices/locations along with the original copy. In addition to the original location,

37.25% of respondents copied content to another device/location, followed by 13.7% of respondents who kept three duplicate copies and 3.26 % of faculties making none of the duplicates copy.

## **FINDINGS AND CONCLUSION**

Advances in ICT and the advent of the Internet have facilitated acquisition, preservation and access to digital content and its linear consumption displays during the Covid-19 period. This study describes the personal, professional, and social influences affecting digital information management (DIM) of higher education institutions (HEI) faculties. The findings of the study show that most of the faculties are quite young in terms of their age and serve at the 'Assistant Professor' level. This survey found that most faculties prefer digital and print formats to preserve their information, with nearly 50% of respondents accessing their digital information on a daily basis. Most of the faculties used born digital and digitized content to preserve information by preferring PDF file format followed by image format, faculty members believe that pen drive, G-mail and G-drive are safe media for digital information storage. While most faculties agree that the teaching-learning process is the primary objective of digital preservation, time-saving, easy storage, and access are the main advantages of DIM. Faculty members themselves have acquired ICT literacy and guidance from their colleagues, technicality and expensiveness of digital devices and web tools are major issues in DIM. The study reveals that most faculties prefer a browsing method to access the stored information and keep two duplicate copies for the safety of their digital content. Currently, it can be concluded that digital information management plays an important role in the personal and professional digital data management of faculties as there is a shift from print to predominantly digital formats in the digital ecosystem. Considering the findings of the survey, the acquisition, storage and access of digital content are knowledge-intensive

processes. Web services can become an important resource for faculty members to manage their personal and professional information for quick and long-term access.

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