

# Data organization and preservation in the context of digital and networked media: public's attitudes, habits and practices in relation to digital curation of personal digital data

**Milijana Mičunović, mmicunov@ffos.hr**

Department of Information Sciences, Faculty of Humanities and Social Sciences, University of Osijek, Croatia

**Hana Marčetić, hana.marčetic@gmail.com**

Centre for Scientific Information, Institute Ruder Bošković, Croatia

**Maja Krtalić, mkrtalic@ffos.hr**

Department of Information Sciences, Faculty of Humanities and Social Sciences, University of Osijek, Croatia

Libellarium, IX, 2 (2016): 109 – 129.

UDK: 004.422.63:004.822: 316.644=111

DOI: <http://dx.doi.org/10.15291/libellarium.v9i2.258>

Research paper

## Abstract

This paper presents the results of a small scale survey on attitudes, habits and practices of Croatian working population in relation to digital curation of personal digital data. The survey was driven by the following research questions: What are the attitudes of working population towards organizing and safekeeping digital documents that they create in everyday life? To what extent is personal digital archiving among working population a planned activity or just a side-effect of generating content in the digital environment? How do they organize and preserve digital data and documents, both offline and online? What are their attitudes to digital afterlife and digital legacy? Data has been collected in the period from November 2015 to January 2016 through an online questionnaire distributed through online social networks and e-mails aiming to reach the employed population in the age group from 18 to 65 in Croatia. The analysis of the results shows detailed behaviour patterns when it comes to preservation practices as well as attitudes towards taking responsibility for safekeeping personal digital data and documents. The results are also discussed in the light of the implication that these issues may have on user studies and services in libraries and archives.

**KEY WORDS:** personal digital archiving, data organization, preservation, digital curation

## Introduction

New technologies, media convergence, and the rise of communication gadgetry and participatory culture are changing our relationship towards media, culture and digital content, especially when it comes to new possibilities for sharing information, creating new forms of content and the rise of technology, which becomes more invisible, integral and almost natural part of our existence and activities (Gere 2008, Martin 2008, Tredinnick 2008, Estelle and Woodward 2010, Campbell, Martin and Fabos 2013). Technology transforms the way we communicate, create and experience culture, gives birth to alternative forms of digital content and promotes some of the main characteristics of the networked culture – decentralization, interaction and collaboration. Many have become overwhelmed with the possibilities that new technologies and media offer, but as Creeber (2008, 21) suggests, society, both on an individual and institutional levels, should take a critical approach while understanding both positive and negative features of our contemporary digital culture. For all the features and highlights may easily become diversions. One of those critical issues is our relationship with the digital data and information, i.e. our organization and preservation practices. This is why some authors (Beagrie 2006, 10, Gladney 2007, 3) emphasize the need for a good organizational strategy and ongoing active management.

Unlike content on traditional media, digital content, i.e. digital data and information depend on technology. Dependence on technology combined with rapid technological changes put our digital data at risk, but careful planning, active management and cooperation can ensure their availability (Why digital preservation is important for everyone 2010), not just in the present moment, but for the future. Nevertheless, advantages of digital technology in digital archiving and preservation have become apparent and they must be utilized to maximize the security and longevity of digital data. But to truly secure the future of our digital content and its continued accessibility on all levels (Webb 2003, 34), we need to cross the “boundaries” of digital preservation and step into the zone of digital curation.

## Theoretical background

### Digital curation

Just as digital preservation, digital curation is an ongoing process that involves maintaining and preserving digital data but with adding (long-term) value throughout data’s lifecycle. „Curation is a useful concept for describing the evolving whole-life view of digital preservation.” (Lazorchak 2011, 1). This process comprises the following eleven steps: conceptualization, creation, access and use, appraisal and selection, disposal, ingestion, preservation, reappraisal, storing, access and reuse, and transformation (Digital Curation Centre 2014).

All these steps make digital curation a content strategy which ensures indefinite, reliable and sustainable access to information. As an information science subfield which is still evolving (Beagrie 2006), it arose from the scientific data and e-science communities and their concerns of being able to re-use the preserved data.

And though digital curation process depends on available technology, human touch in the form of conceptualization, organization, management, appraisal and selection, reappraisal and evaluation is necessary to make it efficient and relevant (Boardman 2013). Lately, digital curation has started dealing with issues such as personal information management and personal digital archiving thus making a question of how people organize and safekeep their personal digital documents and data even more important. But digital curation goes beyond personal information practices – it influences the management of library and archive services and practices of information professionals (Beagrie 2005, 2006, Fourie 2011, Cushing 2010). Marshall (2007, 2008a, 2008b, 2011) presented some key issues and challenges related to personal information management, such as devising a proper strategy and selection criteria, determining the value of digital belongings, enabling search and retrieval from long-term storage, ensuring long term access and survival of digital belongings, and displaying curatorial effort and successful planning. Other authors (Bruce, Jones and Dumais 2004, Williams, Leighton John and Rowland 2009, Huvila, Eriksen, Häusner and Jansson 2014) have also discussed these issues and concluded that individuals exhibit different levels of awareness, employ different keeping methods and different archiving and preservation strategies and practices while appreciating the ability to use information in the future and to benefit from its pluralisation. Personal information management has also been considered and discussed in the context of archival practices and personal digital archiving (Cushing 2010). And while Cushing discussed conceptual positioning of the topic, Bergman (2010) emphasized methodological issues by identifying 15 variables that characterize different personal information management behaviours.

### **Ever-evolving practices of information organization and preservation**

For more than 30 years organization and preservation practices have been a topic of many research papers and studies beginning with information behaviour in the 'print' environment and early days of information and communication technologies and their influence on scholarly research practice (Stone 1982, Ellis 1993). Later on, studies have focused on organizing and preserving personal documents in the digital environment (Bruce, Jones and Dumais 2004, Burrows 2006, Bergman 2013, Karanikolas and Skourlas 2014, 440), i.e. the keeping methods, organization and management of electronic records and today's software applications. These studies showed that people use several common organization and preservation methods when it comes to personal digital archiving and that self-archiving software and technology should be able to offer different features and modules in order to satisfy end-user needs. Most of the previous studies (Stone 1982, Ellis 1993, Bruce, Jones and Dumais

2004, Burrows 2006, Beagrie 2006, Cushing 2010, Fourie 2011, 2012, Marčetić 2014, Huvila, Eriksen, Häusner and Jansson 2014) have explored methods and practices of information organization and preservation, i.e. personal digital archiving among researchers in different scientific fields (humanities, social sciences, etc.), students and information professionals. These studies confirmed that researchers, students and information professionals are aware of personal digital information issues, that they face similar challenges and that they are aware of the importance of having clear selection criteria. They also proved there is a need for education and training in personal information management. Lately, more interest has been given to the concept of the digital afterlife and personal digital legacy discussed by Beagrie (2005) and even more by Carroll and Romano (2010). The authors have concluded that the questions of public's awareness, access, ownership and preservation of digital legacy need to be addressed, especially since great amount of today's culture is created and stored in the digital form. Though many of us tend not to think about the future that surpasses our lifespan, in order to successfully plan and organize our digital legacy, we need to address different aspects of the concept of digital afterlife – from technical and organizational to legal, cultural and social aspects.

### **Different approaches to digital curation**

In order to answer some of the challenges related to durability of different media and longevity of digital documents, Borghoff, Rödig, Scheffczyk and Schmitz (2003) suggest a technical approach. They encourage employing different conversion techniques and tools (e.g. migration and emulation) to secure independence of digital documents on specific software or platforms that are necessary for their interpretation. Ashenfelder (2013) also suggests a technical solution which places personal archiving in the cloud. And even if technological power and digital systems' capacity support people's creative instincts and induce their appetite for digital content (Beagrie 2005, Williams, Leighton and Rowland 2009), they still haven't adapted to individuals' discontinuity of interests which has a great impact on their curation practices. So, besides good and effective software, Fourie (2011, 2012) suggests collaboration as a key to personal information management and reference management. And in the context of networked, collaborative and interactive nature of digital and social media, the issue of collaboration becomes quite understandable. Besides collaboration, which is also emphasized by Cushing (2010, 310), another feature of successful personal digital archiving and digital curation has been identified – having adequate and good selection criteria. Since it requires time, energy and consideration, personal digital archiving may become benignly neglected (Marshall 2011, 110) or easy to put off, forget or avoid (Webre 2013, 51), so good selection criteria may be of great help. Some authors (Bruce, Jones and Dumais 2004, Gladney 2007, Marshall 2011) suggest guidelines for establishing good selection criteria or, as they say, ultimate preservation methods – distinguishing useful from non-useful data, determining data's expected use and determining data's long-term value.

## Purpose and perspective of this paper

This paper presents public's attitudes, habits and practices related to digital curation of personal digital data amongst Croatian working population. It is also focused on public's awareness of digital data organization and preservation issues since awareness presents the first step in proper archiving and safekeeping of digital content and will, as Beagrie (2006, 13) says, *have increasing impact in years to come*. Whether a scientist, a professional, a student or a member of working population, two most important things in becoming a successful digital curator are becoming aware of all the issues and challenges and educating oneself on how to respond to them. The research presented in this paper has also taken into consideration the issue of new digital technology and networked media which modify the way in which citizens as well as cultural and information institutions relate to information organization and preservation. Though our approach and methodology was based upon previously conducted researches and studies that addressed similar issues with scientists, information professionals and student population, this paper's novelty is reflected in choosing working population as selected respondents and emphasizing the issue of digital afterlife and digital legacy. Working population, as part of the general public that needn't have concrete useful aim (e.g. establishing an institutional repository) or who's practices aren't necessarily instigated by data value (e.g. most of commonly created everyday data may be considered as having more ephemeral value than student or research papers and data) may show more inconsistencies or discontinuity in motivation, habits and practices for organization, archiving and preservation of their digital data. Also, the general public isn't formally obligated to comply with copyright law and professional ethics which makes it more liberal in its information behaviour and practices. As for digital legacy, it is interesting to see the working population's attitudes and habits in relation to their digital estate and what they have been doing to organize and preserve their digital legacy.

Another issue we would like to address here, though it wasn't explicitly questioned in this study, is the importance of semantics in the context of digital data curation. Digital culture and networked and social media rise and are partially founded on the grounds of external metadata and user generated tags which have very context-dependent and dynamic nature. This can present different challenges to digital curators, e.g. having to deal with a complex and even cacophonous information pool that can hinder their actions of organizing and archiving information and data. Thus a successful semantic approach to user-generated content with high social context implies intelligent semantic-based methods of organizing and archiving digital information and social media content. Taking these issues into consideration, as well as the fact that modern-day technology and media are mostly publicly available and accessible, and the fact that most of the public creates a certain amount of digital data on a daily basis, we need a comprehensive vision to meet the present, as well as upcoming challenges of data organization and preservation. This is especially true in the context of social media, new cultural practices (e.g. remix and mashup culture) and evolving digital technology.

## Personal digital data curation

### **Aim and purpose of the study and methodology**

The aim of this study was to explore attitudes, habits and practices of Croatian working population in relation to digital curation of personal digital data. Main research questions were:

1. What are the attitudes of working population towards organizing and safekeeping digital documents that they create in everyday life?
2. To what extent is personal digital archiving among working population a planned activity or just a side-effect of generating content in the digital environment?
3. How do they organize and preserve digital data and documents, both offline and online?
4. What are their attitudes to digital afterlife and digital legacy?

The research was conducted in the period between November 2015 and January 2016 using an online questionnaire which was disseminated through social media sites and e-mails aiming to reach male and female workers in Croatia over 18 years of age. The working population was chosen based on two presumptions; that employed people generate digital content in their private and professional lives; and that income enables them to own electronic devices on which they can create digital content. The online questionnaire was chosen as the instrument for data collection because of its possibility to reach the widest possible sample, and gather both quantitative and qualitative data.

The response rate of 179 returned questionnaires has been large enough to gain insight into respondents' habits and attitudes. However, findings cannot be generalized to the entire population because the response rate was too low for that purpose and the sample of respondents did not reflect the general characteristics structure of the population (such as education level, gender, income, age categories, etc.).

The questionnaire consisted of 22 multiple-choice and open-ended questions divided into 4 sections; General information about respondents, Attitudes regarding the organisation and preservation of digital content, Habits and practices of digital data management, Digital afterlife and digital legacy practices. The first group of questions gathered information on demographic data, along with general information on participants' digital lives, i.e. their digital practices (devices they use, digital content they create, library membership, etc.). The second group of questions examined the level of agreement with statements on importance of organizing and preserving personal and work related digital content. The third group of questions was related to the concrete actions and practices of an individual and the way he/she approaches managing digital content. The last group concerned the question of digital content outliving their creators, if they have ever considered this issue at all, and if so, whether

they have undertaken any action to arrange the destiny of their content after they have deceased. It should also be noted that the questionnaire was drafted in the Croatian language, and the terminology was adjusted to the general population with additional explanations where the authors considered it necessary. Furthermore, the introduction to the online survey contained the definitions of the used terms.

Data was analysed using SPSS.

## Results

### General information about respondents

179 questionnaires were returned and analyzed. The analysis showed that the majority (over 70%) of the sample were women. The largest portions of the sample fall into the age groups between 26-35 years or 36-45 years. Furthermore, just under 80% of the respondents have a university degree, and more than 83% are currently employed. The rest of the sample that belonged to the currently unemployed was included in the analysis as well because of their recent working experience which, we presume, influenced their current opinion on digital curation issues.

According to the general characteristics of the respondents, it should be noted that highly educated, comparatively well-off women make up the largest subset of this sample. This has been taken into account when discussing their responses.

It is reasonable to assume that the level of education and financial background influence the awareness and the practices regarding digital lives and preservation habits of respondents. With this in mind, the respondents were asked to pick which devices they use on a daily basis. This question offered multiple answers. The most commonly chosen device was the laptop, followed by smartphones. A more detailed review of devices by the frequency of their usage is available in Table 1. One respondent added a Smart TV to a list of devices he uses every day, which was not on a list of possible answers.

Table 1. Most commonly used devices

Laptop	76.5% (N=137)
Smartphone	72.1% (N=129)
Desktop	55.3% (N=99)
Mobile phone	30.7% (N=55)
Tablet	21.1% (N=38)
E-reader	5% (N=9)

The number of devices used on a daily basis increases in accordance with the household income. The results were analyzed and the implications were determined that a respondent is more likely to use fewer devices if his household income is smaller, and vice versa. Therefore, it might be speculated that individuals coming from household that are well-off are more likely to face some of the issues of preservation. It is safe to presume that the ownership of

a greater amount of media which create and store content lead them to face issues such as migration, scattering of said content across the physical media and such more often.

In an attempt to determine whether respondents perceived libraries as places where they can turn for help and advice in managing their digital lives and documents, and to which extent they are aware of the role of libraries and librarians in educating them on digital preservation issues, they were asked if they are members of any library at all. As it turns out, a larger portion of them (66.5%) are holders of a library card. However, it cannot be overlooked that a significant number (33.5%) are not. Furthermore, the frequency of their visits and using of library services varies, with a largest subset of respondents (just under 37% of the entire sample) using and visiting libraries a few times a month. Notably, a percentage of something over 7% of it also declares visiting libraries a few times a week or on a daily basis, but this leaves a large subset of 'passive' library users. Another thing that should be taken into consideration is that there is a possibility that each individual interpreted the term 'library service' according to his/hers own previous experience and familiarity with what the term means. As libraries offer a variety of services alongside loaning books, it should be noted that some of the services they provide are not perceived as such by their users. Also, it is important to note that those respondents which answered negatively when asked whether they are members of any library were not asked this question. Therefore, besides the fact that library services might be a wider term than some respondents realize (and thus might use them more often than they are aware), it should also be mentioned that it is possible that some non-members might use library services at times as well.

Table 2. Estimation of content a respondent created in one day

Under 1MB	14.0% (N=25)
1-10MB	16.8% (N=30)
10-50Mb	17.3% (N=31)
50-100MB	8.9% (N=16)
100-500MB	8.4% (N=15)
500-1000MB	5.6% (N=10)
Over 1000MB	3.4% (N=6)
Cannot estimate	25.7 % (N=46)

When respondents were asked to estimate the amount of data they generate in a day (Table 2), the respondents' answers varied. Their self-assessment was interesting in this context because it implies the level of their familiarity with the concepts of digital data and its storage and preservation. For the same reason the question of the nature of data was asked (Table 3).

A significant percentage of participants felt unable to give their estimation of the amount of data they generate on a daily basis and the disk space their content requires (25.7%). The lack of understanding of the practical aspects of preservation, such as data storage, might indicate other issues when it comes to specific actions regarding personal data organisation and preservation.

Table 3. Type of content generated most often

Photographs	20.1% (N=36)
Graphics and images	2.2% (N=4)
Video content	1.1% (N=2)
Audio content	1.1% (N=2)
Textual content	45.3% (N=81)
Presentational content (PowerPoint, interactive presentations, infographics)	14.0% (N=25)
Software	2.8% (N=5)
Everything equally	13.4% (N=24)

It is important to stress that these results are the respondents' estimates, which in some cases may differ from their actual habits and practices regarding generating content.

### Attitudes regarding the organisation and preservation of digital content

The issue of preserving personal digital content in the context of today's digital society and culture is widely perceived as important by almost 88% of the sample. In accordance to that, just short of 90% of the participants agree it is important to work out a system of criteria for the selection of those digital files and documents that should be preserved for the future (Table 4).

Table 4. Perceived importance of developing a system of criteria for preserving documents

Strongly agree	60.9% (N=109)
Agree	29.1% (N=52)
Neither agree nor disagree	5% (N=9)
Disagree	3.4% (N=6)
Strongly disagree	1.7% (N=3)

A stronger agreement is perceivable for the statement that such a strategy ensures the longevity of digital content and is a prerequisite for its preservation. Over 91% agree strongly that an organisational strategy is very important for the secure and proper preservation of digital data. The rest do not have an opinion (over 6%), and less than 3% disagree. It also appears that a majority of

the participants in this research are aware of their role in the life cycle of digital content they create, and feel it is mostly their own responsibility to manage it. We have inquired whether they feel that modern technologies and tools enable them to easily organize and preserve their content in the digital surroundings. Furthermore, we were interested whether they feel that the amount of tools and the speed of technological advancement make it more difficult to preserve and organize content by making the choice of right tools more difficult. The respondents' answers are presented in Table 5.

Table 5. Attitudes regarding digital content preservation and organization

Question	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Everyone should take care of organizing and preservation of digital content themselves	46.9% (N=84)	36.3% (N=65)	13.4% (N=24)	1.7% (N=3)	1.7% (N=3)
Modern technology and tools make organization and preservation of digital content very easy for everyone	29.1% (N=52)	39.7% (N=71)	22.3% (N=40)	7.8% (N=14)	1.1% (N=2)
The development of modern technology and tools makes it more difficult to choose the right tool and strategy to preserve and organize digital content	26.3% (N=47)	39.1% (N=70)	23.5% (N=42)	7.8% (N=14)	3.4% (N=6)

The findings imply that there is a prevailing belief that digital content is the responsibility of the individual who generates and creates it. And even though techno-optimism seems to be present as well, and the general attitude is that the advances in technology and the new tools it helped develop facilitate said organization and preservation, at the same time it creates confusion and confusion related to choosing the right strategy and methodology.

This finding coincides with the feeling almost 74% of the respondents share, that given the amount of content generated on a daily basis it is increasingly difficult to decide what to save for the future and how. Another issue of interest was the respondents' opinion regarding the usefulness of a proper organization and storage of digital content to increasing efficiency in their work. As it appears, most of them are aware of the importance of their digital belongings in an environment in which most of our lives and work are documented in a digital form. Additionally, we wanted to see whether they believe that a systematic approach to managing their work related digital objects would have any impact on their effectiveness at work.

Most of the participants (over 93%) in this study are quite aware that they can influence their work performance and quality by properly addressing the issue of digital preservation. Given that it is of great importance to ensure not only longevity of data in digital environment, but also its safety, we were interested to find out whether and to what extent our participants inquired about the security of their digital content when picking an online service, a Cloud service or some similar service for storing data. 61.5% of participants take into account the safety of their digital content when organizing and preserving it, with half of them strongly agreeing with the importance of this step in the process. Moreover, it was discovered that greater weight was given to the notion of personal privacy. 81% either agreed or strongly agreed to take their privacy into consideration when managing their digital content, while only 5.6% took no steps to ensure their privacy when managing digital content.

Furthermore, we inquired whether they think about the longevity and future accessibility when curating personal digital data (e.g. choosing the right format, creating backup, etc.) Although the majority claimed to think about the longevity and future accessibility of their files when saving those (50.9%), a notable percentage either disagreed (26.2%) or didn't care (22.9%).

Before researching specific actions and habits of the participants in this study, we wanted to investigate their awareness of how libraries and archives can help save and organize digital documents by educating and advising them. Interestingly, the results show that there is a high awareness, of as many as 71.5% respondents recognizing the role of libraries and archives with regards to digital archiving and preservation. This points to a need that these institutions should make an effort to offer related education and services to their patrons and a wider population. There is also a 20.7% of the respondents who do not have a strong opinion on a subject of libraries' and archives' role in issues relating to digital curation of personal data, whereas only 7.8% of our sample saw no role of libraries and archives as advisors and educators regarding this issue.

### **Habits and practices**

It is interesting to point out that there seems to be a discrepancy between the opinions and theoretical agreement on the importance of proper curation of personal digital content and practical employment of concrete actions towards it. For this reason, we tried to establish a connection between the awareness of the importance of taking care of personal digital content and the tendency of putting practical efforts into it. Again, the majority of 89.4% of respondents find it important to effectively curate their digital content, 8.9% neither agree nor disagree on its important, and only 1.7% disagree.

Table 6. Curating digital content

Question:	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I attempt to organize digital content I store on my computer	52.0% (N=93)	35.8% (N=64) 87.8%	7.3% (N=13)	4.5% (N=8) 5.1%	0.6% (N=1)
I attempt to save it in a way that ensures its longevity	30.7% (N=55)	35.8% (N=64) 66.5%	21.8% N=(39)	9.5% (N=17) 11.7%	2.2% (N=4)
I sometimes check the documents I have created	24.0% (N=43)	35.8% (N=64) 59.8%	17.3% (N=31)	15.6% (N=28) 22.9%	7.3% (N=13)

Table 6 depicts some general attempts at curating digital content. The claims of attempting to organize and preserve digital content for the future imply that these respondents in general have an awareness of the importance of contemplating their digital content strategy. However, a tendency is already visible that, the more specific a task, the less consistency there exists in following through an action. Another interesting finding is that those of our respondents who tend to organize their content, also strive to preserve them for the future. One seems to entail the other.

Furthermore, as many as 70.4% of respondents believe to have enough knowledge for digital curation of the content they create. But it seems even more interesting that 21.2% cannot assess their apprehension. This, once more, shows a possible lack of understanding of this issue. The remaining 8.4% feel their knowledge is insufficient in that field, which also leaves place for work and education in this field. It, therefore, comes as no surprise that only 38% claim to stay informed on the news and trends regarding digital organization and preservation. The lack of general understanding makes it difficult to stay informed and get acquainted with the novelties of the field. It should also be noted that there is a slightly higher chance that a person will feel more confident about the amount of knowledge among those who responded positively to the question of the issue of digital preservation importance. This might imply that the awareness on the importance of this issue does, in some small extent, influence the tendency to educate oneself on the practices of digital preservation. Offering the right educational opportunities, preferably in libraries which, as stated before, are recognized among majority as the place for seeking the information of such nature, might increase this tendency. 30.7% professed indifference towards trends in the field of digital preservation and

31.3% do not follow them. At the same time, they believe that their personal digital content are their own responsibility above all. Namely, 79.9% responded that the preservation of their digital data is their own responsibility. The rest (20.1%) believe that the longevity and preservation of their digital content should be the responsibility of the companies which create the software and platforms for managing digital content.

Correlations can be established between attitudes, knowledge and practices in digital curation issues. The correlation test showed weak but statistically significant ( $r=0.188$ ,  $p=0,012$ ) correlation between attitudes and knowledge on digital curation issues indicating that those who consider it important to organize and preserve digital documents are also more likely to consider to have enough knowledge about the issue. The correlation test also indicated ( $r=0.552$ ,  $p=0.000$ ) that those who claim to put an effort into organising their digital data and documents also claim to save them in a way that they'll be preserved for the future.

Before moving to concrete organisation and preservation practices, the respondents were asked to prioritize the reasons for keeping their files for the future. 60.9% of respondents stated the need for reusing data as the main reason for keeping digital content for the future, while 20.7% indicated sentimental value as the main reason. Values varied for the second most important reason; 38% of respondents indicated legal value, 27.9% sentimental value and 29.1% the need for reusing documents in the future.

The following table (Table 7) represents the way the respondents organize their files. It was a multiple answer question, and the following answers were suggested. However, there was the option to add any additional methods.

Table 7. Actions undertaken for organizing files

Organize by folders	17.2% (N=39)
Assign metadata	53.3% (N=121)
Separate official from private documents	15.4% (N=35)
Use tool	11.5% (N=26)

No additional methods of content organization were mentioned, even though the question offered the possibility. This might point to the fact that the issue of organizing files and its role in digital preservation was not understood in full among the respondents. Those few respondents who answered that they use tools in managing their digital content mentioned Google Drive, Dropbox, Onedrive and Cloud, Flickr, Calibre, Zotero, Diigo, del.icio.us. and Feedly.

Those respondents that organize into folders, organize their files in the following manners:

Table 8. Methods of organizing in folders

By the date of creation	22.7% (N=10)
By document type	4.5% (N=2)
By the importance of the document (work related, official documents, fun related and so on)	27.3% (N=12)
Alphabetically	2.3% (N=1)
Numerically	52.3% (N=23)

Three additional methods were mentioned; separating those documents that are still “active” from “inactive” ones, organizing by personal categories (no additional explanation given) and by type and subject.

In order to preserve and assure the longevity of personal digital data, creating safety copies i.e. back-up files is needed. Among our respondents, backup is practiced by 87.7%, whereas 12.3% do not backup their files and do not believe it is important. A somewhat smaller number of them makes backup for random files without any previous planning 45.9% (N=72) than the number of those that choose by some criteria and with previous planning 54.1% (N=85). Table 9 describes what digital data the respondents (who answered positive on the question of creating safety copies) in fact backup:

Table 9. The type of digital data backup is created for

Textual	80.9% (N=127)
Multimedia (photos, video, sound, animation etc.)	68.8% (N=108)
E-mails	16.6% (N=26)
Official documents	59.2% (N=93)
Personal documents	52.9% (N=83)

Migration is only practiced when a file is considered important by some criteria. Some respondents point out they plan to start migrating their files, but have not gotten around to it, or cannot find the time for it. One person feels it is an important practice, but simply does not do it.

To prevent the creation of clutter in personal digital data, and successfully manage personal digital content, some of the respondents delete files that are no longer relevant and have “expired” in a sense. A very small number of participants in this study claim not to delete their digital data, while over 90% do. While it is clearly the case that deleting digital content is a widely practiced activity among them, it is interesting to further delve into the practical aspects of it to their digital lives. Namely, a smaller percentage (of just over 18%) practices it very often. For the rest, who claim to do so seldom or sometimes, the applied strategy and the effectiveness of it remain unclear.

Another option for storing data and creating backup that has been increasingly popular is via cloud services. Over 37% use cloud services, and the rest, which make the majority with over 60%, do not. Furthermore, over 40% of the respondents think they are unreliable. It is unclear whether or not they are aware that social media and services such as YouTube and Facebook, are also cloud-based. However, there are some very good reasons given for scepticism. One interesting statement points to the belief that documents stored on cloud-based services are “available to anyone who puts in enough effort to access them”. Another respondent summed up well most of the concerns mentioned:

*“I think that everything that is online is potentially available to third parties, to a much greater level than documents stored on a personal computer or another medium. Besides, (storing on clouds) leaves whether a document will get lost or not up to somebody else (server malfunctions etc.)”*

One of the main issues is still the lack of understanding. A small, but significant number of people, 7.3% of the sample, admit to not understanding the term *cloud* fully. Other answers can be summed up to those that dislike the lack of control, or giving up some of it to the service providers and those who do not believe the privacy and longevity of their documents can be guaranteed by the service providers. Two respondents also mentioned the issue of memorizing the login information, and another two pointed out the dependence on the access to the Internet.

## Digital legacy

Opinions on whether digital documents should be kept and accessible even after one's death vary. This research has shown that 57% of the respondents are not sure whether they would like their digital documents to be accessible after their death. 31.3% answered positively to the question whether they would like their documents to be preserved after their death, and only 11.7% answered negatively. It is no surprise, however, that a majority of the participants has not given any thought yet to what will happen to their digital belongings after their death. To be precise, as much as 75.4% of them answered they have never thought of this issue, while 24.6% have. Of those who have, the following actions were undertaken as a result (Table 10):

It is evident that, even among those few participants of this study who have given some thought to what will happen to their digital content after their death, a large number of them (65.9%) took no concrete actions.

At the very end of the questionnaire, the participants were asked about their interest to learn more on this subject. About a half of them (56.4%), expressed a wish to learn more about organizing and preservation of digital content. 36.9% said they would perhaps be willing to learn more “someday”, while only 6.7% have no interest in further education regarding these issues.

Table 10. Actions undertaken to preserve digital data after creators' death

I have given somebody my user information (password, etc.) to take care of my digital content after my death	22.7% (N=10)
I have set settings on online services, accounts and social media regarding my data after my death	4.5% (N=2)
I delete the content that I have generated myself, so it wouldn't remain [online] after my death	27.3% (N=12)
I have legally named an heir to take care of my digital heritage	2.3% (N=1)
I have not undertaken any actions yet, but I intend to	52.3% (N=23)
I have not undertaken any actions yet, nor do I intend to	13.6% (N=6)

## Concluding discussion

This study partially achieved the aim that was set in the beginning, i.e. is to explore attitudes, habits and practices of the working population in relation to digital curation of personal digital data. Although the questionnaire was distributed in a way to reach a wider working population of Croatian citizens, the response rate was lower than expected and the respondents were mostly women with a university degree with an average or above average income. Another noteworthy point to consider, given the fact that an online questionnaire was used, is that it is safe to assume that their level of knowledge and experience with digital content is somewhat above average. Therefore, the interpretation of the results should be done keeping in mind the respondents profile and the limitations of the sample.

The results can be discussed around three groups of issues on which this research possibly contributed additional knowledge and insights. First one tackles the *attitudes versus practices* of organizing and safekeeping digital documents created in everyday life. The majority of respondents consider it important to preserve personal digital content (87.7%) and agree that there is a correlation between the way they manage and store their data and their efficiency at work (95.5%). They also agree that it is important to have an organized system of criteria for selecting digital files and documents that they want to preserve for the future (89.9%) and are aware that it is their own responsibility to manage digital content they create. These findings confirm the results in Marčetić's study (2014) where significant number of respondents also mentioned the importance of setting good selection criteria, as well as Beagrie's (2006) and Gladney's (2007)

conclusion on selection having a great impact on curation and preservation. The attitudes differ to a much greater extent regarding the role of technology in the process of organizing and keeping digital documents. Even though a high percentage of respondents (68.8%) agree that modern technology and tools make the organization and preservation of digital content very easy for everyone, at the same time a similar number of respondents (65.4%) also agree that the development of modern technology and tools makes it increasingly difficult to choose the right tool and strategy to preserve and organize digital content. Some authors (Stone 1982, Tredinnick 2008, Martin 2008) have already warned about complications and problems technology and new media can impose on the process of curation and preservation, from demanding great inputs of energy, encouraging consumption, provoking information anxiety and having alienating effects, through producing constant information noise, filtering perception and communication and changing values and experiences, to constantly facing rapid technological change and technological obsolescence.

Practical actions of the respondents are quite diverse, but mainly include assigning metadata (53.3%) and organising in folders (17.2%). The majority of respondents (87.7%) practice backup mainly for textual documents and personal multimedia. It is interesting to notice that similar number of respondents makes backup for random files without any previous planning (45.9%) or choose by some criteria and with previous planning (54.1%). On the other side, a smaller percentage of respondents use a cloud service (37.4%). This is also compatible with individuals' inconsistencies in practiced methods presented in Marčetić's study (2014) and with individuals exhibiting great diversity in their personal information management and personal digital archiving practices in the study of Gwizdka and Chignell (2007) and Williams, Leighton and Rowland (2009).

It was a surprising result that a very small number of participants (6.1%) in this study claim not to delete their digital documents, which is contrary to the results on managing collections in Marčetić's study (2014) where deleting the no longer needed documents seems to be omitted. Since the storage space is not such an issue anymore, we expected that respondents would accumulate digital documents and not delete them. Deleting implies regular weeding of personal collections.

The second group of issues to discuss concerns attitudes to digital afterlife and digital legacy, or in other word, *digital self*. The question of thinking about digital belongings after a person dies seems to evoke uncertainty within the respondents since 75.4% of them answered they have never thought of this issue. The larger percentage (57%) of the respondents aren't sure whether they would like their digital documents to be accessible after their death. Others distributed between those who would like their documents to be preserved after their death (31.3%), and those who would not (11.7%). It is no surprise, however, that a majority of the participants hasn't given any thought yet to what will happen to their digital belongings after their death. The issues of digital legacy have mostly been researched in relation to individuals wanting to donate their personal digital archive to a library or some other information

or heritage institution (Beagrie 2005, Burrows 2006), but thinking about what will happen (to our digital estate) when we die still seems to be a question that never gets asked.

The third group of issues is related to *the role of libraries and archives* in the personal digital archiving process. In the light of respondents' perception, of 66.5% of respondents who are library users, 51.5% use a library service rather regularly (from every day to several times a month). The results showed that there is also a high awareness (71.5%) of the role of libraries and archives might have in educating and advising on personal digital archiving and preservation issues. This issue certainly needs more thorough research. Although it may not seem so at first, the question of how people organize and safekeep their personal digital documents and data is of importance and has implications on libraries and archives management. Today a lot of digital content that might have future cultural heritage value is generated in the domain of personal digital collections (Beagrie 2005). This certainly affects processes of collecting, organizing and preserving cultural heritage traditionally done by heritage institutions. Thus we can conclude that there is and will be a great need for vocational education and training for digital curators who will use their skills for long-term preservation and management of digital data and content in information institutions and cultural and heritage institutions. As literature suggests and some studies indicate (Cushing 2010, Fourie 2011, Marčetić 2014), the general population, as well as members of academia, often need or rely upon the help from information professionals when it comes to organizing, preserving and curating their digital assets and *memories for life*; and will do so in the future, especially in the context of creating great amount of data on a daily basis. When one thinks of concepts that are already here, such as big data, cloud computing and smart systems, and of those that are coming in the future, such as hyper-reality technologies and quantum computing, anticipation and careful planning have become just as important as raising awareness. This is why cultural and heritage institutions need to stay alert (Fourie 2011), they need to interact with other professionals and they need to collaborate among themselves in managing their curation services (Cushing 2010). Being a successful digital curator, whether an individual or an institution, implies educating and training oneself not only for today, but for tomorrow.

Some of future concerns, i.e. the future research could raise a question of placing digital preservation and curation in the context of ever evolving social media and participatory culture which support and enable not just collaborative creation, production and distribution of digital content, but also facilitate constant production of new digital data, constant intervention in and interpretation of existing digital data, flexible and indefinite dissemination of digital data<sup>1</sup>, and, as Tredinnick (2008) says, their *resistance to final classification and stable contextualisation*.

---

1 For example, constant intervention, interpretation and flexible and indefinite dissemination make it harder to establish the original author (the question of authorship) and version (the question of authenticity or originality) of the digital data, which may influence attitudes, habits and practices of digital curators.

## References

- Ashenfelder, M. 2013. "Personal archiving in the cloud." In *Perspectives on personal digital archiving: national digital information infrastructure and preservation program*. Washington: Library of Congress.
- Beagrie, N. 2005. "Plenty of room at the bottom? Personal digital libraries and collections." *D-Lib Magazine* 11, 6. Accessed April 15, 2016 <http://www.dlib.org/dlib/june05/beagrie/06beagrie.html> <https://doi.org/10.1045/june2005-beagrie>
- Beagrie, N. 2006. "Digital curation for science, digital libraries, and individuals." *The International Journal of Digital Curation* 1, 1: 3-16. Accessed April 15, 2016 <http://ijdc.net/index.php/ijdc/article/view/6/0> <https://doi.org/10.2218/ijdc.v1i1.2>
- Bergman, O. 2013. "Variables for personal information management research." *Aslib Proceedings: New Information Perspectives* 65, 5: 464 – 483. Accessed April 15, 2015 <http://dx.doi.org/10.1108/AP-04-2013-0032> <https://doi.org/10.1108/AP-04-2013-0032>
- Boardman, M. C. 2013. "Digital curator: job description and responsibilities." Accessed April 15, 2016 <http://www.slideshare.net/MargaretCarrollBoard/digital-curator-roles-and-functions>
- Borghoff, U. M., P. Rödiger, J. Scheffczyk, and L. Schmitz. 2003. *Long-term preservation of digital documents: principles and practices*. Heidelberg: Springer.
- Bruce, H., W. Jones, and S. Dumais. 2004. "Information behaviour that keeps found things found." *Information Research* 10, 1. Accessed April 15, 2016 <http://www.informationr.net/ir/10-1/paper207.html>
- Burrows, T. 2006. "Personal electronic archives: collecting the digital me." *OCLC Systems & Services: International digital library perspectives* 22, 2: 85 – 88. Accessed April 15, 2016 <http://dx.doi.org/10.1108/10650750610663932> <https://doi.org/10.1108/10650750610663932>
- Campbell, R.; C. R. Martin, and B. Fabos. 2013. *Media & culture: mass communication in a digital age*. Boston, New York: Bedford/St. Martin's.
- Carroll, E., and J. Romano. 2010. *Your digital afterlife: when Facebook, Flickr and Twitter are your estate, what's your legacy?* Berkeley: New Riders.
- Creeber, G. 2008. "Digital theory: theorizing new media." In *Digital culture: understanding new media*, edited by G. Creeber and R. Martin. New York: Open University Press.
- Cushing, A.L. 2010. "Highlighting the archives perspective in the personal digital archiving discussion." *Library Hi Tech* 28, 2: 301-312. Accessed April 15, 2016 <http://dx.doi.org/10.1108/07378831011047695> <https://doi.org/10.1108/07378831011047695>

- Digital Curation Centre. 2014. What is digital curation? Accessed April 15, 2016 <http://www.dcc.ac.uk/digital-curation/what-digital-curation>
- Ellis, D. 1993. "Modelling the information-seeking patterns of academic researchers: A grounded theory approach." *The Library Quarterly* 63, 4: 469-486. <https://doi.org/10.1086/602622>
- Estelle, L., and H. Woodward. 2010. "Introduction: digital information, an overview of the landscape." In *Digital information: order or anarchy*, edited by H. Woodward and L. Estelle, 1-33. London: Facet Publishing.
- Fourie, I. 2011. "Librarians alert: How can we exploit what is happening with personal information management (PIM), reference management and related issues?" *Library Hi Tech* 29, 3: 550-556. DOI: <http://dx.doi.org/10.1108/07378831111174477> <https://doi.org/10.1108/07378831111174477>
- Fourie, I. 2012. "Collaboration and personal information management (PIM)." *Library Hi Tech* 30, 1: 186-193. Accessed 15 April, 2016 <http://dx.doi.org/10.1108/07378831211213292> <https://doi.org/10.1108/07378831211213292>
- Gere, C. 2008. *Digital culture*. London: Reaktion Books.
- Gladney, H. M. 2007. *Preserving digital information*. Berlin, Heidelberg: Springer-Verlag.
- Gwizdka, J., and M. H. Chignell. 2007. "Individual differences in personal information management." In *Personal information management*, edited by W. Jones and J. Teevan, 206-220. Seattle: University of Washington Press. Accessed April 15, 2016 [http://eprints.rclis.org/13702/1/2007\\_Gwizdka\\_Chignell\\_ID\\_PIM\\_book\\_Chapter\\_authors\\_final.pdf](http://eprints.rclis.org/13702/1/2007_Gwizdka_Chignell_ID_PIM_book_Chapter_authors_final.pdf)
- Huvila, I., J. Eriksen, E. Häusner, and I. Jansson. 2014. "Continuum thinking and the contexts of personal information management." *Information Research* 19, 1. Accessed April 15, 2016 <http://files.eric.ed.gov/fulltext/EJ1020832.pdf>
- Karanikolas, N. N., and C. Skourlas. 2014. "Personal digital libraries: a self-archiving approach." *Library Review* 63, 6/7: 436-451. DOI: <http://dx.doi.org/10.1108/LR-06-2014-0073> <https://doi.org/10.1108/LR-06-2014-0073>
- Lazorchak, B. 2011. "Digital preservation digital curation, digital stewardship: what's in (some) names?: blog post." Washington: Library of Congress. Accessed April 15, 2016 <https://blogs.loc.gov/digitalpreservation/2011/08/digital-preservation-digital-curation-digital-stewardship-what%E2%80%99s-in-some-names/>
- Marčetić, H. 2015. "Exploring the methods and practises of personal digital information archiving among the student population." *ProInflow: časopis pro informační vědy* 7, 1: 29-40. Accessed April 15, 2016 <http://www.phil.muni.cz/journals/index.php/proinflow/article/view/1105>

- Marshall, C. C. 2008a. "Rethinking personal digital archiving Part I: four challenges from the field." *D-Lib Magazine* 14, 3/4. Accessed April 15, 2016 <http://www.dlib.org/dlib/march08/marshall/03marshall-pt1.html>
- Marshall, C. C. 2007. "How people manage personal information over a lifetime." In *Personal Information Management*, edited by W. P. Jones and J. Teevan, 57-75. Washington: University of Washington Press. Accessed April 15, 2016 <http://www.csdlib.tamu.edu/~marshall/PIM%20Chapter-Marshall.pdf>
- Marshall, C. C. 2008b. "Rethinking personal digital archiving Part II: implications for services." *D-Lib Magazine* 14, 3/4. Accessed April 15, 2016 <http://www.dlib.org/dlib/march08/marshall/03marshall-pt2.html>
- Marshall, C. C. 2011. "Challenges and opportunities for personal digital archiving." In *Digital: Personal Collections in the Digital Era*, edited by C. A. Lee, 90-114. Chicago: Society of American Archivists. Accessed April 15, 2016 <http://www.csdlib.tamu.edu/~marshall/I-Digital-Marshall.pdf>
- Martin, R. 2008. "After new media: everywhere always on." In *Digital culture: understanding new media*, edited by G. Creeber and R. Martin. New York: Open University Press.
- Stone, S. 1982. "Humanities scholars: information needs and uses." *Journal of Documentation*, 38, 4: 292 – 313. <https://doi.org/10.1108/eb026734>
- Tredinnick, L. 2008. *Digital information culture: the individual and society in the digital age*. Oxford: Chandos Publishing. <https://doi.org/10.1533/9781780631677>
- Webb, C. 2003. *Guidelines for the preservation of digital heritage*. UNESCO. Accessed April 15, 2016 <http://unesdoc.unesco.org/images/0013/001300/130071e.pdf>
- Webre, T. 2013. "Forestalling personal digital doom." In *Perspectives on personal digital archiving: national digital information infrastructure and preservation program*. Washington: Library of Congress.
- Why digital preservation is important for everyone. 2010. Washington: Library of Congress. Accessed April 15, 2016 <http://digitalpreservation.gov/multimedia/videos/digipres.html>
- Williams, P., J. Leighton, and J. I. Rowland. 2009. "The personal curation of digital objects: a lifecycle approach." *Aslib Proceedings: New Information Perspectives* 61, 4: 340 – 363. DOI: <http://dx.doi.org/10.1108/00012530910973767> <https://doi.org/10.1108/00012530910973767>

