Digital Preservation for the Individuals

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Abstract:

Purpose - This is a concept paper highlighting the most important points pertaining to the development of a web service for the preservation of the digital assets of individuals.

Design/methodology/approach - A commercial web service aimed at the general public for the preservation of their digital assets is outlined. It encompasses the ability to legitimately bequeath one's digital assets to another individual in case of death or inability, and ensures the preservation and accessibility of the digital files and their metadata for a given (long) period of time, by applying the principles of digital preservation, as described by OAIS. The development and scientific challenges of this endeavor are also briefly discussed.

Originality/value - The project responds to a real contemporary public need, and proposes a service which will become highly relevant in the near future. The lacking of such a service will very soon be painfully felt by the public, with the mass loss and depreciation of their personal digital assets.

Index Terms — digital assets, individuals, digital preservation, bequeathal, MyDAS

I. CONCEPT OVERVIEW

This is a concept paper highlighting the most important points, as we have conceived them, pertaining to the development of a web service for the preservation of the digital assets of individuals.

The explosion of digital technologies has led to the overproduction of digital objects by the general public, mainly of photographs and texts, but also of videos, music and data, existing as single files in smartphones, computers, clouds or storage media, or in combinations in postings on social networking services, emails, blogs etc. These digital objects comprise the individuals' personal digital assets (PDAs) [1], with significant economic and non-economic value to their owners. However, these individual digital assets taken together become invaluable, as they represent a large part of the contemporary culture and creativity. At the same time, the combination of the multifaceted individual personal stories, inherent in the PDAs, records every aspect of everyday life, thus comprising a major part of the history of current civilization. Despite their value, common people are not only lacking the necessary tools and expertise, but most importantly, are oblivious to the imminent risk of permanently losing their PDAs, unlike many organizations that have both the awareness and the resources for digital preservation [2].

The practices for the preservation of the digital assets by individuals have not been rigorously surveyed, are largely unknown in their details, and may change over time. As literature [3], anecdotal evidence and common sense suggest, individuals store their digital assets in their PCs, tablets and smartphones, various cloud services, external hard drives, and other storage media. The various digital files are not described in detail (with appropriate metadata), are probably aggregated in folders, and in the best-case scenarios the individual files and folders are given vaguely descriptive names. Photograph files are usually stored automatically in smartphones and digital cameras with meaningless file names, making accessing a specific file a frustrating endeavor [3]. Moreover, individuals seldom back their files up, and if they do, they do it haphazardly. All the above indicate that the digital preservation practices of individuals are practically nonexistent.

According to the literature and the digital preservation standards, the lack of provenance and description (appropriate metadata) of digital files will inevitably lead to the loss of important information, and after a generation, to their general depreciation [2], [4]. One can imagine that some thousand photographs in a hard drive, even if they are preserved as accessible digital objects, when they are passed to the next generation, they will be just files that no one will know who and what is shown, or when (in what occasion or date) and where they were taken. The loss of information, which will result not only from its abundance but also because of the absence of provenance, has often been referred to as the digital Dark Ages [5].

We have envisioned a commercial web service aimed at the general public for the preservation of their digital assets, enabling individuals to upload their files and insert preservation metadata easily and intuitively, which has been given the tentative name MyDAS[1] (My Digital ASsets). This service will encompass the ability to legitimately bequeath one's digital assets to another individual (child, spouse, friend or relative) in case of death or inability, and will ensure the preservation and accessibility of the digital files and their metadata for a given (long) period of time, by applying the

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[1] MyDAS brings to mind the legendary king Midas of Phrygia, who had the ability to turn everything he touched into gold.

principles of digital preservation [2], [4].

This web service must be easy for the layperson to use, and can be scaled to cater for various needs. For people with basic needs, after registration, a limited space will be offered free of charge (**free user**, probably supported by advertisements), together with a very basic set of metadata. One possible usage scenario may be as follows: The user will upload photographs (or other files), manually or automatically by use of an app or a plug-in immediately after the photograph is taken, and then receive a message asking him/her to provide some details about the photo, such as who are shown in the photograph, and where and when it was taken. Time-stamp and spatial metadata can also be acquired by the digital camera or phone and be converted to human friendly format. Face recognition technology will assist the identification and provide suggestions. An ontology describing relations between persons, places, activities, and objects will provide the necessary connections between inserted metadata entities. Apart from achieving its main target, which is the preservation of the personal digital assets, the service will allow for easy access and organization of the photographs.

At a higher level of complexity (**premium user**), the service will have a subscription fee and the metadata schema and underling ontology will be more complex, in order to support more complicated situations. At its highest level (**corporate/professional user**), the service will address corporations, artists, scientists, politicians, actors etc., i.e. people who produce large amounts of high-value digital data, and who have complex description and organization needs. The service must allow for the creation of groups with diverse access rights (mainly addressing organizations, corporations and societies) and collections (such as artists' portfolios). The owners of the data will have the right to render their data accessible to other users or groups.

The development of the web service can be organized in several steps. Initially, the financial success and sustainability of the endeavor must be ensured, and a publicity campaign should be designed highlighting the risks of the digital assets of individuals, and the solutions this service can offer. An exploratory study addressed to individuals can gather data on their storage and safekeeping practices of their PDAs, their level of awareness of the dangers involved, their intention to adopt such a service, and their needs and preferences. This information will be used for the design and the promotion of the service. This step has been partially implemented, since a pilot survey addressed to the students and personnel of the University of West Attics was performed. Indeed, universities can serve as the perfect environment for developing, testing, debugging and pilot running of such a service. A development scheme could involve three European universities, which in cooperation with private IT companies can develop the software, the metadata schemas, the ontologies, the plug-ins and the user interface independently or in collaboration. This way, the best solutions can be incorporated in the final

design after extensive testing and employment of the service for their own students and personnel for a pilot period.

The metadata schema and ontology should have at least three levels of complexity, addressing the different needs of the three levels of usage discussed above. The system should be designed to incorporate the principles of an Open Archival Information System (OAIS), regarding the information model, the functionality and the preservation practices. The user interface must be optimized for smartphones, and studied extensively so that it does not intimidate the non-expert user.

Several apps and plug-ins can be developed or adapted to improve the functionality and the user-friendliness of the service, while an API can also be provided for independent developers who wish to contribute. These may include:

- An app that automatically uploads a photograph or video immediately after it is taken, together with basic time and spatial metadata.
- Face recognition software, which can be tweaked and guided by the user, linked to a person's database and the underlying ontology
- Plug-ins for the mass migration of files and their metadata
- Apps for harvesting files and their metadata from various cloud and social networking services
- Speech recognition technology for metadata insertion

The above list is not exhaustive, and hopefully more helpful apps and plug-ins will be developed.

It can be argued that such a service is redundant, since many similar solutions are commercially available. For example, Facebook, Instagram and many cloud services are available for the storage of personal digital assets. A number of them offer options for bequeathal, and some of the extras described above. Nevertheless, there is a key issue with all of them. Their aim is not digital preservation, and this is obvious from the beginning. By signing in, the user must accept a disclaimer which states that the service carries no liability in case of data loss! There are also several services offered for critical data preservation, but they are not aimed at individuals, and their context is financial, technical, legal, or administrative. Available open source and commercial solutions that are partially relevant to the service, such as Omeka, DSpace, Fedora, and DuraCloud do not address the general public, but need certain expertise for setup, administration, tweaking and usage.

Several scientific and technical challenges must be addressed effectively, because this endeavor is unprecedented. Legal issues involving bequeathal and digital rights management must be researched and resolved. The service should assume responsibility for the preservation of the digital files, ensuring their security, usability, and accessibility for a given period of time. The typical disclaimer of various cloud services that the user has to accept in order to use them should be replaced by a warranty that the data will be preserved through various manipulations for a given period of time. An auditing procedure by a suitable

organization should be also involved. Modification of the OAIS principles should be also studied and suggested, the most important of them stemming from the fact that the Administration and Management (as defined by the OAIS model) must involve the individual owners of the digital assets, which are an ill-defined Designated Community with no specific Knowledge Base [2], [4]. User awareness campaigns must also be organized, that will inform the public of the risks concerning their digital assets.

Rigorous study will specify the system's technical and performance specifications and limitations. Finally, the commercial model of running the service must be decided and implemented.

The project suggested above responds to a real contemporary public need, and can offer a service which will become highly relevant in the near future. If this need is neglected, the lacking of such a service will very soon be painfully felt by the public, with the mass loss and depreciation of their personal digital assets.

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