

Impact of design that encourages keeping folders on retrieving files in the cloud / Yaron Frishman

Abstract

File repositories based on cloud retention technology are growing rapidly and their number is expected to overtake local storage reservoirs by 2020 (Anderson & Rainie, 2012). Applications and tools such as Dropbox, Google Drive, Amazon Cloud Drive, Apple's iCloud and Sky-Drive are reporting rapid adoption of the technology. Google Drive alone has more than 800 million active users. There are two main advantages to storing files in cloud-based repositories: First, the cloud allows access to information anywhere, anytime and on any device with Internet access. Second, it allows file sharing in a very easy way without any limitation of the size of the file shared, and without having to replicate using email attachments. Sharing itself is more convenient because it can be shared in a number of ways - from download ability only to simultaneous collaboration from different places, one file, one folder containing files, and even a whole database of information like Google Drive.

Despite its many advantages and the ease of working with Google Drive, we believe that Google Drive has a specific problem: its design does not encourage file retention in folders and allows it to finish without a meaningful name. One of the most common interfaces for Mac / Windows users is the MS Office environment - a group of "Office" programs that produce documents of various types. This interface encourages users to store their files in folders in a process of conscious retention. When users create a new file or work on a file that is not saved locally on their computer and try to close the file without naming it and choosing a specific folder, the system requires them to do so. Google Drive files, on the other hand, are automatically saved every few seconds after they are created, and there is no specific point of time when the users are being asked to select a name for them or classify them in a folder. That is, those who have shared a file with Google Drive and who created new files on

their own, receive no indication encouraging them to classify the files by placing them in folders or selecting a name for a new document. However, the study of shared files shows that retrieving folders created by the user increases the chances of finding the files in a more efficient and successful way than when saved in the default folders (such as My Downloads folder, My Documents, no subfolder or Dropbox root folder).

In order to raise users' awareness of the correct retention processes in the Google Drive store, we designed a plug-in named SaveAs, which is activated when users try to close a file that does not have an informative name or is stored in a root folder ("My Drive" or "Shared with me") and reminds users to store the file in a dedicated folder and / or name it. Although this is not a new idea or even a standard process in the Mac / Windows-based interface, it can help overcome the current gap and make it easier for future retrieval processes. This principle, which requires immediate investment for a future contribution, is similar to other activities that we sometimes perform unwillingly for future profit such as physical activity, retirement funds, etc. which will ensure a better future - health improvement, better economic situation in old age, and in our context better retrieval capacity when needing information (Nemmerly & Brangier, 2014; Nemmerly, Brangier, & Kopp, 2011). In order to encourage such behavior, it is desirable to create supportive and easy processes, and in the case of our extension - to use "persuasive design" - that is, to design a process that is easy and simple to operate and thus encourage its implementation (Fogg, 2009). In order to simplify the process, will allow giving an informative name and will encourage file transfer to folders, which may help and facilitate when trying to retrieve in the future. Our research hypotheses were: (a) that the plugin will actually encourage participants to store their Drive files in folders they created (hereafter referred to as participant folders) or folders already in use. Second, retrieving files from the participants' folders will result in faster and more successful retrieval (reduces the times), so using our extension will improve retrieval and increase user access to their information.

In order to examine these hypotheses as well as the specific research questions discussed below, we conducted a study that was completed by 34 participants working in various professions and their ages ranged between 19-40, 22 of them were women. The study included two sessions that allowed us to compare the subjects' retrieval before and after the use of the supplement (the manipulation of the experiment). At the first session, we asked participants to retrieve files from their Drive to measure their success in retrieval and efficiency. We then installed the plugin on their computers and asked them to exercise discretion every time it came up (i.e., not necessarily to act according to what they want). After about three months with the supplement, we prepared the second meeting, which reconstructed the course of the experiment that was conducted at the first meeting and measured the retrieval of files that the subjects worked on after the installation of the supplement. At the end of the meeting, the subjects were asked to answer a short questionnaire regarding their treatment of the supplement.

The results of the study showed a 19% increase in the use of folders - that is, in the period that passed from the installation of the plugin, the subjects worked on more files in the folders and when we checked who these folders belong to, we found that the number of files retrieved from the folders created by the participants doubled. Another finding that can be attributed to the previous finding is that the retrieval time of the files has improved from an average retrieval time of 30.53 seconds for retrieval before the installation of the extension, to an average of 23.82 seconds after a period of use. We did not find a clear increase in the percentage of success of retrieval processes (11.5% failure at the beginning of the experiment, and 9% of the total recovery time, Failure in the measurements of the second encounter). However when we examined the success rate while referring to the folder creator, from which the files were retrieved, we found that the failure rate of the retrieved files from folders created by the participants dropped to 1.5% only (i.e. more than 98% success in retrieval). Which strengthens the argument regarding the importance of saving files in folders. Another

finding was that despite the increase in the amount of files stored in folders, there is no increase in the depth of the tree, that is, the number of subfolders and the location of the files within them. This is very important because previous studies show that a deeper folder tree may lead to slower file retrieval (Bergman et al., 2010). Another finding that is not related to the work is that there is a direct correlation between the time in which the last use of the file and the probability of failure to retrieve it increases the need to help users maintain the information more easily for future retrieval and to create "retrieval hints". Such as the thematic framework of the folder, or "active" experience of the retention process - that will facilitate access to information when desired. The participants in the experiment expressed their satisfaction with the plugin developed for this study. Several suggestions were made to improve their ability to influence other file types and even outside the boundaries of the browser (Google allows the installation of folders directly from the computer), and most of them even recommended embedding them into the drive as an integral part.

Moreover, when examining shared files through the retrieval perspective (Bergman, Whittaker, & Falk, 2014) results indicate that retrieval from participants' folders (e.g. Dropbox folders that the user had created) is substantially more successful and efficient from both shared folders (created by the participants' collaborators) and default folders (such as the Dropbox root directory). The authors explain this in several ways: First, classification is subjective and as reported different people classify their information to folders in different ways and therefore users were substantially less successful in finding files that other people had categorized. Second, the act of creating folders and actively organizing files into them, engages thinking about these files and this in turn aids retrieval (Bergman, Beyth-Marom, & Nachmias, 2003; Jones et al., 2005). Third, when retrieving files from that they stored in their own folders, people can rely not only on semantic memory but also on episodic memory (i.e. specific memories of the occasion and context in which the document was stored). And Forth, when people decide where to store their own files their locos of control is internal, but

is external when their collaborators makes these decisions, and reduced control over a situation decreases both motivation and task performance (Ajzen, 2002)

In light of the results of the research, the evidence of the contribution of the plugin to users, which is reflected in the increase in the use of folders when saving files, the reduction of latency times and the great contribution of saving a file in the folder created by the user on the level of success in retrieving it, we agree with the recommendation of the study participants, Drive, and create a mechanism that reminds users to keep their files in relevant thematic folders.

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