Searching vs. Navigating preference differences between mobile platforms and personal computers \ Nimrod Yanai

Abstract

There has been a dramatic increase in cellphone sales in recent years. Nowadays, cellphones have become common world-wide and they replace many devices which used to stand on their own, including cameras, music players and radio, GPS navigation systems and even personal computers. Several studies which examined personal information management have confirmed a preference for information retrieval using navigation rather than search – that is, a preference for information retrieval by manually moving in and out of folders created by the user rather than activating search engines by using search bars. In this study, we have studied the information retrieval strategies in cellphones in opposed to personal computers. The goal was to discover if the switching of platforms influenced the retrieval strategy of the users, its effectiveness and its efficiency. Towards that end, we studied the retrieval strategies of users on a laptop and on a cellphone in a controlled experiment where we monitored the different independent variables, including the type of retrieved information – personal files and email messages, the time of last retrieval of a file or an email's received date and the folder structure depth from which the files were taken and different background variables.

This study could affect the development of user interfaces on cellphones by mapping the information retrieval habits of cellphone users.

60 participants took part in the experiment. It was conducted with EPIR (Elicited Personal Information Retrieval) method in which each participant is asked to retrieve personal information from his personal data to increase ecological validity. The participants were asked to retrieve a list of files and email messages taken from their cloud storage, once on a laptop and once on their cellphone. Their actions were recorded in video and measured by the type of retrieval strategy they used, the success of the retrieval and the length of time of the retrieval. The fact that the files and emails were taken from the cloud and distributed randomly between the two platforms guaranteed that variables relating to the information items themselves won't be different between the platforms. The background variables were collected using a closed-ended questionnaire.

The experiment was conducted in three parts: (1) locating the information items – at this stage we created a list of 12 information objects (6 files and six emails) from the subject's cloud storage and email account. The objects were selected by date (email's receiving date or the file's last retrieval time) in set integers of two days, two weeks and two months before the experiment, two files for each time. The lists were split into six information items of each kind for each platform. (2) The experiment – the participants were asked to retrieve the information items once in a laptop and once on their cellphone, with counter-balance between the two. (3) After the experiment has ended, the participants filled a personal information questionnaire to collect background variables.

Most statistical analyses were within-subject design to reduce the effects of human variability on the results.

The results were as follows:

Platform influence – the results did not indicate a statistical significance for search percentages for files between the laptops and cellphones, but the retrieval of emails was higher for cellphones (55% mean) than for the laptops (42% mean). The failure rate of file retrieval on the cellphone (38% mean) was higher than on the laptop (23% mean), but there was no statistical significance in retrieval rate for emails. A possible explanation for the later results is that the email interface requires scrolling on the computer as well as the cellphone, which reduces the differences between the platforms. However for files on the cellphone, the screen size prevents the display of all folders at once, which increases the file hiding problem. Surprisingly, no significant difference was found between the retrieval time on each platform, despite the differences in keyboard and screen size – it is possible people have become accustomed to cellphone technology and use it frequently enough to subdue the differences.

Format influence – the results show search percentage to be significantly higher by 7-8 times in email retrievals than files retrievals on both cellphones and computer. Emails seem to possess more attributes which make the use of searching a more comfortable retrieval strategy.

Additional findings – a particularly interesting result is the consistency of search percentages across formats and platforms. This result may indicate the selection of retrieval strategy as a personality trait (people who tend to search and people who do not tend to search). This tendency will be examined more extensively in future studies, including the retrievals of previously visited web pages and other types of information items.

Other results confirm previous studies: folder depth is negatively correlated to success percentages – the greater the folder depth, the smaller the chance to retrieve the file. Furthermore, folder depth is positively correlated to retrieval time – the deeper the folder, the longer the retrieval process takes. The information item's date (last retrieval or receiving time) was also found to be positively correlated with retrieval time – the more time passed since receiving or last retrieval, the longer it took to retrieve the item.

This study opens the door for further studies in this field – the study of retrieval in different user interfaces between the platforms, different file types with different attributes such as music files, photos, files that aren't stored in the cloud, web pages etc. The results indicate a successful simulation of the computer user interface on cellphones. Simultaneously, the results indicate a lack of use in search options for files on cellphones, which could influence the future development and design of user interfaces on that platform.

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