From planification to search in computer help systems

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Abstract

Existing literature on help systems reports on major difficulties novice users encounter when trying to learn new software functionalities through the use of an embedded help system. Far to be a simple and univocal task, information search in a help system is most often accomplished as a secondary task during a primary activity that is performed in a dynamic context under specific constraints (e.g. professional situations). We assume that one of the main sources of difficulty for users lies in the formulation of a definite search query from an ill-defined problem encountered in the primary activity. We carried out an experiment to evaluate the users' performance and search strategies with different types of targets. The targets were defined as either simple or complex according to the familiarity of their denomination, and they could be reached in either 3 or 4 steps in the help system arborescence. In order to be as close as possible to an ecological text formatting task, the users were asked to reproduce a formatted text in which four elements were to be searched in the help system. The results showed that the familiarity of the target denomination affected dramatically the searching performance, but that the depth of its position in the help system arborescence had little effect on it. We conclude in deriving some guidelines for the design of help systems that would effectively support learning.

Key words: Information search, computer help systems, human factors, experiment.

Summary

Most softwares now include embedded help systems, in most cases in the hypertext form, that can be very sophisticated from a technical point of view. These systems are meant to help novice users to learn about the software functionalities, and sometimes also about domain-specific knowledge. However, it has been observed that users are reluctant to use these help systems and are not satisfied with them (Capobianco & Carbonnel, 2003). Such observations can be explained by two paradoxes (Caroll, Smith-Kerker, Ford, & Mazur-Rimetz, 1987). First, there is a motivational paradox: Insofar as the primary goal of the users is to perform a task and not to learn to perform the task, they do not wish to allocate much time to studying the information provided by the help system. Second, there is a cognitive paradox: Novice users tend to over-generalize the available knowledge regarding a given software and to use it for further interaction with the system. According to Caroll et al. (1987), a novice user can not learn to master a software if his/her primary goal is to use it immediately. For that purpose, some help systems propose tutorials with extended explanations like animated instructions. However, given the two paradoxes underlined by Caroll et al., most users will not use the help system as a learning system but rather than a « trouble shooting » advisor. Thus it appears that an adequate help system should be designed to facilitate information search.

We assume that the lack of perceived effectiveness of computer help systems comes mostly from the difficulties that novices encounter in defining an information searching goal and a searching strategy on the basis of a practical task to achieve. In accordance with Rouet and Tricot's (1996) model, we assume that the definition of a relevant searching goal will be particularly difficult when the information is highly specialized, since novices in the domain (i.e. in the software at hand) do not know the relevant verbal cues to search for. Rouet and his colleagues (Rouet, Cros, Jegou, & Metta, 2003) found that novice users attained lower performance scores for implicit than for explicit hypertext-based information search. We designed a small scale experimental study to assess the hypothesis that learners who do not know the

relevant verbal cues will have difficulty in using help systems associated to usual office software. A full description of the study can be found in Romualdi's (2004) master thesis.

The participants were 5 men and 5 women recruited on a voluntary basis in the same workplace. They were all acquainted with computers and used office software daily. Individually, they were asked to reproduce a small text including four targets that were visually highlighted by colours and not labelled. The participants had to search for these four elements in the embedded help system even if they knew how to produce them. The four targets were distinguished according to their depth in the help system (i.e., minimal number of steps necessary to find them in the help hierarchy, 3 or 4 steps) and the easiness of labelling (easy or domain-specific) which was assessed in a pre-test. For each target, they were asked to tell, before searching, 1) whether they knew how to produce it and 2) what they were going to search in the help system. The participants then searched for the target and indicated when they were done. They then evaluated the difficulty of the search on a four-point Lickert scale. At the end of the experiment, the experimenter conducted a semi-directed interview about the searching experience. The searching was automatically recorded by a screen capture software.

The results showed that the searching time was significantly higher for domain-specific than for easy labelling targets (t = 2.81, p<.05), while there was no difference according to the depth in the system. Similarly, the number of cycles necessary to perform the search was significantly different according to the labelling difficulty but not the depth. In contrast, both factors had a significant effect on the number of pages accessed in the help system during the search (domain specific higher than easy, $t(9) = 4.44$, $p <.005$; 4 clicks higher than 3 clicks, $t(9) = 3.12$, $p <.05$). Regarding the searching strategies the participants used, we found that they most often directly typed searching expressions in the search field and very rarely used the index or the menu of the help system. The searching expression involved nouns in 80% of the cases, and verbs in 20% of the cases.

To conclude, this small-scale experimental study showed that the participants had hard time finding targets that were domain-specific and for which the exact labelling was not familiar to them, even if they could describe them with a verbal paraphrase. This result reinforced the assumption that one difficult part of using help systems is translating a concrete problem occurring in a primary task into searching terms that are adequate regarding the help systems. Help systems that intend to get users learn about a new software in a non-familiar domain should thus incorporate guidance for formulating adequate queries and be organized in a way that makes sense to novice users.

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