An Interview-Based User Study on the use of Visualizations for Folder Browsing

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Abstract

Hierarchically structured data collections often need to be visualized for the purposes of digital information management and presentation. File browsing, in particular, has an inherent hierarchical structure and plays an important role in the context of Personal Information Management (PIM). A multitude of file browsers are nowadays available, offering different functionalities, while users adopt diverse practices and habits for browsing activities. In this paper, we investigate these aspects to obtain insights into their advantages and disadvantages and suggest solutions in the area of PIM, as well as in other domains employing similar visualization paradigms. The presented study focuses on the two most widespread visualizations used by file browsers, namely the indented list and zoomable interface paradigms, and assesses their effectiveness for various tasks and contexts, both by exploiting results on existing evaluations on hierarchy visualizations and folder hierarchy visualizations in particular, and by conducting an interview-based user study.

Keywords--- **File browser visualization, Indented list visualization, User study, Windows Explorer**

1. Introduction

Hierarchies are a quite common and widely applicable information structure, and have thus been the focus of extensive Computer Science-related research [1]. Since hierarchies support a number of information organization and retrieval approaches (i.e., file storage and browsing, thematic categorizations in digital libraries, ontology management and so on), research efforts have insofar produced a number of hierarchy visualizations, aiming to help the users understand, browse and manage the represented information. Although many visualization techniques [2] have been proposed insofar the most widespread paradigms for file browsing [which is an integral part of Personal Information Management (PIM)] are indented list and zoomable visualizations. In the indented list paradigm, each node appears below its parent indented to the right; Microsoft Windows Explorer, Linux Konqueror and Nautilus are a few common examples. Zoomable user interfaces allow the user to zoom in or out of specific part of the hierarchy (e.g. Grokker [3]; the zoomable paradigm is also adopted by multiple implementations in windowing environments). In a number of evaluations, the indented list approach has been reported to have the best performance in the majority of the cases, thus it is considered as a baseline method in many visualization evaluations. The indented list's success has been partially attributed to user familiarity with it.

This work is an attempt to further explore the issue of file browsing visualizations and the indented list paradigm in particular, based on existing hierarchy evaluations and an interview-based user study. The user study records user browsing habits in the context of PIM to provide further insight on how to improve existing file browsing visualizations.

The following section presents related work and further explains the motivation for this work. Section 3 describes the user study group and method while section 4 presents the evaluation and its main results. Finally, in section 5 conclusions are drawn.

2. Related work and motivation

Browsing in hierarchies to locate specific items is a common task in environments encompassing information-seeking. Especially in the case of PIM, there is a well-documented tendency [4], [5] of users towards browsing (as opposed to searching) in order to locate a specific file in their collection. [5] in particular notes that users overwhelmingly prefer browsing and suggest that this probably happens because it engages more actively the mind and body and imparts a sense of control. However, it is unclear from existing studies how existing

visualization methods and tools relate to browsing and what is the extent of the indented list paradigm use (e.g., WE) as compared to the extent of other methods' use.

In most existing hierarchical visualization evaluations [3], [6], [7], indented list visualizations report a significantly better performance for node finding tasks, and are therefore established as baseline methods for the evaluation of the rest of the visualizations.

[8] evaluates several hierarchy visualizations and reports that WE shows a very good overall performance with regard to correctness, speed of task completion, and user satisfaction but notes that the potential practice effects for the other systems should not be overestimated. [8] concludes that while at least one system achieved the same performance as WE, none of them showed benefits for users that went significantly beyond this baseline. It is however not yet clear whether WE's success is owing to user familiarity with it or to possible inherent advantages, compared to other visualizations. In the work presented in [9] for example, Hierarchical Browsing is reported to facilitate information seeking tasks when the user is not looking for specific and already known information.

The aforementioned studies focused on the use of WE for retrieval tasks in an unknown hierarchy. [10], on the other hand, reports on a comparative study between WE and a simple ZUI-based file browser in the context of both a familiar and an unfamiliar hierarchy. The initial hypothesis of this experiment was that the Indented List visualization (i.e., WE) would perform better than the simple ZUI when the user browsed for items the location of which was unknown, while the simple ZUI would perform better for items the location of which was known. Statistical tests on task completion times reported by [10] though did not support this hypothesis; however, user comments did suggest a preference towards WE when browsing an unknown hierarchy. Its worth noting, however, that the user group used in [10] contained only one participant that actually used WE systematically: this weakens the argument that WE's success may be owing to user familiarity with it, but weakens also the statistical credibility of the results, since a user group is clearly underrepresented.

The current evaluation is an effort to further clarify the issue by conducting a larger scale interview-based user study on the topic and, at the same time, explore the users' browsing habits and how they relate to the visualization paradigm used. The following section describes the user study group and method.

3. User study description

3.1. Description of compared visualizations

The **Indented List** visualization represents the folder hierarchy as a tree with the sub-folders presented as a list under their parent and indented to its right. The lists of sub-folders may be retracted or expanded at will by clicking on their parent. The files and direct sub-folders within the selected folder are displayed to the right of this visualization; WE uses a separate pane for this purpose, while other implementation use an indented list under the folder icon (Gnome Nautilus List option).

The **ZUI** visualization is a method offered by most OSes and window-based environments for file browsing. The current hierarchy level is displayed, with each sub-folder visible either in a list or in a tiled manner. If the user wishes to inspect the contents (sub-folders and files) of a particular folder s/he has to drill in it (by double-clicking or single-clicking, depending on the settings) so as to make it the current one. Depending on the user preferences, a preview for documents may be displayed (e.g. a thumbnail of pictures, movies or graphics), while document previews may also be embedded within the icon corresponding to the containing folder.

3.2. User group

Our selected user group consisted of 76 users and had the following characteristics:
- Gender : female (42), male (34)
- Age: 18–24 (18), 25–34 (41), 35–45 (15), >45 (2)
- Years of computer experience: 1-3y (1), >3y (75)

From the 76 users that form our group, 73 were using a computer in their home, 64 in their working environment and 49 for their studies (note that groups are not mutually exclusive). 60 users out of the 76 declared that they were self computer-literate, 20 users had attended a seminar as well, and 30 stated that someone (e.g., in a course or a friend) trained them (groups again are not mutually exclusive).

For the needs of this study, we grouped the participants according to their competence, when using the computer, in three major categories:

Low Competence (L.C.) – **13 users**: LC users have the minimum skills required to use the computer for basic tasks such as compiling a Word document or surfing the web. They lack knowledge of basic desktop tasks like creating or moving a folder, placing items on the desktop etc. The desktop area for them is at the best case a point of access to "My Documents" and to program shortcuts. These users do not generally have a complicated folder hierarchy but rather have few documents stored in the default OS location (e.g., My Documents).

Basic Competence (B.C.) – **27 users**: BC users have a basic s of windows operations, enough to allow them to organize their documents in folder hierarchies. They are aware of the uses of the desktop as a temporary or more permanent file repository and are capable of organizing it, adding or removing items from it. They are able to install programs and perform simple maintenance tasks such as using an antivirus.

High Competence (H.C.) – **36 users**: HC users have a deep understanding of computer operations, including programming, hardware knowledge and handling complex OS issues. These users exhibit complicated hierarchies of files.

Participants used one or more OSes, as shown in Table 1. All subjects used an OS of the Microsoft

Windows family, while some of them were using another OS too.

	Win XP	Win 2000	Win Vista	Linux	Mac Os	Other Unix-based
LC	12	0	2	0	0	0
BC	26	1	2	4	1	1
HC	35	2	3	17	3	3
Total	73	3	7	21	4	4
	76					

Table 1: Use of OSs in the study user group

3.3. User tasks

As already stated, the core motivation of this study was to investigate issues related to visualization used for file browsing. Therefore, the task of locating a file or folder in one's hierarchy was thoroughly examined. The tasks of moving and comparing files or folders were also taken into consideration during the interview and questions regarding these tasks were posed to the users.

3.4. Method

The interview was conducted at the users' home or working environment and lasted about 15 minutes. It was based on a set of questions to guide the discussion, but users were asked to elaborate more when they felt it was necessary, or add any comment that was not covered by the questions. When needed, they were shown in the computer the particular features they were asked about, in order to avoid cases of misconceptions on used terminology. In certain cases, they were asked to demonstrate their browsing method for accessing files and folders. The last two points, together with the ability to further elaborate on subject answers lacking detail, were the main reasons why interviews were chosen over questionnaires for data collection in this experiment.

4. User Study Results

When the interviews were concluded, the analysis stage followed. The results are presented in the following sections. Results are presented with respect to competence only, since no significant differences were found regarding the age group or the gender of the subjects.

4.1. Use of Indented list Folder Browsers

From the 76 interviewed users, 66 (86%) know that an indented list browser (ILB) exists, while 40 users (about 53%) use one. Results by competence are presented in the following table:

Mann-Whitney tests on the pairs of ILB use according to competence showed a significant difference between HC users and those of the other two groups, revealing that there is a connection between user competence and file browsing habits. This result is partially expected, as HC users are more experienced with the op-

tions offered by their OS and have more specific needs. As Table 2 shows, even though 96% of the BC users knew the existence of WE, only 41% used it.

	Knowledge		Usage	
	Users	Pct	Users	Pct
LC	4	31%	1	8%
BC	26	96%	11	41%
HC	36	100%	28	78%
Total	66	86%	40	53%

Table 2: Number and percentage of users that (a) know and (b) use an ILB.

Apart from WE, users stated that they use other file browsers following the indented list paradigm. Some of these browsers offer the indented list as an option (e.g., "Folders" options in the Windows XP OS). Table 3 lists these browsers and the number of subjects that use them.

	LC	BC	HC	Total
WE	1	10	25	36
Gnome Nautilus	0	1	4	5
KDE Conqueror	0	0	4	4
MacOS Finder	0	0	1	1
Midnight Commander	0	0	1	1
Directory Opus	0	0	1	1
Total Commander	0	0	1	1

Table 3: The use of WE and other browsers that offer an indented list option.

The 1 BC user of Nautilus also uses WE in Windows. Of the 13 HC users that use other browsers apart from WE, 2 use only Nautilus and 1 only Total Commander. As to how they learned of WE, table 4 summarizes the replies given.

	LC	BC	HC	Total
Seminar	0	3	1	4
Discovered myself	0	4	1	5
Someone showed me	1	3	23	27
I don't remember	0	2	3	5

Table 4: How users learned about of WE.

The most prominent answer is "Someone showed me", which is indicative of 2 things:
1. ILBs, and WE in particular, are not that obvious to the user so as to discover them by him/herself. The help of an experienced friend or colleague is needed in most cases, to show them the existence and use of the tool for the first time.
2. Very few users seemed to have learned about WE in a formal seminar; out of the 20 that had attended a seminar, only four stated that they were shown how to use WE in it.

Several users stated that they do not use an ILB for every browsing task, but rather in specific cases. Table 5 summarizes the reasons given for the use of an ILB.

Users of ILBs who fall into the "Other Cases" category, do not use the browser regularly; they only use it for a number of (often diverse) specific tasks, such as

moving files between folders, creating a new folder, specifically for searches deep in the hierarchy, etc. Their preference in this case is based on the perceived advantages of an ILB.

	LC	BC	HC	Total
Always	1	3	16	20
When I don't remember the item location	0	1	7	8
When browsing in different locations (drives, computers, etc)	0	3	3	6
Other cases	0	6	5	11

Table 5: Use cases of ILBs.

	LC	BC	HC	Total
Quick access to files and folders, even deep in the hierarchy, without double clicking	0	1	11	12
Nice overview of the hierarchy	0	4	10	14
Helps to see the exact file/folder path and current place in the hierarchy	0	2	3	5
Useful for moving files between folders	0	0	2	2

Table 6: Advantages of ILBs (user replies).

As Table 6 shows, most users in favor of the indented list paradigm commented that it is very useful for quick access, as they can change the current folder with one click and move between many levels at the same time. It also provides an overview of the hierarchy, especially useful for deep and/or wide hierarchies, or when the user does not remember the exact path. On the other hand, subjects that do not use an ILB gave various reasons for this choice. These are summarized in the Table 7.

	LC	BC	HC	Total
It is not convenient	0	3	4	7
It is tiring/frustrating	0	3	4	7
I did not know it exists	4	1	0	5
I know where to find my files	6	6	3	15
I'm not used to it	4	3	1	8
I have not tried it	1	2	0	3
I am short-sighted/it has small icons	0	1	2	
It is too professional for me	0	1	0	1
(for WE) folders and files are separated	0	0	1	1
It uses up too much space	0	1	0	1
It is too chaotic/I don't like to see the whole structure at once	0	2	0	2
It is hidden, cannot make it default	0	2	2	4

Table 7: Reasons for not using an ILB

We made the hypothesis that using or not an ILB depends not only on user competence, needs and tasks, but also on the first OS s/he learned to operate. As seen from Table 8, all users that started with Windows 3.1 seem to favor ILBs. Half of the first DOS and Windows 95 users seem to prefer of ILBs and the other half not, while most users that started with other console-based systems prefer ILBs. It is important to note that WE, in particular, debuted in Windows 95 as a replacement for

the older Windows 3.1 File Manager [11]. User comments were enlightening on the use of ILBs. Many users, especially HC, who started with Windows 3.1 or DOS, stated that they use an ILB (WE or an equivalent one), as it reminds them of the DOS DIR command. Another issue investigated was the connection between the users' current OS(s) and ILBs. Table 9 presents these results.

	LC		BC		HC		Total	
	use		use		use		use	
	yes	no	yes	no	yes	no	yes	no
DOS	1	6	4	8	13	4	18	18
Other console- based OS	0	1	2	1	5	1	7	3
Win3.1	0	0	0	0	10	0	10	0
Win95	0	3	5	3	4	3	9	9
Win98	0	1	0	2	3	2	3	5
WinNT	0	0	1	0	0	0	1	0
Win2000	0	1	1	0	1	0	2	1
WinXP	0	1	1	1	0	0	1	2

Table 8: Use of ILBs against users' first OS.

	LC		BC		HC		Total	
	use		use		use		use	
	yes	no	yes	no	yes	no	yes	no
Win XP	1	11	10	16	27	8	38	35
Win 2000	0	0	1	0	1	1	2	1
Win Vista	0	2	1	1	3	0	4	3
Linux	0	0	2	2	15	2	17	4
Other Unix-based OS	0	0	1	0	3	1	4	1
MacOS	0	0	0	1	3	0	3	1

Table 9: Use of ILB against users' current OS

4.2. Use of Views

Most Windows–based environments offer different options as to how the user may view file and folder icons. Since the majority of our user group was Windows XP users, we apply here the classification of the icon view options available in this OS. Although "Tiles" view seems to be the default view after WinXP OS is installed, only 7 users said that they use it. Table 10 presents user preferences as to the View(s) that Windows XP employ. As seen from the table, the most popular views were Details, Thumbnails and List. About half the subjects also stated that they alternate between their preferred views according to the task at hand, as Table 11 shows.

	List	Details	Thumbnails	Tiles	Icons
LC	4	4	1	0	4
BC	11	20	14	2	3
HC	9	29	19	5	4
Total	24	53	34	7	11

Table 10: Use of different available views

	Yes	Sometimes	Rarely	No
LC	2	2	4	5
BC	3	7	6	11
HC	8	14	9	4
Total	13	23	19	20

Table 11: Frequency of view changes.

It is interesting that 21 of the 34 users that use the "Thumbnails" view stated explicitly that they do so when they are browsing for an image file. A usual comment for the "List" view is that it was preferred when a folder contained many items and the user wanted to locate an item among them. "Details" view was preferred mostly for tasks like finding the most recent version of a file in a folder or grouping many files by type in order to make easier locating a specific one.

As Table 12 shows, "name" is the most popular sorting option, followed closely by "Date Modified" and "Type". "Date Modified" is used mostly when a user works with different versions of documents, facilitating the task of moving files between different locations (e.g. different computers or backup folders), and the task of locating the most recent ones. "Type" is mostly used in folders with many files, particularly system ones, without icons. The 3 in the Other column refers to Arrange By User (1 user) and Date Created (2 users).

	Name	Date Modified	Size	Type	Other
LC	3	3	0	1	0
BC	12	13	6	11	0
HC	23	18	11	19	3
Total	38	34	17	31	3

Table 12: Sorting columns for the Details View.

4.3. Use of the Navigation Buttons

Navigation Buttons (e.g., Back, Forward and Up) are a tool for navigating with a zoomable folder browser, as they offer the potential for reaching the upper or previous folder level. Table 13 presents user answers regarding the use of these buttons. As seen from the table, almost all users at some point employ these buttons and the majority of them use the buttons regularly. The "Up" button seems to be the most popular one, with "Back" following it closely. Forward seems to be a bit less used. On "Back" specifically an HC user stated that he uses it to go back to the previous level keeping selected the folder he lastly entered, in order to be able to continue browsing a long list from the last item checked.

	Yes	Sometimes	Rarely	No
LC	7	5	2	1
BC	21	3	6	1
HC	24	6	9	0
Total	52	14	17	2

Table 13: Use of Navigation Buttons

4.4. Use of the Keyboard

Most OSes provide keyboard shortcuts for many of their operations. We investigated the use of the keyboard as an alternative to the use of the mouse. The results are presented in the following table. It seems that about half of the participants use the keyboard regularly while browsing their folders. The majority use it to locate directly a specific file or folder by pressing the first letter

of its name. The rest use the arrows, the backspace or other shortcuts like Alt+Tab. Some of the reasons they gave for not using it is that they did not know that certain options existed, such as the first letter and backspace for Back, or that they do not have that many files in a folder and they do not need it.

	Yes	Sometimes	Rarely	No
LC	2	3	0	8
BC	4	5	4	14
HC	20	6	6	4
Total	26	14	10	26

Table 14: Use of the keyboard for navigation

4.5. Use of the Address Bar

The Address bar, located at the top side of the folder window, is used to display the folder name or its full path. The user may use this path by editing it to get directly to a specific folder or use the Drop Down list which provides direct access to the available top level locations, like Desktop, My Computer and My Documents. Users were prompted on the use of this particular tool and specifically asked whether they use the Address Bar to manipulate the file path directly and/or whether they use the Drop Down list. Results are presented in Tables 15 and 16.

	Yes	Sometimes	Rarely	No
LC	0	1	2	10
BC	1	3	7	16
HC	11	5	7	13
Total	12	9	16	39

Table 15: Users that edit the Address Bar path

	Yes	Sometimes	Rarely	No
LC	0	1	0	12
BC	1	5	1	20
HC	6	7	5	18
Total	7	13	6	50

Table 16: Users that use the Address Bar drop down list to navigate

In both cases we may note that most of the users use these features rarely or not at all. Those that do use the path are in their majority HC users that take advantage of the auto-complete properties of the path or delete many folder levels at once in order to move instantly to another location higher in the folder hierarchy.

The drop down list seems to be more under-used. For some users it is the usual way for quick access to other locations, but others do not use at all, preferring the use of WE or the Task Pane in Windows XP.

The use of the keyboard in searching and browsing for personal files does not seem to relate significantly with the use of the Address Bar path and the drop down list. An interesting point here is that these activities concern mostly users of the HC group; in fact, using the keyboard and the explorer path in a browsing task is mostly an HC user's practice. On the other hand, people

who use the Address Bar path in their browsing tasks tend to use an ILB (15 users), whereas the number of those who do not use an ILB while they use the path is lower (7).

Similarly, those who use the drop-down list and ILB (12 users) are slightly more than those that use the list but do not use an ILB. However, some users commented that they don't use the drop down list feature because they use WE. One specific user that used the drop-down list frequently to navigate stated that she started to use WE when in some point the Address Bar had disappeared from the folder window.

4.6. Other ways of access to files

An issue investigated indirectly related to folder browsing was the existing alternative ways to open a file in windows-based OSs and Windows XP (the most commonly used one) in our user group in particular. For using the "My Recent Documents" list, users gave the answers presented in Table 17.For using the "Recent Documents" choice offered in several applications, the answers are presented in Table 18. The most common answer was "No", meaning that most users did not prefer to use this option. The reasons given for this were:

On the other hand, users that do use it believe that it is convenient and one may save time with it. The *Recent Document* feature existing in many applications seems to be more popular, as a shown from the Table 18. Subjects used this option when available mostly when (a) the application was already open (b) they did not remember the exact location of the file or (c) they remembered it was recently used. In the case of opening a file form the Open option of the application (see Table 19), again most users stated that they prefer this option for specific applications or when the application is already open. Those that do not use it feel that it is more convenient and quick to do it from the file browser.

	Yes	Sometimes	Rarely	No
LC	0	2	2	9
BC	2	6	3	16
HC	3	10	6	17
Total	5	18	11	42

Table 17: Results on the use of the "My Recent Documents" options of the WinXP start menu

	Yes	Sometimes	Rarely	No
LC	2	2	4	5
BC	3	7	6	11
HC	8	14	9	4
Total	13	23	19	20

Table 18: Use of the "Recent Documents" application menu.

We made the hypothesis that ILBs may serve as a complete tool for folder browsing, meaning that users that employ them for their browsing tasks would not need to use as much other tools like the Recent Documents and Open options offer by the OS or

applications. This hypothesis was not supported for HC and LC users. LC users do not use WE in their majority whereas the HC users have the ability and will to switch more easily between tools according to the task at hand. However, most of the BC users that used WE did not use neither the Recent Document options nor the Open one.

These findings suggest that any file hierarchy visualization should be complemented with additional provisions to access files; these provisions may be time-oriented (recent documents), application-oriented (open file) or both (applications' recent documents).

	Yes	Sometimes	Rarely	No
LC	3	2	2	6
BC	3	9	6	9
HC	3	16	9	8
Total	9	27	17	23

Table 19: Use of the "Open" application menu

4.7. Search

The use of the search tool in any OS seems to be very popular to the users. In our study (see Table 20), ~93% use Search tool when searching for their personal files, independently of the competence group they belong in, or whether they use WE or not. However, some of the HC users who are very organized in their personal files declared that they only use Search in order to locate system files. An interesting remark here, is that only the ~7% of the participants states that they never use Search during their searching activities, either because they manage to find their files using an ILB or because they do not have a large hierarchy, and thus they always find what they are searching for.

	Yes	Sometimes	Rarely	No
LC	2	7	2	2
BC	7	11	8	1
HC	2	19	13	2
Total	11	37	23	5

Table 20: Results on the use of the Search tool.

The frequency with which users state that they use this tool is assembled between "some times" (48,68%) and "rarely" (30,26%), indicating that search is a complementary tool to a user's practices when seeking a file. It is interesting to note that some users claimed that the Search tool is extremely slow and that some of them preferred to install and use the Google Desktop application that seems to be very quick and efficient.

4.8. General Opinions and Suggestions

Two HC participants, who use WE for every task they perform, claimed that they sometimes open two WE windows side-by-side. Four HC and WE-users thought that it would be useful to be able to see in the WE the contents of more than one folders. One of them also stated that while using the WE, it happens to move by chance a file to the wrong destination and suggested that

a message box could appear and inform the user before moving the file. Moreover, a user suggested that WE could support tabs, similarly to Konqueror in the Linux K desktop environment (i.e., KDE), and another one proposed a user-defined color and shape coding in the folders of WE in order to be able to recognize immediately the desired folders. Regarding the task of moving/copying a group of files/folders, a user said that he would like to have a file pool function similar to multiple item clipboard in order to collect files from different origins and then be able to move/copy all the files at once to the desired destination. Furthermore, two users claimed that they would like to have a way to create hard links to files through the file browsing visualizations in order to organize their files to multiple categories without wasting disk space. Information regarding the number of hard links of each file and a more foolproof file removal interface would be useful.

Users that worked on other OSes, apart from Windows, such as Mac OS X and Linux, stated that WE seems to be slow, lacks in efficiency and has limited possibilities. One Mac OS X Tiger user said that he likes that Finder has shortcuts to his desired folders and that he can easily browse its contents. A participant also proposed WE having integration with the Web in order to be able to mount network shares, a feature that exists in Nautilus File Manager of Linux.

Conclusions and Future Work

The user study of 76 users of various competence levels presented in this work is an attempt to provide insight in the use of various visualizations and tools provided for folder browsing by current OSs.

A main, and rather expected conclusion of this work is that the HC users exhibit more variety in the use of the available OS functionalities than BC and LC ones.

Almost all LC and most BC users preferred the simple ZUI method for accessing their files and folders. 78% of the HC users, on the other hand, seem to employ an ILB in all cases or in specific ones. The use of ILBs seems to be related with deep and wide hierarchies for which there is a need for quicker access and better overview than the ZUI paradigm provides.

A main issue mentioned by many BC and HC users is that WE is in fact hidden and difficult to be made as default browser in recent versions of the Windows OS. This has had an impact on the use of WE, as it seems that many of the users that started using a computer with an MS-DOS or Windows 3.1 OS seem to prefer WE as a folder browsing tool.

The majority of users belonging in the LC group state that they do not use an indented list explorer. The reason for this is that they may not know its existence in combination with the fact that they maintain a shallow hierarchy and thus they know the exact location of their files. It seems that these users are not very keen in using the OS's functionalities, they do not explore the various tools available for aiding them while searching and browsing and they limit their practices in what they first learned in order to open and edit their personal files.

However, even the LC users who know the existence of WE choose not to use it, if they have learned to reach their documents in other ways. These remarks enhance our conclusion that LC users make very restricted use of the tools offered by their operating system, whereas the HC users seem to have explored the same functionalities and they develop their usual practices according to their personal preferences

As all users use Windows as their main or secondary operating system (73 of them use Windows XP and the rest Windows Vista or 2000) there were points to be made on the comparison of Windows with other operating systems. Search and the use of Thumbnails, for example, were characterized as "problematic" and "too slow" by some users.

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