tagstore

Formal Experiment 2011-04

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1. Introduction

The amount of information has increased enormously in the last few years. Average users need to manage a wide range of personal files on their own computers.[1] Re-finding data became more complicated.[2] Despite this fact storage systems on today's modern operating systems have not improved.[3] Navigating through folder hierarchies to access information is the common practice. Strict hierarchies of folders are familiar to users. The question arises if it is the best way to store and search for files and folders.[4]

The conducted study compared a new approach of file and folder management by means of tagging to the common hierarchical navigation and storing. This new navigational approach called TagTrees (see Chapter 2) uses tagging to create a navigational hierarchy automatically. The research software implementing TagTrees is called tagstore.

In this report the basic architecture of tagstore is introduced. Furthermore results of a formal experiment where tagstore and hierarchy were compared are presented. Within the scope of this project, TagTrees created by tagstore and folder hierarchies were compared. For this purpose a formal experiment with 24 test users was conducted.

In Chapter 2 TagTrees and the research software tagstore are presented in more detail. Thereafter in Chapter 3 the methodology which has been used to evaluate tagstore and common file hierarchy is provided. Chapter 4 discusses and presents the results of the test. Finally in Chapter 6 conclusions will be established.

The whole (anonymized) data-set is available online[5]. It contains all artifacts presented to and derived from the test persons, all derived data, and scripts which were

[1] Gibson, Miller, and Long (1998); Boardman and Sasse (2004); Leung et al. (2008); Cho, Kim, and Lee (2009)

[2] Feldman and Sherman (2001); Morville and Rosenfeld (2006, pp. 11–12); Baeza-Yates and Ribeiro-Neto (2011, pp. 642–643); Jones (2007, p. 218)

[3] Voit, Andrews, and Slany (2009); Accenture survey 2007: http://www.businesswire.com/news/home/20070104005159/en/Managers-Majority-Information-Obtained-Work-Useless-Accenture – retrieved on 2012-07-18.

[4] Lansdale, 1988.

[5] https://github.com/novoid/2011-04-tagstore-formal-experiment – retieved 2012-08-14.

used to filter and analyze the data. The tagstore software will be available online as well.[6]

[6] http://tagstore.org and https://github.com/novoid/tagstore – retrieved 2012-08-14

2. Tagtrees and tagstore

TagTrees is a new concept for storing and retrieving files and folders using automatically maintained navigational hierarchies.[1] The research software, called tagstore, implementing TagTrees is developed by the Institute for Software Technology of Graz University of Technology.

The main concept of TagTrees and tagstore is shown in Figure 2.1. All files and folders are stored in a central storage folder. After adding new items to this folder a tagging window opens. As shown in Figure 2.2 users can add tags to the items. It is possible to add one or more tags to a particular item. Based on these tags tagstore creates an associative navigational hierarchy (TagTrees) where multiple paths lead to a specific file. Users can re-find there files intuitively via associative navigation and do not have to remember their folder hierarchy. Navigating TagTrees does not require any specific software, database or any of that kind. TagTrees are mapped into the file system and therefore compatible with all applications.

[1] Voit, Andrews, and Slany, 2011; Voit, Andrews, Wintersteller, et al., 2011; Voit, Andrews, and Slany, 2012; Voit, 2012.

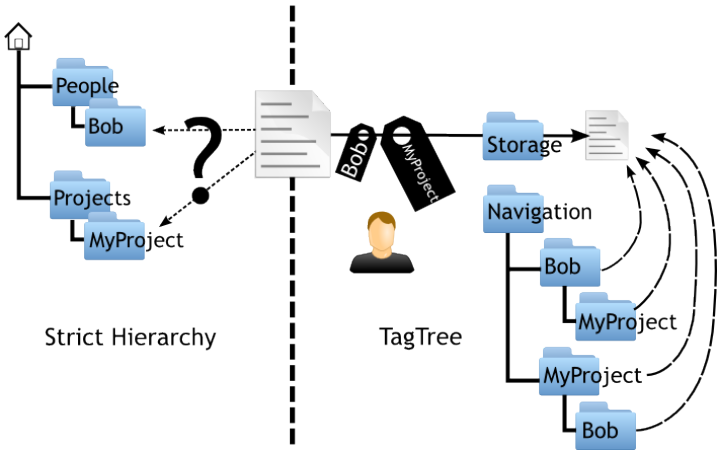


Figure 2.1.: The TagTree concept when storing a file Bob's ideas about MyProject.txt [Source: (Voit, Andrews, and Slany, 2011)].

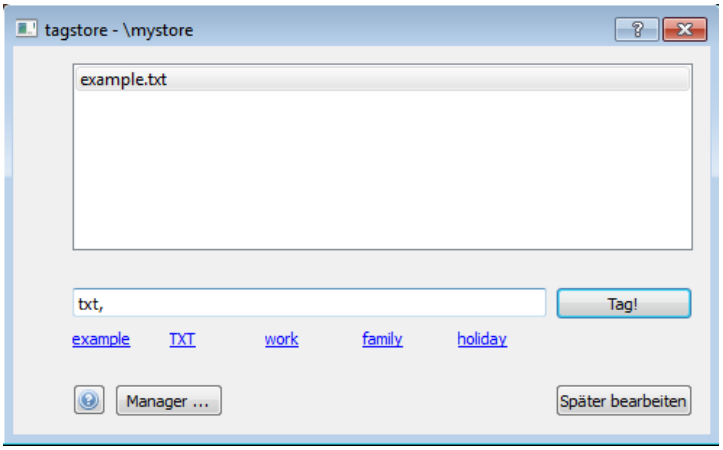


Figure 2.2.: Tagging window.

3. Test Methodology

This section introduces relevant aspects of the methodology used to compare tagstore and the common navigation through folder hierarchies (Windows Explorer). In order to compare these two different navigational approaches a formal experiment with repeated measures (within-groups) was conducted. All test users were performing each task with both conditions. When performing a repeated measure experiment user performance in the second condition can be better because of the learning effect or worse by reason of fatigue effect. In order to avoid undesired effects participants were divided into two random groups. By the group separation unwanted effects could be compensated. Group 1 used hierarchy condition first, group 2 performed tagstore condition first. After completion of the tasks, a conclusive interview has been conducted with the test users. After the interview test users have been asked to fill out a final questionnaire partly in form of a semantic differential.

The whole test was held in German as it took place at Graz University of Technology (Austria) and all test users where German native speakers. All results and materials of the test were therefore translated for this report.

3.1. Test users

Originally 27 test users started the test but only 24 finished the second part of the test. The remaining three could not attend the second part and were therefore eliminated from every analysis. Only their test numbers were not eliminated, so the highest test person number is still 27.

The formal experiment described above was conducted by 24 test users at an average age of 32. They were divided randomly into two equal groups of twelve participants.

33 % of all test persons were female and 67 % male. Gender distribution among subgroups was exactly the same.

All test users have a high education level. 2 % of the total number of test persons completed a doctorate, 33 % already possessed a university degree, the majority of

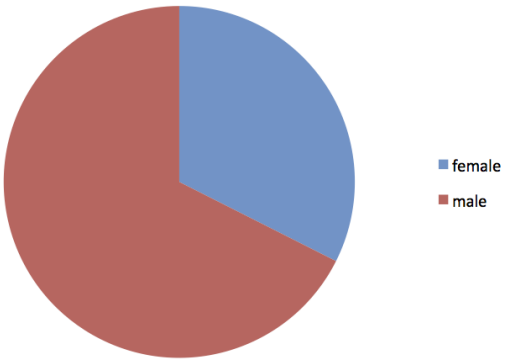


Figure 3.1.: Gender distribution of test users

users which was 59 % has a graduation diploma and are university students. One test user has a graduation diploma and is not a student.

The computer experience varies between 10 and 30 years, corresponding to an average of 19 years. The average weekly computer usage varies between 7 and 98 hours, resulting in an average of 46 hours per week. 50 % of the test test participants are Windows users. 29 % use some version of Linux, 18 % Mac OS X and the remaining 3 % are using Unix. The operating system distribution is shown in figure 3.2.

Most test users (92 %) knew the meaning of tagging but only 58 % of them actually use tagging.

To collect some information about the habits regarding filing and piling, test users were asked to answer how many folders they consider to be their most used folders or main folders. Eleven test users out of 24 (46 %) have five or less main folders. Five test users (21 %) have ten main folders and eight participants (33 %) use ten or more main folders.

The following user groups were identified and compared to each other regarding their time analysis and feedback questionnaires.

- Group 1 (hierarchy condition first) versus group 2 (tagstore condition first)
- Female versus male
- Previous usage of tagging versus no previous usage of tagging
- Platform Windows versus other platforms (Mac OS, Linux, Unix)
- Test persons with finished or ongoing IT studies versus test persons with finished or ongoing other studies (minus 1 user with no studies)

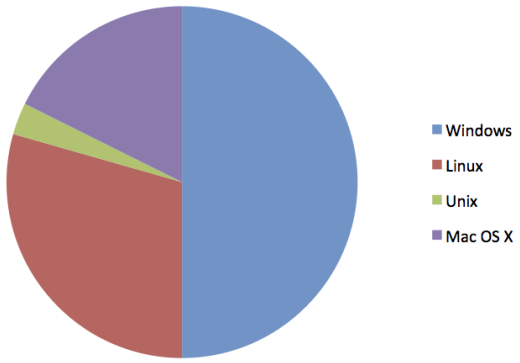


Figure 3.2.: Operation system distribution of test users

- Filer (>5 most used folders) versus Piler (<= 5 most used folders)

3.2. Test Procedure

The test was divided and conducted in three parts

1. Viewing
2. Filing and
3. Re-finding selected files

with a break of two weeks between point 2 and 3.

Viewing

Initially test persons were allowed to spent as long as they needed for examining 60 test items in a separate room (Room IC02084). The test items were composed of the following three different types of files.

- Text, article (pdf)
- Picture (jpg)
- Graphics (png)

Modifying the files was not allowed, respectively not possible because the other tasks were done on a different computer. After viewing the test items the test users were asked to go to the actual test lab.

Filing

First the facilitator did the orientation with users. He also filled in a background questionnaire and a consent form with them. Before filing the test items, already known from task one, the corresponding filing method was explained to the user by the facilitator. Then users had to file those 60 test items, one time with folder hierarchy condition and one time with tagstore condition.

The sequence of conditions was changed for our two groups. This was done to eliminate any advantage for any method due to customization and better knowledge of the files.

After each task test users were asked by the facilitator "How was it?" and for some feedback. Afterwards they had to fill in a feedback form themselves.

Finding Files

Two weeks after the first part the test, users were asked to perform the second part of the test. This break should ensure that users were going to find the selected files by navigating and not by remembering their exact folder structure. In the course of the second part users had to re-find the same ten selected files in their file hierarchy and within TagTrees (see Chapter 2). Similar to the first part, one group had to look first into the Windows Explorer hierarchy and one group first within the tagstore TagTrees.

Users were again asked "How was it?" and filled in a feedback form for both conditions.

3.3. Tasks

The following tasks (see Chapter A) had to be performed by the test users:

Task 1

1. Get an overview of the 60 files.

Task 2

1. File the 60 files into folder hierarchy.

Task 3

1. File the 60 files with tagstore.

Task 4

Using Windows Explorer condition:

1. Find the file GVB timetable of route 3.
2. Find the comic with the witch.
3. Find the picture with the chair lift.
4. Find the file with the participants of the marathon 2011.
5. Find the application form for cultural funding.
6. Find the article about fresh herbs from the garden.
7. Find the graphic with the overview of nuclear power plants next to Austria.
8. Find the picture of Formula-1-Driver Sebastian Vettel.
9. Find the article about the clock change.
10. Find the picture with the red poppy in it.

Using tagstore condition:

1. Find the file GVB timetable of route 3.
2. Find the comic with the witch.
3. Find the picture with the chair lift.
4. Find the file with the participants of the marathon 2011.
5. Find the application form for cultural funding.
6. Find the article about fresh herbs from the garden.
7. Find the graphic with the overview of nuclear power plants next to Austria.
8. Find the picture of Formula-1-Driver Sebastian Vettel.
9. Find the article about the clock change.
10. Find the picture with the red poppy in it.

Figure 3.3.: Picture of the room where the tests took place. The test users sat on the chair in front of the laptop, the facilitator sat to their left. The table at the left side of the picture was the observer's workplace. Greeting, orientation, background questionnaire etc. were done at the desk with the clipboard on it.

3.4. Test Environment

3.4.1. Location

The tests were conducted in two rooms of the Institute for software technology at Graz University of Technology.

- Room IC02084: in this room users viewed the test items
- Meeting room IST, Figure 3.3: in this room tests were conducted

3.4.2. Setup

The test setup is shown in Figure 3.4. Figure 3.5 and Figure 3.6 show the work stations of facilitator and observer.

3.4.3. Hardware and Software

All tests were conducted with the following equipment.

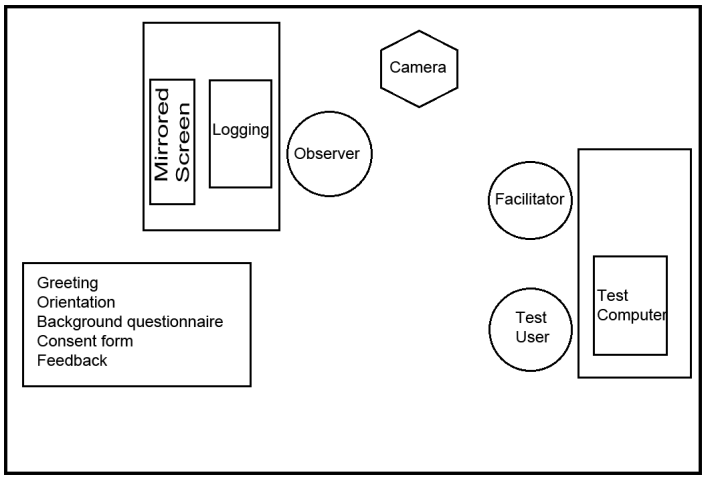


Figure 3.4.: Test setup

Figure 3.5.: The facilitator sat to the left hand side of the test users.

Figure 3.6.: The observer's workplace.

Item Viewing Computer

Hardware:	Asus A7v400-MX
CPU:	AMD Sempron (2400X), 1,66 GHz
RAM:	1024 MB RAM
Monitor resolution:	1280×1024
Operating system:	Microsoft Windows XP Home, 32 Bit, SP3

Figure 3.7 shows the file browser that was used for viewing the test items.

Test laptop

Hardware:	lenovo SL 500, Type 2746-6FG
CPU:	Intel Core 2 Duo P8400, 2,26 GHz
RAM:	2048 MB RAM
Monitor resolution:	1280×800
Operating system:	Microsoft Windows 7 Enterprise, German

The test laptop was used to file the test items, once with Windows Explorer and once with tagstore (see Figures 3.8 and 3.9).

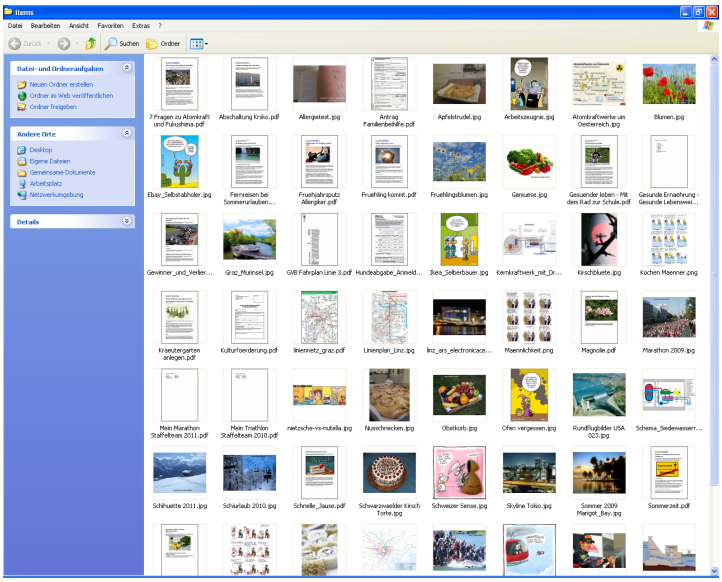


Figure 3.7.: Item viewing screen seen by the test users.

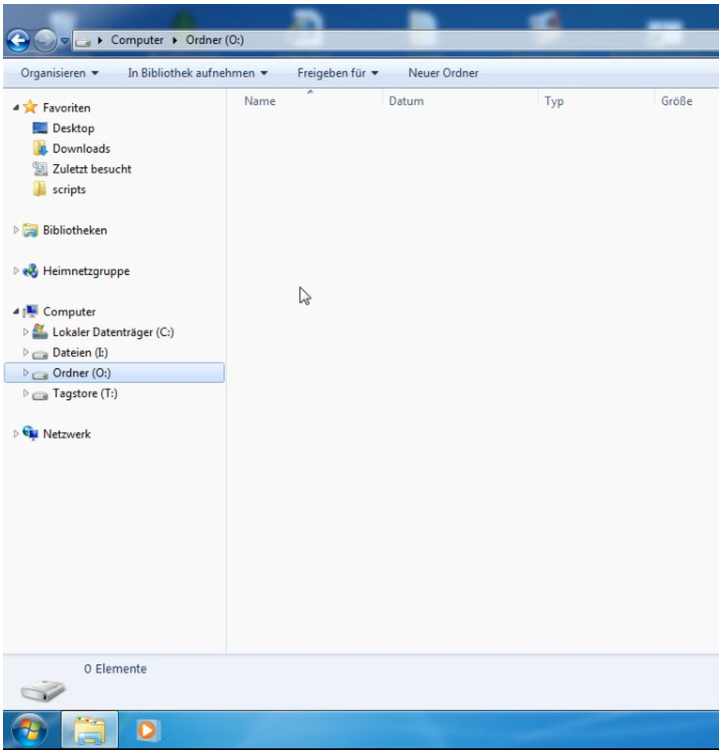


Figure 3.8.: Filing the test files with Windows Explorer.

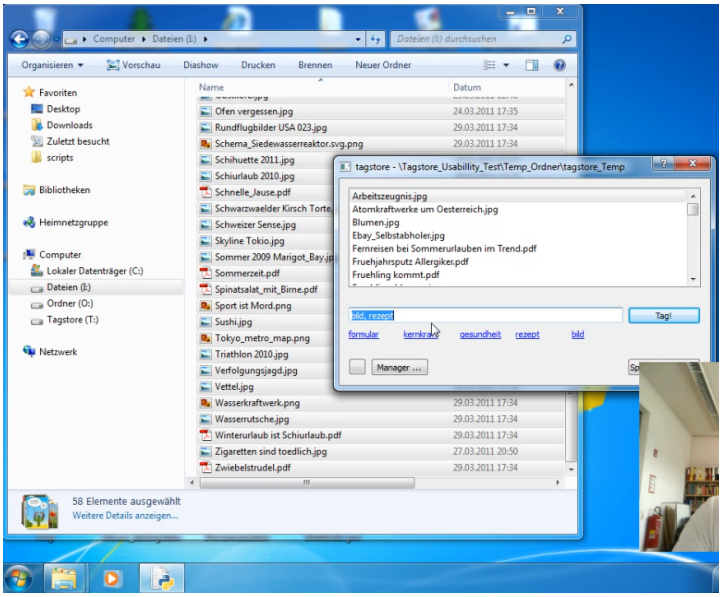


Figure 3.9.: Filing the test files with tagstore.

Observer laptop

Hardware: Sony Vaio VGN-SR19VN
CPU: Intel Core 2 Duo P8400, 2×2,26 GHz
RAM: 4096 MB RAM
Monitor resolution: 1280×800
Operating system: Microsoft Windows 7, Englisch

3.4.4. Recording Equipment

Video Camera

Digital Camcorder Sanyo Xacti HD1010 (SD-Card)

Recording Software Morae 3.2.1

The Morae Recorder was used to capture and log screen and user activity. On the observer PC Morae Observer was installed and used to monitor the tests. A standard LCD display was used to mirror the screen of the test laptop for the observer.

Following parts of the test were conducted at a table, away from the test computer and recorded with an external video camera:

- Greeting
- Orientation
- Background questionnaire
- Consent form
- Feedback form (first part of the test)

Following parts of the test were conducted at the test laptop and recorded with Morae using the internal web cam:

- Tasks
- Interview ("How was it?")

Following parts of the test were conducted at the test laptop and recorded with an external video camera:

- Feedback form (second part of the test)

The viewing of the test items was done in another room and only filmed once wit a video camera.

3.5. Data Processing - Video Logs

Unfortunately the Morae-logs, which were created by the observer during the tests, could not be used for further analysis, for the following reasons:

- Unexpected events occurred, which were not considered in the guideline
- The temporal precision for short re-finding sequences was too rough

In order to get precise time stamps of the user's actions during the tasks on the test laptop, the videos which were recorded with Morae needed to be examined manually. For every part of the test (filing and re-finding with tagstore and hierarchy) a finite state machine and a specific language were defined.

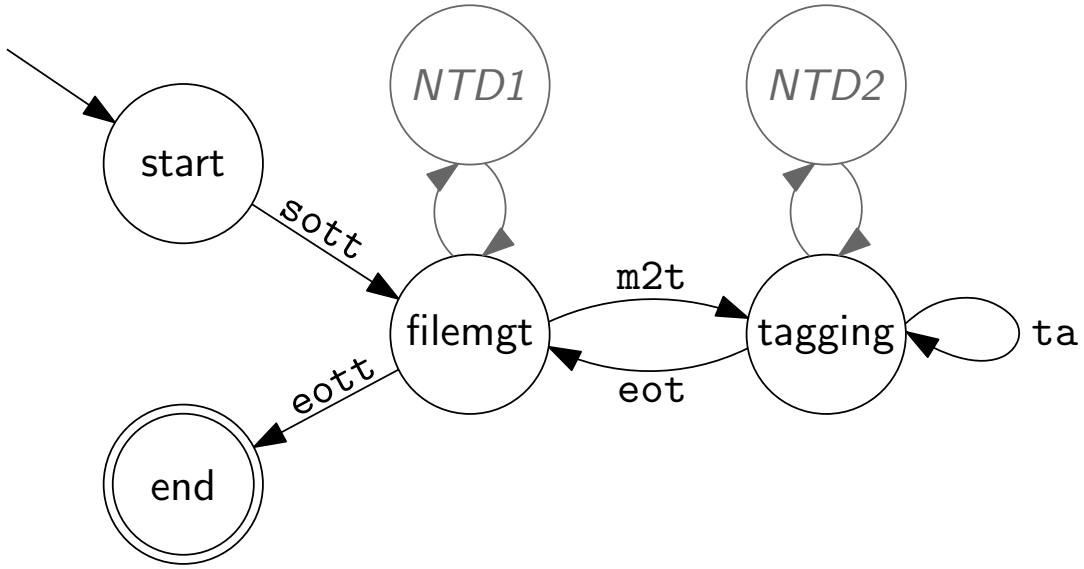


Figure 3.10.: FSM for filing with tagstore [Source: (Voit, 2012)].

3.5.1. Filing with tagstore

Figure 3.10 shows the finite state machine for the filing task with tagstore. There are four different states a user can reach while filing with tagstore:

- `filemgt` (file management)
  This state is used when a user copies or moves files from the initial directory to the tagstore storage.
- `tagging`:
  The state `tagging` is used when a user is in the stage of tagging files, which are in the tagstore storage. This state is left, when all files in the storage are tagged.
- `NTD1` (Non Task Distractions 1):
  This state can be reached from `filemgt` (file management) and means that a user is distracted from things which are not part of the test, like viewing the content of the files again.
- `NTD2` (Non Task Distractions 2):
  This state can be reached from `tagging` and means that a user is distracted from things which are not part of the test.

The events for this task are defined as follows:

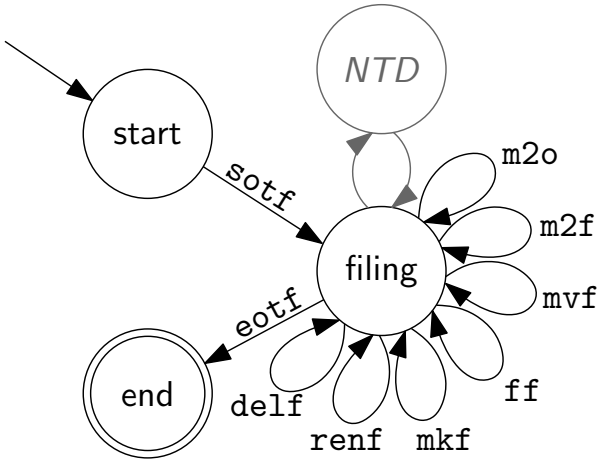


Figure 3.11.: FSM for filing with hierarchy. [Source: (Voit, 2012)]

<mm:ss> sott	Start of tagstore task
<mm:ss> m2t <nr files>	Copy or move <nr files> files to tagstore storage
<mm:ss> ta <nr tags>	Assign <nr tags> to a file
<mm:ss> eot	End of tagging (All files in the tagstore storage were tagged)
<mm:ss> eott	End of tagstore task

Here is a simple example of a tagstore task log file:

00:42 sott
01:17 m2t 3
01:22 ta 2
01:26 ta 3
01:37 ta 1
01:38 eot
02:02 m2t 1
02:06 ta 1
02:07 eot
02:08 eott

3.5.2. Filing with hierarchy

Figure 3.11 shows the finite state machine for the filing task with hierarchy. There are two different states a user can reach while filing with hierarchy:

- `filing`:
  This state is used when a user is filing items using hierarchy.
- `NTD` (Non Task Distractions):
  This state can be reached from `filing` and means that a user is distracted from things which are not part of the test.

The events for this task are defined as follows:

<mm:ss> sotf	Start of folder task
<mm:ss> m2o <nr files>	Copy or move <nr files> from temporary directory to the target directory
<mm:ss> m2f <nr files> <folder>	Copy or move <nr files> from temporary directory to a sub folder in the target directory
<mm:ss> mkf <folder>	Create a new folder
<mm:ss> renf <folder1> <folder2>	Rename <folder1> to <folder2>
<mm:ss> delf <folder>	Delete <folder>
<mm:ss> ff <nr files> <folder>	Move <nr files> into <folder>
<mm:ss> mvf <nr folders> <folder>	Move <nr folders> folder(s) into <folder>
<mm:ss> eotf	End of folder task

Here is a simple example of a folder task log file:

34:02 sotf
34:33 mkf Music
34:37 mkf Videos
34:48 mkf Images
36:03 m2f 3 Videos
36:26 renf Images "My pictures"
36:33 m2o 2
37:15 ff 2 "My pictures"
37:58 mvf 2 "My pictures"
38:02 delf Music
38:05 eotf

Non Task Distractions:

Figure 3.12 shows the finite state machine for all possible non task distractions. There are three types of events, which can distract the user from going on with the task:

- `inspecting`:
  The user can't remember what an item is about and therefore views the content of this file again.

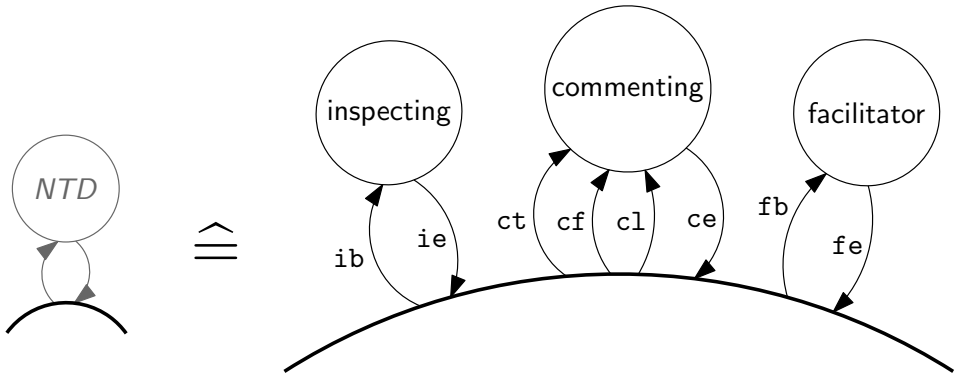


Figure 3.12.: FSM for non task distractions. [Source: (Voit, 2012)]

- `commenting`:
  This state is reached if someone gives a comment on anything and distracts the test person. Comments can possibly be made by the test person, facilitator or logger.
- `facilitator`:
  This state is entered if the facilitator takes over control during a task (for example for solving a problem).

The events for the distractions are defined as follows:

<mm:ss> ib	Begin of file inspection(s)
<mm:ss> ie	End of file inspection(s)
<mm:ss> c(f|t|l) <comment(s)>	Comment(s) of facilitator (f), test person (t) or logger (l)
<mm:ss> ce	End of comment(s)
<mm:ss> fb <comment(s)>	Facilitator takes over
<mm:ss> fe	Facilitator is finished and user starts again

Distractions can occur during every other event.
Please note, that the times from state `NTD` were deducted from the times of the corresponding states in which these distractions occurred. The net times of each state, which are used for calculating the results, are computed as follows:

- Filing with tagstore:
  Net `filemgt` (file management) = Gross `filemgt` (file management) - `NTD1`
  Net `tagging` = Gross `tagging` - `NTD2`
- Filing with hierarchy:
  Net `filing` = Gross `filing` - `NTD`

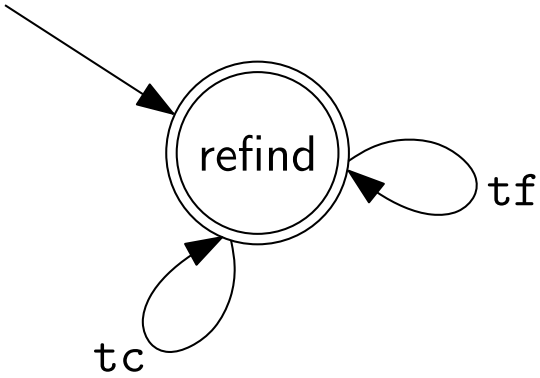


Figure 3.13.: FSM for filing with hierarchy. [Source: (Voit, 2012)]

3.5.3. Re-finding task

Figure 3.13 shows the finite state machine for the re-finding task. The state `refind` is entered immediately from the beginning, until all tasks are done.

The events for the re-finding task are defined as follows:

<mm:ss> tf <task nr> (<minutes>:)<ss.ds> <nr mouse clicks> (<nr keys>)
User finished task <task nr> in (<minutes>:)<ss.ds>, needed <nr mouse clicks> mouse clicks and used (<nr keys>) keys

<mm:ss> tc <task nr> (<minutes>:)<ss> (<comment>)
User skipped or canceled the task after (<minutes>:)<ss>. An optional comment can be added.

Here is a simple example of a re-finding task log file:

01:05 tf 4 05.62 2 0
01:37 tf 5 20.43 2 0
01:53 tf 6 06.39 2 0
02:20 tf 7 16.25 3 0
04:31 tc 8 45.08 ”File not found”
04:49 tf 9 05.10 2 0

3.5.4. LogAnalyzers

In order to analyze the log files automatically a compiler for every type of log file was developed. With the help of the compilers two goals should be achieved:

- check, if the log files are lexical and syntactically correct
- measure how much time a user spent in which state and extract metrics of interest

As long as errors in the log occur, no results are created. Hints for debugging the logfiles are given by the analyzer as well. Once the log files are error less, results are being computed and written to a csv file.

LogAnalyzerTagstore

This compiler analyzes the log files of the tagstore filing task, which are the input for this analyzer. The compiler generates a csv file, which contains the following results:

- Overall time
  Gross time for overall tagstore filing task (incl. `NTD`).
- Overall time without distractions
  Net time for overall tagstore filing task (excl. `NTD`).
- Tagging time
  Gross time user spent in state `tagging` (incl. `NTD2`).
- Tagging time without distractions
  Net time user spent in state `tagging` (excl. `NTD2`).
- FMGT time
  Gross time user spent in state `filemgt` (file management) (incl. `NTD1`).
- FMGT time without distractions
  Net time user spent in state `filemgt` (file management) (excl. `NTD1`).
- Sum of distractions
  Sum of all NTD.
- Tagging distractions
  Sum of all distractions, which occurred during the state `tagging` (`NTD2`).
- FMGT distractions
  Sum of all distractions, which occurred during the state `filemgt` (file management) (`NTD1`).
- Commentary time
  Sum of all distractions, which result from comments of test person, facilitator or logger.

- TP Inspection time
  Sum of all distractions, which result from viewing test items during the filing task.
- Facilitator time
  Sum of all distractions, which occurred when the facilitator took over.
- Sum of tags
  Sum of used tags for all test items.
- Avg Tags/Item
  Average of used tags per test item.
- List # tags/item
  List with the number of tags which were used for item 1 .. n.
- List of time user spent for tagging/item
  List of time (in s) user spent for tagging item 1 .. n.
- # m2t
  Sum of occurrences of the event: m2t.

LogAnalyzerFolder

This compiler analyzes the log files of the hierarchy filing task, which are the input for this analyzer. The compiler generates a csv file, which contains the following results:

- Overall time
  Gross time for overall hierarchy filing task (incl. `NTD`).
- Overall time without distractions
  Net time for overall hierarchy filing task (excl. `NTD`).
- FMGT time
  Gross time user spent in state `filemgt` (file management) (incl. `NTD`).
- FMGT time without distractions
  Net time user spent in state `filemgt` (file management) (excl. `NTD`).
- Sum of distractions
  Sum of all `NTD`.
- FMGT distractions
  Sum of all distractions, which occurred during the state `filemgt` (file management) (`NTD`)

- Commentary time
  Sum of all distractions, which result from comments of test person, facilitator or logger.
- TP Inspection time
  Sum of all distractions, which result from viewing test items during the filing task.
- Facilitator time
  Sum of all distractions, which occurred when the facilitator took over.
- Number of created folder
  Sum of created folders.
- # M2F
  Sum of occurrences of the event: m2f.
- # MVF
  Sum of occurrences of the event: mvf.
- # RENF
  Sum of occurrences of the event: renf.
- # DELF
  Sum of occurrences of the event: delf.

LogAnalyzerRefinding

This compiler analyzes the log files of the re-finding task, which are the input for this analyzer. The compiler generates a csv file, which contains the following results:

- Mouse clicks
  List with the number of mouse clicks a test user needed to finish task 1 .. n.
- Time per Task
  List with the times (in (mm:)ss.ds) a test user needed to finish task 1 .. n.

The script file `CSVMerge.py` was used to merge all csv files of one task to one single csv file. This resulting file contains n columns, representing the metrics and m rows, where m stands for the number of the test users. The final csv files were imported into a spreadsheet software, where all figures were created and results were calculated.

3.6. Data Processing - Test Person Artifacts

The artifacts produced by the test persons were not examined yet. They are available online[1] for further analysis.

[1] https://github.com/novoid/2011-04-tagstore-formal-experiment – retrieved 2012-08-14.

4. Results

4.1. Success rate

"For 240 re-find processes per condition, there was one unsuccessful re-finding process for the folder condition and four for the tagstore condition. This results in a success rate of 99.6 percent for the folder condition and 98.3 percent for the tagstore condition." (Voit, 2012)

4.2. Task Performance

"In Table 4.1 the task times for the folder condition are smaller for filing as well as for re-finding. For filing, there is a significant difference with $p < 0.01$ ($t(23) = -6.11$). For re-finding there is no significant difference ($p > 0.09$ with $t(23) = -1.73$). Hence, folders are significant faster for filing and for re-finding there is no significant difference.

The histograms shown in Figure 4.6 and Figure 4.7 clearly show a number of sessions where the tagstore condition did perform worse. Figure 4.1 and Figure 4.2 show the boxplot for filing and re-finding of both conditions.

The comparison of the averages mouse clicks of each test person in both conditions did not reveal any significant difference ($p > 0.92$ with $t(24) = -0.10$)." (Voit, 2012)

4.3. Artifacts

"The artifacts the test persons created had on average 7.6 characters per folder name and 7.5 characters per tag name (Figure 4.3). Comparing the number of (parent) folders for each file to the number of tags per file revealed 1.7 folders per file and 2.2 tags per file on average (Figure 4.4). For tagging, test persons used much more different tags than folder names (Figure 4.5)." (Voit, 2012)

	filing items		re-finding items	
	folder cond.	tagstore cond.	folder cond.	tagstore cond.
total [s]	16288	25075	2650	3400
mean [s]	678.67	1044.79	110.41	141.69
std dev	193.69	404.26	41.21	85.31

Table 4.1.: Total task times for all test persons. Mean values show that the folder condition was faster with a high level of standard deviations. (Voit, 2012)

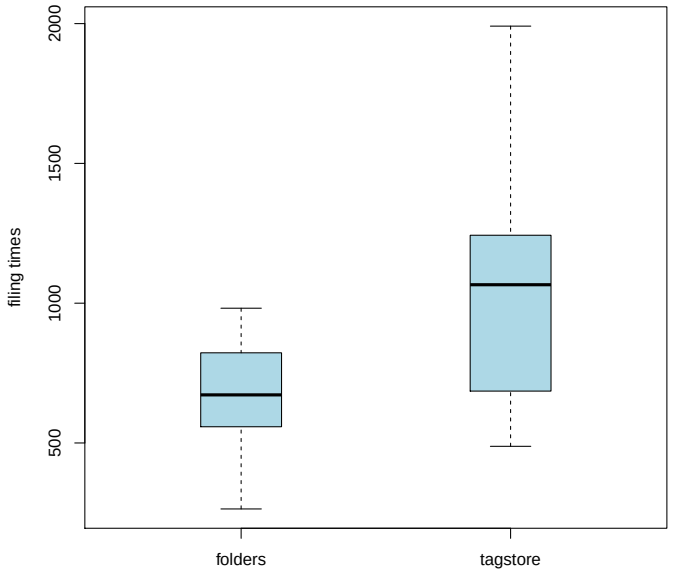


Figure 4.1.: Boxplot of the filing tasks: The folder condition is significantly faster. (Voit, 2012)

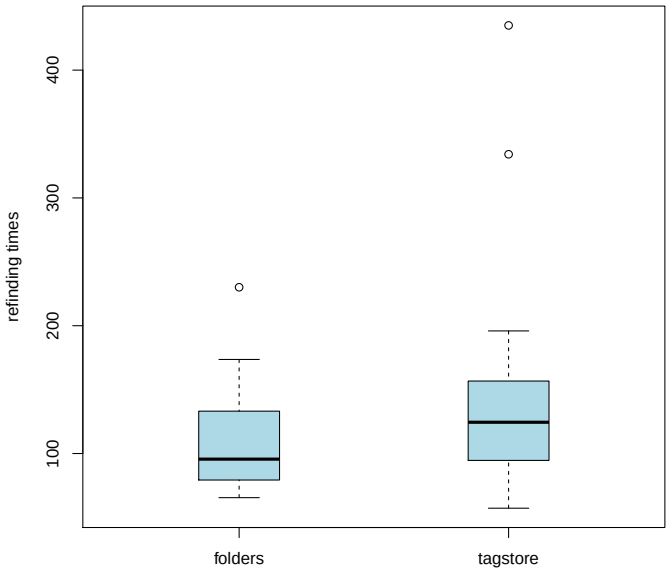


Figure 4.2.: Boxplot of the re-finding tasks: No significant difference could be found. (Voit, 2012)

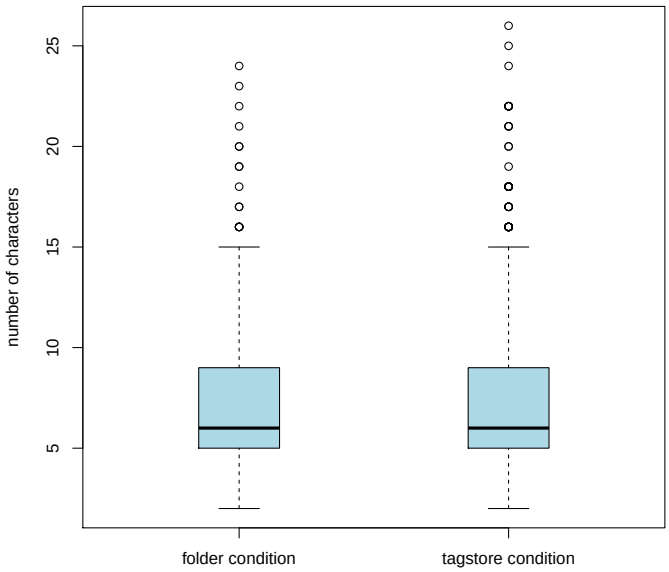


Figure 4.3.: A comparison of the lengths of folder names and tag names showed that there is not much difference in the length. (Voit, 2012)

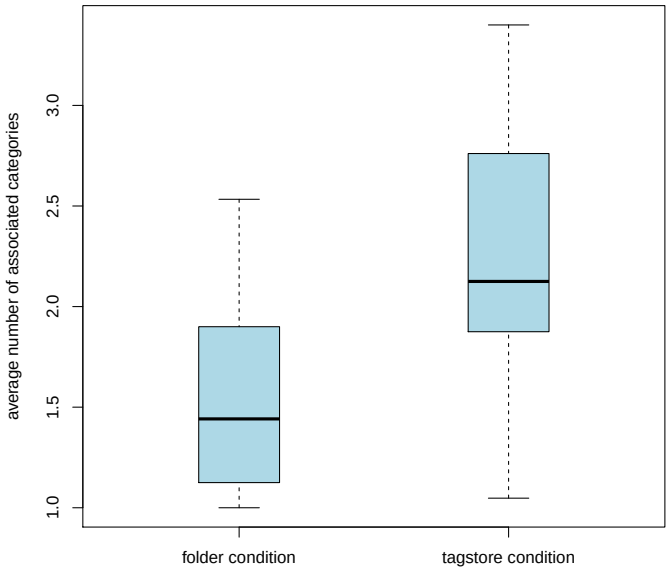


Figure 4.4.: The number of associated (parent) folders of a file-path compared to the number of tags attached to files show that there are more tags associated to a file than folders. (Voit, 2012)

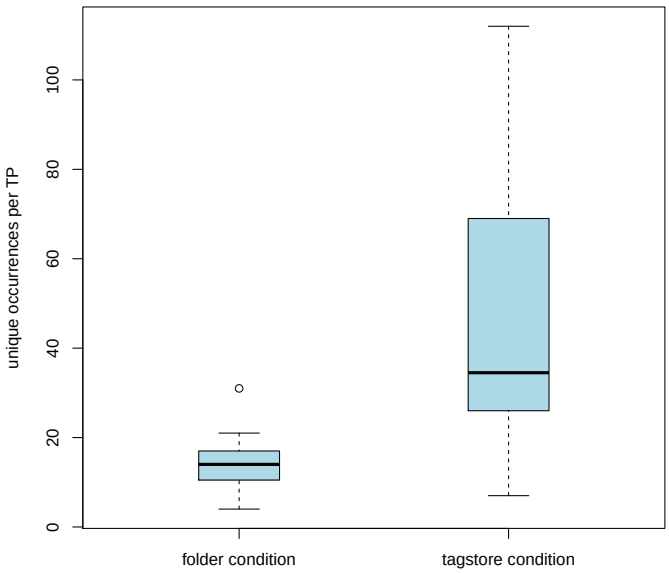


Figure 4.5.: Boxplot comparing the list of number of (unique for each test person) folders with the list of tags (unique for each test person) of the test persons. There were much more different tags used than different folder names created. (Voit, 2012)

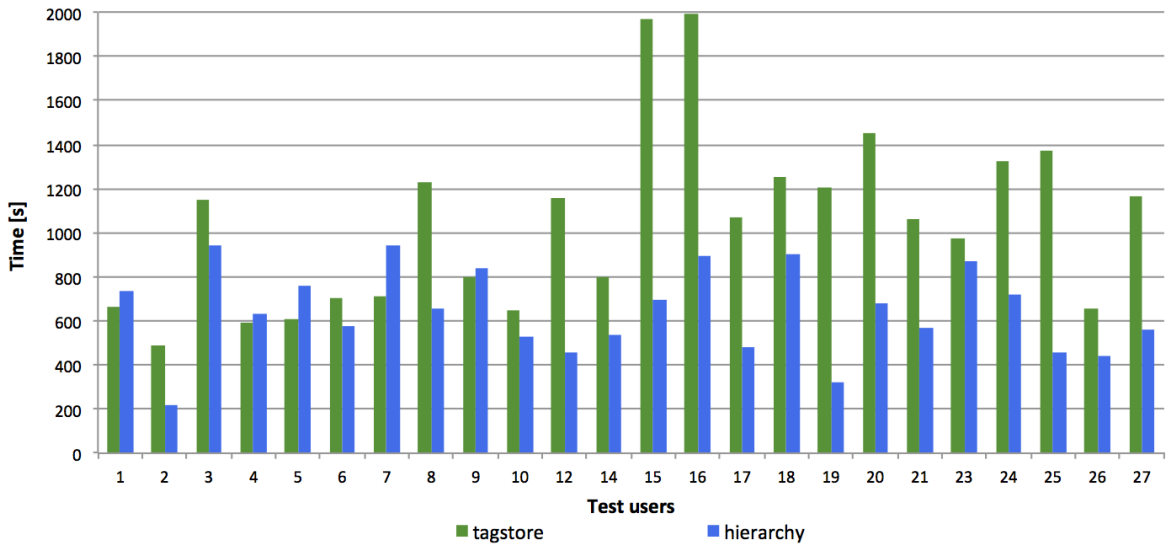


Figure 4.6.: Overview of filing times for tagstore and hierarchy

4.4. Overall time comparison

As shown in Figure 4.6 19 of 24 test users needed more time for filing with tagstore than for filing with hierarchy. Nine test users needed even twice as much time for filing with tagstore as for filing with hierarchy. Two of the test users spent twice as much time using tagstore as the average test user.

As shown in Figure 4.7 ten of 24 test users were faster with tagstore when re-finding items, 14 were faster with hierarchy. One user needed more than twice as much time for re-finding with hierarchy than for re-finding with tagstore. Five users needed more than twice as much time for re-finding with tagstore than for re-finding with hierarchy.

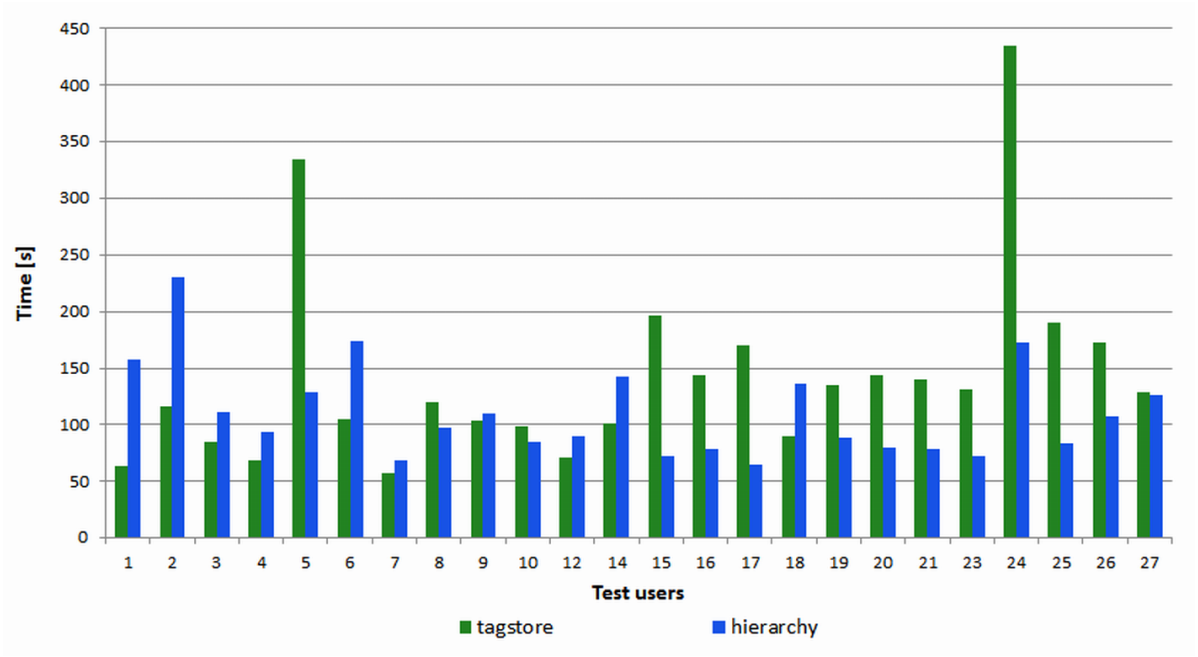


Figure 4.7.: Overview of re-finding times for tagstore and hierarchy

4.5. How to read the group comparison Figures?

The y-axis shows the time in seconds for each user. On the x-axis the test users of both groups are represented. Each marked point on one of the two curves represents one user and the user's time. If one curve is shorter than the other, the two groups are not equally sized.

4.6. Group comparisons for filing

4.6.1. User groups

The following user group/filing time comparisons were done for both tagstore and hierarchy condition.

- Group 1 (hierarchy condition first) versus group 2 (tagstore condition first)
- Female versus male
- Previous usage of tagging versus no previous usage of tagging
- Platform Windows versus other platforms
- Test persons with finished or ongoing IT studies versus test persons with finished or ongoing other studies (minus 1 user with no studies)
- Filer (>5 most used folders) versus Piler (<= 5 most used folders)

The following table 4.2 shows the test users and the user groups, they belong to.

4.6.2. Classification of user groups

Classification of filers and pilers

In the background questionnaire users were asked how many of their folders, they regard as their most important and most used folders. Five folders were defined as limit for pilers. All users with more than five most used folders were classified as filers.

users	group	gender	uses tagging	OS	IT	filer/piler
TP01	1	m	×	other		filer
TP02	1	f		other		filer
TP03	1	m		other	×	piler
TP04	1	m		win		piler
TP05	1	m	×	other	×	piler
TP06	1	m	×	win		filer
TP07	1	f		win		filer
TP08	1	m	×	other	×	filer
TP09	1	f		other	×	piler
TP10	1	f		win		piler
TP12	2	m	×	win		filer
TP14	2	m	×	other	×	filer
TP15	2	m	×	win	×	piler
TP16	2	m	×	other	×	piler
TP17	2	m		win		filer
TP18	2	f		win		filer
TP19	2	m	×	win	×	piler
TP20	2	m	×	other		filer
TP21	2	m		win	×	filer
TP23	2	f		win		filer
TP24	2	f	×	other		piler
TP25	2	m	×	other	×	filer
TP26	2	f	×	win	×	piler
TP27	1	m	×	other	×	piler

Table 4.2.: User groups and test users

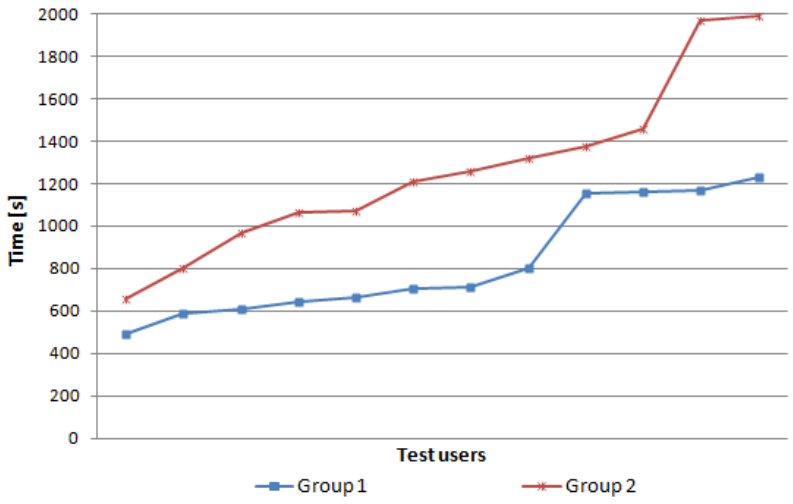


Figure 4.8.: Comparison between group 1 and group 2 while filing with tagstore

Classification of IT studies and other studies

IT studies include telematics, software engineering, electrical engineering and computer science.

Other studies include business economics, civil engineering, medicine, mechanical engineering, mathematics, physics and process engineering.

Classification of Windows platform and other platforms

Windows platform includes Windows XP, Windows Vista and Windows 7.

Other platforms include Mac OS X, Linux Ubuntu, Linux Debian, Linux Gentoo, Linux Slackware and Unix.

4.6.3. Group 1 versus group 2

As one can see in Figure 4.8 members of group 2 were always faster than members of group 1 when filing with tagstore. The time advantage for group 1 is approximately seven and a half minutes.

Times for filing with hierarchy from group 1, which used hierarchy first, and group 2, which started with tagstore, are almost the same. The time difference between the

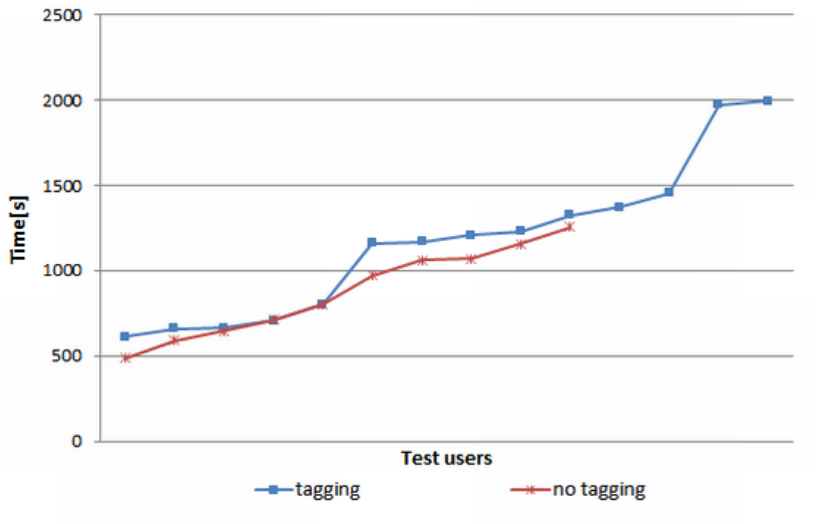


Figure 4.9.: Comparison between users with previous tagging experience and users without previous tagging experience while filing with tagstore

average time of group 1 and group 2 with hierarchy condition was approximately 16 seconds.

4.6.4. Female versus male

Women were on average faster with tagstore than men. Relatively to the average male time the average female time with tagstore was 24.7% faster. When filing with hierarchy men were on average faster (9% based on the average female time) than women. Men and women were on average approximately 10 minutes faster with hierarchy than with tagstore.

4.6.5. Previous usage of tagging versus no previous usage of tagging

Users with previous tagging experience needed more time for tagstore condition. This is an unexpected result, as one would have expected them to be faster because of their previous experience with tagging. Maybe they chose their tags more carefully than users who tagged for the first time.

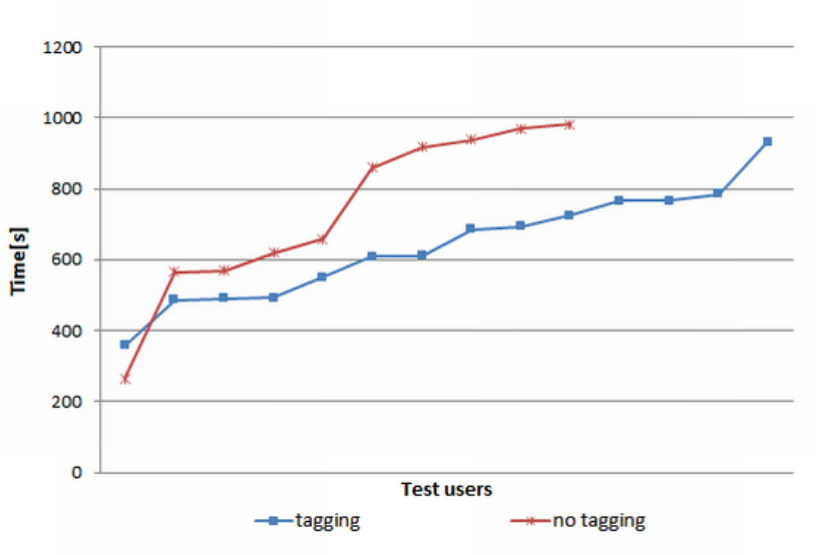


Figure 4.10.: Comparison between users with previous tagging experience and users without previous tagging experience while filing with hierarchy

As shown in Figure 4.9 users with tagging experience were on average slower with tagstore condition than users without previous tagging experience. Relatively to the average time of users with previous tagging experience the average time of users without previous tagging experience was 25% faster.

Users without previous tagging experience were on average slower with hierarchy condition than users with previous tagging experience (see Figure 4.10). The time difference between both average times was 13%, based on the average time of the no previous tagging experience group.

Both groups were faster with hierarchy than with tagstore.

4.6.6. Platform Windows versus other platforms

For classification of Windows and other platforms see Section 4.6.2.

With tagstore condition both groups needed on average the same amount of time for filing. Windows users were on average slower with hierarchy than the others. Relatively to the average Windows user time, other users were 12.8% faster.

4.6.7. Test persons with finished or ongoing IT studies versus test persons with finished or ongoing other studies (minus 1 user with no studies)

For classification of IT studies and other studies see Section 4.6.2.

One user did not study and was not included in this comparison. Test users who study or finished IT studies were slower with tagstore and faster with hierarchy than the other users. This might be due to the fact that IT students/professionals have more routine with the traditional ways of storing files and folders. With tagstore users with other studies were relatively to the average time of users with ongoing or finished IT studies 12.5% faster.

4.6.8. Filer (>5 most used folders) versus Piler (<= 5 most used folders))

For classification of filer and piler see Section 4.6.2.

On average, filers were approximately 106 seconds (9.6% relatively to piler average time) faster with tagstore than pilers. With the hierarchy condition filers were on the average about 45 seconds faster than pilers.

The reason for filers being faster can be, that pilers normally don't care where they put their files and for the test they had to create a least a view folders.

4.7. Group comparisons for re-finding

How to read the Figures? See Section 4.5

The following user group/re-finding time comparisons were done for both tagstore and hierarchy condition.

- Group 1 (hierarchy condition first) versus group 2 (tagstore condition first)
- Female versus male
- Previous usage of tagging versus no previous usage of tagging
- Platform Windows versus other platforms
- Test persons with finished or ongoing IT studies versus test persons with finished or ongoing other studies (minus 1 user with no studies)

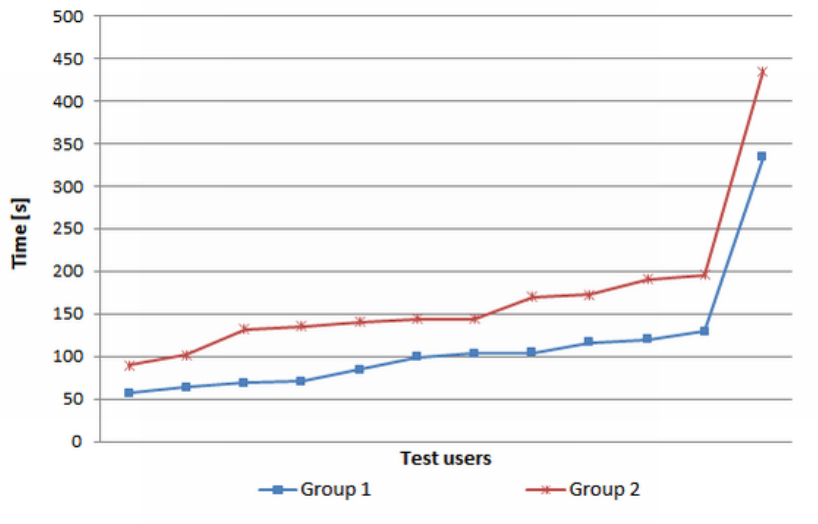


Figure 4.11.: Comparison for re-finding between group 1 and group 2 with tagstore

- Filer (>5 most used folders) versus Piler (<= 5 most used folders)

4.7.1. Group 1 versus group 2

Group 1 was on average approximately one minute (34.1% relatively to group 2 average time) faster with tagstore than group 2 (see Figure 4.11).

Group 2 was approximately half a minute (20% relatively to group 1 average time) faster with hierarchy than group 1 (see Figure 4.12).

4.7.2. Female versus male

Men were on average 13.5 seconds (8.9% relatively to women average time) faster than women with tagstore. With hierarchy men were approximately 18 seconds (15.2% relatively to women average time) faster than women.

The same comparisons were done without three users (5, 24 for tagstore and 2 for hierarchy). These three users needed more than twice as much time for re-finding than the average other user. Therefore they were eliminated from the comparison. Then the results were compared.

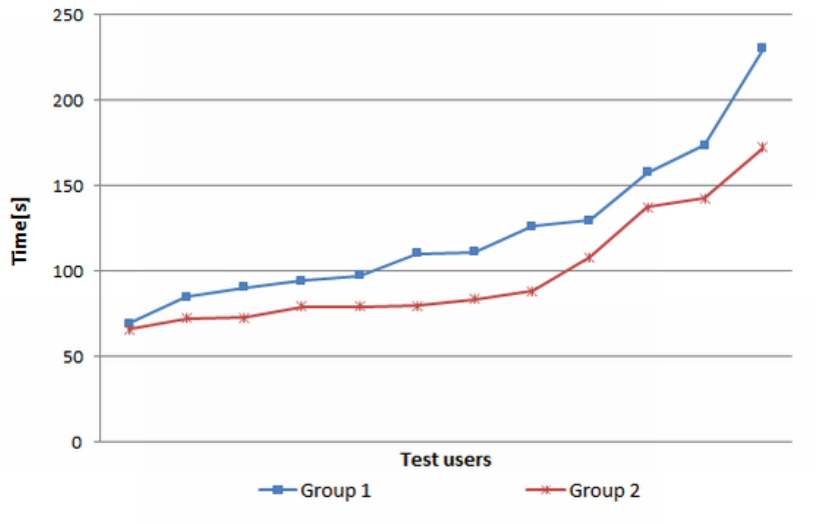


Figure 4.12.: Comparison for re-finding between group 1 and group 2 with hierarchy

Now the data look different. Women were now on average 14.15 seconds (12.9% relatively to men average time) faster than men with tagstore. With hierarchy men were still approximately 3 seconds (3.1% relatively to women average time) faster than women.

Figure 4.13 shows the time comparison with the slow users. After eliminating users 5 and 24 the gender comparison in Figure 4.14 shows a different picture.

The longest time of the female group is now smaller than the longest time of the male group. Also the average time of the female group is now smaller than the average time of the male group.

For all other groups the elimination of users 2, 5 and 24 had no big impact. The time difference between the groups shrinks but it does not change the overall picture.

4.7.3. Previous usage of tagging versus no previous usage of tagging

Users with previous tagging experience needed more time for tagstore condition. This is an unexpected result, as one would have expected them to be faster because of their previous experience with tagging.

For re-finding with tagstore the time difference was approximately one minute. Users with no tagging experience were 36.5% faster relatively to the average time

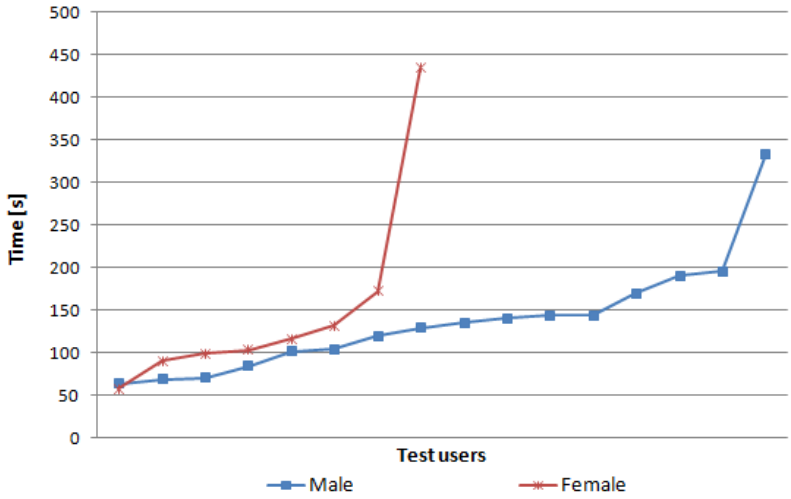


Figure 4.13.: Re-finding times for tagstore for male and female group including slow users

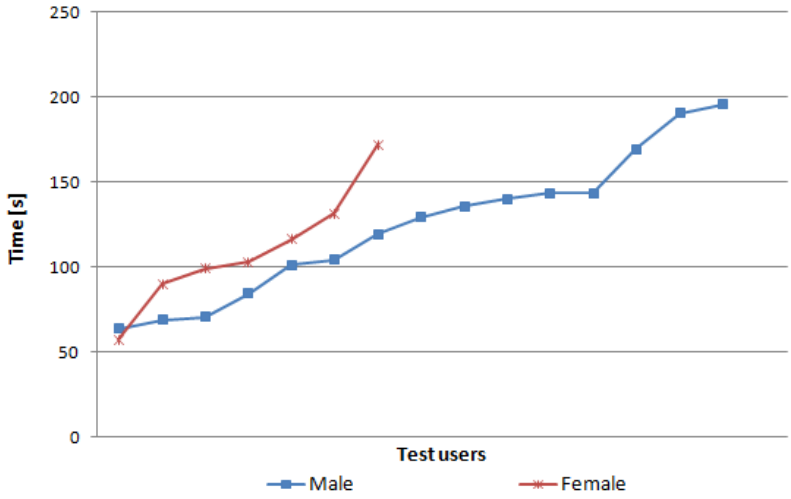


Figure 4.14.: Re-finding times for tagstore for male and female group without slow users

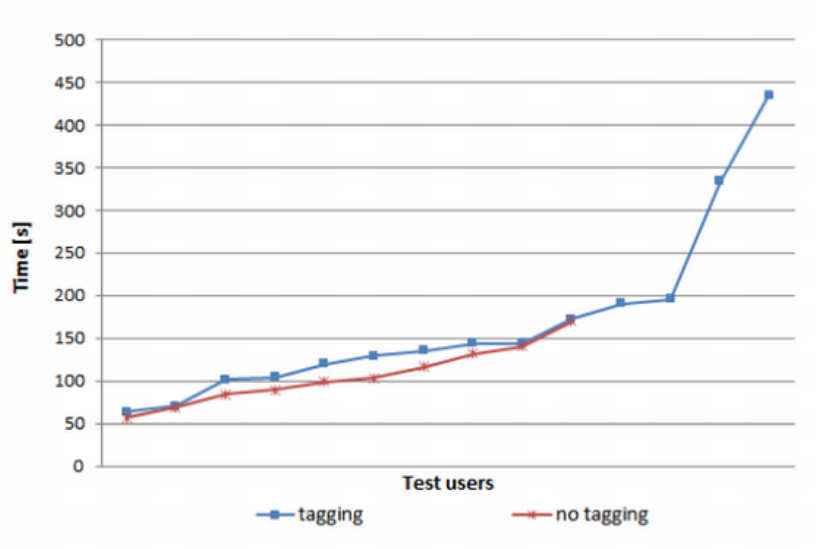


Figure 4.15.: Re-finding times for tagstore for users with and without previous tagging experience

of users with previous tagging experience. (see Figure 4.15). With hierarchy users with previous tagging experience were approximately nine seconds (7.8% relatively to average time of group without previous tagging experience) faster than users without previous tagging experience.

4.7.4. Platform Windows versus other platforms

For classification of Windows and other platforms see Section 4.6.2.

Windows users were 44.5 seconds (27.7% relatively to the average time of users of other platforms) faster than users of other operating systems (Linux, OS X, ...) with the tagstore condition (see Figure 4.16).

Windows users were also approximately 25 seconds (20.9% relatively to the average time of users of other platforms) faster with the hierarchy condition (see Figure 4.17).

4.7.5. Test persons with finished or ongoing IT studies versus test persons with finished or ongoing other studies (minus 1 user with no studies)

For classification of IT studies and other studies see Section 4.6.2.

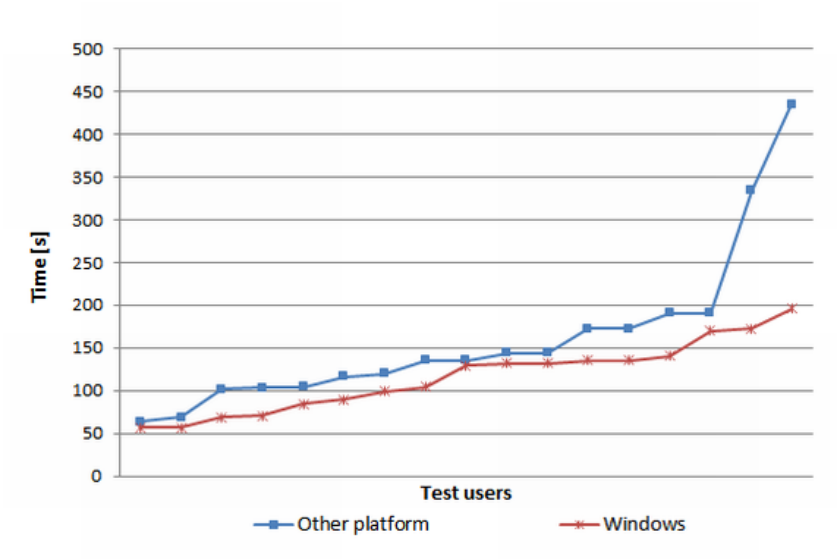


Figure 4.16.: Re-finding times for tagstore for users of Windows and other platforms

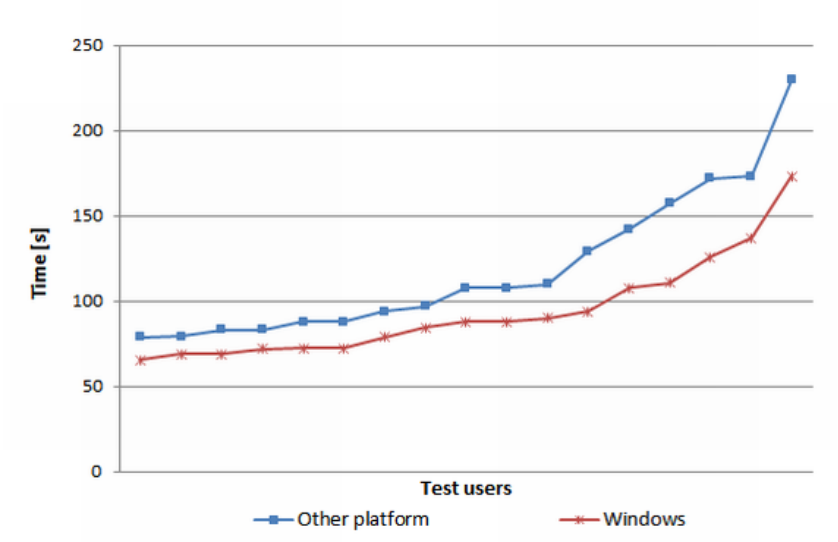


Figure 4.17.: Re-finding times for hierarchy for users of Windows and other platforms

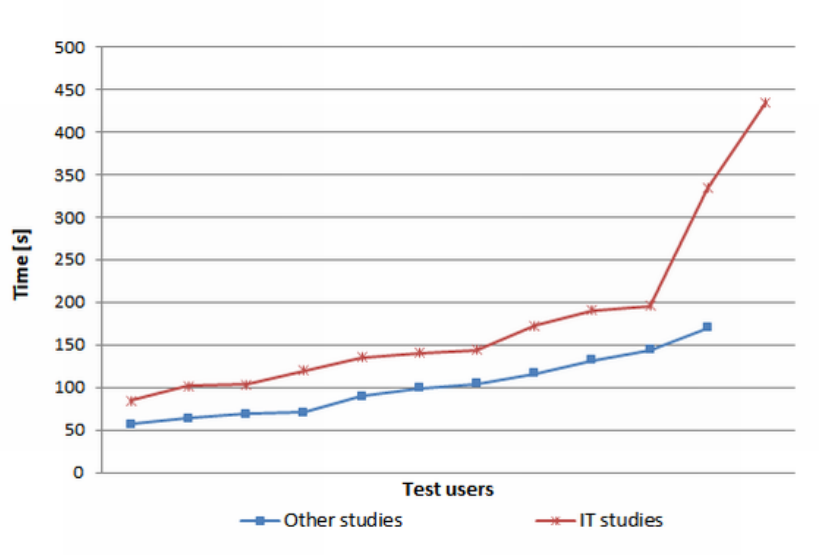


Figure 4.18.: Re-finding times for tagstore for users with ongoing or finished IT studies or other studies

One user did not study and was not included in this comparison.

Test users with other studies were on average 78.5 seconds (43.6% relatively to the average time of users with ongoing or finished IT studies) faster with tagstore then users with ongoing or finished IT studies (see Figure 4.18).

As expected users with ongoing or finished IT studies were approximately eight seconds (7.1% relatively to the average time of test users with other ongoing or finished studies) faster with hierarchy than the other users.

4.7.6. Filer (>5 most used folders) versus Piler (<= 5 most used folders)

For classification of filer and piler see Section 4.6.2.

The average re-finding time of filers with tagstore was almost one minute (33.3% relatively to the average piler time) less than the average re-finding time of pilers (see Figure 4.19). With hierarchy condition pilers were approximately seven seconds (6.1% relatively to the average filer time) faster than filers.

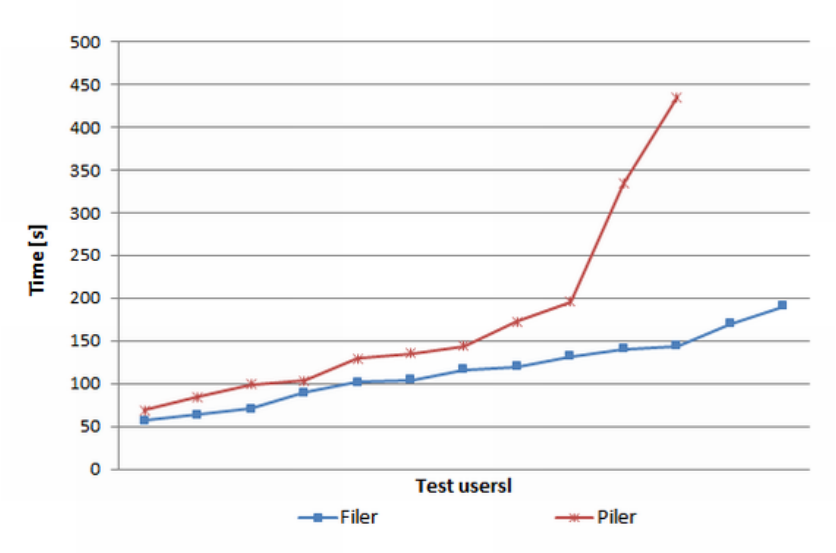


Figure 4.19.: Re-finding times for tagstore for filer and piler

5. Feedback

In this section interesting findings of the feedback questionnaires will be graphically presented and discussed.

Following user group comparisons were done for filing files for both conditions, tagstore and hierarchy.

- Group 1 (hierarchy condition first) versus group 2 (tagstore condition first)
- Female versus male
- Previous usage of tagging versus no previous usage of tagging
- Platform Windows versus other platforms
- Test persons with finished or ongoing IT studies versus test persons with finished or ongoing other studies
- Filer (>5 most used folders) versus Piler (<= 5 most used folders)

For classification of the user groups see Section 4.6.2.

5.1. Filing

The first part of the test was to file 60 items, either starting with hierarchy or starting with tagstore. This section represents the results from the feedback questionnaire regarding the filing task.

Questions for Hierarchical filing with Windows Explorer

Users were asked to answer following questions (see Chapter A) about the usage of hierarchical filing with Windows Explorer in terms of a semantic differential:

- Q1: How did you like the usage of Windows Explorer hierarchy for filing items in general?

- Q2: How did you like the usage of Windows Explorer hierarchy for filing images?
- Q3: How did you like the usage of Windows Explorer hierarchy for filing text items?

Questions for Filing with tagstore

Users were asked to answer following questions about the usage of hierarchical filing with tagstore in terms of a semantic differential:

- Q4: How did you like the usage of tagstore for filing items in general?
- Q5: How did you like the usage of tagstore for filing images?
- Q6: How did you like the usage of tagstore for filing text items?

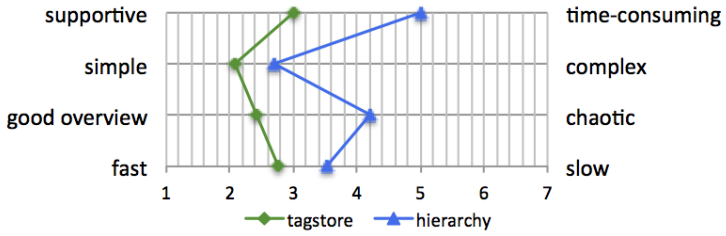
General Questions

After filing task users were asked to answer following two questions:

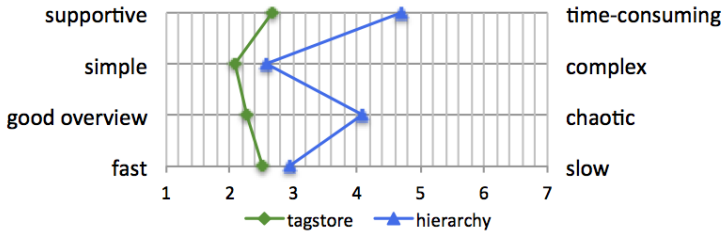
- Q7: Would you use tagstore on your own computer?
- Q8: Which condition would you prefer?

5.1.1. General Results

First of all test users were asked how they liked the two conditions in general. As shown in Figure 5.1 users preferred tagstore condition in every respect. For users tagstore seems to be more supportive, simpler, gives a better overview and is subjective faster than the hierarchical filing with Windows Explorer, although the objective time comparison from Chapter 4 proves otherwise.



(a) Filing items in general - hierarchy versus tagstore

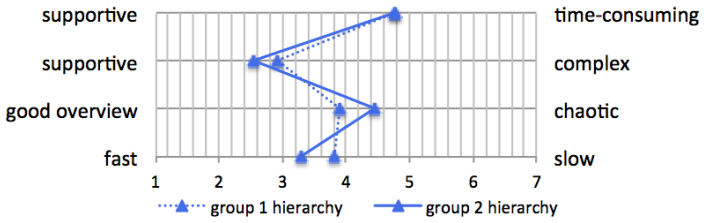


(b) Filing images - hierarchy versus tagstore

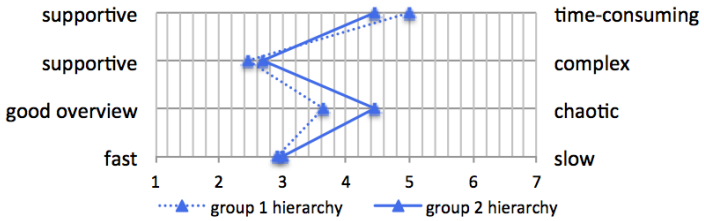
(c) Filing text items - hierarchy versus tagstore

Figure 5.1.: All test users - comparison between tagstore and hierarchy

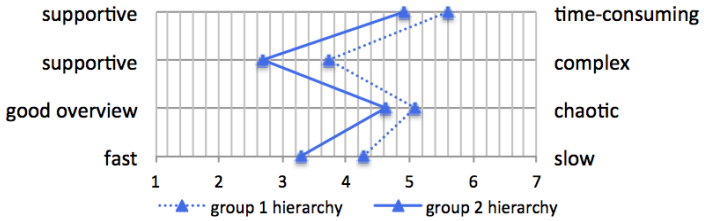
5.1.2. Group 1 versus Group 2



(a) Filing items in general with hierarchy



(b) Filing images with hierarchy

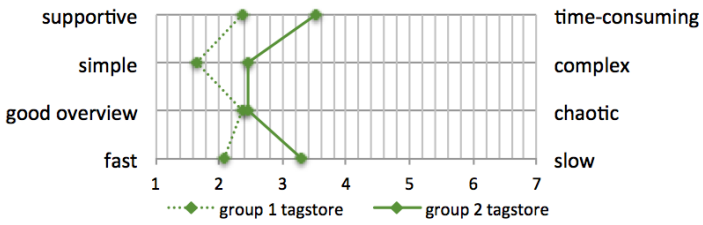


(c) Filing text items with hierarchy

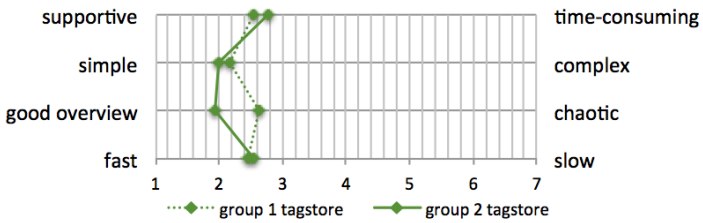
Figure 5.2.: Group 1 versus Group 2 - filing with hierarchy

Figure 5.2 shows that, in general, members of group 2 preferred the hierarchy condition a little bit more than members of group 1. Figure 5.3 shows that group 1 rated tagstore more positive than group 2. This is probably due to learning effects. Test users of group 1 started with the hierarchy condition. Hence, these users were already more familiar with the items during the filing with tagstore than users of group 2 and vice versa.

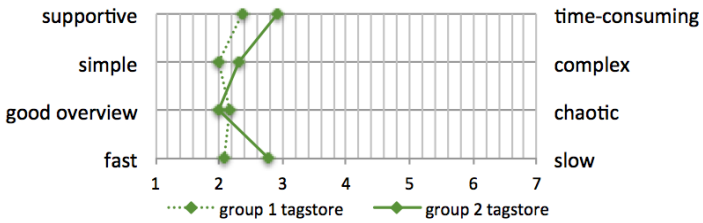
The comparison of the results obtained for group 1 and group 2 for image filing yielded interesting results. For filing items in general and text items users rated the



(a) Filing items in general with tagstore



(b) Filing images with tagstore

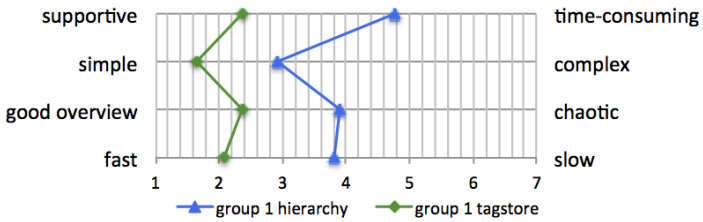


(c) Filing text items with tagstore

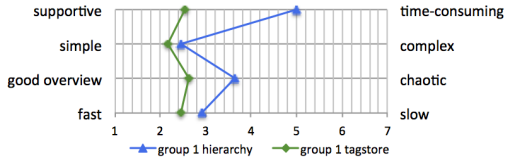
Figure 5.3.: Group 1 versus group 2 - filing with tagstore

second condition better, no matter which condition was the second one. For image items both groups liked their first condition more (see Figures 5.2(b) and 5.3(b)).

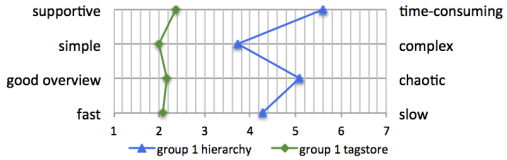
As one can see in Figures 5.4 and 5.5 both groups rated tagstore more positively than hierarchy but for group 1 (hierarchy condition first) the difference is greater between both conditions.



(a) Filing items in general

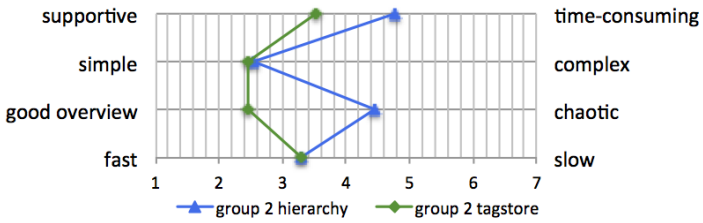


(b) Filing images

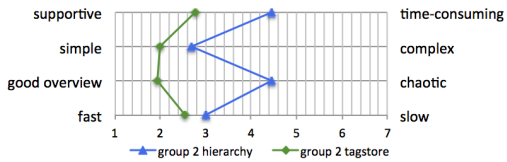


(c) Filing text items

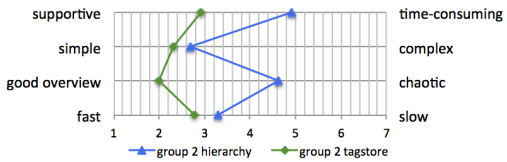
Figure 5.4.: Group 1 - comparison between hierarchy and tagstore



(a) Filing items in general



(b) Filing images

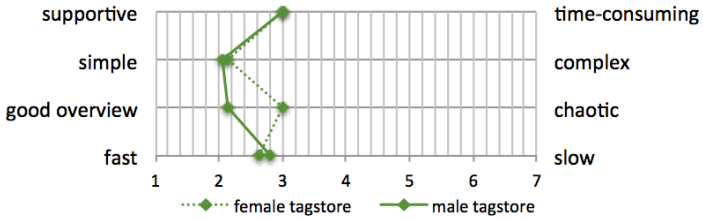


(c) Filing text items

Figure 5.5.: Group 2 - comparison between hierarchy and tagstore

5.1.3. Female versus male

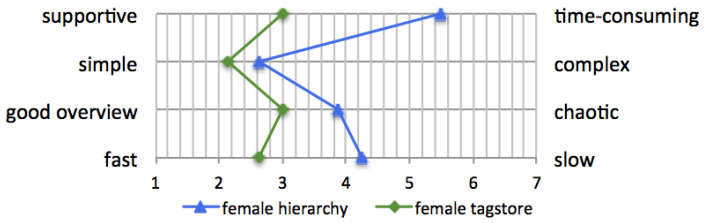
(a) Filing items in general with hierarchy



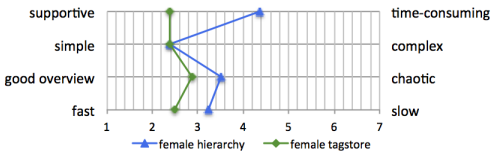
(b) Filing items in general with tagstore

Figure 5.6.: Female versus male - comparison between hierarchy and tagstore

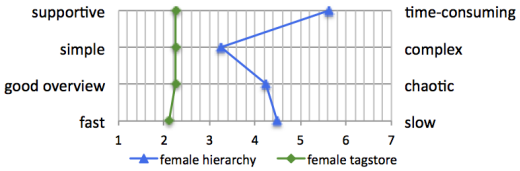
According to Figure 5.6 female test users seem to be more sceptical towards hierarchy and tagstore than male users. In general male users give better ratings except for regarding hierarchy more chaotic and tagstore slower than female users.



(a) Filing items in general

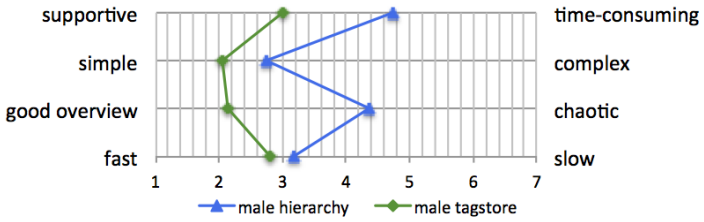


(b) Filing images



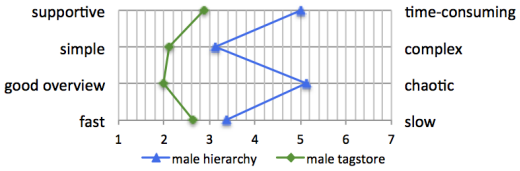
(c) Filing text items

Figure 5.7.: Female users - comparison between hierarchy and tagstore



(a) Filing items in general

(b) Filing images



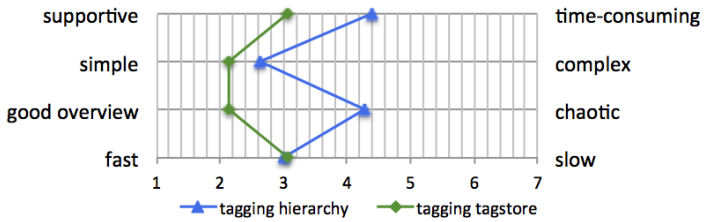
(c) Filing text items

Figure 5.8.: Male users - comparison between hierarchy and tagstore

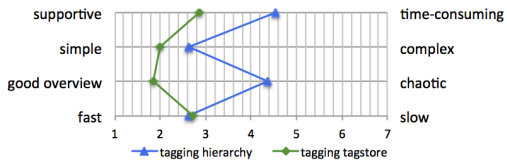
Figures 5.7 and 5.8 reveal an interesting difference. While men rate hierarchy and tagstore for all kind of items more or less the same, women rate them differently. Female users always rate tagstore better than hierarchy but for text items the difference is bigger than for images and items in general.

5.1.4. Previous usage of tagging versus no previous usage of tagging

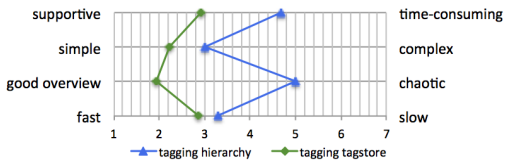
Users with previous tagging experience rate hierarchy and tagstore quite the same for all kind of items (see Figure 5.9), whereas users without previous tagging experience see a difference between the different kinds of items (see Figure 5.10). Users without previous tagging experience like tagstore best and hierarchy least for text items.



(a) Filing items in general

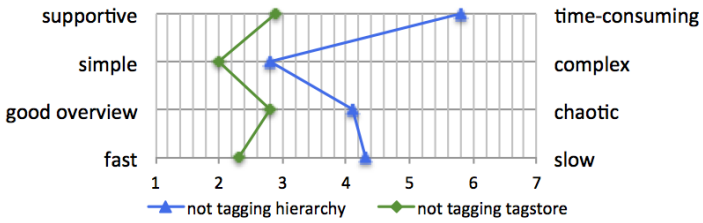


(b) Filing images

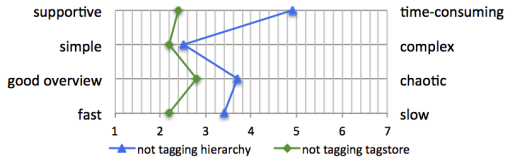


(c) Filing text items

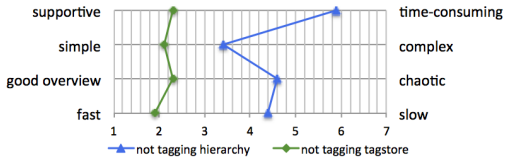
Figure 5.9.: Users with previous tagging experience - comparison between hierarchy and tagstore



(a) Filing items in general



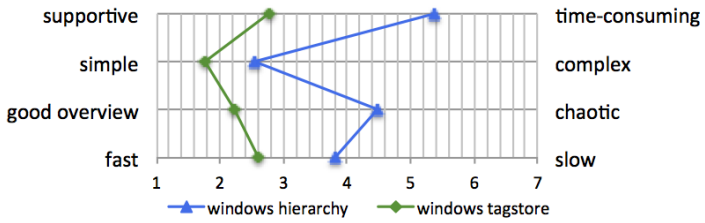
(b) Filing images



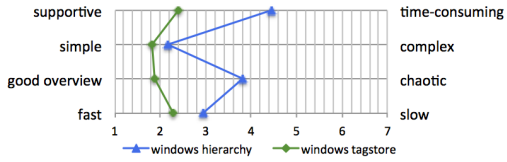
(c) Filing text items

Figure 5.10.: Users without previous tagging experience - comparison between hierarchy and tagstore

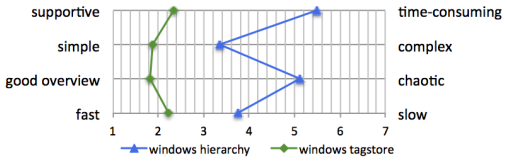
5.1.5. Platform Windows Versus Other Platforms



(a) Filing items in general



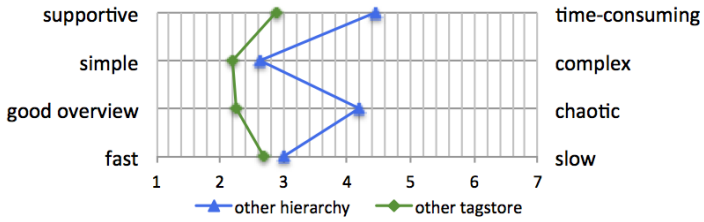
(b) Filing images



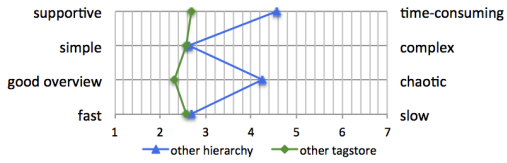
(c) Filing text items

Figure 5.11.: Windows users - comparison between hierarchy and tagstore

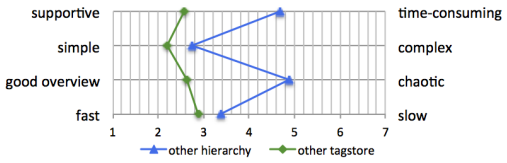
Figures 5.11 and 5.12 show an interesting outcome. Windows users like hierarchy less for items in general and text items than users of other platforms, although they use it almost on daily basis. Only for images Windows users like hierarchy more than users of other platforms. Maybe the dissatisfaction with their own system is also the reason why Windows users rated tagstore in general better than users of other platforms.



(a) Filing items in general



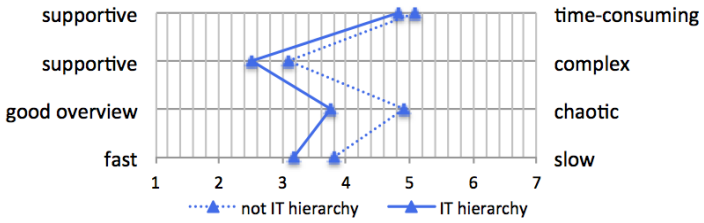
(b) Filing images



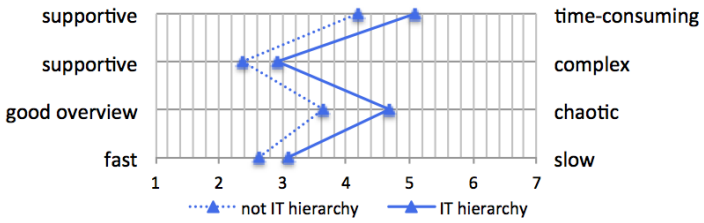
(c) Filing text items

Figure 5.12.: Users of other platforms - comparison between hiearchy and tagstore

5.1.6. Test persons with finished or ongoing IT studies versus test persons with finished or ongoing other studies



(a) Filing items in general

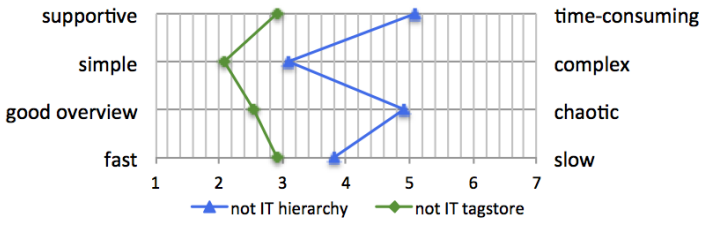


(b) Filing images

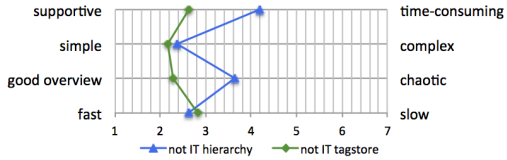
Figure 5.13.: IT studies versus other studies - filing with hierarchy

Figure 5.13 shows another swap of ratings. While test persons without an IT study rate hierarchy worse for items in general than users with an IT study, they rate hierarchy better for images.

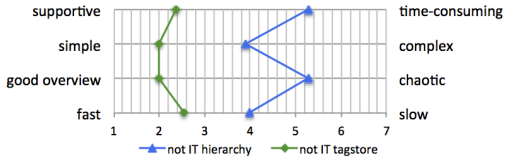
For the ratings of tagstore previous experience of tagging seems to make no great difference, both groups rated tagstore more or less the same (see Figures 5.14 and 5.15).



(a) Filing items in general

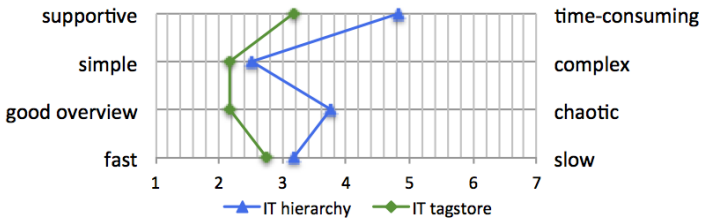


(b) Filing images

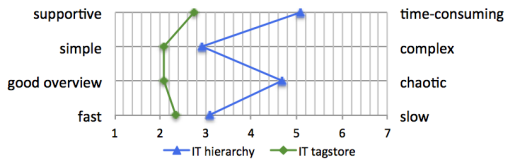


(c) Filing text items

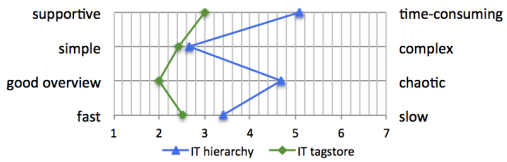
Figure 5.14.: Users with other studies - comparison between hierarchy and tagstore



(a) Filing items in general



(b) Filing images

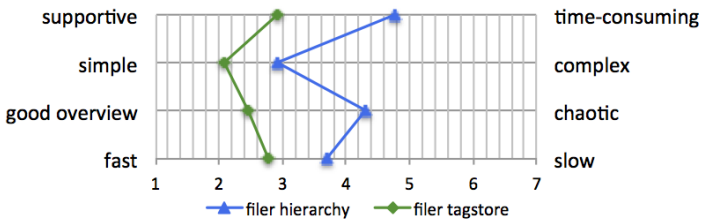


(c) Filing text items

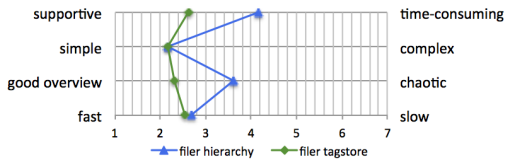
Figure 5.15.: Users with IT studies - comparison between hierarchy and tagstore

5.1.7. Filer versus Piler

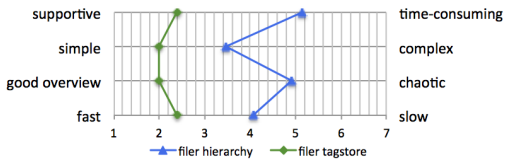
Figures 5.16 and 5.17 show the same results as described in previous sections. For tagstore the ratings are more or less the same for both groups. For hierarchy the ratings differ. Pilers give hierarchy better ratings for items in general and text items and worse ratings for images.



(a) Filing items in general

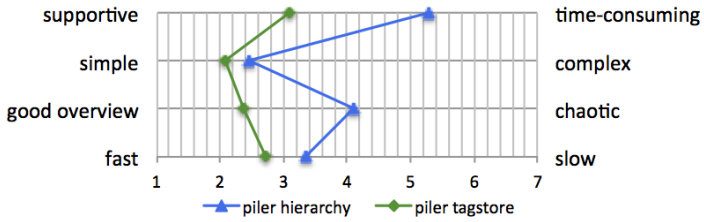


(b) Filing images

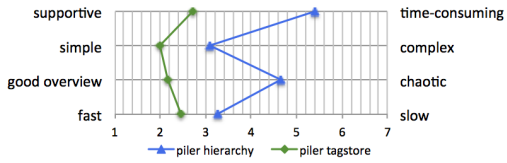


(c) Filing text items

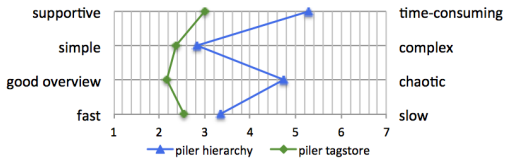
Figure 5.16.: Filer - comparison between hierarchy and tagstore



(a) Filing items in general



(b) Filing images



(c) Filing text items

Figure 5.17.: Piler - comparison between hierarchy and tagstore

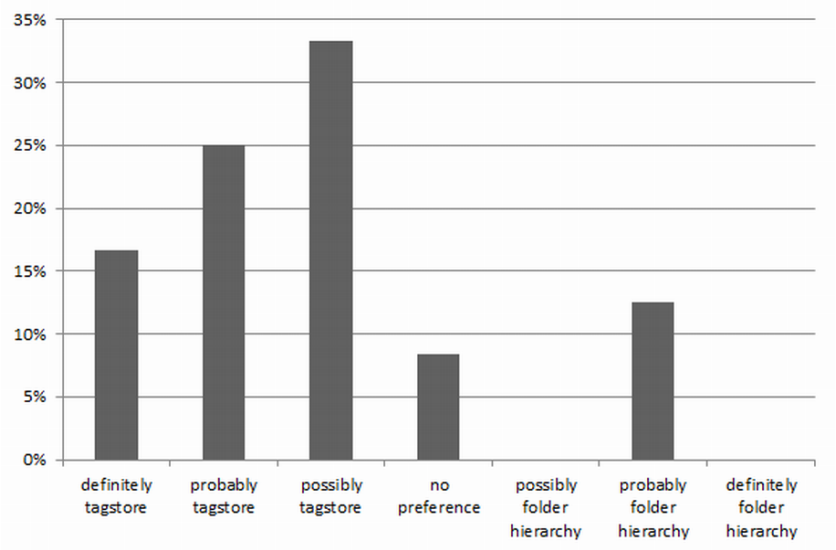


Figure 5.18.: Which condition would you prefer?

5.1.8. Acceptance of tagstore

The last two questions of the questionnaire were about the possible future usage of tagstore. One question being "Which condition would you prefer?" and the other "Would you use tagstore on your own computer?".

Figure 5.18 shows the exact ratings and Figure 5.19 shows the summarised ratings of question "Which condition would you prefer?".

Ratings definitely tagstore, probably tagstore and possibly tagstore were summarised as tagstore.

Possibly folder hierarchy, probably folder hierarchy and definitely folder hierarchy were summarised as hierarchy.

Two users had no preference for either one of the conditions, three users would prefer hierarchy and the vast majority of 18 of 24 users would prefer tagstore condition.

Figure 5.20 shows the exact ratings and Figure 5.21 shows the summarised ratings of question "Would you use tagstore on your own computer?".

Ratings strongly agree, agree and somehow agree were summarised as yes.

Somehow disagree, disagree and strongly disagree were summarised as no.

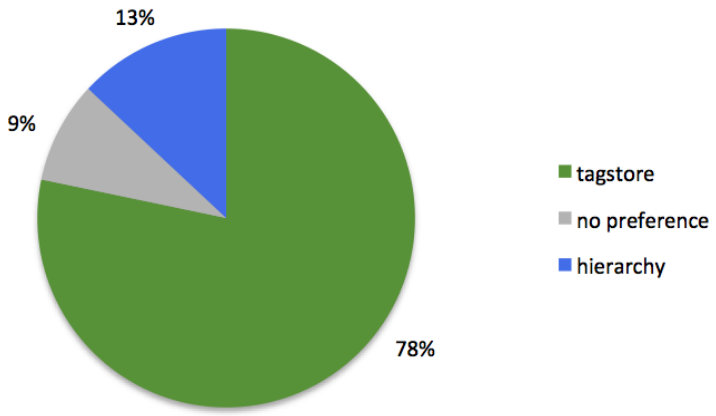


Figure 5.19.: Which condition would you prefer?

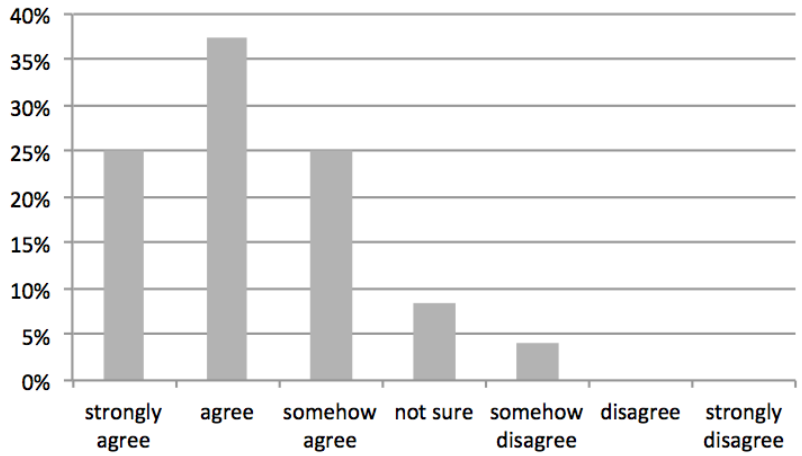


Figure 5.20.: Would you use tagstore on your own computer?

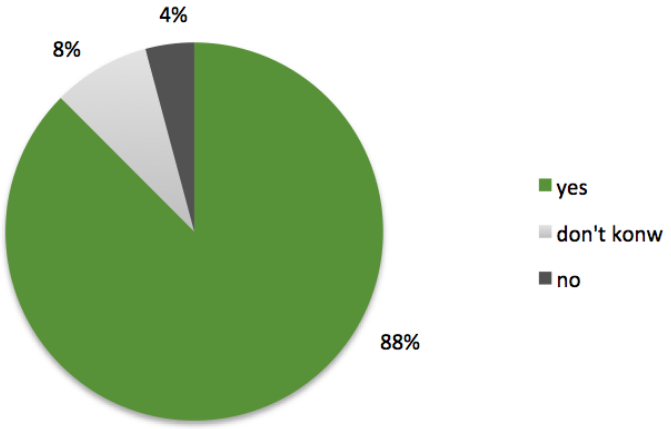


Figure 5.21.: Would you use tagstore on your own computer?

Two users didn't know if they would use tagstore on their computer, one user would not use tagstore and the vast majority of 21 of 24 users would use tagstore on their computer.

5.2. Re-finding

Two weeks after the first part of the experiment, users were asked to search ten designated items out of 60 they filed in the previous task. Again one group started with re-finding items in the hierarchy created by tagstore. The other group started with the hierarchy they created on their own with Windows Explorer. Following section presents the results from the feedback questionnaire (see Chapter A) regarding this task.

Questions for Re-finding with tagstore

Users were asked to answer following questions about the usage of re-finding with hierarchy created by tagstore.

- Q1: How did you like tagstore for re-finding items?
- Q2: How did you like tagstore for re-finding images?
- Q3: How did you like tagstore for re-finding text files?

Questions for Re-finding with hierarchy

The same questions as for tagstore had to be answered by the users after the re-finding task with the hierarchy condition.

- Q4: How did you like hierarchy for re-finding items?
- Q5: How did you like hierarchy for re-finding images?
- Q6: How did you like hierarchy for re-finding text files?

General Questions

After the re-finding users were asked following two questions:

- Q7: Would you use tagstore on your own computer?
- Q8: Which condition would you prefer?

In this section we will compare the same user groups for re-finding as for filing.

- Group 1 (hierarchy condition first) versus group 2 (tagstore condition first)
- Female versus male

- Previous usage of tagging versus no previous usage of tagging
- Platform Windows versus other platforms
- Test persons with finished or ongoing IT studies versus test persons with finished or ongoing other studies
- Filer (>5 most used folders) versus Piler (<= 5 most used folders)

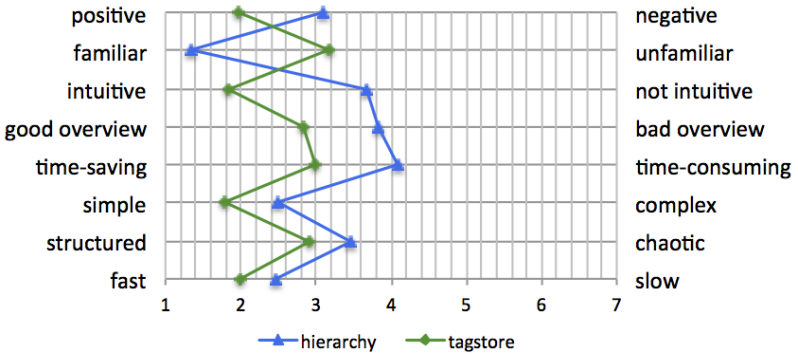
5.2.1. General Results

First of all an overview is given over all users and both conditions for re-finding items (see Figure 5.22). Users predominantly prefer tagstore. During the whole questionnaire tagstore is evaluated better than hierarchy.

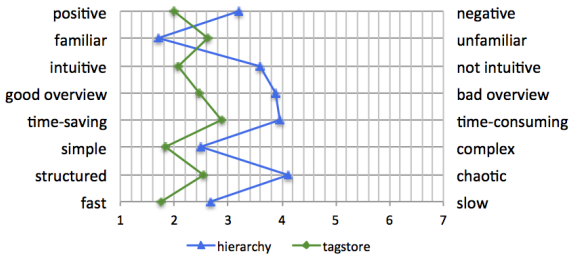
For every question eight opposite adjectives were compared. Users were asked to evaluate each condition. Users felt more positive about tagstore. They found it more intuitive, simple, time-saving, structured and faster than hierarchy condition.

In comparison with hierarchy tagstore gives also a good overview. On a scale of seven where the positive adjectives are on the left side (scale one) and the opposite negative adjectives are on the right side (scale seven) the worst scale for tagstore was 3.25 whereas for hierarchy it was 4.46.

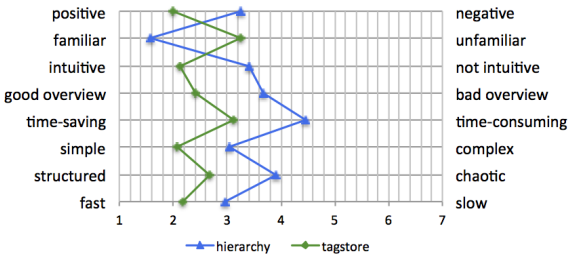
The only aspect were tagstore is always rated worse than hierarchy is the familiarity of the condition. Hierarchy is rated about 1.84 points on the scale better than tagstore. That is no surprise because none of the test users have used tagstore before the test.



(a) Re-finding items in general



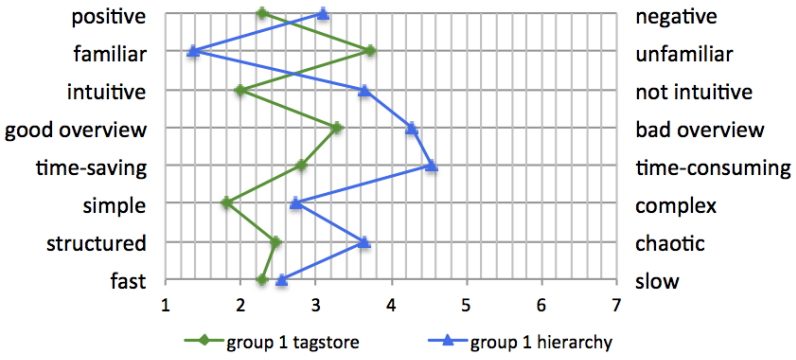
(b) Re-finding images



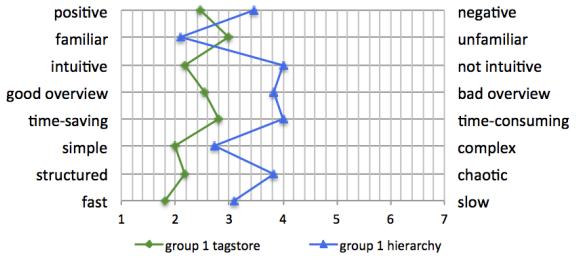
(c) Re-finding text items

Figure 5.22.: All test users - comparison between tagstore and hierarchy

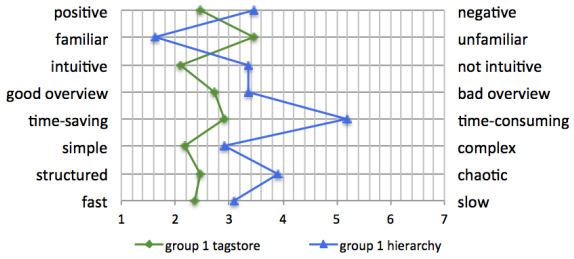
5.2.2. Group 1 versus Group 2



(a) Re-finding items in general



(b) Re-finding images



(c) Re-finding text items

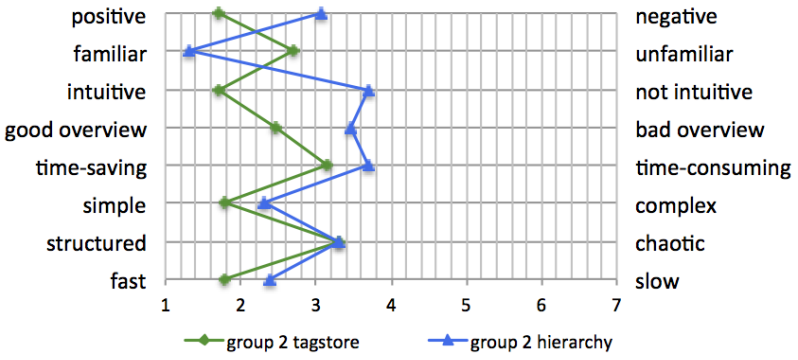
Figure 5.23.: Group 1 - comparison between hierarchy and tagstore

As shown in Figure 5.23 group 1 rated tagstore more positively than hierarchy. Results of group 1 and for all test users are almost the same. Users felt more unfamiliar with tagstore compared to hierarchy. All other adjectives are rated better for tagstore.

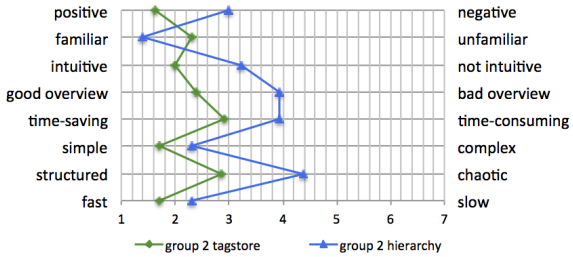
On the time-saving/time-consuming scale the difference between tagstore and hierarchy is 2.27 point. Comparing all adjectives on the scale this is the worst value (5.18) for hierarchy (compare Figure 5.23 (c)).

For group 2 the results are almost the same as for group 1. Users preferred tagstore condition in seven of eight counterpart adjectives. As well as group 1 they felt more unfamiliar with tagstore then with hierarchy.

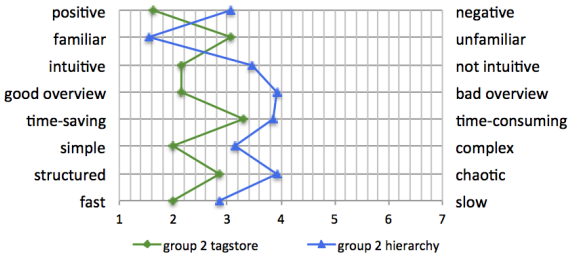
The biggest difference between the ratings on the surveyed scale was for intuitive/not intuitive for the question how they liked tagstore/hierarchy for re-finding



(a) Re-finding items in general



(b) Re-finding images



(c) Re-finding text items

Figure 5.24.: Group 2 - comparison between hierarchy and tagstore

items in general. Worst rated is hierarchy for the adjective pair chaotic - structured with a value of 4.38.

Conspicuous is the result for re-finding text items with hierarchy. Both groups felt that hierarchy is much more time-consuming, although only ten (of 24) users were faster when re-finding items with their tagstore hierarchy. Fourteen users where faster when re-finding with their Windows Explorer hierarchy.

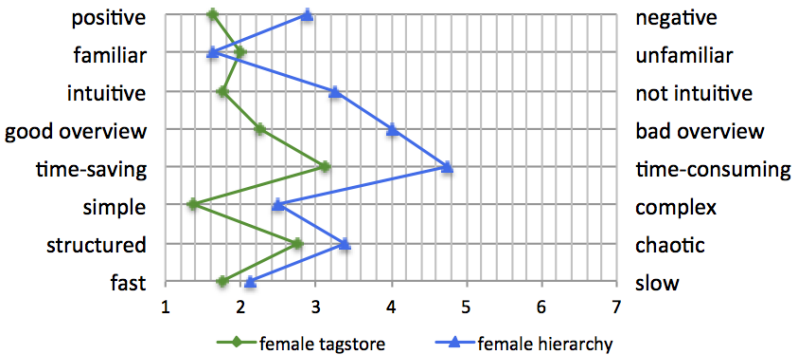
5.2.3. Female versus male

The female versus male group comparison once again shows that tagstore is favoured by all users. Comparing Figures 5.25 and 5.26 it can be said that female users liked tagstore generally a bit more than male users, although after the filing task it was the other way around.

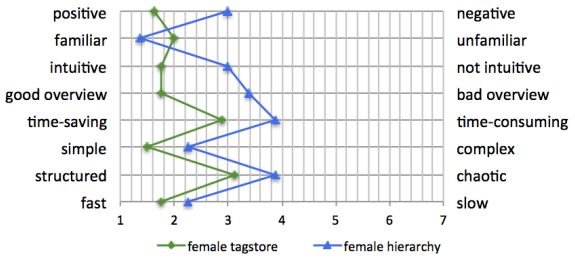
These figures also show that the familiarity of the two conditions is rated quite differently by female and male users. While women rated tagstore with an average of 2 on the familiar - unfamiliar scale, men rated an average of 3.75.

The reason for this difference in the rating of the familiarity may lie in the computer usage of both groups. While the general usage (in years) of computers is quite the same (women: 20 years, men: 18 years) the weekly usage shows a big difference (women: 37 hours/week, men: 51 hours/week). Therefore men may see a greater difference because they are used to Windows Explorer a lot more than women.

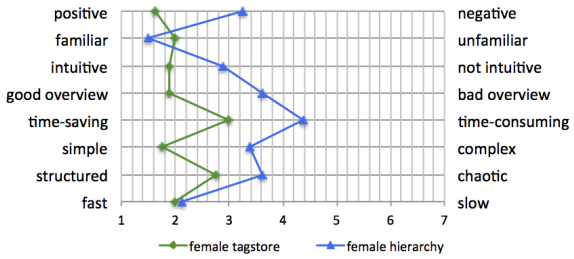
Woman rated tagstore for re-finding items in general over one point better than hierarchy for the following adjective pairs: simple - complex, time saving - time consuming, good overview - bad overview, intuitive - not intuitive and positive - negative (see Figure 5.25 (a)).



(a) Re-finding items in general

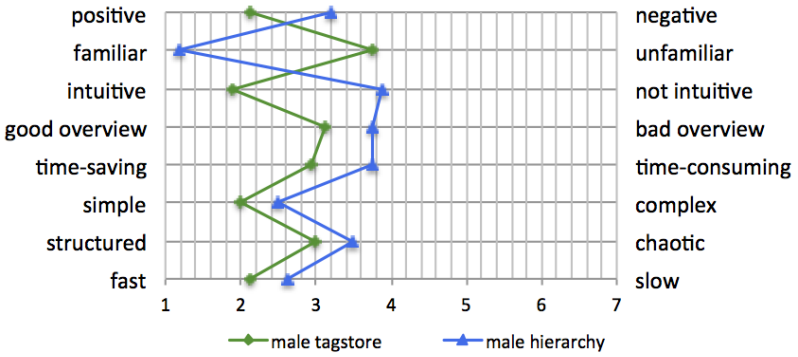


(b) Re-finding images

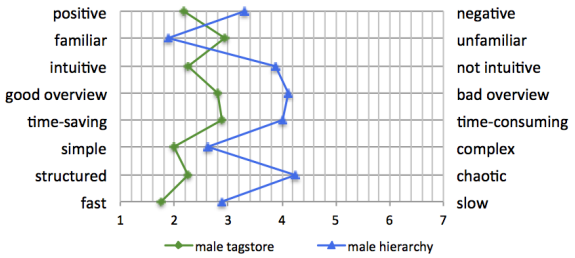


(c) Re-finding text items

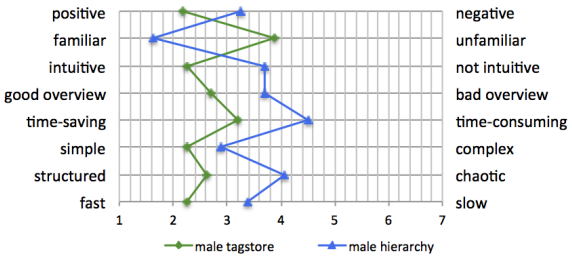
Figure 5.25.: Female users - comparison between hierarchy and tagstore



(a) Re-finding items in general



(b) Re-finding images



(c) Re-finding text items

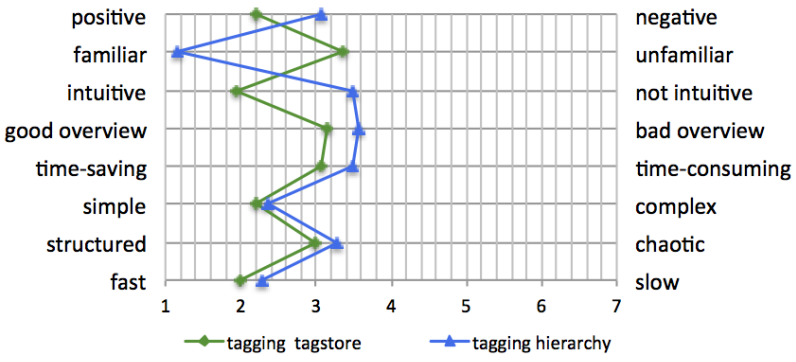
Figure 5.26.: Male users - comparison between hierarchy and tagstore

5.2.4. Previous usage of tagging versus no previous usage of tagging

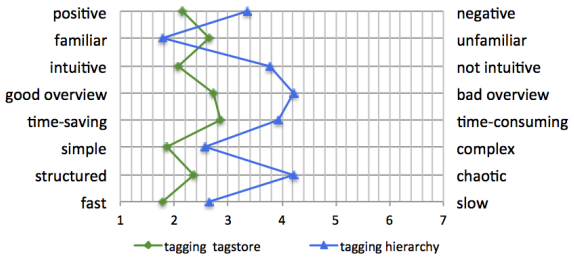
In this section the results of user group with previous usage of tagging and the user group with no previous usage of tagging will be analyzed and compared.

For re-finding items with tagstore users without previous tagging experience rated almost always tagstore better than users with previous tagging experience. Only for re-finding images users with no previous tagging experience rated tagstore a little less structured than users with previous tagging experience.

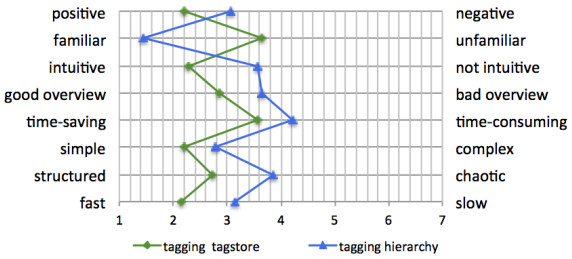
Especially ratings for the adjective pair simple - complex (see Figures 5.27 and 5.28) is surprising. Users without previous tagging experience found tagstore simpler than users with previous tagging experience.



(a) Re-finding items in general



(b) Re-finding images



(c) Re-finding text items

Figure 5.27.: Users with previous tagging experience - comparison between hierarchy and tagstore

As shown in Figure 5.28 the ratings for tagstore and hierarchy are more apart for users without previous tagging experience than for users with previous tagging

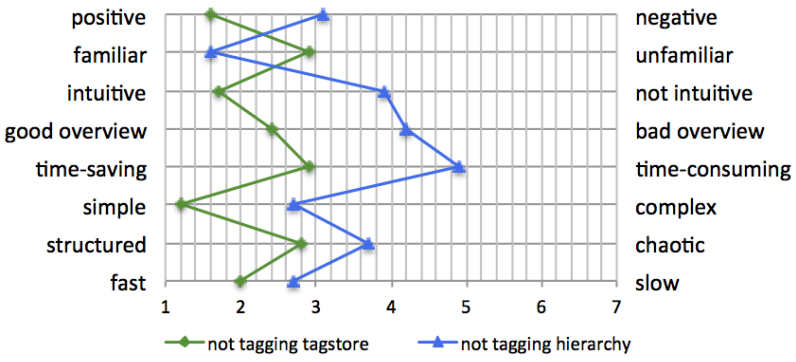
experience.

Users without previous tagging experience rated hierarchy for re-finding items in general noticeable bad (4.9) on the time-saving - time consuming scale. The difference for this value (two) on the scale between tagstore and hierarchy is very big.

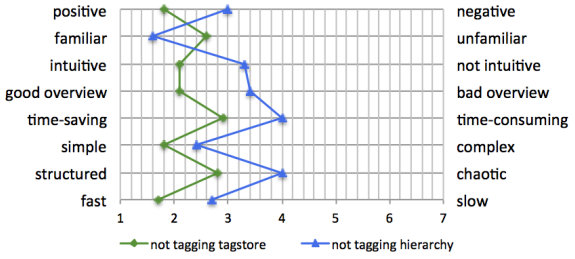
For every adjective pair expect simple - complex (0.6 difference) the scale difference between tagstore and hierarchy for re-finding images is greater than one (see Figure 5.28 (b)).

For re-finding text items the difference is even bigger for most of the adjective contra pairs (see Figure 5.28 (c)).

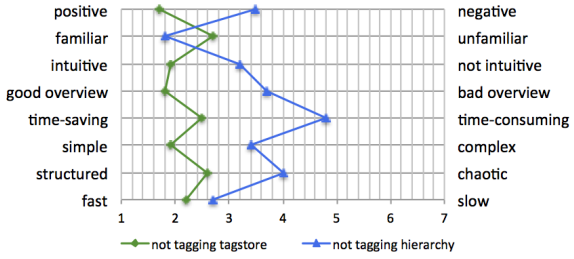
Summing up the results both groups rated tagstore better than hierarchy for all asked adjective pairs expect familiarity (see Figure 5.27).



(a) Re-finding items in general



(b) Re-finding images



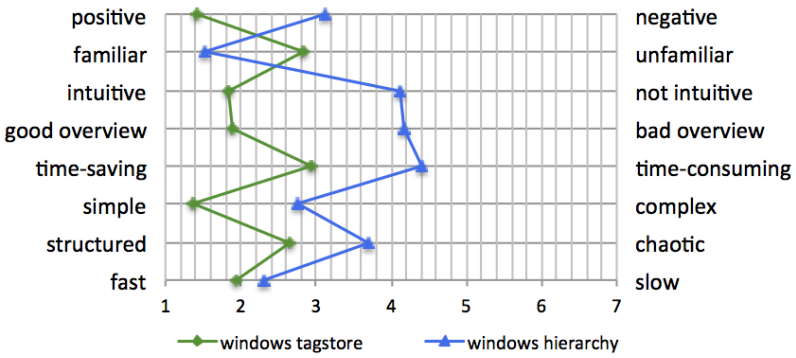
(c) Re-finding text items

Figure 5.28.: Users without previous tagging experience - comparison between hierarchy and tagstore

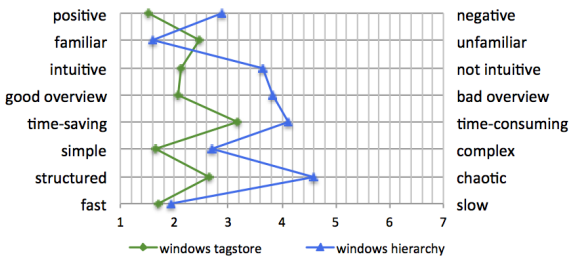
5.2.5. Platform Windows Versus Other Platforms

In this section the results will be discussed and compared regarding the different platforms users are accustomed to. One group consists of Windows users and the second group consists of users of all other operating systems.

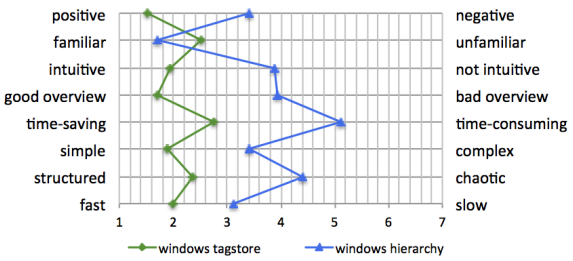
As Figure 5.29 (a) shows, Windows users rated hierarchy clearly worse than tagstore for the adjective pairs intuitive - not intuitive and good overview - bad overview (difference of 2.29 points on scale of seven). The difference (1.49) for time saving - time consuming between tagstore and hierarchy ratings is not as large as for the previous two adjective pairs but it is still remarkably better for tagstore. Especially for re-finding text items Windows users preferred tagstore (see Figure 5.29 (c)).



(a) Re-finding items in general



(b) Re-finding images

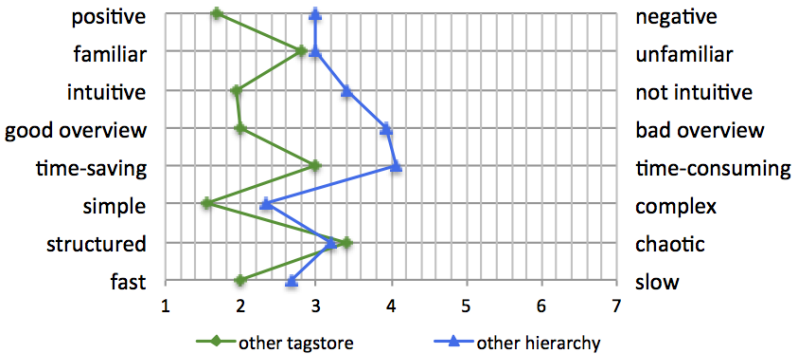


(c) Re-finding text items

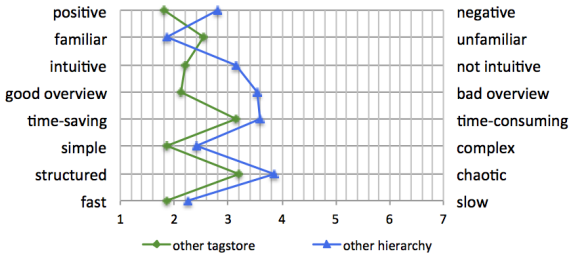
Figure 5.29.: Windows users - comparison between hierarchy and tagstore

Unix, Linux and Mac OS X users were combined to one group. As shown in Figure 5.30 this users preferred tagstore too. They rated almost all adjective pairs on the scale better for tagstore than for hierarchy. These test users were the only ones that

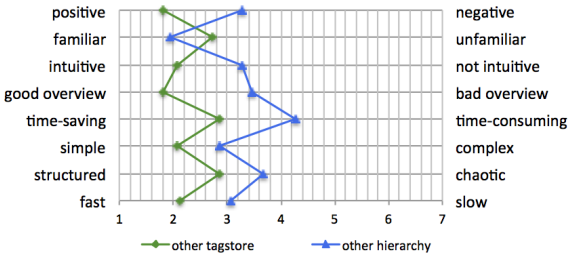
rated tagstore more familiar than hierarchy for re-finding items in general. For re-finding items in general they also rated tagstore more chaotic than the hierarchy they created with Windows Explorer.



(a) Re-finding items in general



(b) Re-finding images

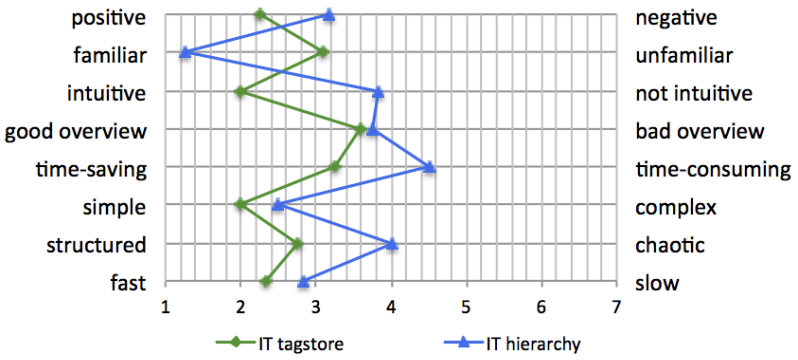


(c) Re-finding text items

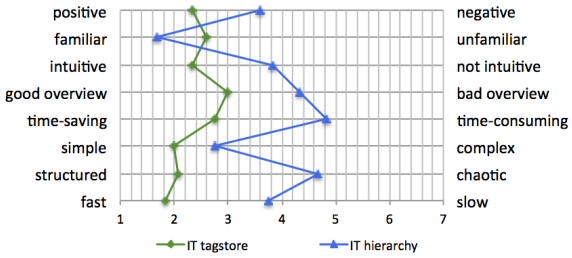
Figure 5.30.: Users of other platforms - comparison between hiearchy and tagstore

5.2.6. Test persons with finished or ongoing IT studies versus test persons with finished or ongoing other studies

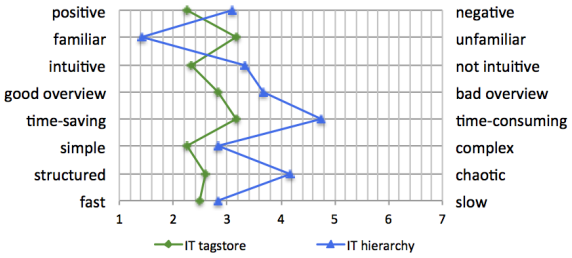
Similar to all other groups test persons with finished or ongoing IT studies preferred the usage of tagstore for re-finding items in general, images and text items. Regarding the difference between the ratings for tagstore and hierarchy test users preferred re-finding images with tagstore most. Hierarchy created with Windows Explorer seems to be more time-consuming than tagstore for IT professionals.



(a) Re-finding items in general



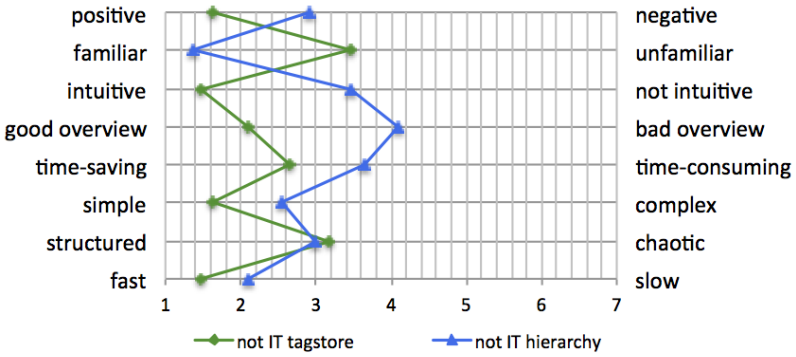
(b) Re-finding images



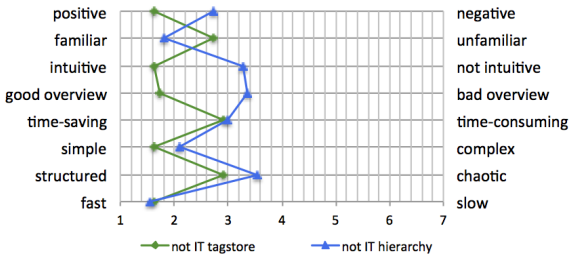
(c) Re-finding text items

Figure 5.31.: Users with IT studies - comparison between hierarchy and tagstore

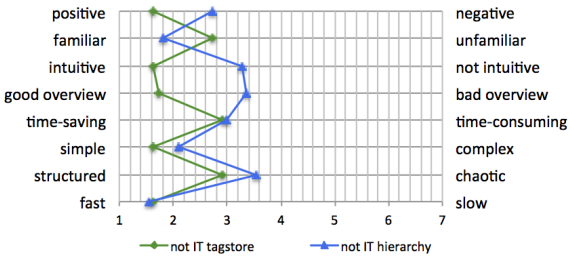
IT professionals rated tagstore more positively than test persons without IT education. Interestingly, the rating difference for re-finding images and re-finding text items between tagstore and hierarchy is smaller for non IT professionals than it is for IT professionals. As shown in Figure 5.34 (a) and (b) the biggest difference seems to be between adjective pairs intuitive - not intuitive and good overview - bad overview namely about 1.6 points whereas all other values are smaller than one.



(a) Re-finding items in general



(b) Re-finding images



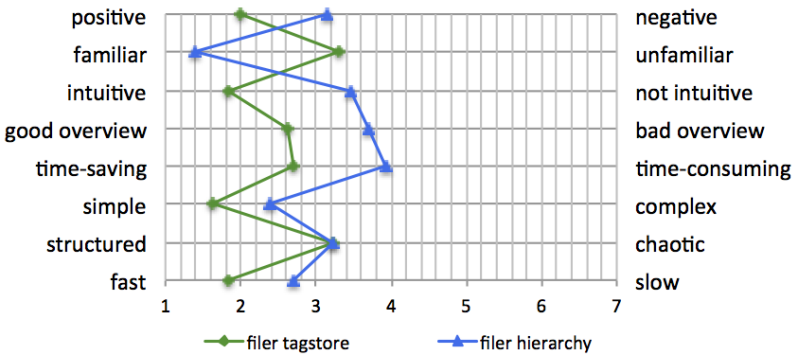
(c) Re-finding text items

Figure 5.32.: Users with other studies - comparison between hierarchy and tagstore

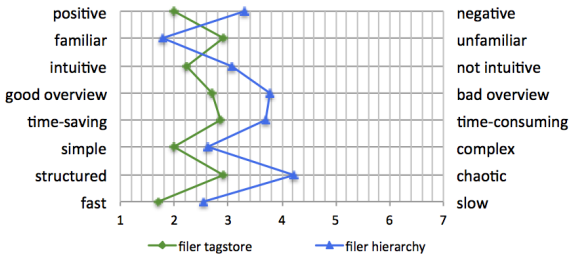
5.2.7. Filer versus Piler

The results presented in Figure 5.33 for filers are almost the same as for other groups. They liked tagstore more than hierarchy and they felt more familiar with hierarchy.

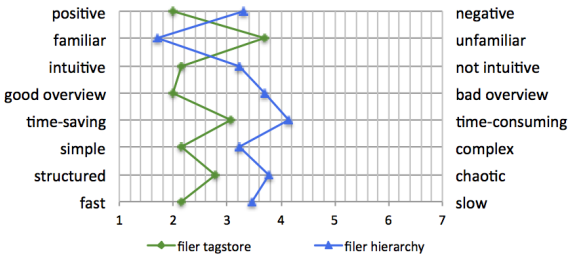
For re-finding items in general filers rated tagstore same as hierarchy for the adjective pair structured - chaotic on the scale. Re-finding images and re-finding text items were rated better for tagstore condition than for hierarchy created by Windows Explorer. Regarding the Figure 5.33 (c) this group liked tagstore for re-finding text items best, because the rating difference on the scale is more over one point between tagstore and hierarchy for seven out of eight bipolar pairs of adjectives.



(a) Re-finding items in general



(b) Re-finding images

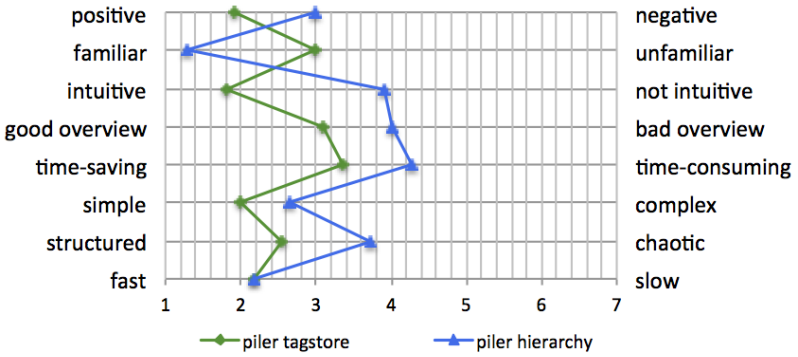


(c) Re-finding text items

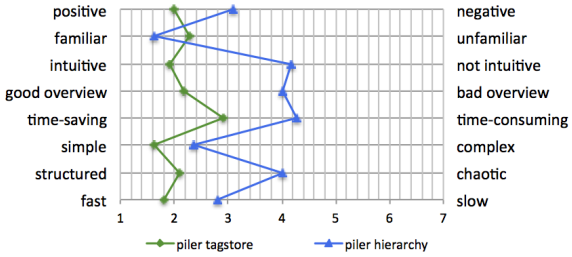
Figure 5.33.: Filer - comparison between hierarchy and tagstore

The results for pilers are almost the same as for filers. They preferred tagstore rather than hierarchy for six of eight adjective pairs. As all other groups pilers felt more familiar with hierarchy than with tagstore. The biggest difference between the scale

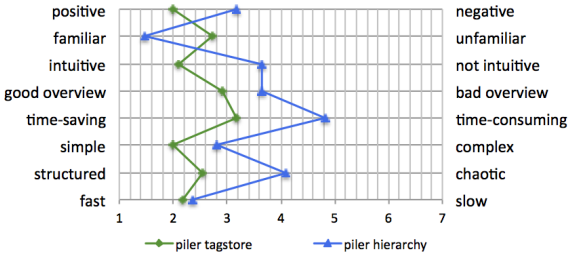
scores for re-finding items in general and text items for tagstore and hierarchy is the one for the adjective pair intuitive - not intuitive which is more than two points.



(a) Re-finding items in general



(b) Re-finding images



(c) Re-finding text items

Figure 5.34.: Piler - comparison between hierarchy and tagstore

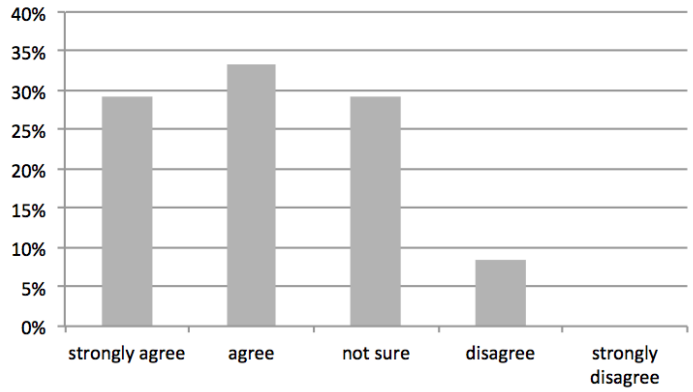


Figure 5.35.: Would you use tagstore on your own computer?

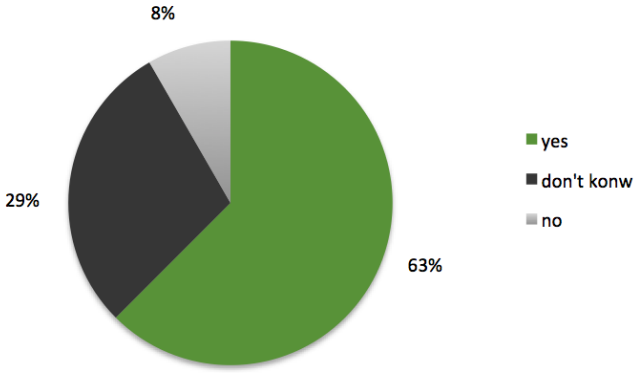


Figure 5.36.: Summerized question: Would you use tagstore on your own computer?

5.2.8. Acceptance of tagstore

After the last re-finding task all test users have been asked again if they would use tagstore on their private computers or still prefer their usual systems. Obviously, most test users have been convinced by tagstore and would use it in the future on their own computers and also for managing files at work. Seven out of 24 test users (29.17 %) strongly agree with the question if they would use tagstore on their own computer, eight users (33.33 %) agreed. Summing it up 15 out of 24 users (63 %) would use tagstore on their own computer.

Seven (29.17 %) test users answered the question with "not sure". Only two test users (8 %) disagreed. None of the respondents strongly disagreed.

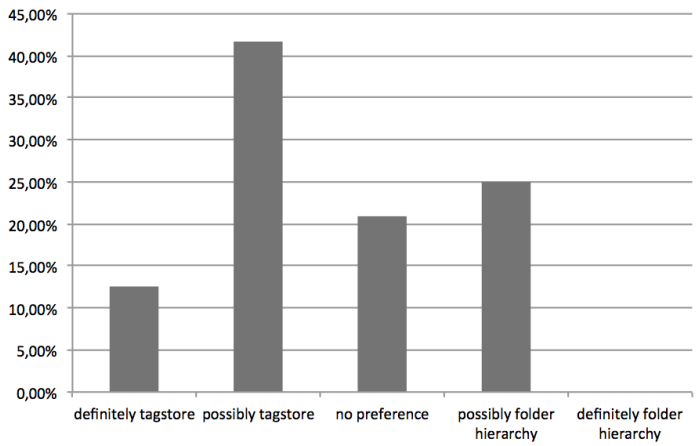


Figure 5.37.: Which condition would you prefer?

Figure 5.35 shows the exact ratings and Figure 5.36 shows the summarized ratings of question "Would you use tagstore on your own computer?".

Ratings strongly agree and agree were summarized as yes.

Disagree and strongly disagree were summarized as no.

Personal preferences of test users have also been identified in the course of the question "Which condition would you prefer?". Regarding the preferred condition tagstore has turned out to be the favoured alternative. Figure 5.37 illustrates the exact ratings and Figure 5.38 shows the summary.

Ratings definitely tagstore and possibly tagstore were summarized as tagstore.

Possibly folder hierarchy and definitely folder hierarchy were summarized as hierarchy.

54 % of all test users chose tagstore, three users (12.50 %) chose definitely tagstore and ten users (41,67 %) chose possibly tagstore. 25 % of the test users stated that possibly folder hierarchy is their preferred condition. Nobody selected definitely folder hierarchy as the favoured condition.

It can be concluded that tagstore is definitely the favoured condition for tested users.

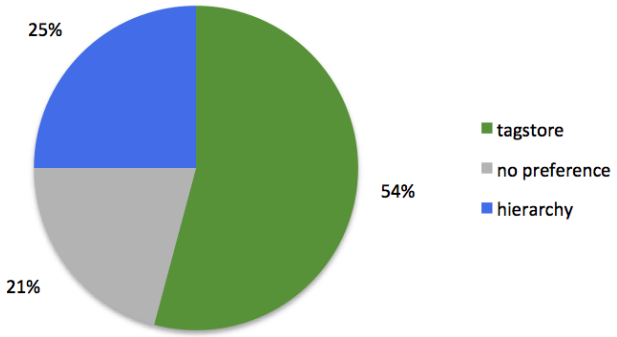


Figure 5.38.: Summerized question: Which condition would you prefer?

6. Conclusions

The goal of this work was to compare the usage of tagstore and Windows Explorer hierarchy. In order to reach this goal, a formal experiment has been conducted with 24 test users in total.

Obtained results show that 19 out of 24 users needed more time for filing items with tagsore as with Windows Explorer (compare Figure 4.6). However only ten of 24 test users were slower for re-finding items with tagstore than with the hierarchy created on their own with Windows Explorer (compare Figure 4.7). Interestingly the subjective feedback from test users was clearly better for tagstore than for hierarchy. Many test users even believed to be faster with tagstore than with hierarchy.

One bitter pill for tagstore is the decline in user acceptance. After the filing task 78 % preferred tagstore condition and after re-finding only 54 % remained (see Figures 5.19 and 5.38).

The number of test users who would use tagstore on their computer declined from 88 % to 63 % (see Figures 5.21 and 5.36).

Many participants mentioned during their last interview that they believe tagstore to be much faster compared to their ususal hierarchies when using it with more and their personal files. A future field study will cover exactly that topic. In this study the user acceptance and usage of tagstore on participants personal computers and with their data will be researched.

Appendix

Appendix A.

Test Material

Orientierungsskript

Hallo, mein Name ist Matija. Das sind Annemarie, Karl, Mario und Vesna. Wir sind heute hier, um eine Software zu testen und möchten Sie dabei um Ihre Hilfe bitten.

Ich werde Sie auffordern, einige typische Abläufe durchzuführen. Versuchen Sie Ihr Bestes, aber machen Sie Sich keine Gedanken über Ihren Erfolg, die Software wird getestet und nicht Ihr Können. Da das System nicht perfekt ist, kann es sicher noch da und dort ecken, kleinere Fehler können auftreten und nicht alles wird so funktionieren, wie man es sich erwartet.

Meine Rolle ist es, die Vor- und Nachteile des Designs von Ihnen aus gesehen aufzunehmen. Für mich ist es daher wichtig, Ihre echte, ehrliche Meinung zu bekommen.

Stellen Sie auftretende Fragen bitte zu jeder Zeit, allerdings darf ich einige wahrscheinlich erst am Ende des Tests beantworten.

Während Sie arbeiten, werden Notizen gemacht. Für jene, die heute nicht hier sein können, werden wir die Tests auch auf Video aufnehmen.

Wenn Sie sich unwohl fühlen, können Sie den Test jederzeit abbrechen.

Haben Sie Fragen?

Wenn nicht, lassen Sie uns damit beginnen, eine kurze Hintergrundbefragung auszufüllen.

Figure A.1.: Orientation Script

Datum:_____ Uhrzeit:_____ Testperson Nr.:_____

Hintergrundbefragung

Geschlecht: □ weiblich □ männlich

Alter: _____

Beruf: _____

Ausbildung

Abgeschlossene Ausbildung:

☐ Lehre ☐ Matura ☐ Studium ☐ Doktorat

Wenn Sie studieren oder studiert haben, beschreiben Sie bitte ihr Hauptstudiengebiet:

_____

Umgang mit Computer

Wie lange benutzen Sie bereits einen Computer? _____

Wie viele Stunden pro Woche verwenden Sie einen Computer? _____

Besitzen Sie einen eigenen Computer? ☐ Notebook ☐ Standrechner ☐ nein

Besitzen Sie Administratorrechte auf ihrem Computer? ☐ ja ☐ nein ☐ weiß ich nicht

Welches Betriebssystem verwenden Sie am meisten?

☐ Windows7 ☐ WindowsVista ☐ WindowsXP ☐ Mac OS X

☐ Linux Ubuntu ☐ andere: _____

Welchen Datei-Browser verwenden Sie? ☐ Windows Explorer ☐ Finder ☐ weiß nicht ☐ andere: _____

Welche Tätigkeiten führen Sie am häufigsten auf ihrem Computer aus?

☐ Internet surfen ☐ Email & Office ☐ Textverarbeitung ☐ Software Entwicklung ☐ Spielen & Musik

☐ Fotos/Videos bearbeiten, speichern, verwalten

Figure A.2.: Background Questionnaire, page one

Ist Ihnen der Begriff Tagging bekannt? ☐ ja ☐ nein

Wenn ja, was verstehen sie darunter? _____

_____

Verwenden Sie Tagging? ☐ ja ☐ nein

Wenn ja, wo verwenden Sie Tagging am häufigsten? _____

_____

Ungefähr wie viele Ordner würden Sie als ihre wichtigsten Ordner erachten? _____

Wie viele Emails befinden sich für gewöhnlich in ihrer INBOX (=Posteingang)? ☐ <10 ☐ 10-50 ☐ 50-500 ☐ >500

Haben Sie ihre eigene hierarchische Struktur in der Sie Ihre Emails archivieren, oder lassen Sie alle Emails in ihrer INBOX? ☐ eigenes Archiv ☐ INBOX

Wenn Sie eine eigene hierarchische Struktur haben, wann ordnen Sie Ihre Emails in diese ein? ☐ sofort ☐ binnen 1 Woche ☐ >1 Woche

Erfahrung mit Usability Tests

Haben Sie schon an einer Usability Studie teilgenommen? ☐ ja ☐ nein

Wenn ja: ☐ als Testperson ☐ Mitglied des Testteams

Was war das für eine Studie? ☐ Thinking Aloud Test ☐ Formal Experiment

☐ ich weiss es nicht mehr

Vielen Dank!

Figure A.3.: Background Questionnaire, page two

Vertraulichkeits- und Einverständniserklärung

Danke, dass Sie an unserer Studie teilnehmen. Bitte beachten Sie, dass Ihnen unter Umständen vertrauliche Informationen zuteil werden und dass Sie diese nicht weitergeben dürfen.
Bild- und Tonaufnahmen werden von Ihrer Sitzung gemacht, um eine bessere Auswertung der Daten zu ermöglichen.

Bitte lesen Sie die untenstehende Einverständniserklärung und unterschrieben Sie an der dafür vorgesehenen Stelle. Vielen Dank.

Ich erkläre, keine Informationen aus der Studie weiterzugeben.
Ich weiß, dass Bild- und Tonaufnahmen von meiner Sitzung gemacht werden. Ich gebe die Erlaubnis, diese Aufnahmen für Lehrzwecke und im Rahmen wissenschaftlicher Forschung anonymisiert zu verwenden und zu veröffentlichen.

Testperson:_____

Ort: Graz, Inffeldgasse 16 b

Datum: _____

Name:_____

Geburtsdatum: _____

Unterschrift:_____

Figure A.4.: Consent Form

T1.
Verschaffen Sie sich einen Überblick über die 60 Dateien.

T2. Übliche Ordner Variante
Legen Sie die 60 Dateien in einer Ordner Hierarchie ab.

T3. tagstore
Legen Sie die 60 Dateien mit tagstore ab.

T4. Übliche Ordner Variante
Finden Sie den GVB Fahrplan der Linie 3.

T5. Übliche Ordner Variante
Finden Sie den Comic mit der Hexe.

T6. Übliche Ordner Variante
Finden Sie das Bild mit dem Sessellift.

T7. Übliche Ordner Variante
Finden Sie die Datei mit den Teilnehmern der Marathonstaffel 2011.

T8. Übliche Ordner Variante
Finden Sie den Antrag für die Kulturförderung.

T9. Übliche Ordner Variante
Finden Sie den Artikel zu den frischen Kräutern aus dem Garten.

Figure A.5.: Tasks, page one

T10. Übliche Ordner Variante
Finden Sie die Graphik mit der Übersicht über die Atomkraftwerke, die sich in den Nachbarländern Österreichs befinden.

T11. Übliche Ordner Variante
Finden Sie das Foto des Formel-1-Fahrers Sebastian Vettel.

T12. Übliche Ordner Variante
Finden Sie den Artikel über die Zeitumstellung.

T13. Übliche Ordner Variante
Finden Sie das Bild der roten Mohnblume.

T14. tagstore
Finden Sie den GVB Fahrplan der Linie 3.

T15. tagstore
Finden Sie den Comic mit der Hexe.

T16. tagstore
Finden Sie das Bild mit dem Sessellift.

T17. tagstore
Finden Sie die Datei mit den Teilnehmern der Marathonstaffel 2011.

T18. tagstore
Finden Sie den Antrag für die Kulturförderung.

Figure A.6.: Tasks, page two

T19. tagstore
Finden Sie den Artikel zu den frischen Kräutern aus dem Garten.

T20. tagstore
Finden Sie die Graphik mit der Übersicht über die Atomkraftwerke, die sich in den Nachbarländern Österreichs befinden.

T21. tagstore
Finden Sie das Foto des Formel 1 Fahrers Sebastian Vettel.

T22. tagstore
Finden Sie den Artikel über die Zeitumstellung.

T23. tagstore
Finden Sie das Bild der roten Mohnblume.

Figure A.7.: Tasks, page three

Datum:_____ Uhrzeit:_____ Test Nr.: 1 Testperson Nr.:_____

Feedback Formular

Bewerten Sie bitte anhand folgender Aspekte Ihre Vorliebe für die eine oder die andere Dateimanagement-Variante.

Wie fanden Sie die übliche Ordner Variante allgemein bei der Dateiablage?

schnell	O	O	O	O	O	O	O	langsam
chaotisch	O	O	O	O	O	O	O	übersichtlich
einfach	O	O	O	O	O	O	O	kompliziert
zeitraubend	O	O	O	O	O	O	O	unterstützend

Wie fanden Sie die übliche Ordner Variante für das Ablegen der Bilder?

schnell	O	O	O	O	O	O	O	langsam
chaotisch	O	O	O	O	O	O	O	übersichtlich
einfach	O	O	O	O	O	O	O	kompliziert
zeitraubend	O	O	O	O	O	O	O	unterstützend

Wie fanden Sie die übliche Ordner Variante für das Ablegen der Textdateien?

schnell	O	O	O	O	O	O	O	langsam
chaotisch	O	O	O	O	O	O	O	übersichtlich
einfach	O	O	O	O	O	O	O	kompliziert
zeitraubend	O	O	O	O	O	O	O	unterstützend

Wie fanden Sie tagstore allgemein bei der Dateiablage?

schnell	O	O	O	O	O	O	O	langsam
chaotisch	O	O	O	O	O	O	O	übersichtlich
einfach	O	O	O	O	O	O	O	kompliziert
zeitraubend	O	O	O	O	O	O	O	unterstützend

Figure A.8.: Feedback Questionnaire for filing items, page one

Wie fanden Sie tagstore für das Ablegen der Bilder?

schnell	O	O	O	O	O	O	O langsam
chaotisch	O	O	O	O	O	O	O übersichtlich
einfach	O	O	O	O	O	O	O kompliziert
zeitraubend	O	O	O	O	O	O	O unterstützend

Wie fanden Sie tagstore für das Ablegen der Textdateien?

schnell	O	O	O	O	O	O	O langsam
chaotisch	O	O	O	O	O	O	O übersichtlich
einfach	O	O	O	O	O	O	O kompliziert
zeitraubend	O	O	O	O	O	O	O unterstützend

Könnten Sie sich vorstellen tagstore auf ihrem Computer einzusetzen?

Ja, auf jeden Fall	O	O	O	O	O	O	O Nein, niemals

Weswegen? _____

_____

Welche Variante würden Sie bevorzugen?

tagstore	O	O	O	O	O	O	O herkömmliche Ordner

Weswegen? _____

_____

Figure A.9.: Feedback Questionnaire for filing items, page two

Datum:_____ Uhrzeit:_____ Testperson:_____ Test Nr.: 2

Feedback Formular

Übliche Ordner Variante - Windows Explorer

Bewerten Sie bitte anhand folgender Aspekte Ihre Vorlieben für die übliche Dateimanagement-Variante.

4. Wie fanden Sie die ***übliche*** Ordner Variante ***allgemein*** beim Wiederfinden der Dateien?

	trifft zu	trifft eher zu	trifft gar nicht zu	weder noch	trifft gar nicht zu	trifft eher zu	trifft zu	
schnell	○	○	○	○	○	○	○	langsam
chaotisch	○	○	○	○	○	○	○	strukturiert
einfach	○	○	○	○	○	○	○	kompliziert
zeitraubend	○	○	○	○	○	○	○	zeitsparend
übersichtlich	○	○	○	○	○	○	○	unübersichtlich
intuitiv	○	○	○	○	○	○	○	nicht intuitiv
vertraut	○	○	○	○	○	○	○	unbekannt
positiv	○	○	○	○	○	○	○	negativ

5. Wie fanden Sie die ***übliche*** Ordner Variante für das Wiederfinden der ***Bilder***?

	trifft zu	trifft eher zu	trifft gar nicht zu	weder noch	trifft gar nicht zu	trifft eher zu	trifft zu	
schnell	○	○	○	○	○	○	○	langsam
chaotisch	○	○	○	○	○	○	○	strukturiert
einfach	○	○	○	○	○	○	○	kompliziert
zeitraubend	○	○	○	○	○	○	○	zeitsparend
übersichtlich	○	○	○	○	○	○	○	unübersichtlich
intuitiv	○	○	○	○	○	○	○	nicht intuitiv
vertraut	○	○	○	○	○	○	○	unbekannt
positiv	○	○	○	○	○	○	○	negativ

6. Wie fanden Sie die ***übliche*** Ordner Variante für das Wiederfinden der ***Textdateien***?

	trifft zu	trifft eher zu	trifft gar nicht zu	weder noch	trifft gar nicht zu	trifft eher zu	trifft zu	
schnell	○	○	○	○	○	○	○	langsam
chaotisch	○	○	○	○	○	○	○	strukturiert
einfach	○	○	○	○	○	○	○	kompliziert
zeitraubend	○	○	○	○	○	○	○	zeitsparend
übersichtlich	○	○	○	○	○	○	○	unübersichtlich
intuitiv	○	○	○	○	○	○	○	nicht intuitiv
vertraut	○	○	○	○	○	○	○	unbekannt
positiv	○	○	○	○	○	○	○	negativ

Figure A.10.: Feedback Questionnaire for re-finding items with Windows Explorer

Datum:_____ Uhrzeit:_____ Testperson:_____ Test Nr.: 2

Feedback Formular

tagstore

Bewerten Sie bitte anhand folgender Aspekte Ihre Vorlieben für ***tagstore***.

1. Wie fanden Sie ***tagstore Ordner*** Variante beim Wiederfinden der Dateien?

	trifft zu	**trifft eher zu**	**trifft gar nicht zu**	**weder noch**	**trifft gar nicht zu**	**trifft eher zu**	**trifft zu**	
schnell	○	○	○	○	○	○	○	langsam
chaotisch	○	○	○	○	○	○	○	strukturiert
einfach	○	○	○	○	○	○	○	kompliziert
zeitraubend	○	○	○	○	○	○	○	zeitsparend
übersichtlich	○	○	○	○	○	○	○	unübersichtlich
intuitiv	○	○	○	○	○	○	○	nicht intuitiv
vertraut	○	○	○	○	○	○	○	unbekannt
positiv	○	○	○	○	○	○	○	negativ

2. Wie fanden Sie ***tagstore Ordner Variante*** für das Wiederfinden der ***Bilder***?

	trifft zu	**trifft eher zu**	**trifft gar nicht zu**	**weder noch**	**trifft gar nicht zu**	**trifft eher zu**	**trifft zu**	
schnell	○	○	○	○	○	○	○	langsam
chaotisch	○	○	○	○	○	○	○	strukturiert
einfach	○	○	○	○	○	○	○	kompliziert
zeitraubend	○	○	○	○	○	○	○	zeitsparend
übersichtlich	○	○	○	○	○	○	○	unübersichtlich
intuitiv	○	○	○	○	○	○	○	nicht intuitiv
vertraut	○	○	○	○	○	○	○	unbekannt
positiv	○	○	○	○	○	○	○	negativ

3. Wie fanden Sie ***tagstore*** Ordner Variante für das Wiederfinden der ***Textdateien***?

	trifft zu	**trifft eher zu**	**trifft gar nicht zu**	**weder noch**	**trifft gar nicht zu**	**trifft eher zu**	**trifft zu**	
schnell	○	○	○	○	○	○	○	langsam
chaotisch	○	○	○	○	○	○	○	strukturiert
einfach	○	○	○	○	○	○	○	kompliziert
zeitraubend	○	○	○	○	○	○	○	zeitsparend
übersichtlich	○	○	○	○	○	○	○	unübersichtlich
intuitiv	○	○	○	○	○	○	○	nicht intuitiv
vertraut	○	○	○	○	○	○	○	unbekannt
positiv	○	○	○	○	○	○	○	negativ

Figure A.11.: Feedback Questionnaire for re-finding items with tagstore

7. Bitte geben Sie an, inwieweit die folgenden Aussagen auf Sie zutreffen.

	ja, auf jeden Fall	eher ja	vielleicht	eher nein	nein, auf keinen Fall
Können Sie sich vorstellen, tagstore auf ihrem Computer einzusetzen?	○	○	○	○	○

Weswegen?_____

_____

8. Welche Variante würden Sie nun bevorzugen?

- ○ **ich bevorzuge tagstore**
- ○ **ich bevorzuge eher tagstore**
- ○ **weder noch**
- ○ **ich bevorzuge eher die übliche Ordner Variante**
- ○ **ich bevoorzuge die übliche Ordner Variante**

Weswegen?_____

_____

Figure A.12.: Feedback Questionnaire which condition do you prefer?

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