



**POLITECNICO  
MILANO 1863**

HYPERMEDIA APPLICATION:  
WEB AND MULTIMEDIA

# **BOOKSTORE**

BOOKSTORE PROJECT

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## **Usability Evaluation Report**

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# 1 Introduction

## 1.1 Revision History

Version	Date	Authors	Summary
1.0	20/06/2019	Davide Avanzi, Francesca Bernecich, Fabrizio Carsenzuola	Final review
0.1	20/05/2019	Davide Avanzi, Francesca Bernecich, Fabrizio Carsenzuola	Living document

## 1.2 Abstract

This document reports our evaluations on the usability of the web application we developed. The target audience of this document are the future developers of the system, as well as the project owner, prof. Garzotto. The website is reachable at this address: <https://hyp.avanzi.dev/>.

## 1.3 Reference documents

- “HYP\_2018\_19\_PROJECT\_SPECIFICATIONS.pdf”: Project assignments
- “PROJECT THEME HYP2018-19 - FRONT END TECH - Till July 2019.pdf”: Front-end document specifications / C-IDM
- “project-manual.pdf”: Back-end document specifications
- “USABILITY EXAM AND REPORT.pdf”: specifications on the usability report to deliver

## 2 Usability evaluation: heuristic inspection

### 2.1 Inspection

We performed an inspection on the main pages of our website using the following heuristics:

- Interaction consistency
- Group navigation
- Structural navigation
- Landmarks
- Information overload
- Text layout
- Interaction placeholder
- Spatial allocation
- Consistency of page

After analyzing the website, we assigned a score for each heuristic for every page. We also added some comments reporting our thoughts on the scores.



CATEGORY	HEURISTIC	SCORE	COMMENTS	#BOOKS
Navigation	Interaction consistency	● ● ● ● ●	In the navigation bar, there are same links to main section pages.	
	Group navigation	● ● ● ● ●	It's possible to navigate easily through the categories thanks to dropdown filter menus	
	Structural navigation	● ● ● ● ●	Users have the freedom and control to undo/redo actions thanks to a navigation status bar	
	Semantic navigation	● ● ● ● ●	The navigation through different topics is provided just by landmarks in this section	
	Landmarks	● ● ● ● ●	The landmarks are present in every page and give the user the possibility to orient themselves	
	Information overload	● ● ● ● ●	The unnecessary information are cutted out and clutter to enhance visibility. Giving maybe too little information	
Layout	Text layout	● ● ● ● ●	The font-size is appropriate for every section, enough to be readable in any format;	
	Interaction placeholder	● ● ● ● ●	The suggested action is given just by mouse hover. They should give more feedforward.	
	Spatial allocation	● ● ● ● ●	The relevance of the content is not perceive visually. Bu the separation between dropdown menus horizontally and vertically is good.	
	Consistency of Page	● ● ● ● ●	The visual properties of pages of the same type are similar, maybe too much. But the contrast and the simplicity of the page reduce visual noise.	

Figure 1: Heuristic scores for books page

CATEGORY	HEURISTIC	SCORE	COMMENTS	#SINGLE BOOK
Navigation	Interaction consistency	● ● ● ● ●	There are same links to main section pages.	
	Group navigation	● ● ● ● ●	From this page is possible to navigate to authors and events and directly to cart if logged	
	Structural navigation	● ● ● ● ●	Users have the freedom and control to undo/redo actions thanks to a navigation status bar.	
	Semantic navigation	● ● ● ● ●	The navigation through different topics is provided by a text link (not self explanatory) and a button.	
	Landmarks	● ● ● ● ●	The landmarks are present in every page and give the user the possibility to orient themselves	
	Information overload	● ● ● ● ●	The unnecessary information are cutted out and clutter to enhance visibility.	
Layout	Text layout	● ● ● ● ●	The font-size is appropriate except for the author's section, it's a bit big.	
	Interaction placeholder	● ● ● ● ●	The suggested action is given just by mouse hover. They should give more feedback.	
	Spatial allocation	● ● ● ● ●	The relevance of the content is perceive visually. The content of a single book is not visible without scrolling	
	Consistency of Page	● ● ● ● ●	The visual properties of pages of the same type are similar, maybe too much. They need to be differentiated between each other (e.g. different genre could have a different connotation)	

Figure 2: Heuristic scores for single book page

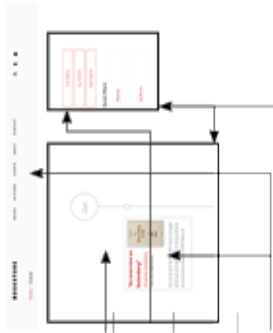
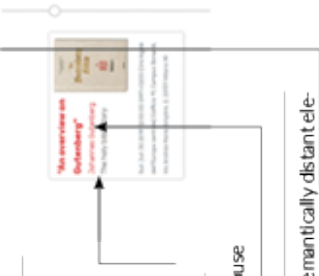
CATEGORY	HEURISTIC	SCORE	COMMENTS	#EVENTS
Navigation	Interaction consistency	● ● ● ● ●	Here the interaction capability is different and it's organized as a timeline, due to the time relation with the topic.	
	Group navigation	● ● ● ● ●	It's possible to navigate the events thanks to dropdown menus and timeline organization.	
	Structural navigation	● ● ● ● ●	Users have the freedom and control to undo/redo actions thanks to a navigation status bar	
	Semantic navigation	● ● ● ● ●	The navigation through different topics is provided just landmarks and single event link	
	Landmarks	● ● ● ● ●	The landmarks are present in every page and give the user the possibility to orient themselves	
	Information overload	● ● ● ● ●	The unnecessary information are cutted out and clutter to enhance visibility.	
Layout	Text layout	● ● ● ● ●	The font-size is a bit small to fit this little box	
	Interaction placeholder	● ● ● ● ●	The suggested action is given just by a little mouse hover. They should give more feedback.	
	Spatial allocation	● ● ● ● ●	Semantically related elements are close and semantically distant element are far away. The page is well divided	
	Consistency of Page	● ● ● ● ●	The relevance of the content is perceive visually. The timeline organization of contents reflects the chronological order of events	

Figure 3: Heuristic scores for events page



CATEGORY	HEURISTIC	SCORE	COMMENTS	#LOGIN/REGISTER
<b>Navigation</b>	Interaction consistency	● ● ● ● ●	Registration process allows users to enter data after errors are made, then forces them to repeat entry	
	Group navigation	● ● ● ● ●	The link to books and other categories is provided just by landmarks	
	Structural navigation	● ● ● ● ●	Users have the freedom and control to undo/redo actions thanks to a navigation status bar.	
	Semantic navigation	● ● ● ● ●	There are interactions that require registration or login before the action of "add to cart" so it could be useful to notice the need to login/register before	
	Landmarks	● ● ● ● ●	The landmarks are the main structure that help the user orienting himself in the website	
	Information overload	● ● ● ● ●	The unnecessary information are cutted out and clutter to enhance visibility.	
<b>Content</b>				
<b>Layout</b>	Text layout	● ● ● ● ●	The font-size is appropriate and readable	
	Interaction placeholder	● ● ● ● ●	Textual and visual elements are quite expressive	
	Spatial allocation	● ● ● ● ●	The relevance of the content is perceived visually. But the user needs to scroll to see the button of registration, while in mobile version the entire registration is visible before the login.	
	Consistency of Page	● ● ● ● ●	The dual navigation menu is not consistent with Web standards and confuses users	

Figure 4: Heuristic scores for login/register page

CATEGORY	HEURISTIC	SCORE	COMMENTS	#GENERAL
Navigation	Interaction consistency	● ● ● ● ●	Page of the same type have the same links to main section' pages. Well-functioning error messages are good, they could be improved preventing errors.	
	Group navigation	● ● ● ● ●	It's possible to navigate easily through the categories and inside them , thanks to visible correlated links. They should give more feedforward to the expected action.	
	Structural navigation	● ● ● ● ●	Users have the freedom and control to undo redo actions and to exit out of situations if needed, thanks to a navigation status bar at the top of every page	
	Semantic navigation	● ● ● ● ●	The semantic navigation is good, but it can be improved creating more differences between the different topic covered.	
	Landmarks	● ● ● ● ●	The landmarks are present in every page and give the user the possibility to find and orient themselves in the website.	
Content	Information overload	● ● ● ● ●	The unnecessary information are ctted out and clutter to enhance visibility.	
Layout	Text layout	● ● ● ● ●	The font-size is appropriate for every section, enough to be readable in any format; it's flexible and suitable to every kind of user (expert and novices)	
	Interaction placeholder	● ● ● ● ●	The textual or visual labels of interactive elements are quite expressive. They suggest the action through mouse hover. They should give more feedforward.	
	Spatial allocation	● ● ● ● ●	There's a separation of contents semantically distant, but it's related to the page they belong to. Inside a single page the semantic relation could be more present	
	Consistency of Page	● ● ● ● ●	The visual properties of pages of the same type are similar, maybe too much. The unnecessary information are ctted out and clutter to enhance visibility.	

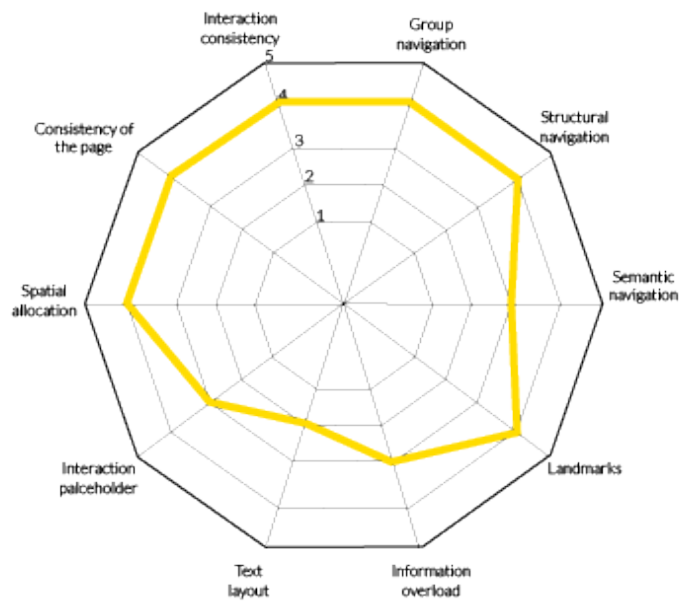
Figure 5: Heuristic scores for the general website

## **2.2 Results**

Here are the results of our heuristic analysis for each page examined, followed by an average of them.

## EVENTS

- Interaction consistency
- Group navigation
- Structural navigation
- Semantic navigation
- Landmarks
- Information overload
- Text layout
- Interaction placeholder
- Spatial allocation
- Consistency of Page



## LOGIN / REGISTRATION

- Interaction consistency
- Group navigation
- Structural navigation
- Semantic navigation
- Landmarks
- Information overload
- Text layout
- Interaction placeholder
- Spatial allocation
- Consistency of Page

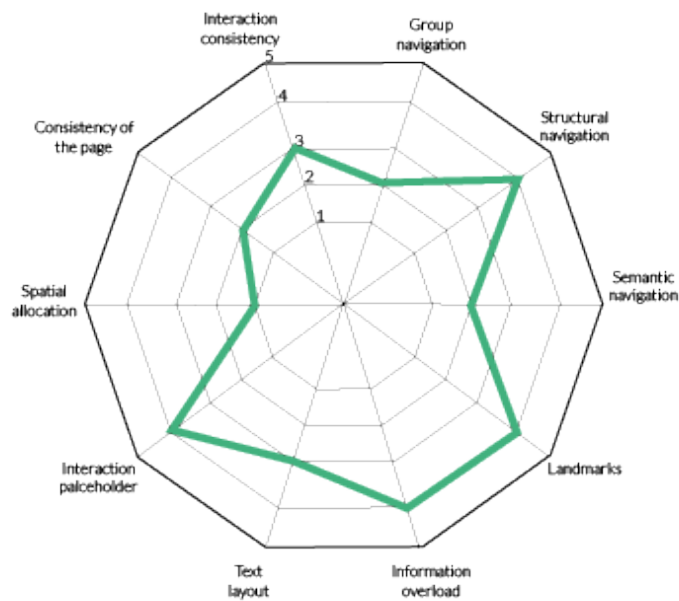
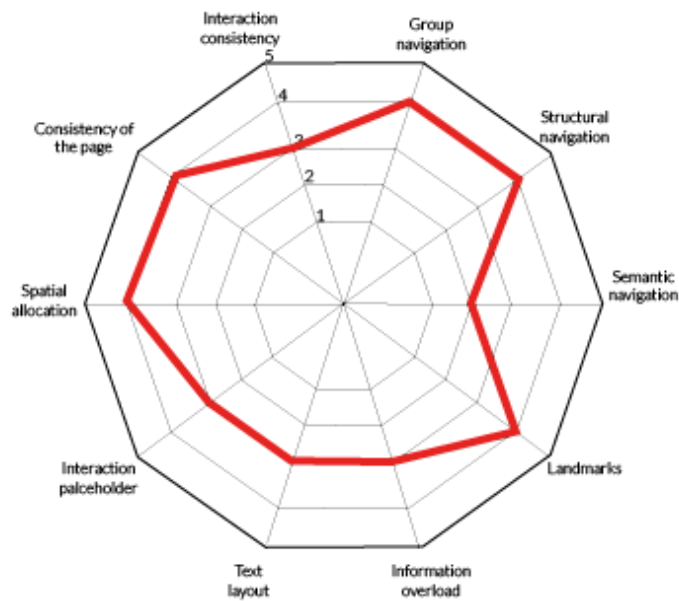


Figure 6: Heuristics for events and login/registration pages

## BOOKS

- Interaction consistency
- Group navigation
- Structural navigation
- Semantic navigation
- Landmarks
- Information overload
- Text layout
- Interaction placeholder
- Spatial allocation
- Consistency of Page



## SINGLE BOOK

- Interaction consistency
- Group navigation
- Structural navigation
- Semantic navigation
- Landmarks
- Information overload
- Text layout
- Interaction placeholder
- Spatial allocation
- Consistency of Page

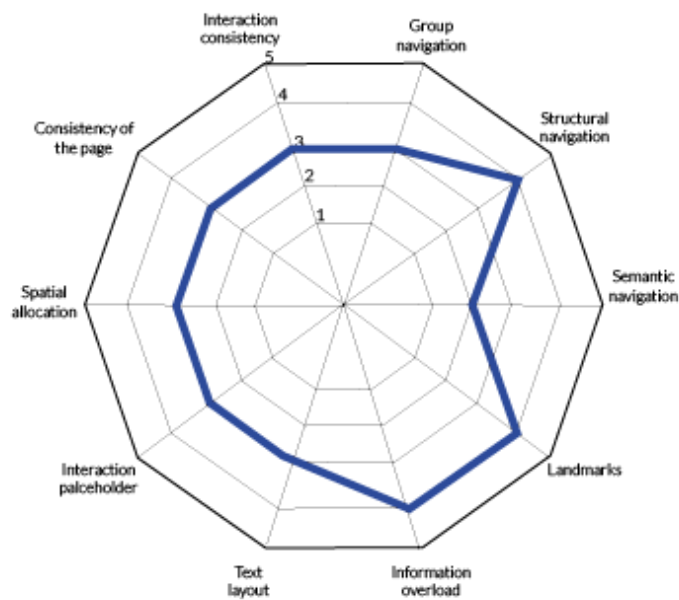


Figure 7: Heuristics average

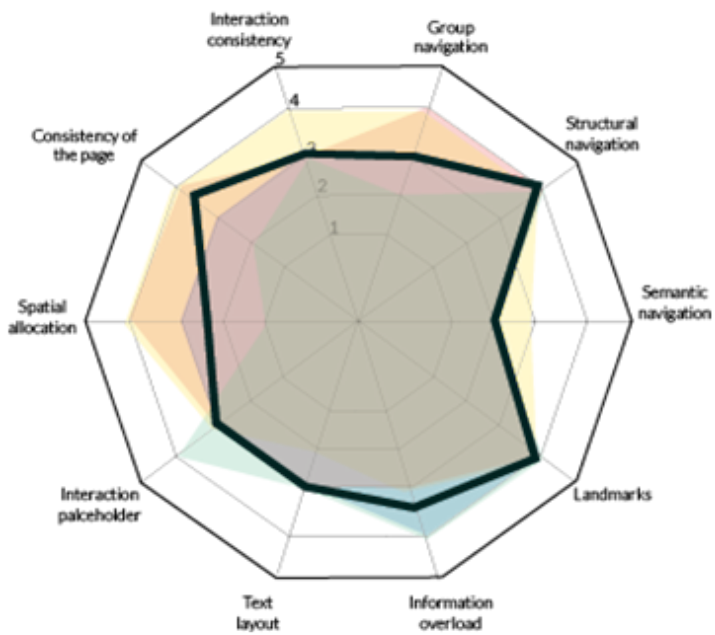
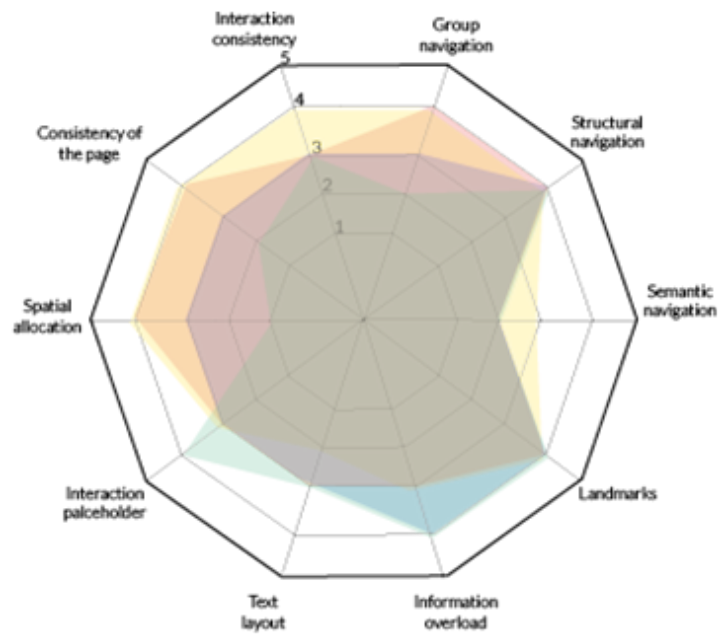


Figure 8: Averages for heuristics

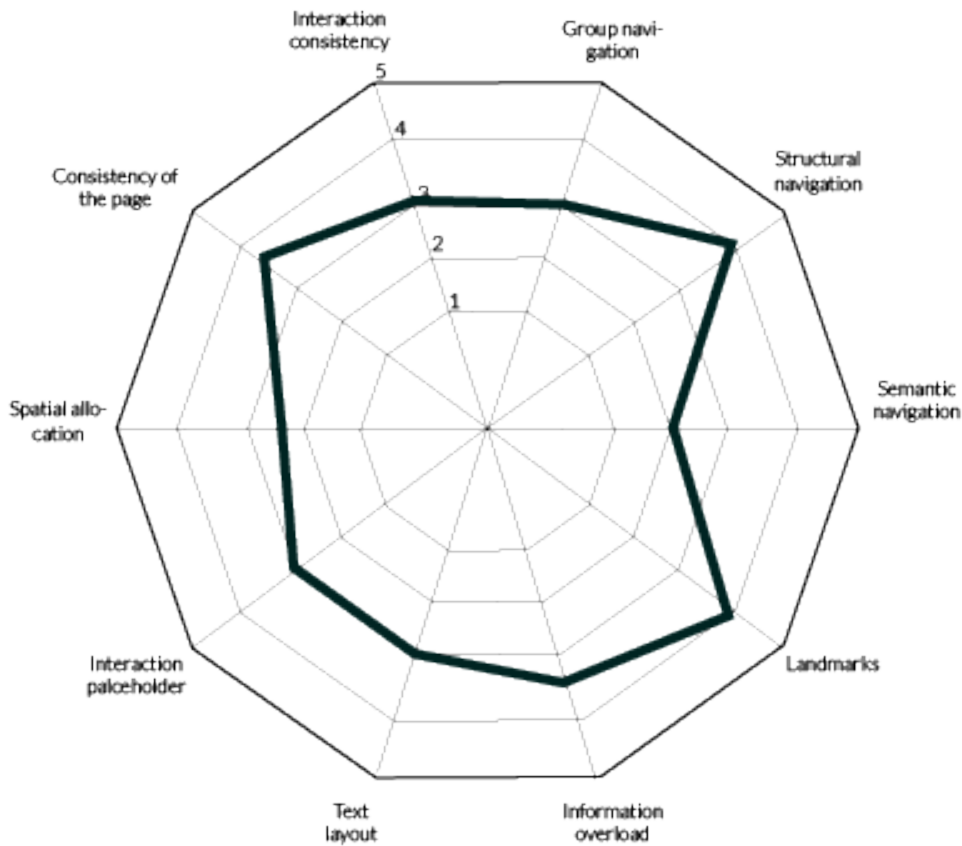


Figure 9: Final result

This graph shows the final result of the heuristic inspection on our website. we can clearly see the strenghts and weaknesses of our design:

Strenghts: the structural navigation is well defined as well as the landmarks, which got a high score. Pages were overall consistent without too much information overload.

Weaknesses: the website lacks of semantic and group navigation, the spatial allocation is not exploited at its best.

This analysis represent a good starting point for a future redesign of the user interface, giving some hints of possible improvements.

### 3 Usability evaluation: empirical testing

To further prove the results of our analysis, we conducted some empirical tests. We'll report in this section how we crafted and carried out the test, along with its results.

#### 3.1 Goal

We conducted this usability evaluation to test whether our website was easy to use by the target audience we selected, with the purpose to reveal confusing experiences which may reveal bugs or other issues with our application.

#### 3.2 Test definition

The empirical test we conducted consists in a series of tasks that a group of users had to complete in the website while being compliant to a set of rules and with the screen being recorded. We'll provide here a summary of the test and how it has been defined.

##### 3.2.1 Audience profile

We decided to take as reference audience the profile of the user we think will use our website the most: the college student (age 20-25), with a passion for reading books and an overall knowledge of the web and online shopping platforms. We then recruited five different users of this kind and asked them to perform our test.

##### 3.2.2 Participant profiles

Participant #	Age	Gender	Education
1	24	Male	Bachelor Degree
2	23	Female	Bachelor Student
2	24	Male	Bachelor Degree
3	20	Female	Bachelor Student
4	24	Female	Bachelor Degree

Table 1: Participant profiles

##### 3.2.3 Rules

These were the rules each user had to follow: failing in respecting those rules would have revealed great flaws in the design of the website.

1. You should continue to work on each task until you either complete it or reach the point at which you give up/wrong answer or seek assistance.
2. You have three attempts to complete the tasks. You can also have one tip from the supervisor. If you can't complete them within the first three attempts, please report it in the evaluation form.



3. You have at most 4 minutes to solve each task. If you can't complete them within the first four minutes, please report it in the evaluation form.

#### 3.2.4 Tasks

1. Suppose you want to buy some books, before doing so you need to be logged in: complete the registration procedure and create one account for yourself, then login.
2. Suppose you want to buy a book for your friend that likes a lot Tolkien but already owns The Lord of The Rings. Find another suitable book add it to your cart.
3. Before buying Child of Time, suppose you want to know more about one of the two writers of this book (Robert Silverberg): have a look at his biography.
4. Suppose you want also to read about JK Rowling: reach her page and get to her biography.
5. Suppose you change your mind and you don't want to buy a book: remove it from your cart.
6. Suppose you want to participate to an event. You like a lot wizards stories. Find a suitable event for you and get more informations about it.
7. You are finally done: perform the logout from the system.

#### 3.2.5 Questions

These are the questions we asked to the user who completed the tasks. Each question is defined with a linear scale answer from 1 to 10, ranging from "strongly disagree" to "strongly agree". At the end of the test we collected suggestions and thoughts from the users.

1. Overall, these tasks were difficult
2. The language of the tasks you were given was easily understood
3. The content (including images) was easy to understand
4. The pages of the website were fast to load (in average)
5. The texts in the website pages were useful to complete your tasks
6. The text in the website pages were relevant about the topics dealt with
7. I could quickly get to know the structure of the site
8. The organization of the site was clear
9. Under each section the site was well organized
10. It was easy to find the information that I needed
11. I got what I expected when I clicked on things on this website
12. The site helped me to find what I am looking for

13. Using this website was effortless
14. Using this website made me feel tired
15. The layout of the pages was consistent
16. The colours helped me to distinguish different sections or actions
17. The highlighted areas helped me to find what I was looking for
18. I think that I would like to use this website frequently
19. I found this website unnecessarily complex
20. I thought this website was easy to use
21. I think that I would need assistance to be able to use this website
22. I found the various functions in this website were well integrated
23. I thought there was too much inconsistency in this website's designs, layouts or architecture (pretty much anything that bothers you consistency wise)
24. I would imagine that most people would learn to use this website very quickly
25. I found this website very cumbersome/awkward to use
26. I felt very confident using this website
27. I needed to learn a lot of things before I could get going with this website

### 3.3 Test results

The test results were overall satisfying, all users were able to complete the tasks while being compliant with the rules. We recorded the test sessions and uploaded to a cloud folder, which is reachable at this link: [https://drive.google.com/drive/folders/1Ds\\_WksQQZ6WwBhbWLwaIJHZgDSsThLSAo?usp=sharing](https://drive.google.com/drive/folders/1Ds_WksQQZ6WwBhbWLwaIJHZgDSsThLSAo?usp=sharing)

#### 3.3.1 Answers averages

Here we provide two graphs with the average scores, by user and by question.

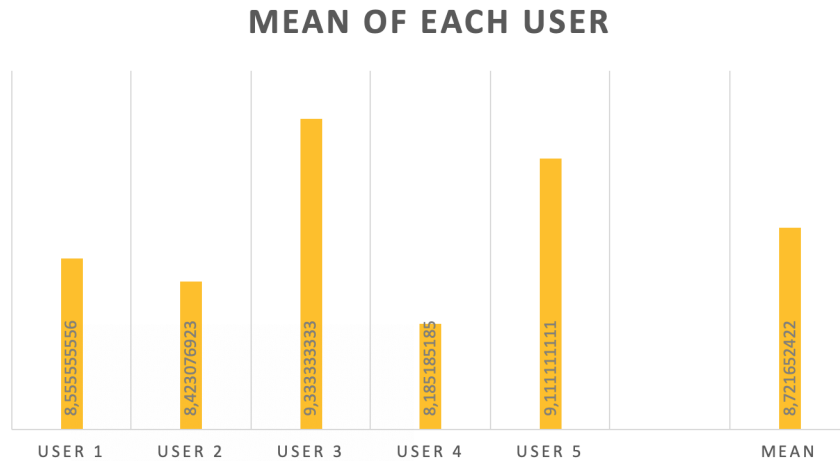


Figure 10: Average score given by each user

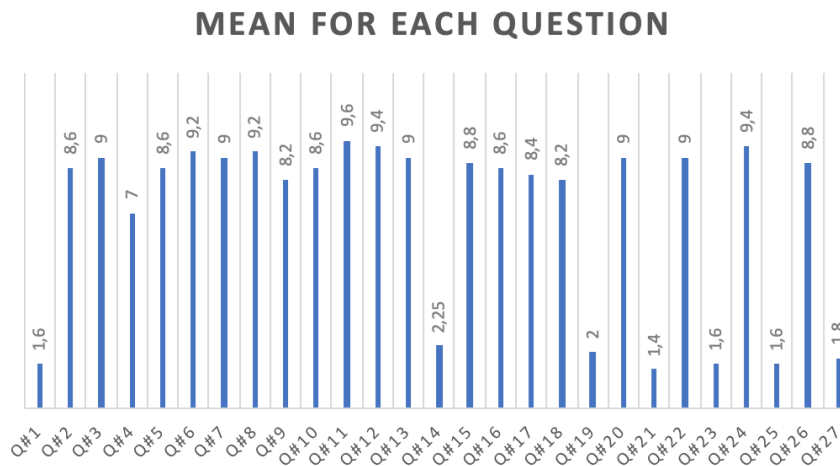


Figure 11: Average answers for each question

### 3.3.2 Answers breakdown

Here we provide a breakdown of the answers for each question.

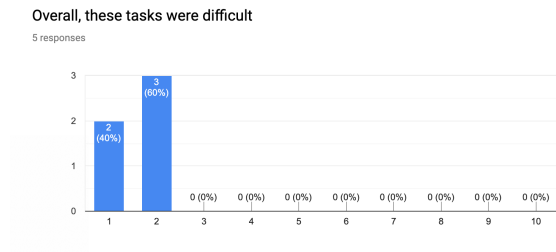


Figure 12: Question 1

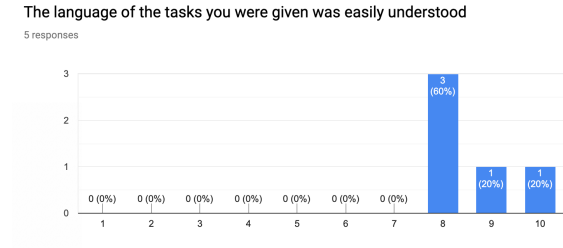


Figure 13: Question 2

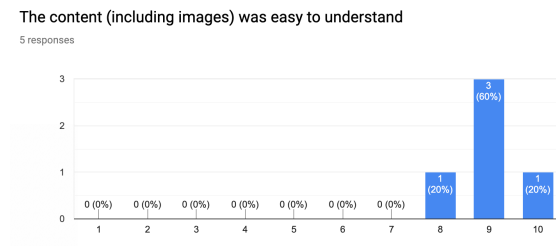


Figure 14: Question 3

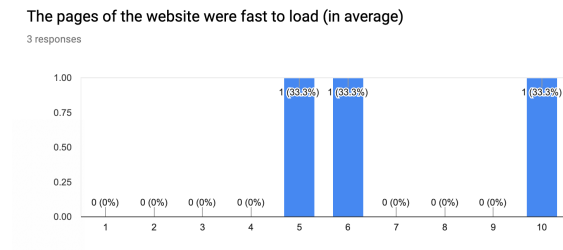


Figure 15: Question 4

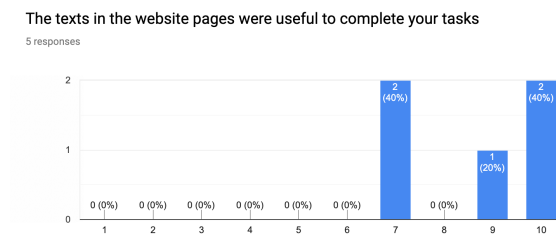


Figure 16: Question 5

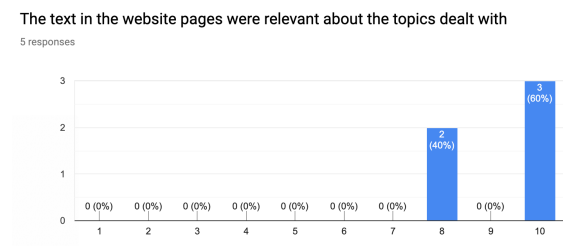


Figure 17: Question 6

I could quickly get to know the structure of the site

5 responses

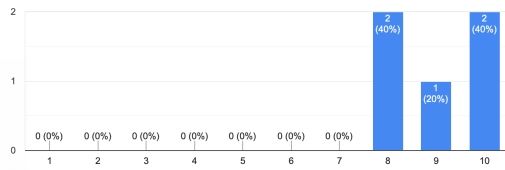


Figure 18: Question 7

The organization of the site was clear

5 responses

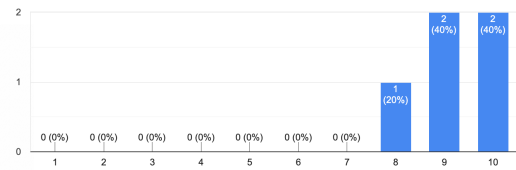


Figure 19: Question 8

Under each section the site was well organized

5 responses

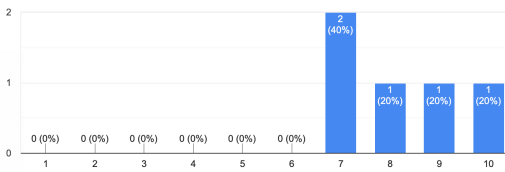


Figure 20: Question 9

It was easy to find the information that I needed

5 responses

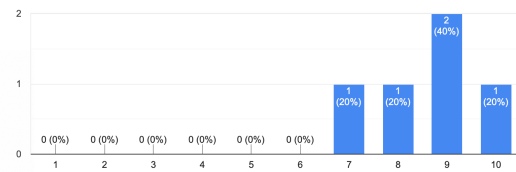


Figure 21: Question 10

I got what I expected when I clicked on things on this website

5 responses

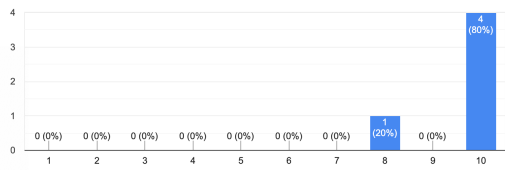


Figure 22: Question 11

The site helped me to find what I am looking for

5 responses

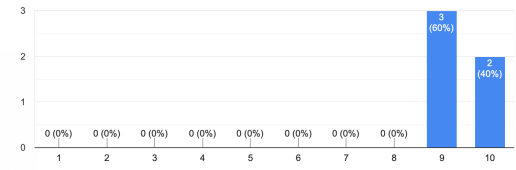


Figure 23: Question 12

Using this website was effortless

5 responses

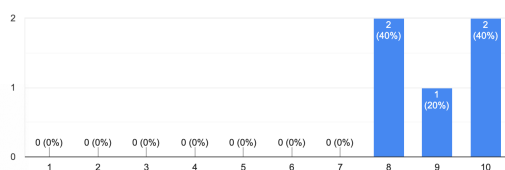


Figure 24: Question 13

Using this website made me feel tired

4 responses

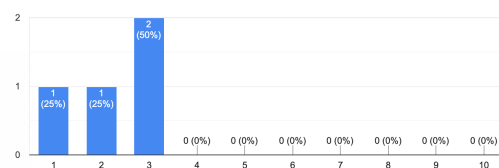


Figure 25: Question 14

The layout of the pages was consistent

5 responses

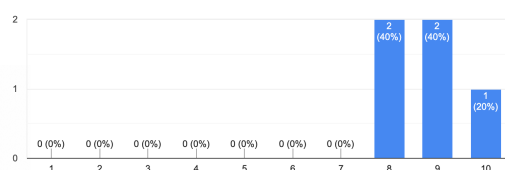


Figure 26: Question 15

The colours helped me to distinguish different sections or actions

5 responses

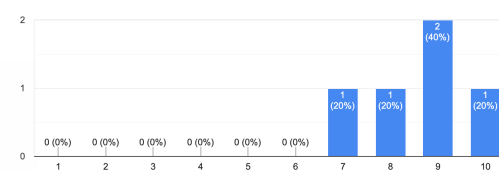


Figure 27: Question 16

The highlighted areas helped me to find what I was looking for

5 responses

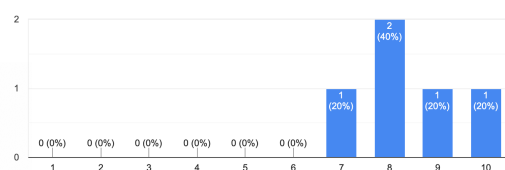


Figure 28: Question 17

I think that I would like to use this website frequently

5 responses

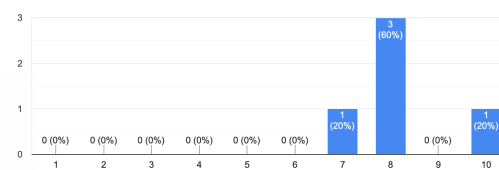


Figure 29: Question 18

I found this website unnecessarily complex

5 responses

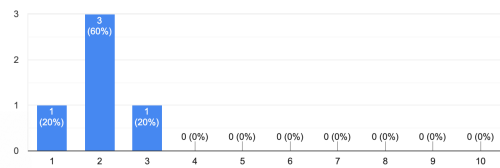


Figure 30: Question 19

I thought this website was easy to use

5 responses

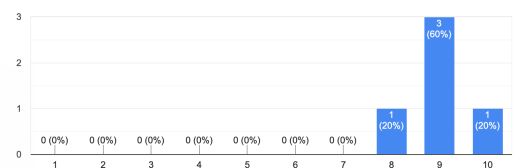


Figure 31: Question 20

I think that I would need assistance to be able to use this website

5 responses

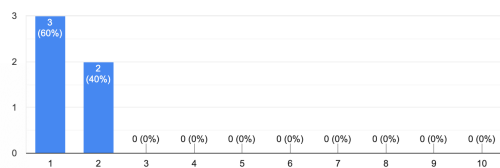


Figure 32: Question 21

I found the various functions in this website were well integrated

5 responses

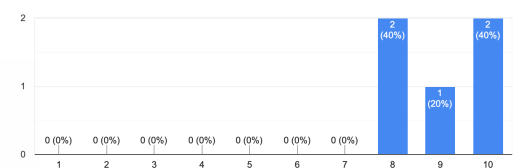


Figure 33: Question 22

I thought there was too much inconsistency in this website's designs, layouts or architecture (pretty much anything that bothers you consistency wise)

5 responses

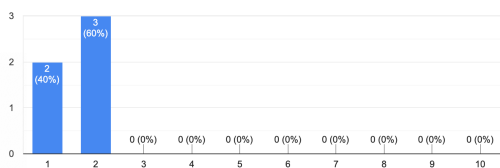


Figure 34: Question 23

I would imagine that most people would learn to use this website very quickly

5 responses

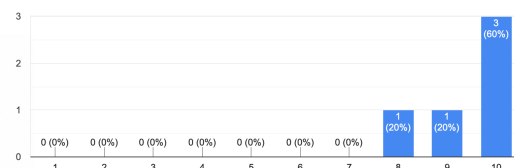


Figure 35: Question 24

I found this website very cumbersome/awkward to use

5 responses

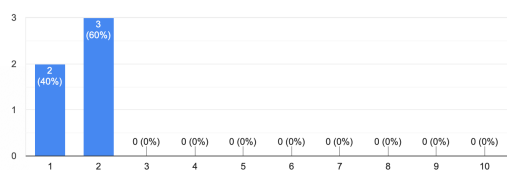


Figure 36: Question 25

I felt very confident using this website

5 responses

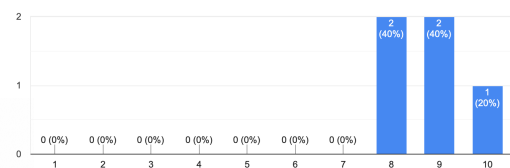


Figure 37: Question 26

I needed to learn a lot of things before I could get going with this website

5 responses

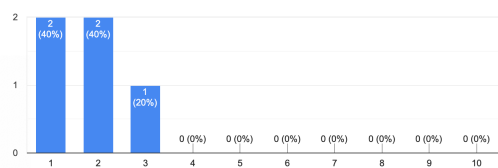


Figure 38: Question 27



### 3.3.3 Suggestions from the users

These suggestions highlight some issues in the navigation flow that we didn't realize by ourselves:

1. Even though I like the fact there are no useless colours I have to say that some more would be useful, in particular to distinguish some areas on the screen (for example when you click on "books" the work should remain red to allow you to recognise more easily where you are). Second, the text is too small compared to the images. (See "stock", the description of the book and also the description of the event which was far too small). The images drive away too much attention.
2. Add a drop menu under the icon of the person which contains my account (if you're not logged in you would be redirected to the login page) and register.
3. The search of the event was not so intuitive. You may add a section which summarises the topics (e.g. wizards, fantasy, science etc.). When I click on the topic all the relative events open up. Easier for the user, less time consuming and dispersive.
4. In some areas (e.g. event) the font size of the text was too small

### 3.3.4 Positive comments

1. There are not too much colors, this allows the user to have a clear view on the website.
2. It's simple, clear and without too much useless stuff around. It's user friendly. Nothing is terribly difficult. I think everyone will be able to use it easily. I used it on a PC, don't know about the Smartphone version.
3. I really like that every button/clickable link was in red color, this help me to better use the website

### 3.3.5 Bugs and issues

The results were very helpful in finding issues in the design of our website, and we are grateful to the users who took part in the test. We also discovered an issue with the overall website: the pages were not loading very fast for most of our users: after analyzing the problem, we found out a speed limit with our custom installation of the server (cloud VPS). We didn't discover this issue before because the developement environment was kept local in our machines.

## 4 Conclusions

We are overall satisfied with the results of both the heuristic inspection and the empirical test we conducted, the flaws reavealed from this usability evaluation are valid and represent friction points preventing the user from having a smooth experience while using our website. We are also pleased by the strenghts of our design and simple navigation process to reach all the informations an user may need.