UNIVERSITY NAME

DOCTORAL THESIS

Thesis Title

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A thesis submitted in fulfillment of the requirements
for the degree of Doctor of Philosophy

in the

Research Group Name
Department or School Name

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Declaration of Authorship

I, John SMITH, declare that this thesis titled, "Thesis Title" and the work presented in it are my own. I confirm that:

- This work was done wholly or mainly while in candidature for a research degree at this University.
- Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated.
- Where I have consulted the published work of others, this is always clearly attributed.
- Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work.
- I have acknowledged all main sources of help.
- Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself.

Signed:

Date:

"Thanks to my solid academic training, today I can write hundreds of words on virtually any topic without possessing a shred of information, which is how I got a good job in journalism."

Dave Barry

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Abstract

Faculty Name
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Doctor of Philosophy

Thesis Title

by John SMITH

The Thesis Abstract is written here (and usually kept to just this page). The page is kept centered vertically so can expand into the blank space above the title too...

Acknowledgements

The acknowledgments and the people to thank go here, don't forget to include your project advisor...

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Chapter 2

Theory

2.1 Cultural differences in Perception

Cultural differences affect more than just how we behave it also can affect how we perceive information. According to (bla and bla) "good quote" [7]

2.2 User Centred design

2.3 Usability

2.4 User Experience

User Experience (UX) is a expression popularised by Donald Norman and Jakob Nielsen in "The design of everyday things" (länka på rätt sätt)(Källa!). Norman and Nielsen define User Experience the following way “True user experience goes far beyond giving customers what they say they want, or providing checklist features. In order to achieve high-quality user experience in a company’s offerings there must be a seamless merging of the services of multiple disciplines, including engineering, marketing, graphical and industrial design, and interface design” (Norman and Nielsen, 2016). (latex quota på rätt sätt).

The term User experience is a widly used term and can be associated with several diffrent meanings another attempt to define the word has been done by The International Organization for Standardization. They defined UX in ISO 9241-210 as “A person’s perceptions and responses that result from the use and/or anticipated use of a product, system or service.” Moreover, the ISO standard states that “UX includes all users’ emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviors and accomplishments that occur before, during and after use”. The standard also states that “UX is a consequence of functionality, system performance, interactive behavior and assistive capabilities of the interactive system, the user’s internal and physical state resulting from prior brand image, presentation, experiences, attitudes, skills and personality, and the context of use” (dubbel kolla att detta kanske är för kopierat??, det är absolut aldeles för kopierat och bör fixas till....)

2.5 Elements of Web Design

2.6 F-shaped Pattern

The F-shaped pattern regards to a finding made in the xxx study [10] (find correct article for f-shaped pattern and cite it here as well). This pattern is named the "F-shaped pattern" since the study found that users often scan through the page starting with a horizontal movement, usually across the upper part of the content area. Then the users read across in a second horizontal movement further down on the page that typically covers a shorter area. Lastly users scan the content's left side in a vertical movement. When measuring the users eye gazing as a heat map this creates a pattern that resembles a F. Quite a few web pages either knowingly or unknowingly have designed their websites in regards to this pattern. The F-shaped pattern is not a absolute law and there exists several other scanning patterns but the F-shaped pattern is still the most prevalent in western cultures. [9] If a website design a page without knowledge about this pattern they run the risk of putting important information in places where their users might miss it. The F-shaped pattern is mostly prevalent in western cultures where the studies have been conducted.

2.7 Perception in asia (f-shaped pattern.)

2.8 Natural Mapping

2.9 User Testing

2.10 Usability Metrics

There are several different types of metrics that can be used to measure the usability of your prototype/product. Among them there are performance metrics, Issues-Based Metrics, Self-Reported Metrics Behavioral Metrics, Comparative metrics etc [13]. For this project we have chosen to focus on Performance Metrics and Self-Reported Metrics. Usability metrics is a very powerful tool that is usually under utilized by most companies [6].

2.10.1 Performance Metrics

Performance Metrics can be used to measure the users behavior when using a product. In this project the performance metric data will be automatically gathered. This data can then later be analyzed to gain a greater understanding for the users. To be statistically significant the data gathered with a appropriate confidentiality interval at least eight participants are needed [13]. There are 5 basic performance metrics which include: [13]

- Task success
- Time-on-task
- Errors
- Efficiency
- Learnability

To be able to measure the task success metric the task at hand has to be clearly defined and have a clear end. "Send a email to x" is a good task were task success can be successfully measured. The task "research cheap car brands" on the other hand does not have a clear end defined and is therefore not suitable for measuring task success.
There are two different types of task Success. The first is a binary measure either the user is able to complete the task or not [13]. The second type is to measure the level of success. This is a useful measure if the task can be partly completed, one example of a task that could be measured with the help of partial success would be ..... The simplest way to measure level of success is to assign it a numeric value. A example of this might be from 0-1 where 0.5 means the user has halfway completed the task. There is several ways a user can fail in a task. The user may think the task is completed when in fact it is only partially completed, the user might give up on trying to solve the task or the user might completely think he has successfully finished the task while he might not have done the correct task at all. This data can be very useful and will be able to a higher degree tell you how well a user understands the system.

Time-on-task is a very simple measure it simply tells you the time it took the user to complete or fail the task at hand.

Errors in this case is not referred to programmatic errors but mistakes made by the user. One example of a error could be a goes in to a wrong tab before finding the correct one. In this example every wrong path/click to be able to perform the task except the optimal one is a error. Error measurements can help us how well the user is understanding the website and how intuitive the website is for a first time user.

Efficiency can be seen as the same as Time-on-task measure, but it can also be measured by how many steps the user had to take to complete the task. It is important to note that efficiency should only be measured on successful tasks [13].

Learnability can be seen as to how high degree does the user become more efficient at using the product over time. Basically the time reduction of completing the task the second or third time will tell us how well the user learned to use the product.

2.10.2 Self-Reported Metrics

Self-Reported Metrics ask the user what he thought of the product. A way to do this is by using a form. A common method for doing this is by using System Usability Scale also called SUS [13] [1]. Sus is a method created by John Brooke. SUS is a form containing ten questions with a scale from 1-5 where 5 is "Strongly agree" and 1 is "Strongly disagree". See (appedix x) for a example of the form. SUS is a metric tool that have been used and proven over 22 years to be a robust and simple tool for measuring usability [1]. (SEE APENDIX for SUS ecample)

2.11 Usability Testing

2.12 Colour and Culture

Different cultures have always had a focus on different colours, this has also have a effect to what degree a user trust and like a website. Not all people prefer the

same colour scheme and study made by (XXXX) [2] shows that this colour preference can also be cultural. The study showed that the colour schema a website use affect the trust and how well liked a website can be. It also showed that people from different cultures have a preferences for colours associated with that culture. This is something that has to be taken into account when designing a website for an certain culture this since the correct colour schema can affect how well the users will like and interact with the website. Using colours that the users from a culture feel more comfortable with can be very important to enhance the users experience when using the site.

2.13 Trends

Trends are a thing that exists in all things, a trend simply mean that something is popular in the moment. This does not necessary mean that the trend is the best or most efficient way to do something, it's quite usually the opposite. Comparing design trends to usability in this thesis simply mean that we will try to examine if there is any actual underlying data that supports the trend from a usability perspective. This can have two outcomes either the trend has grown forth because it more closely cater to how its users use the respective products effectively or the trend is a bi-product from how things have previously been done. One example of this could be that we load more information than necessary on to a page because we have always previously done so. The reason we started doing this was because of slow internet speed which lead to large loading times when clicking through a page. So even if the internet speed is now very quick and we don't have to load all information to a page we still do so since we and our users have become used to this old pattern.

2.14 Culture and Usability

2.15 Great Firewall of China

The Great Firewall of China (GFC) is a combination of laws and technologies by the Chinese government that allows them to regulate the internet domestically. Example of services blocked by GFC are Google, Facebook, Youtube and many others. GFC also cause traffic from about to be significant slower than applications hosted in China. Hosting a application on a server in China requires a specific IPC license from the Chinese government and getting one is a very long and slow process. The sort of algorithms that are used by GFC are largely unknown and can be hard to circumvent.

2.16 Asynchronous

Asynchronous programming is simply the task of making several data process run in parallel to each other usually without impacting one another. Asynchronous parallel processes are often called threads. One example of this would be one thread working on reacting to a users request and supply him with the correct information. This while at the same time another thread that is not seen at all by the user is saving all the users actions and send them to a server.

2.17 AWS - Amazon Web Services

AWS (Amazon Web Services) is the largest provider of web-hosting in the world. Amazon allows for the users to easily host their application globally and provide several features to help users with this task.

2.17.1 EC2

EC2 (Elastic Cloud Compute) is a basic web server service aws offer. EC2 allows you to set up a virtual server with different amounts of CPU, Memory etc.. These servers can be set up on several aws locations across the world. This server can be customised to run a operating system of your choice, the most common being Linux and Windows.

2.17.2 Auto scaling

Auto scaling is a feature provided by aws that automatically scales up the server in case of increased traffic. This mean if a application has a large of amount of traffic on a server the auto scaling functionality create an extra server can handle user requests. Auto scaling also allows for automatic scale down in case of low traffic.

2.17.3 Load balancing

Load balancing is a feature from aws that automaticaly balances the load of the EC2 instances. If a user have 3 EC2 instances the load balancing will make sure that the workload is shared by all EC2 instances. This helps to prevent one instance from overloading.

2.17.4 RDS

RDS (Relational database service) is a database service provided by aws. RDS lets you set up a database of your choice and host it on aws servers. You can set this database up on several locations all across the world and configure it to suit your application.

2.17.5 S3

S3 is a aws feature that allows for object storage in the cloud. S3 allows the user to store anything he seems fit this can be everything from files, Images, code repositories etc. Images that are used on websites can stored here and then downloaded to the website when the user opens it, this is a common way to handle images in web sites and applications.

2.17.6 Elastic Beanstalk

Elastic Beanstalk also called EB is a feature provided by aws that automatically sets up a instance complete environment with auto scaling, load balancing, Relational database and EC2 instances.

2.18 React-Redux

React is a front-end JavaScript library developed by Facebook. React is based on the user building and reusing components. This allows for very structured and highly scalable code.

Handling data-flow in a react application can be very tricky, this is where redux comes in. Redux is a JavaScript library that allows for structuring and handling a web applications data flow in a structured way . React and Redux are so commonly used together that libraries combining them have been made. React-Redux is the most popular use of these libraries and they work very well together to allow scalable and reusable code.

2.18.1 Redux-saga

referense(https://redux-saga.js.org/docs/introduction/ and https://github.com/redux-saga/redux-saga) Redux-saga is a javascript library that is made to handle a applications asynchronous tasks. Redux-sagas is often used for data feching and posting. It can also be used for other asyncronius tasks. Sagas handle asynchronous tasks without the user getting impacted at all by what goes on in the background.

2.19 MySql database

MySql is a version of the database quiery language SQL. SQL has been used since 1981 and is used to set-up, save and get information from a database. MySql is free to use and has a public license. Mysql is a language that is both simple to use and quite powerful. Setting up inputting and getting data from a sql database can be done by only a few lines of code.

2.20 API

Api (application programming interface) is a interface between the front-end and server. A api allows the application to communicate with functions and servers outside the internal environment. Examples of these are databases, other servers and other api's. A api allows for clearer communication between different actors on the web.

2.21 Statistical significance

2.22 T-plot (whatever it's called)

Chapter 3

Working Process

3.1 Main Section 1

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3.1.1 Subsection 1

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3.1.2 Subsection 2

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3.2 Main Section 2

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Chapter 4

Phase 1 - Investigation

The aim of the investigation phase is to obtain a more nuanced understanding regarding the differences in perception and navigation of western versus Chinese websites. This information will facilitate the decision making process concerning which features to keep, which features need to be analysed, and what usability metrics should be implemented in the study.

4.1 Method

As an initial step, Chinese websites a long with their western equivalents were identified and curated. After obtaining a corpus of websites from China and western countries (e.g., United Kingdom), the key design differences between these respective sites were documented. Once the primary design variances were explored, this information was used to decide which design patterns should be tested in the study. Finally, the specific metrics to measure the results of these different designs were concluded.

4.2 Results

4.3 Chinese vs Western websites comparison

In reviewing the websites, it was evident that Chinese pages differed significantly from western counterparts. The differences between sites extend from the look and feel to the UX design. A few of China's most popular browsing sites will be analysed and compared to similar western counterparts to further investigate these design distinctions.

4.3.1 QQ

QQ is one of the most visited websites in China (see fig 4.1). [12] [11] QQ, like many other Chinese websites, does not focus on one thing but has multiple different functions. Some of the functions that QQ supports are: instant messaging, online games, music, shopping, microblogging, news, movies, group chat software, and etc. On the QQ homepage, users are greeted by the site's news page, which is highly information dense. Without hoovering over any content on a standard computer screen, there are roughly 147 clickable elements. In contrast, BBC's homepage [4], which is considered fairly information dense by western standards, has only 48 clickable elements on its homepage. This means that with only counting clickable elements, QQ is over 3 times more information dense than BBC.

FIGURE 4.1: QQ's homepage which provide which is mostly used for news.

One element that is notably common on Chinese websites, including QQ, is the menu bar design (see fig 4.2). On the QQ page, the menu bar contains two rows with a total of 40 clickable options - this format of menus is typical in China and is shared by multiple other Chinese sites.

FIGURE 4.2: A close-up of the menu bar used at QQ.

4.3.2 BBC

4.3.3 Taobao and Ebay

Taobao, which provides services akin to America's Ebay, is one of the world's biggest e-commerce platforms. Both Taobao and Ebay are shopping websites where users can purchase nearly any product they need, both from retailers and from other consumers. However, although these sites are similar in service, the design and user-experience focus on these sites differ significantly. Ebay, for instance, boasts a sleek design, employing dark-themed colors and contains only 20 clickable elements on the home page (see fig:4.3). Conversely, the Taobao page contains more colors, employs a brighter theme, and incorporates more clickable elements compared to its western counterpart. Another notable distinction between the websites is that Ebay has an expanding menu bar containing roughly 6-10 clickable elements while Taobao's menu contains much more (see fig:4.4).

In examining the Chinese version of Taobao, the difference in information density is evident (see fig:4.5). The main page, for example, hosts roughly 49 clickable elements. Additionally, the menu items on the screen's right side is expandable, displaying between 55 to 88 clickable links and elements see fig:4.6). This amounts to about eight times the amount of clickable elements on Ebay. Further, while Taobao employs strong color themes (e.g., red, purple, orange, and blue), Ebay generally employs muted colors (e.g., grey) allowing for the products to be the center of focus.

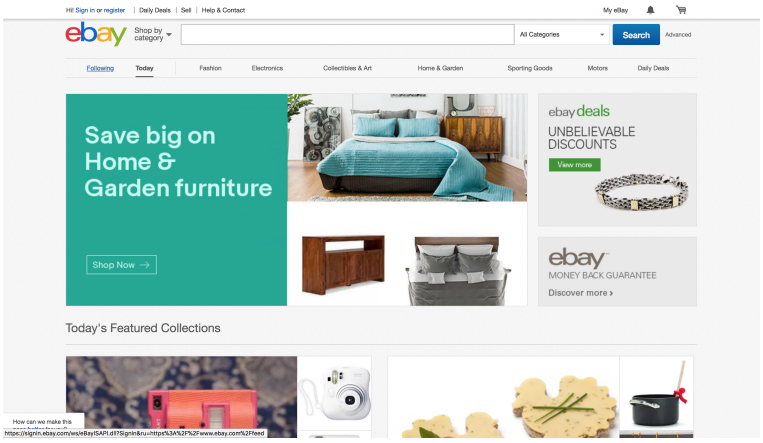


FIGURE 4.3: Ebay a popular American online shopping site

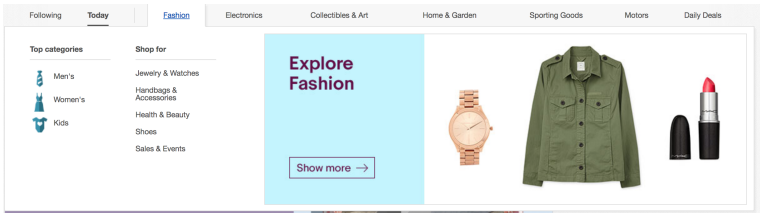


FIGURE 4.4: Expanding the menu on Ebay.

4.3.4 Analyses of Ctrip

Interestingly, the layout on many Chinese websites change significantly when the language is changed. For instance, the layout of Ctrip, a common travel site used for booking hotels and flights in China, becomes very different when users select English for the site (see fig: 4.7 versus for the Chinese version (see fig: 4.8 for English version). With the exception of the brand and name of the website, it is difficult to tell that it is actually the same website .

The main difference documented between the sites is content density. The Chinese version of Ctrip has a lot more content in a small area compared to the English-translated version of the site. Counting clickable elements without hovering over anything, 40 clickable elements were found on the Chinese version compared to only 26 clickable elements on the English version. When using the Chinese site, all links open a separate window instead of a second menu or tab - a common phenomena found on Chinese sites.

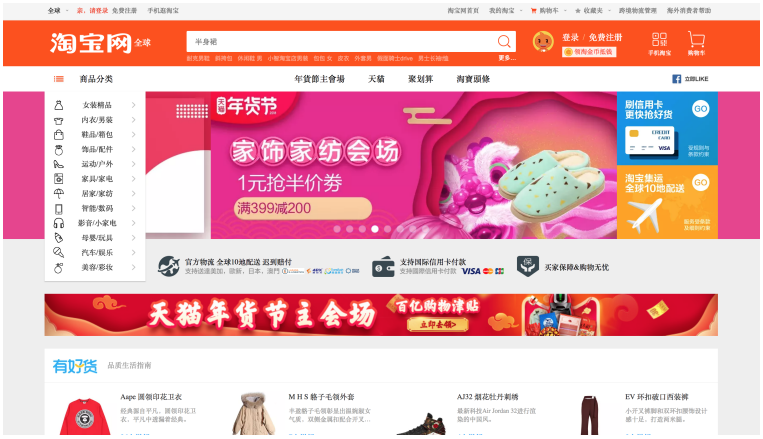


FIGURE 4.5: Taobao a popular Chinese online shopping site

FIGURE 4.6: Expanding the menu on Taobao.

4.4 Conclusion Phase 1

4.4.1 Common Chinese design that differs from western design

Looking through the websites we can identify several design features (outside of the language differences) that differ in Chinese and western websites.

These are:

- High information density
- Colors
- Ad content
- Navigation

The main factor of variance across the sites is information density. Chinese websites have significantly higher information density compared to their western counterparts. As such, information density is one feature that will be closely examined in this research. Colors and navigation features will be explored, but not prioritized. These aforementioned features will be included to aid in understanding the look and feel of the sites, rather than being the primary objectives of investigation. Additionally, since Chinese sites contain a higher ratio of ad content compared to western sites, advertising will be another feature explored in this study. There are several theories accounting for why Chinese sites are more information dense. Some of these hypotheses are: cultural/trends, historical, holistic vs analytic perceptions

FIGURE 4.7: The Chinese version of the travel website Ctrip.

(ref or cite..) and language. Due to limitations concerning Chinese language and knowledge of the history and culture, we will mainly examine trends and perception.

For the purposes of this research, different interfaces were created for the purpose of investigating trends and perception differences between sites. One page is western inspired and another was created with inspiration from Chinese designs. To ensure that the interfaces maintain authentic Chinese and western designs, professional UX-designers from Sweden and China assited in the development of some prototypes. These prototypes were then tested on both users with Swedish and Chinese heritages respectively. Finally, working interfaces, cable of measuring what actions users take in responding to certain tasks, was developed given the feedback from these prototypes. Main measurements that will be used are task-success, time-on-task and a modified System usability scale. [1]

Four interfaces will be created, with two following a western design and the other two using a Chinese layout. The first interface takes inspiration from the QQ and BBC news site home pages. The goal of implementing these interfaces is to explore how fluidly users from different cultural backgrounds can navigate sites containing high information density (e.g., copious amounts of images and texts). Both interfaces contain roughly equivalent levels of material and clickable elements; the primary difference is that the western site will be longer, forcing users to scroll down the page. Additionally, some of the information will be mapped in sub-menus using natural mapping for the western site [8]. Conversely, the Chinese inspired site will provide most of the material directly on the screen for users to view without any nested menus.

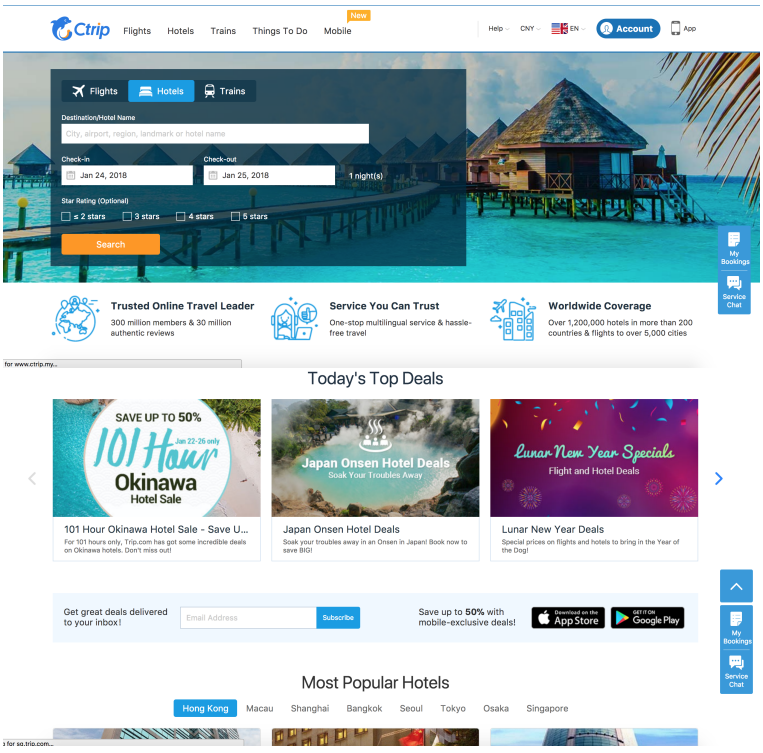


FIGURE 4.8: The English version of the travel website Ctrip.

Categorization of Data

Choosing the ux questions: In [7] has shown that perception differs in western and eastern cultures. [3] further indicates that this perception difference holds true in the case of people observing websites. Specifically, users using analytical processing follow the F-shaped pattern when browsing sites [10]. Holistic thinkers, conversely, do not follow the F-shaped pattern when browsing through a website. [3] In light of these past studies, it will be interesting to explore how these perception differences will influence users' abilities to navigate and perceive web pages. To investigate this question, we select elements both in accordance to the F-shaped pattern and elements outside of this pattern. By testing the performance on both analytical and holistic thinkers, we should get an indication of the differences and how well people follow the F-shaped pattern when looking for specific elements. The test will be unsupervised, meaning that we will have to get a larger test audience in order to obtain significant results. To test variances in perception, we will create tests for the sites BBC and QQ. On these pages, we will ask test subjects to find elements following an F-shaped pattern and elements not following this pattern. F-shaped pattern vs non F-shaped ([3]) Information density

Chapter 5

Phase 2 - Prototyping

The goal of Phase 2 is to quickly create prototypes for our design. The prototypes will then be tested and further developed. A pilot study using high-fi prototype will then be preformed to check how well the the study will work when performed online.

5.1 Method

Test method for low-fi and high-fi prototype. The Low-fi prototype was a simple sketch made on paper. The high-fi prototype was made in a program called sketch. A questionnaire was designed according to a modified system usability scale and where also tested in the pilot study.

5.2 Results

5.2.1 Low-fi Prototype

The Low-fi prototype was quickly sketched with pen on paper. The low-fi prototype was mostly made for planning purposes. The sites used for the test already existed so checking what functions and part of the current websites with a low-fi prototype would have no purpose four our test.

Parts outside of the defined web-pages The parts of the test that exists outside of the already defined news site low-fi prototypes were created and tester on. This since these parts needed to be defined for this test and had to be made so they would not interrupt the flow of the original website. A image of a low-fi prototype that was made for this part can be seen below (ADD IMAGE). This low-fi was tested iteratively before creating a high-fi prototype.

5.2.2 High-fi Prototype

Two High-fi prototypes was made from the online news site bbc [4] and QQ [5]. These prototypes was directly modelled from the websites and then the corresponding logos was removed. The websites was also both translated to English respectivly Chinese. The High-fi prototypes can be seen in the following figures: QQ (CITE to QQ image), BBC (SITE TO BBC IMAGE). The main purpose of creating and testing these high-fi prototype was to see how well the site would work when translate to another language. The site got a very different look after being translated partly because the Chinese language produce a lot smaller sentences. To translate from English to Chinese and vice-versa Google translate was used. This translated text was then looked over by the Tetra pak supervisor who is a native Chinese speaker.

The second benefit of creating and testing the high-fi prototype was to determine what questions worked well for the test and were understood in both English and Chinese. The questions were first created in English and then translated to Chinese. The questions selected was roughly half inside the F-shaped pattern (cite somehting maby?) and half outside the pattern. Some questions were selected to test the different menu-bars as well. The questions selected can be seen in the pilot study (cite pilot study).

5.3 Discussion Phase 2

Both of the pages were modelled from a combination of big websites that are already existing. Because of this the low-fi prototype had very limited benefit to test since what we wanted test already exists. The high-fi prototype on the other hand needed to be tested together with the questions to make sure these were understandable. The pilot study was also conducted to make sure that the main test is feasible.

5.4 Conclusion

To make sure the test will work and to see if we will get any sort of interesting result from the real test before programming the websites a pilot study using the high-fi prototype was conducted 6).

Chapter 6

Pilot study

The goal of this pilot study is to test if the hypnosis will have any chance of giving any significant results. The pilot study will also test if the tasks in the study actually answers what we want to find out. The pilot study will also give a clearer indication of the limitations of these tests.

6.1 Method

6.1.1 Pilot study

The pilot study was done by showing the test people the developed sketch prototype. Using this sketch prototype the tester sat next to the user and asked them to perform the tasks written down on a piece of paper (In chinese for the Chinese users and in English for the Western users). First the people got a minute to look around the page to get a quick feel for the layout of the site. Then a question was showed to the user and a timer was started at the same time. When the test subject found the requested image or text they indicated that they had found the information and the timer was then stopped. This was repeated until all the tasks where fulfilled.

6.2 Results

The users where asked to perform the following tasks:

English BBC Questions:

1. Click the news about ivory stabbing
2. Click on the Korean men beauty revolution
3. Click on the news about the freed samung heir
4. Click on the news about Zuma refusing to step down.
5. Click on the news that has to do with a angry sports coach.
6. Click on the long read article about the catholic priest father
7. Click on the video about cooking with strangers
8. Click on the video that has to do with Indonesia
9. Via the top menu go to the new phones site
10. Via the top menu go to US politics

11. Via the top menu go to news about the stock market

English QQ Questions:

1. Click on the following news: One hundred Hongkong staff more than half hiding in the United States and Canada
2. Click on the following news: Fishermen are no longer allowed to bring their own baits.
3. Click on the following news: Russian fighter pilots last words before blowing himself up with a grenade “For my brothers"
4. Click the following news: True beauty don’t fear wrinkles
5. Click on the video with a Chimpanzee
6. Click on the video below: Premier League - Liverpool 2-2
7. Click on the skyscraper picture
8. Click on the news below: Dow plunge near 700 on Friday what trigged it?
9. Choose from the following menu items: News
10. Choose from the following menu items: Health
11. Choose from the following menu items: Sports
12. Choose from the following menu items: Digital

The BBC pilot study resulted in the following results:

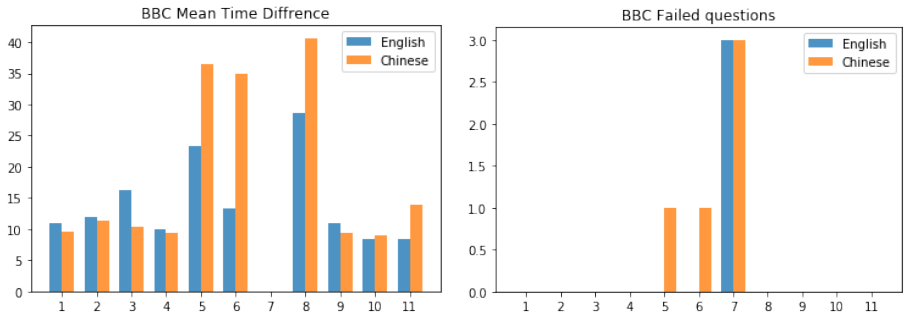


FIGURE 6.1: Results from the pilot study for the BBC inspired news prototype.

The QQ pilot study resulted in the following mean results:

6.3 Discussion

Doing this study provided a lot of relevant information some of the main problems with the test that was identified where that some of the news where repeated on several places of the site this made some tasks irrelevant since the news could be located at several different locations. Some of the questions seemed badly translated as well. For example the question of the sports coach seemed to confuse many of the

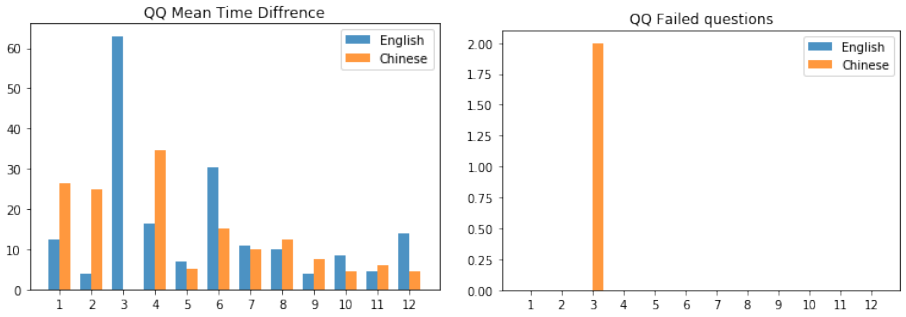


FIGURE 6.2: Results from the pilot study for the QQ inspired news prototype.

Chinese users. Also the questions regarding finding images on the qq site did not provide with any meaningful result this since QQ has very few pictures and therefore they did not check how well the user preformed in information dense sites. Another thing that was noticed during the test were how much the positioning of the questions were. The users seem to start their new search pattern from the point of the last task. This means that subjects who were asked to find new information all quickly found news closely located to the previous task. This needs to be kept in mind when designing the next set of questions, it might also be interesting to keep this in mind when analysing the results of the larger study.

We can see the measurements from the study in 6.1 and 6.2. Since the goal of the pilot study was to try out if the concept for the real study works we did not have enough participants for this data to have any statistical significance. As mention above the goal of the study was to find problems with the questions, translation and ux. According to (ref vem det nu var) we only need about 5 participants to find the majority of the user experience problems. But if we want this survey to be statistical significant when actually measuring time differences we would need 20 participants on each individual page. This would mean a total of 80 participants.

One thing that was noticed that were missing from a usability perspective is asking the user to perform actual tasks. All of the questions where focused on finding information. We would also to some extent test how the users deal with actual tasks and functions that are present on the different sites. One common task that is used on news based sites is giving feedback to the hosts and following the sites on social media.

6.4 Conclusion

Many questions will be changed to better be able to get results for the projects, also both the sites will have questions with the same structure. Both sites will have 16 tasks to perform. Four of the tasks will be about the menu-bar, four of the tasks will be functional, four of the tasks will be about finding precisely described news titles and lastly 4 of the tasks will be about finding more general described news. About half of the tasks will be in the F-shaped pattern view sight. The other half of the questions will be located to the right-hand and central side of the website. Finally

the sites will be designed so the content of both sites will be as similar to each other as possible.

Some functionality will be added to the prototype such as giving feedback and also following on social media. This will be done according to standards as can be seen in 4. A menu with the option to give feedback and follow on social media will be added to the right hand side on the Chinese pages respectively on the bottom of the page for the western site.

The new questions selected for bbc are the following: .....

The questions selected for qq are the following: .....

Chapter 7

Phase 3 - Building the Interfaces

The goal for phase 3 is to develop the beta-test,test it, fix, finish actual test and deploy it so it can be accessed and used globally by people all over the world. To be able to do this several different technologies had to be used

7.1 Method

To be able to perform the test on users all over the world without actually having to be there a web based test had to be constructed. The test was made using several different technologies and hosted on aws.

Several things had to be taken into consideration such as: slower network in china, possibility of web connection getting interrupted, measuring correct behaviours, making sure a completable devices was used for the test (mobile device would not at all test the same thing).

7.1.1 Front-End

The most important front-end technology on this website are React, Redux and Redux-Sagas. These three libraries create most of the functionality in website and they work very closely together. With React we show the user what we want him or her to see. All the users behaviours are stored in Redux (imagine a database for the browser), then depending on the updates in Redux, React appropriately up dates the information the users see. Some of the actions a user does triggers a Saga (Example: Pressing the finish button). That Saga then makes a asynchronous call to our API and send over the data stored in Redux to our mysql database hosted on AWS in Seoul.

Our front-end consist of four different pages. Homepage, bbc, qq, sus and done. The names of these pages are taken from the material that inspired them. The bbc site is not a actual bbc site but is named so since it is inspired from the bbc website. These namings is not something the users see and therefore does not affect them it's only to make it clear what page that is currently being disused. The flow of the test is as follows: The user starts at the Homepage, depending on the last test made by someone the user will either end up at the bbc page or the qq page. Depending on the language selected by this user they will see the page in the selected language. After finishing the bbc or qq test the user will be taken to the questionnaire on the sus page. After this is completed the user will arrive at the done page which contain a simple message thanking the user for their participation and provide my contact information if they have any questions.

Homepage

The homepage is the first page the user will see. This page is responsible for gathering information needed to decide how the rest of the test will be set-up. The homepage will start by asking the user if they want to do the test in Chinese or English. The test will then proceed to give the user information about the test in their chosen language. The web page will then query the database to check which of the sites that have the least number of tests done (bbc or qq). The user will then be see a description of the test in the selected language (see 7.1). After the user finishes reading the description and press "start" the site will start the test.

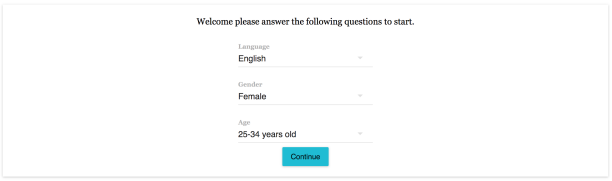


FIGURE 7.1: Image of the first page the user is greeted with.

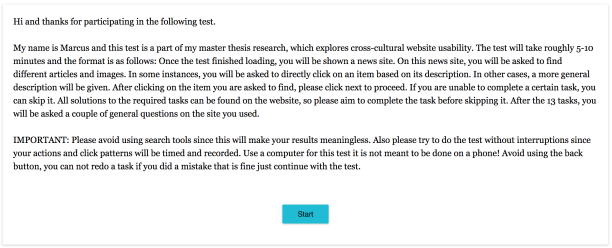


FIGURE 7.2: Description in chinese and english.

BBC and QQ

Both the bbc and qq inspired sites have the same basic layout. When the user arrives at the page a pop-up will appear with a loading bar, this is to make sure the user can't start the test until all the images has been loaded from the server. When all the images have been loaded the user will be able to start the test (see ref....).

All the news in this test has been translated so they have both the English and Chinese versions available depending on what language the user selected from the Homepage. Once the user starts the test a timer starts, the user is not able to see this timer. Each click the user does is recorded, the time it takes to complete the task and if the user gets the correct task or not. The number of questions the user have left to complete is also shown. The questions and what the user has most recently clicked is shown in a bar at the bottom of the screen (see 7.3). Once the user finishes the test their answers are sent to the database via the API and they are redirected to the SUS site.

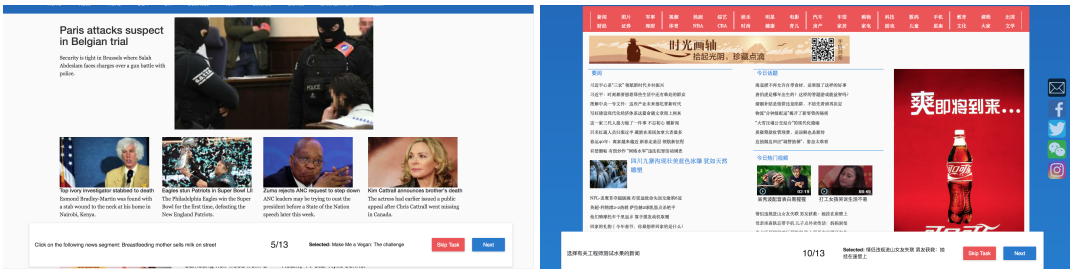


FIGURE 7.3: A example of what it might look for a user when testing bbc and qq inspired websites.

SUS

This site consists of the before mentioned predefined questions designed to get a understanding for what the user fleet about the website, test and design (See fig 7.6). Once the user has answered all the questions and pressed finish their answers will be sent to the database via the api. The user will then be rerouted to the done site where they will see a message thanking them for participating in the test (See fig 7.7).

7.1.2 Database

The database consists of five diffrent tables: Main, Actions, Questions, Sus and QuestionTexts. (See fig: 7.8 for figure of the full database)

The Main mainly is used to identify the user where each user has a unique row. The table has four columns Id, Site, Language and Age. The id in the main table is the main id to identify a user. This same id can be found for each user in all other tables except QuestionTexts.

The Questions table contain all the answers from the users, the table has seven columns: Id, MainId, QuestionId, Correct, StartTime, EndTime, Correct, TotalTime.

FIGURE 7.4: The full view of QQ site in english and chinese

MainId and QuestionId is foregin keys referencing the ids in the Main and QuestionsTexts tables. Each row in the Question table contain a answer from a user.

The Action table contain all the click-actions a user did per question. The table contain seven columns: Id, QuestionsId, PosX, PosY, ScreenWidth, ScreenHeight, RelativeTime. Where QuestionsId is a foregin key referencing the Id in Questions. Each row in the Action table contain a action made by the user.

The Sus table simply contains all the users answers to the Sus questions. The QuestionTexs table contain all the questions the user are asked in the test

7.1.3 Api

A express Api was set up to handle communication between the front-end and database. The Api takes the information that is sent from the users front-end code and transform it into a format that works for the sql database. The Api then quires the database and insert the new data into the database tables.

7.1.4 Hosting AWS

To host this app on AWS we used the feature called "Elastic Beanstalk" also called eb. Eb allowed us to easily launch a application that automatically set up a EC2 instance, auto scaling, load-balancing, RDS. The services was set up in Seoul. This to decrease

the loading time for China as much as possible. Since Seoul also have very good network connections to the rest of the world this does not increase the loading time in Europe and the US that much. A lot of time had to be spent changing parts of the code so it would run on AWS servers.

7.1.5 Beta-tests

Once a working version of the test was created. A beta test was made to find possible bugs in code and improve user-experience in terms of font-size and design of the testing parts. The beta-tests where made in the form of letting users try to finish the test while It was supervised. Notes where taken about possible misunderstandings, bugs and improvements that could be made to the test. Some examples of notes that was taken during the beta tests can be seen below.

1. Make selected bigger so the user can easier see what they have done.
2. Should we log scrolling?
3. Some correct question gets logged as incorrect in database in-spite of being correct.
4. Waiting for sus site is very slow. Is it waiting for the database?
5. Left top-side of qq site is too small, because of commercial?
6. Wrong spelling in some news.
7. Skip task not working.
8. Some correct question gets loged as incorrect in database in-spite of being correct.
9. Change so the size of the page is constant no matter the screen size. (Looked very bad on a big screen right now.)
10. Start time not working correctly on some questions.
11. Remove video from questions, does not give any relevant information.

The beta was tested on about ten people where six did the English version of the test and four the Chinese version. After about eight tests almost no new information about usability problems and bugs where found so it was concluded to finish the beta testing and launch the test.

7.1.6 Launch

The launch of the test when fairly quickly with AWS. During the launch the performance of the site was monitored closely and we could thereby see that loading times increased when several people used the site at the same time and not all results where logged in the database. It was quickly concluded this was beacuse a problem with the database connection from the api and within the matter of minutes this bug was fixed and the site was updated. It can be estimated that about 4-5 test results where lost due to this mistake.

7.1.7 How the test was conducted

it was sent out so only one test person did the test once. No repeats of the test where made

7.2 Results

We received quite a few responses from both English and Chinese users. In total we revived about 99 replies from people who did the test. 40 of these where from Chinese users and 59 from English speaking users. Of these users 61 where male and 38 female.

The majority of the test subjects are students studying at university. Most of the english speaking students are from Lunds University and the majority of the Chinese speakers are from xxxxx university in China. The rest of the test subjects are a mix of people from the Swedish and Chinese Tetra pak offices. The age of the test subjects are quite similar as can be seen in the graph below (/ref here for graph!).

(Bild från age grafen)

7.3 Discussion

The programing is the largest and most time consuming part of this thesis and there were several requirents of the code for the tests results to be useful. (OBS BORDE DHA MED ALLA REQUIREMTENTS NÅGONSTANTS. The requirements from the code can be seen in (REF TO REQ HERE). On top of previusly decided requirements the following where also added when it was realised that they where needed:

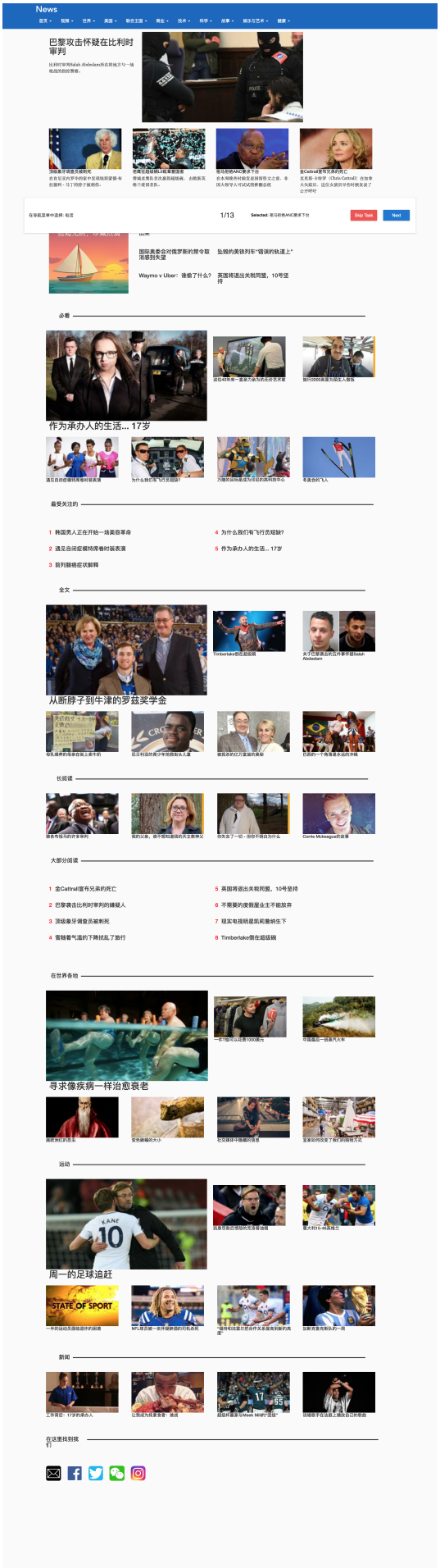
1. Users are not allowed to use ctrl-search
2. What site the user will test on should be controlled, this so we receive equal amount of tests for both sites.
3.

The results are from the raw data. This means that the data will have to be cleaned before able to be used. Some examples of what have to be removed are:

1. Tests done on Phone
2. Questions where the user has left the test.
3. Tests where the user only skipped through all the questions

7.4 Conclusion

Vad som behövde ändras efter beta, samt panik updatering på mysql databasen, hur vissa trots text försökte göra på mobil


News
巴黎攻击怀疑在比利时审判
作为承办人的生活... 17岁
从断脖子到牛津的罗兹奖学金
寻求像疾病一样治愈衰老
周一的足球追赶
在这里找到我们

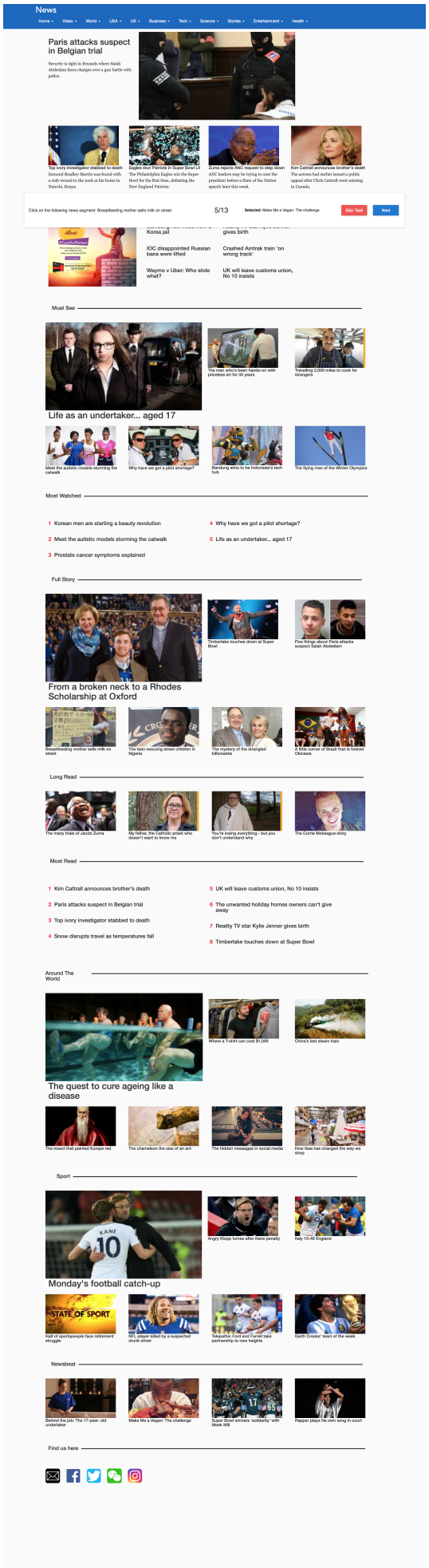

News
Paris attacks suspect in Belgian trial
Must See
Life as an undertaker... aged 17
Most Watched
From a broken neck to a Rhodes Scholarship at Oxford
Full Story
Long Read
Most Read
The quest to cure ageing like a disease
Around The World
Monday's football catch-up
Sport
Newsbeat
Find us here:

FIGURE 7.6: The sus site

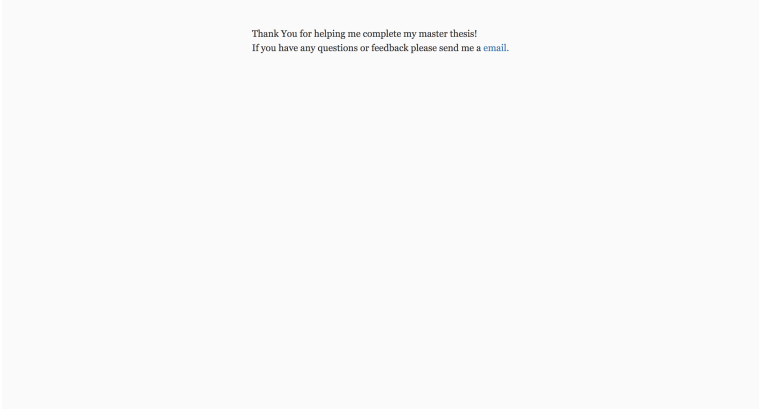


FIGURE 7.7: Last site the user is shown when they have finished the test.

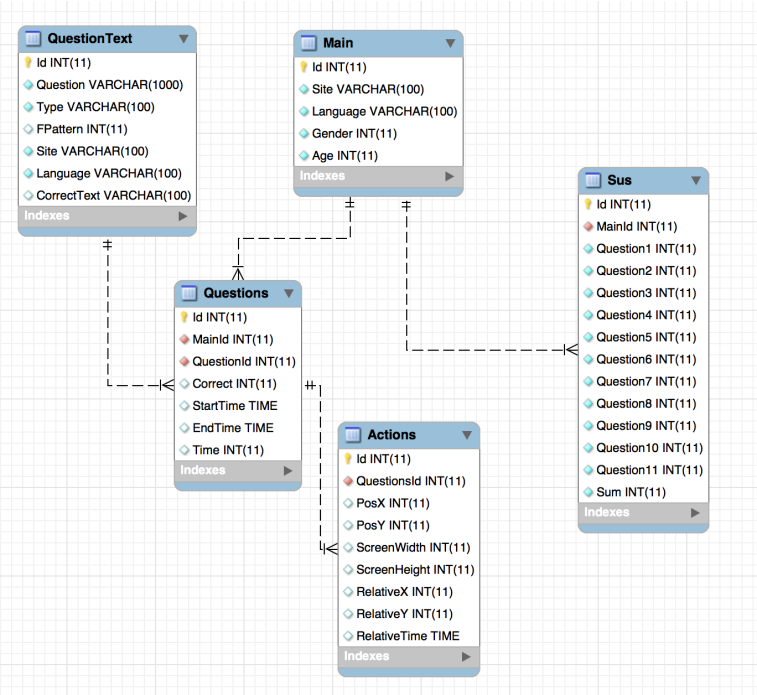


FIGURE 7.8: A EER schema of the mysql database. Yellow icons show the tables primary key, red the foreign keys and blue/white the atributes.

Chapter 8

Phase 5 - Analyzing Data

8.1 Method

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8.1.1 Results

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8.1.2 Discussion

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8.2 Conclusion

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Chapter 9

Discussion

9.1 Meaning of results

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9.2 Conducting a non monitored test

9.2.1 The good

9.2.2 The Bad

9.2.3 Subsection 2

Morbi rutrum odio eget arcu adipiscing sodales. Aenean et purus a est pulvinar pellentesque. Cras in elit neque, quis varius elit. Phasellus fringilla, nibh eu tempus venenatis, dolor elit posuere quam, quis adipiscing urna leo nec orci. Sed nec nulla auctor odio aliquet consequat. Ut nec nulla in ante ullamcorper aliquam at sed dolor. Phasellus fermentum magna in augue gravida cursus. Cras sed pretium lorem. Pellentesque eget ornare odio. Proin accumsan, massa viverra cursus pharetra, ipsum nisi lobortis velit, a malesuada dolor lorem eu neque.

9.3 Main Section 2

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Chapter 10

Conclusion

10.1 Stuff i don't know where to put yet....)

Mainland china diffrence largly beacuse of isolation or are there other factors

Use the same content on both sites... to ensure better results and measure more

western website use pictures so might be good to use some picture question and see if i can find something out

Make sure to make some good questions about some thing in the chinese text (not finding a exact pattern)

10.1.1 Emerging trends in chine

10.1.2 Reason for differences

10.2 Limitations

// FROM Investigation chapter Although many of the well-known websites in China are quite information dense, several other websites that have adopted a sleeker look. Two big examples of this is the messenger application WeChat, a popular Chinese social media platform, and the the Alipay service website. We will not focus on these more modern sites as it is beyond the scope of this research. In this project, we specifically select the most popular regularly used sites that differ from the western design standard. In the case of Taobao, it might seem very difficult for westerners to navigate the site, but it is now one of the biggest websites in the world. There are also cases of websites more or less copying western websites because they are blocked in China. A typical example of this is Youku, which mimicked the American video sharing site, YouTube - these types of sites will not be investigated in this report either.

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