

UNIVERSITY NAME

DOCTORAL THESIS

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## 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

February 23, 2018



## 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*

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**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 1

# Introduction

### 1.1 Background

east vs west

### 1.2 Global Website design

### 1.3 Tetra Pak

### 1.4 Limitations

### 1.5 purpose

### 1.6 scope

Focus on differences between China and Sweden



## 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

### 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 User Testing

## 2.9 Natural Mapping

## 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 (appendix 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 example )

## 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

## 2.14 Culture and Usability



## Chapter 3

# Working process

### 3.1 Main Section 1

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### 3.2 Main Section 2

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## Chapter 4

# Phase 1 - Investigation

The goal of the Investigation phase is to gain a deeper understanding of the differences between Chinese and western websites. Then using this information we will decide on what features we want to analyse and what usability metrics we want to use for this.

### 4.1 Method

Firstly, several Chinese websites and their western counterparts were identified and the main differences that had to do with the project scope were analysed. Secondly, a conclusion where what design patterns that will be tested was selected. The metrics used to measure these design differences was also decided.

### 4.2 Results

#### 4.3 Chinese vs Western websites comparison

Chinese websites are clearly very different in design compared to their western counterparts. The differences are more than just the look and feel of the sites but also the UX design of the sites are very different. We will look at some of Chinas biggest and most popular websites and in some cases compare them to the English counterparts.

##### 4.3.1 QQ

QQ is one of the top most visited website in China (see fig 4.1). [12] [11] QQ like many other Chinese websites does not focus on one thing but has many different functions. Part of the functionality that QQ offer is: instant messaging, online social games, music, shopping, microblogging, news, movies, group and voice chat software etc. Going to the main homepage (QQ.com) you will be greeted by their news page. As we can see this page is quite information dense. If we count all the clickable elements without hovering over anything on a standard computer screen we get about 147 clickable elements . If we compare this to BBC's homepage [4] which is considered fairly information dense by western standards. It has 48 clickable elements on its homepage. This means that with only counting clickable elements QQ is over 3 times more information dense than BBC.

One element that is quite common on Chinese websites that we can see in QQ as well is it's menu bar (see fig 4.2). This menu bar has two rows with a total of 40 options. This type of menu bar is quite common and can be seen at many other Chinese sites.



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



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

### 4.3.2 BBC

### 4.3.3 Taobao and Ebay

Taobao is one of the biggest websites in the world. Taobao is similar to the American Ebay in terms of what the website provide. They both are online shopping websites where you can buy almost everything you need. The design and user-experience focus on the sites are quite different. Ebay has a very sleek design with darker colors and only 20 clickable elements (see fig:4.3). Ebay also have expanding menu bar that contains about 6-10 clickable elements (see fig:4.4).

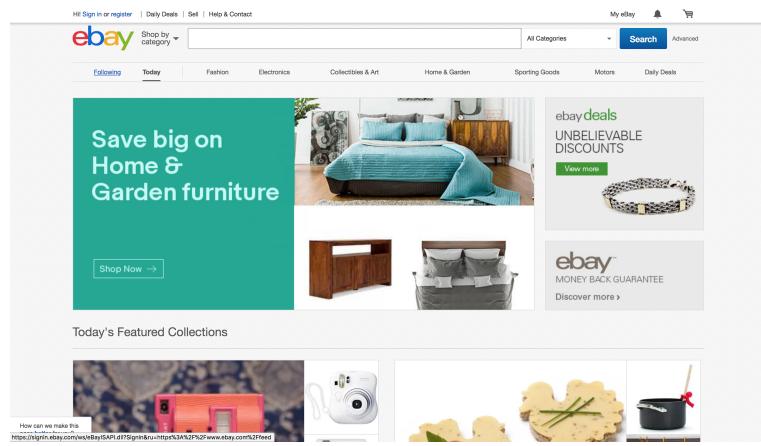


FIGURE 4.3: Ebay a popular American online shopping site

If we look at the Chinese version Taobao we once again can clearly tell the difference in information density (see fig:4.5). The main page has about 49 clickable

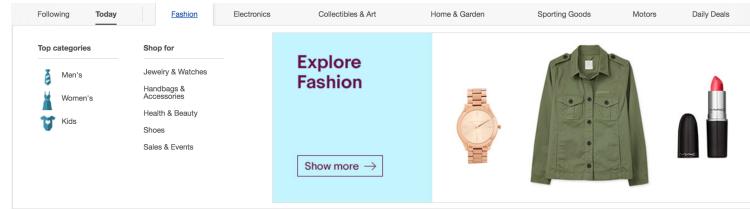


FIGURE 4.4: Expanding the menu on Ebay.

elements. And the menu items on the right hand side can expand and show between 55-80 clickable links and elements (see fig:4.6). That is about 8 times more clickable elements compared to Ebay. Another thing to take notice on Taobao is the strong colors, Taobao frequently use very strong red, purple, orange and blue. Ebay keeps more to gray and let their products provide the stronger colors to make you focus on them.



FIGURE 4.5: Taobao a popular Chinese online shopping site



FIGURE 4.6: Expanding the menu on Taobao.

#### 4.3.4 Analyses of Ctrip

Many Chinese web sites change quite a lot when changing language. Ctrip is one of these sites. Ctrip is a very common travel site in China which allows you to book hotels, flights, car rental etc. When you select to translate this site to English it does not only translate the site but the whole layout and design of the website change as

well (see fig: 4.7 for Chinese version and fig: 4.8 for English version). Except for the brand and name of the website you can barely tell that it is the same site.

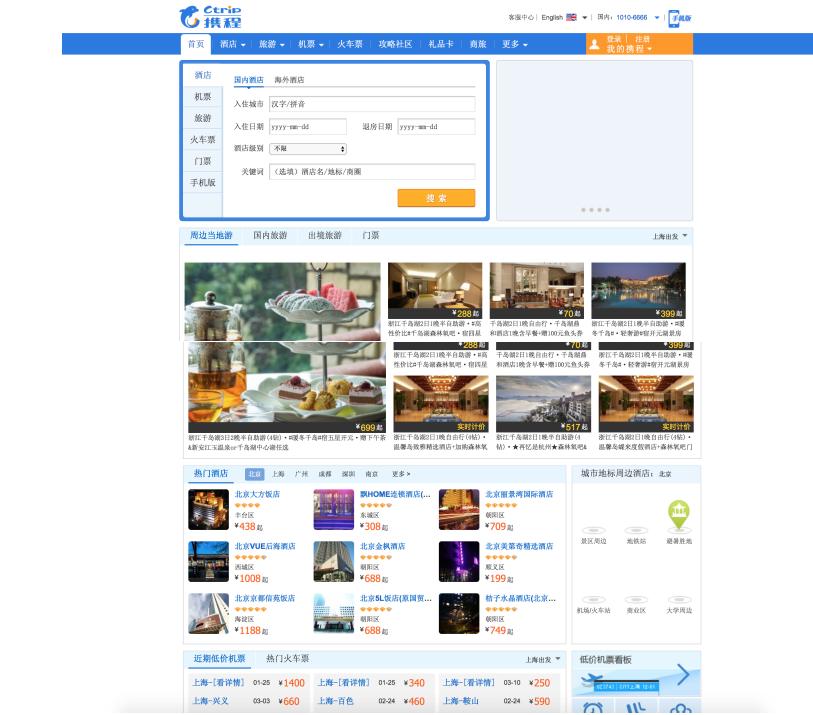


FIGURE 4.7: The Chinese version of the travel website Ctrip.

The main difference we can see between these sites is the density of content. The Chinese version has a lot more content on a smaller area. Counting clickable elements without hovering over anything we can find 40 clickable elements on the Chinese version compared to 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. This is a quite common phenomena found in many sites.

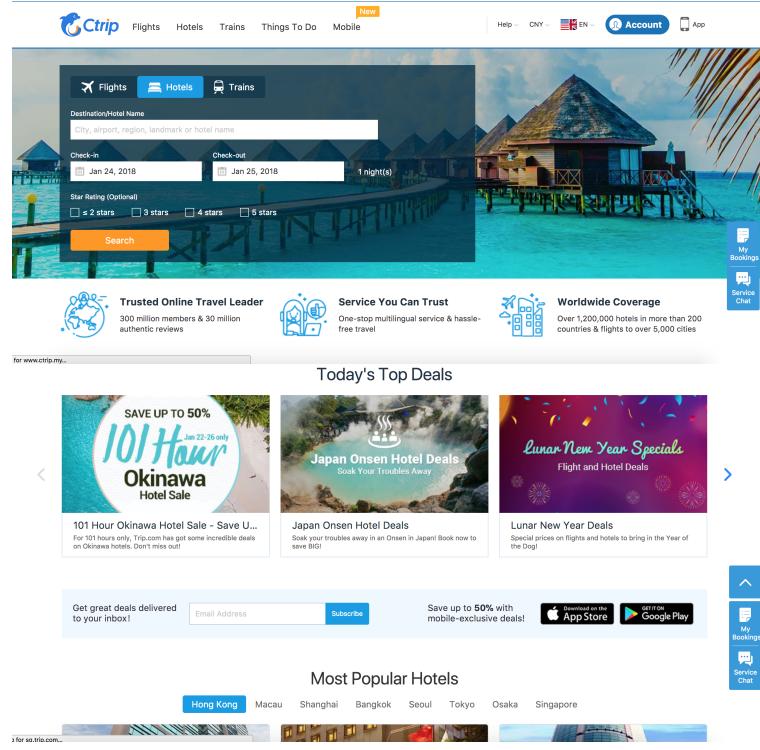


FIGURE 4.8: The English version of the travel website Ctrip.

## 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 we could see across all websites is the difference in information density. Chinese websites have significantly higher information density compared to their western counterparts. This is one feature we want to examine more closely in our later study. Colors and navigation will be explored but not prioritized. These will be included to give a more accurate feel of the site instead of focused on. Chinese sites have a higher ad content than many of the western counterparts, this is a feature that not will be looked into in this study. There are several hypothesis for why Chinese sites are so information dense. Some of these hypothesis are: cultural/trends, historical, holistic vs analytic perceptions (ref or cite..) and language. Because of limitations with understanding of the Chinese language, history and culture we will mainly examine trends and perception.

To do this we will create two interfaces, one western inspired and one with inspiration from Chinese designs. To make sure that the interfaces will look Chinese and Western we will with the help from professional UX-designers from Sweden and China develop some prototypes. The prototypes will then be tested on both users with Swedish and Chinese heritage respectively. We will later develop a working interface from these prototypes that will be able to measure what the users do in response to certain tasks. Main measurements that will be used are task-success, time-on-task and a modified System usability scale. [1]

Four interfaces will be created, two with western design and two with a Chinese design. The first interface will take inspiration from the news sites QQ and BBC homepages. The goal with these interfaces will be to test how well the users can find materials in highly image and text cluttered interfaces. Both interfaces will have about the same amount of material and clickable elements, the main difference will be that the western site will be longer which forces the user to scroll down on the page and some of the information will be mapped in sub-menus using natural mapping. [8] The Chinese inspired site will provide most of the material on the screen directly for the user to see without any nested menus. The other two interfaces will use more advanced material. In these two sites the users will have to analyse and click on graphs to complete tasks, here we will also have a more cluttered Chinese inspired site and one western inspired. The goal with these is to also check how well the users can understand and deal with information density. The reason for having this website as well is to check how the two groups can perform on non text based material, i.e. does visual material that requires the user to analyse pictures and patterns change how much information the user can handle? Having a separate interface will also allow us to gather more data to minimize the risk of abnormalities from testing one site will influence the data to much.

### Categorization of Data

Choosing the UX questions: In [7] has shown that perception differs in western and eastern cultures. [3] further proves that this is true in the case of people observing websites where users with analytic perception follows the F-shaped pattern [10]. Holistic people on the other hand does not follow the F-shaped pattern when browsing through a website. [3] One interesting aspect to look into is how this affects performance when looking for specific elements. To do this we will 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 minded people we should hopefully get an indication if there is any difference and how well people follow the F-shaped pattern when looking for a specific element. The test will be unsupervised which means that we will have to get a larger test audience to get any significant results. To test this we will create tests for the sites BBC and QQ where we will ask the test subject to find elements inside the F-shaped pattern range and also outside F-shaped pattern vs non F-shaped ([3]) Information density

#### 4.4.2 Limitations

Even if many of the biggest websites in China are quite information dense there are several websites that have adopted a sleeker look for their sites/services. Two big examples of this is the messenger application WeChat which is very big in China and the Alipay service website. I will not focus on sites like this and there might

be a trend in china that is moving towards a sleeker look. In this report i have specifically chosen the some of the most popular regularly used sites that differ from the western design standard. In the case of Taobao it might seem very difficult for many westerners to use but it is as of 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 and youtube, these types of sites will not be focused on in this report either.

## 4.5 Lägg till

Undersök lite angående functionalitet samt vilka du kan lägga till i sidan



## Chapter 5

# Phase 2 - Prototyping

The goal of Phase 2 is to quickly create prototypes for our design that achieve what we want for the project. The prototypes will then be tested so that the actual website will have some testing behind it before building and thereby enable a quicker development.

### 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. Since one of the websites was almost a direct imitation of two current large Chinese and English news sites those where only quickly showed for people with different ethnicity to see that everything looked correct and nothing was missed. The main focus with the Low-fi prototype was spent on the second site that was not made directly from any external source. Firstly a quick paper prototype was drawn on paper (see figures...). These figures where then showed from a ux-design specialist in China and Sweden. A new model was drawn according to feedback and showed/tested on some potential users from China and on some from Sweden. (Write how the test was conducted with test methodology etc....) This feedback was then used to create a High-fi Prototype.

#### 5.2.2 High-fi Prototype

##### News Site

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 respectively Chinese. The High-fi prototypes can be seen in the following figures: QQ (CITE to QQ image), BBC (SITE TO BBC IMAGE)

### **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 was not necessary to test. 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**

## 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 were fulfilled.

## 6.2 Results

The users were 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 an 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 triggered 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:

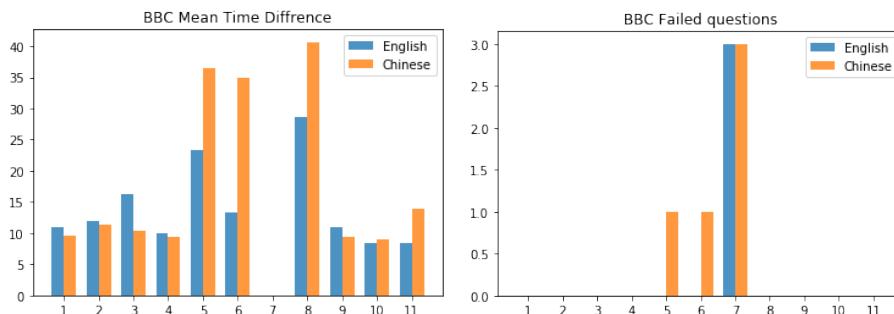


FIGURE 6.1: Results from the pilot study for the BBC inspired news prototype.

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

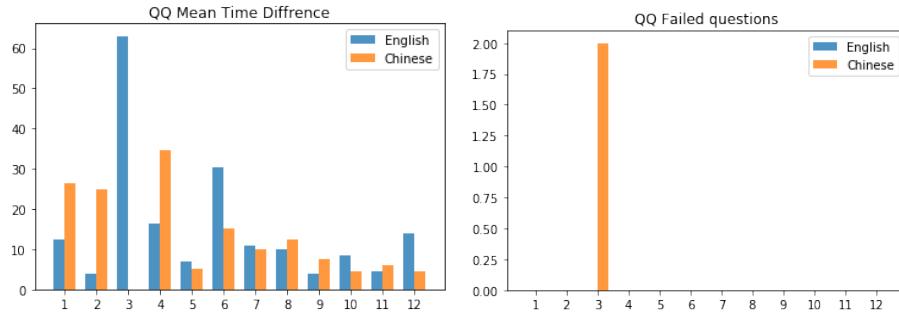


FIGURE 6.2: Results from the pilot study for the QQ inspired news prototype.

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.

HMM TANKAR————— skulle vilja lägga till något som hjälper dig navigera i sidan. så användaren faktist försöker använda det

### 6.3.1 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 20 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.

## Chapter 7

# Phase 4 - Building the Interfaces

### 7.1 Main Section 1

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#### 7.1.1 Subsection 1

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#### 7.1.2 Subsection 2

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### 7.2 Main Section 2

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## Chapter 8

# Phase 5 - Analyzing Data

### 8.1 Main Section 1

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#### 8.1.1 Subsection 1

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### 8.2 Main Section 2

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## Chapter 9

# Discussion

### 9.1 Main Section 1

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#### 9.1.1 Subsection 1

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#### 9.1.2 Subsection 2

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### 9.2 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**



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