Evaluation of Google Maps

Name of Heuristic	Broken or Well Applied	Explanation	Improvements
1. Visibility of system status	Broken	There is no feedback on what the system is doing. Although, feedback may not be need so much with this application as routes are calculated so quickly that there isn't much need to explain what is going on.	To improve on this, Google could show a hint (pop up text), informing the user that the route is being calculated or that its searching for the destination.
2. Match between system and the real world	Well Applied	When navigating across the map, cities and town are appropriately labelled with motorways and major roads clearly shown. Mountainous areas are shown in green and (water features) are shown in blue, just like on a real paper map, which would be familiar to the user. The options to drive, walk, cycle or get a train all have appropriate and clear icons. All roads and motorways have correct names. I think the language and terms chosen would be suitable for all ages. However, to users who have no prior knowledge to navigational applications, they may not know what the "go to current location" and "select destination" icons mean.	Perhaps to replace the "go to current location" and "select destination" icons with buttons, which clearly state what, the buttons will do. Although this could ruin the minimalistic design.
3. User control and freedom	Well Applied	If the user type in the wrong destination or route and the application starts navigating, the user can easily press the "X" button at the bottom of the screen where the time and distance to destination is. This will take them back to the screen where they can choose their route and from there the user can change the destination. At times there is a clearly marked back button at the top of the screen, which goes back to the previous screen but this is not present after every action.	I don't think there is much need for improvements here as on every screen there is in some way an "emergency exit strategy". Although these "emergency exit strategies" may not be crystal clear to the user. To improve on this, I think the button should simply be labelled as "Back".
4. Consistency and standards	Well Applied	The icons to show the methods of transportation and icons that show nearby places are all grouped together with the same design, colour scheme and size. Previous destinations shown in the history tab are all grouped together with the same font and font size. All road, town, cities and countries names have same font and font size respectively. The overall colour scheme of the application is also consistent. However, "emergency exit strategies" range from an "X" button to a "<" button, which is inconsistent.	There should just be one button on each screen labelled "Back" instead of having one button labelled "X" and another "<" which have the same purpose but this may not be clear.
5. Error prevention		To test this heuristic out, I decided to search for a postcode in Cardiff with one more letter on the end "CF14 9UGH". Google Maps autocorrected this to "CF14 9UG". I also typed in "SA3 lDP" hoping to change it to	Improvement can be made by allowing users to input letters which are similar to numbers and autocorrect

		"SA3 1DP" but Google Maps wasn't able to autocorrect it.	these such as such as "l" to "1" and "o" to "0".
6. Recognition rather than recall	Well Applied	The search bar in Google Maps shows suggested destinations as the user is typing. This means the user doesn't have to recall the whole address to type in, and can rely on the suggested destinations. Once the user has search for their first destination, they wont have to learn how to do it again as the procedural methodology will be the same.	There is not much need for improvement here, but perhaps making the destination History tab easier to access. For example, a clear tab in the menu section. Although there is a section in the menu section for "Your Places" the user will need to actually save the destinations in here to view them.
7. Flexibility and efficiency of use	Well Applied	Google Maps offer a few shortcuts to speed up interaction with the application. These include easier searching, voice recognition and getting current location. When searching for a destination, the user does not have to type in the full address; only part of it, and the application will come up with suggestions with almost always the correct address amongst them. There is also an option to use the built in microphone on the phone to search for the destination. For the user to input their current location, all they need to do I click the button with the blue target symbol and it will automatically detect what your location is.	I believe there is no need for improvements in this area.
8. Aesthetic and minimalist design		Google Maps is simple, clean, easy to use and has no clutter. The menu tab is hidden away to avoid taking up much of the screen. There are also a lot of simple icons used instead of big buttons with text. However, for a first time user this minimalistic design may be confusing at first and they may not know how to navigate around the application, but will learn very quickly. The map is also aesthetically pleasing as it is very high quality, with options to display the terrain and satellite view.	As with all Google applications, Google Maps is very minimalistic and very aesthetically pleasing. I have no improvements to make here.
9. Help users recognize, diagnose, and recover from errors	Well Applied	If the user types in a destination that is not in Google Map's records then a message will pop up saying "No results for …". Also, if the user types in the destination wrong, then Google Maps will autocorrect it and display a message saying "Your search was spell corrected".	I have no come across any other errors apart from those mentioned and they both had error messages explaining to the user what has happened.
10. Help and documentation	Well Applied	Help and documentation are not visibly displayed on the main user interface. However, clicking on the icon with three horizontal bars next to the search bar brings down a menu with multiple different options. One of these options is "Help". Upon opening help, a search bar appears at the top where you can search through the documentation for answers to your question. There is a useful list underneath the search bar with popular	Overall, I think the help and documentation section is done well. However, it may not be clear to the user how to get to the help section, as it is not clearly labelled. To improve this I think the settings icon needs to be

		articles with answers for popular questions. Also, you can send Google feedback including system logs by clicking on the feedback button at the bottom of the help screen.	more obvious to the user that it is a settings tab.

User Study

Outline:

This study aims to compare a digital mapping application to using the standard physical map. I am constructing this study to see which way of navigating is best. I will ask 10 people to participate in this study. A questionnaire (look at Appendix A) will be given out for people to fill in so I can decide which people I'd like to participate in my study. I will base the people I choose on age group, gender and experience with navigational technology. There will 10 participants with an equal number of male and female. There will be five different age groups: 20-29, 30-39, 40-49, 50-59 and 60-69. This will help me gain a better understanding of how well each method works for certain types of people.

5 participants will have an Android device with Google Maps already installed and the other 5 will have a physical AA Road Map (dependent variables). Out of these 10 participants there will be an equal number of male and female. There will be five different age groups: 20-29, 30-39, 40-49, 50-59 and 60-69. This will help me gain a better understanding of how well each method works for certain types of people.

Throughout the study I will be gathering data on how well each participant navigates to the desired destination. I will be giving the participants questionnaires (look at Appendix B) to fill in asking them how many wrong turns the participants take, how long it takes to plan a route and how long it takes them to reach the destination (independent variables).

Procedure:

There will be three consecutive destinations they will need to navigate through to. At each destination the participants will fill out a questionnaire so I can gather data more reliably, as the participants may forget if they only do one questionnaire at the end of the study. The participants will start at Swansea University outside Fulton House. From there they will walk to The Cricketers (a pub on King Edwards Road). Then, they will make their way to Dillwyn Street. From Dillwyn Street they will then walk to Parc Tawe Retail Park. I have chosen these destinations as there are side roads, which can be used for shortcuts and some places can be tricky to get to without taking the long way.

Ethical Rights:

This will be given to each participant before the study starts, so if they do not agree with their rights they do no have to participate. These rights are taking from the Swansea University's Research Participant bill of Rights [1].

As a research participant, you have the right:

• To be treated with respect and dignity in every phase of the research.

• To be fully and clearly informed of all aspects of the research prior to becoming involved in it.

• To enter into clear, informed, and written agreement with the researcher prior to becoming involved in the activity. You should sense NO pressure, explicit or otherwise, to sign this contract.

• To choose explicitly whether or not you will become involved in the research under the clearly stated provision that refusal to participate or the choice to withdraw during the activity can be made at any time without penalty to you.

• To be treated with honesty, integrity, openness, and straightforwardness in all phases of the research, including a guarantee that you will not unknowingly be deceived during the course of the research.

• To receive something in return for your time and energy.

• To demand proof that an independent and competent ethical review of human rights and protections associated with the research has been successfully completed.

• To demand complete personal confidentiality and privacy in any reports of the research unless you have explicitly negotiated otherwise.

• To expect that your personal welfare is protected and promoted in all phases of the research, including knowing that no harm will come to you.

• To be informed of the results of the research study in a language you understand.

• To be offered a range of research studies or experiences from which to select, if the research is part of fulfilling your educational or employment goals.

Pilot Study Findings

Summary of success and issues

For the pilot study I had one person doing the study twice, once with Google Maps and once with a paper road map. These are the results from the questionnaires that the participant filled out:

Using Google Maps

- The participant took 8:13 minutes to get to the first destination, 11:02 minutes to get to the second destination and 9:43 minutes to get to the last destination.
- The participants took only one wrong turn when reaching the last destination.
- It took the participant 7 seconds to plan a route
- The participant rated Google Maps as 9 out of 10.
- No issues were found with the study.
- The participant said that they would rather have only one destination not three.
- Additional Comments: “Google Maps was very fast at calculating my route and very easy to use. I found no problems with it. However, maybe for a first time user who hasn’t had much experience with the application, it may be a bit too minimalistic. The icons should be made clearer what they actually do.”

Using paper road map

- The participant took 8:27 minutes to reach the first destination, 13:14 to reach the second and 11:57 to reach the final destination.
- The participants took two wrong turns, once walking to the second destination and once walking to the last destination.
- It took the participant 3:30 to plan a route to reach all three destinations.
- The participant rated using paper maps as 5 out of 10.
- No issues were found with the study.
- The participant said that to improve this study, a bigger road map should have been supplied.
- Additional Comments: “Using a paper map was much worse than using Google Maps. There was no real time guidance given and searching for road names was much harder. There were way too many pages to search through and the text was small to read, unlike Google Maps where you can zoom in.”

Discussion on changes that could be made

After compiling results from the participants questionnaires, if was to do this study again I would

- Change the number of destinations to only one that is further away and possibly more difficult to get to.
- Supply a bigger road map for the participants to read.
- I would accompany the participant on their way to the destination and record my own notes on how the participant interacted with the application or road map.

Differences between this and Heuristic Evaluation

When using Google Maps, the participants said, “Maybe for a first time user who hasn’t had much experience with the application, it may be a bit too minimalistic. The icons should be made clearer what they actually do”. This is also a problem that I found whilst doing my heuristic evaluation of Google Maps. I found that the icon to get your current location is ambiguous and I fell that this was what the participant was referring to also.

APPENDIX A: Pre Study Questionnaire

Pre Study Questionnaire

Form Description

What age gap are you?

- 20-29
- 30-39
- 40-49
- 50-59
- 60-69

What gender are you?

- Male
- Female

Experience with navigational technology

- None
- Little experience
- Some experience
- Vast experience

Occupation

APPENDIX B: Post Study Questionnaire

Post Study Questionnaire

Form Description

How long did it take you to reach your destination?
Please enter answer as HH:MM:SS

How many wrong turns did you make?

How long did it take you to plan your route?
Please enter answer as HH:MM:SS

On a rating from 1-10 how did you find using your method of navigation?

1 2 3 4 5 6 7 8 9 10

Did you have any problems with the study?

- Yes
- No

If yes, what problems did you have?

Do you have any suggestions how to improve the study?

Any additional comments?

References

[1]
http://www.swansea.ac.uk/compsci/dept/committees/ethics/rights.pdf