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Usability assignment

by Samuel Hashan

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Research and Analysis of Smart Public Transport System

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Course - Web Development

Module – Usability Engineering ACCA6017

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Introduction

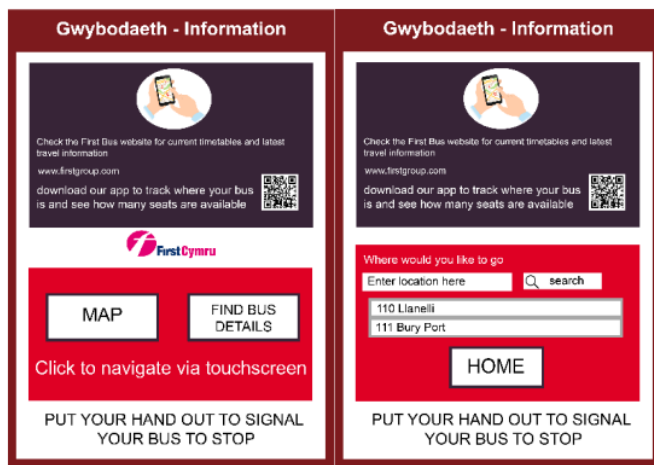
This report will look discuss the usability of a public transport display scenario for a local bus stop. It will look at how the infrastructure can be improved with the use of a better public use display. The reason for why this public transport was chosen and how it can be improved will be shown with a design idea displaying a better version of the information system. The usability guidelines will also be looked at and how the public transport information system can be made more accessible. The strategy for implementing the proposed public transport information system was then looked at and evaluated explaining the process and what could have been done. The map applications usability was then looked at and the challenges with developing map-based interfaces as well as providing a sketch of a suitable map-based interface.

Explanation of chosen public transport design idea.

There is public transport information system that is being looked at is one from a bus stop on middle road. This information system can be improved in so many ways. For starters, it is quite small and has a lot of space around that it could have used. The text is small so that it can be difficult to read what it says on the bus. This is not great for the human vision.

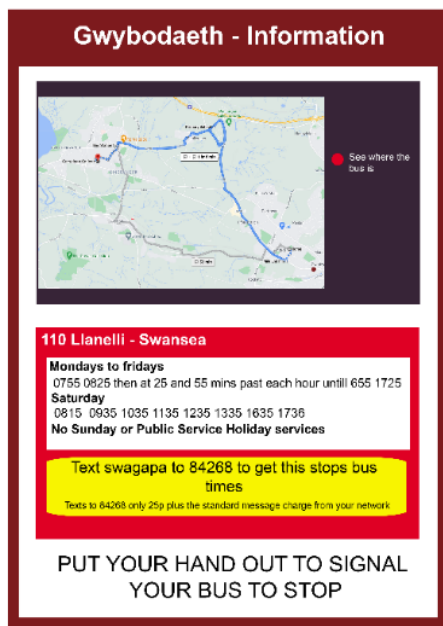


This can be made better in various ways and a better design was created to showcase how it can be improved. The text was made a lot bigger so the user can read easier as many people taking the bus might not have the best eyesight such as the elderly in particular. As it is an electronic board, users will be able to zoom in into look at certain details displayed. The original board has a lot of content on at once and that does make the board look more messy so one good method would be too add buttons to the board that the user can use to navigate to their desired page. There is a QR code that the users can scan so they can connect to the first app on their phones. However, some of the users of public transport might not be familiar with the application or have it such as some of the elderly users so it could be easier for them to use the board. This board will also save costs spent on cutting down trees for paper. There will be text letting the users now to interact via touch screen with the board.



The users will be able to know which bus takes them to their chosen route by clicking on route and they will be sent to a page where they can enter their location and the bus that takes them there will be shown and they can select a bus and it will direct them to the buses timetable.

Once the user selects their bus, they get sent to a screen displaying their bus times and a map showing their route and also where the bus is. This should give the user a better idea of where the bus is and how long it can take for the bus to get there.



Usability Guidelines and accessibility

Various usability guidelines were applied to the display. One of these were guidelines on accessibility for users with visual disabilities. For the users that might have visibility disabilities, the text was made bigger so the users can read the text easier. There will also be text to speech so the users that would struggle reading can hear the important details. The size of most of the fonts are over 24 as that is the recommended size suggested in the visual disabilities.

Schneiderman's user guidelines were also followed. Schneiderman has listed 8 golden rules. Examples of these are to make sure the interface remains consistent with the content used. This is done in this information system by using the same colours and same menu hierarchy. Another example is to allow users to have shortcuts they can use frequently, and this was done by having a button that takes the users to the home page on every page. Schneiderman also did talk about error handling as one of the rules but there are not many errors the users can make on this information interface as they will simply just be reading the data. The only error they would make is typing in the wrong location. The 8 golden rules are consistency, shortcuts, informative feedback, dialogue, error handling, permit reversal of actions, support internal locus of control and reduce short term memory load.

One of Jakob Neilson's heuristics for user interfaces were to make it efficient and flexible to use. One way Jakob Neilson has stated that this could be done was by adding shortcuts. This could be added to many user interfaces but not this in particular as this is a very simple information system. The users will not find many features that they would need a shortcut too. Another way he mentioned that the user interface can be made more flexible allowing the user to personalize the content. This will not really be able to be applied here as the display system is used by many users. Other users might struggle to use the system with someone else's personalised settings. This is a public use system not a personal system.

W3C Web Accessibility Initiatives have some guidelines that can be used while designing this information system. It is a good idea to apply these guidelines when possible as it will only make the information system improve and be more accessible to more users.

Usability Evaluation Strategy and Implementation

The interface design was created on photoshop as Photoshop is a software that is familiar to use, and it has all the tools to make the interface look as planned. There are a range of evaluation techniques that could have been used during the creation of the information systems. The first stage of the project would be to evaluate the current information system and gather details about the information system. An interview and then could then be had with users to gather their insight on what would be needed. The data gathered from the observation of the information system and the user interviews and survey responses could then be used to list the requirements for the information system. A paper prototype can then be created showing how the information system on the bus stop would look. The paper prototype will then be reviewed by other users and their feedback can be taken to create another prototype. Once the final prototype has been created, the final product can begin its development. Once that has been created it will be tested by users and they can provide feedback on it and compare it with the previous information system for the bus stop to help evaluate it. These methods do work as they were implemented in the final personal project that was also done this year. There various types of evaluation being:

- observing users
 - Observing users can be done by recording the interactions with the systems. This can provide insight on how they would use the system, in this case, how the user would read the bus stops information systems.
- gathering their opinion
 - Gathering the users' thoughts on the design can be a good way to see what they dislike about the system and work on what they dislike. The users' opinions can be gathered by performing interviews and sending surveys to the users and collect some qualitative data.
- Experimenting
 - An experiment is normally done to test a hypothesis. For example, in the personal project an experiment was done to test if mobile first websites are better than responsive websites. HCI experiments can measure how small changes made in the information systems will affect the users' performance. Experiments are normally done at the end of the development process. In this case, the hypothesis being tested would be if the new information system is better than the previous.
- interpretive evaluation
 - Interpretive evaluation looks at how technology would be used by people in natural situations. This gives the findings a more subjective interpretation. The evaluations usefulness is looked at more. It is more about understanding the reality and understanding that the data gathered is subjective which is a real possibility as some people might prefer the old information system.
- predictive evaluation.
 - Predictive evaluation is the method of predicting the usability by using an engineering model of human cognition. The model is abstract, will collect quantitative data, the data is approximate and estimated from the user experiments. Users will not have to build a UI prototype so the design alternatives can be compared without implementing it. This means a prototype information system will not have to be built first for the bus stops.
- Simulation
 - Simulation is a technique that is used in usability evaluation when it can be dangerous or inconvenient to gather data from real users. Users in a rush might find it to do the survey or an interview. Simulation won't be useful here however as the evaluation on the information system will require the users opinions and that cannot be faked to make sure the results are accurate and credible.

Analysis of map usability

There are many challenges that will arise during the development of map-based interfaces. One of them is that many map applications is that it can take a very long time to load as it does require a lot of data. The user interface can sometimes be overloaded with various information on map applications. These could include too many links, images or adverts. There also times where the map applications map being displayed is too small which doesn't give the user the best idea of the locations.

The users using the map applications would most likely be users on public transport as they will need it too to find how to get to certain locations and will need to see the bus times and the various ways, they can get to their desired location.



This mobile map application has followed the heuristics stated by Kupařinen et al.

The visibility of maps functions and locations are important. Map applications need to be able to interact with the user providing them feedback at an adequate time. The functions on this app are clearly visible.

Another heuristic of a map application is that it can match the users' physical surroundings. The map should display the user's location clearly as well as other important locations such as their destination and this was applied on the map interface created.

Consistency is also key. It is good practise to ensure that the platform conventions are followed by map application when designing the user interface. The application needs to be consistent with the various functions, features and controls used while using well known symbols as it will make it easier for the user to understand what they mean. Various well known symbols were used on the map interface such as the bookmark, search, zoom in and zoom outs.

Another good practice for map applications is that they are flexible and scalable. For example, allowing users to save certain locations such as their home or workplace will make the application more flexible as well as efficient. Allowing the user to access external data via the app will also make it more flexible. The application should also be able to be scaled for various screen sizes.

The final heuristic stated by Kuperinen et al is that the design of the application is balanced and simple. This makes the content easier to read and will avoid any visual clutter. The user will be able focus on the important content more. The map interface that is shown here is very simple and it does not have too much content covering it.

Conclusion

The bus stop information system outside of a shop called Martins food and wine was observed and another information system was designed that can be used instead of it. The various usability guidelines and accessibility was also looked at. The evaluation strategies were also looked at and what the methods can be used when developing an information system. Analysis of map usability for the bus transport system was looked at and the many challenges that comes with it. Kuperens guidelines were used to design a map application.

Abstract

References

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FINAL GRADE

62/100

GENERAL COMMENTS

Instructor

1. Analysis and Design

An outline analysis is presented with some current problems. A few theory topics were applied and a new design created. You could have made the key info bigger (without scrolling) compared to the put your hand out message. 17/25

2. Guidelines and Accessibility

A brief analysis is given, referring to key resources. Further examples, even images, could have been added. 14/25

3. Evaluation Strategy

A sensible strategy is presented, with suitable evaluation methods suggested. Simulation could be useful because of weather and users trying to catch the bus! More references would have improved this topic.

16

4. Map Usability

Very brief outline of map usability challenges. An outline map is presented - it looks like it is concentrating on stops along the route which is a good choice.

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Overall some good application of Usability Theory. See comments above.

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