Easy Rider

Designing a tool for sustainable traveling habits

N I K L A S   H Ä G E R K L O
a n d   E R I K   B E N G T S O N

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Easy Rider

Designing a tool for sustainable traveling habits

NIKLAS HÄGERKLO
and ERIK BENGTSON

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Supervisor at CSC was Jorge Zapico Lamela
Examiner was Nils Enlund

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"*When I see an adult on a bicycle, I do not despair for the future of the human race."*

~H.G. Wells

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ABSTRACT

The concept of a bicycle sharing system is a trend which is growing worldwide. In cities like London, Washington D.C. and Melbourne it is already a popular way to commute within the city. To collect a bicycle at the start of the trip and then deposit it when reaching the goal is a flexible, environmental friendly and likewise a healthy alternative to other means of conveyance. This thesis focuses on how to ease the use of this service through mobile technology. An interface for such an application as an aid for the service in Stockholm was designed, which was tested and evaluated during the working process.

The thesis reflects what guidelines to follow during such a design process, and concludes with suggestions for future development and recommendations of how to implement these.

SAMMANFATTNING

Konceptet med ett lånesystem för cyklar är en trend som växer runt om i världen. I städer som London, Washington D.C. och Melbourne är det redan ett populärt sätt att pendla inom staden. Att plocka upp en cykel vid resans början och lämna den vid resan slut är ett smidigt, miljövänligt och dessutom hälsosamt alternativ till andra färdmedel. Den här rapporten fokuserar på hur man kan underlätta användandet av denna tjänst genom att använda sig av mobil teknologi. Ett gränssnitt till en sådan applikation som hjälpmedel för tjänsten i Stockholm designades, som sedan testades och utvärderades under arbetets gång.

Rapporten speglar vilka riktlinjer som skall följas under en sådan designprocess, och avslutas med förslag till framtida utveckling och rekommendationer för att implementera dessa.

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1 INTRODUCTION

1.1 Background

This work is part of the Persuasive Services project initiated by the Centre for Sustainable Communications (CESC)[1], which is a research center located at the main campus of the KTH Royal Institute of Technology in Stockholm, Sweden. The mission with the research is to enable innovative media and communication services for sustainable practices, and the project focuses on the practical implementation of services for mobile phones to contribute to environmental behavior.

The idea of having stations around a city where you can rent a bicycle for a limited amount of time is a growing trend around the world. It is often referred to as bicycle sharing system or community bicycle programs, the reasons for a city to have these systems are numerous. The main advantages are that it offers an environmental friendly choice to other

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[1] http://www.sustainablecommunications.org/

public transportation as trains or buses and in this aspect reduce the overall carbon footprint that comes from transportation. It also promotes well being since it is good exercise when commuting through the city.

However, there are several drawbacks of the system, when the idea first came to mind in the 1960s in the Netherlands it was not a success, the bicycles were stolen and vandalized almost instantly. Through time this problem has been reduced due to safer means of renting the bicycles.

Attempts have been made to facilitate the usage of the service in form of mobile applications, for instance in cities like Barcelona and Montreal. However these were made for commercial use and not from a scientific point of view. Many of these applications have been developed for the iPhone, which has become very popular in Sweden since its initial launch in July 2008. Recent reports have suggested that the sales in Sweden are in the area of 400 000[2] sold units. For a country of 9 million people that is an immense market. The iPhone App Store has become its own economy with millions of sold applications, thousands of developers and an average of only 5 days to get an application approved[3].

1.1.1 About the service

Stockholm has also adopted such a service, called Stockholm City Bikes[4]. It is a collaboration between the City of Stockholm[5] and Clear Channel Communications[6]. The project is primarily financed from the advertisements that are located on the bicycles. It is a community bicycle program and allows the user to rent a bicycle for 3 hours at a time from 6.00 am to 22.00 p.m.

To use the bicycles you need a membership and a rental card, this can be obtained at an SL[7] centre, and requires a Swedish identity card containing D.O.B. For tourists a passport is required. 2 types of memberships are offered, one is a season card that costs 250 SEK that allows you to use the bicycles the whole period that the service is available which is April 1st to October 31st. The other type of membership is a 3-day card that costs 125 SEK. You can also load the card with several one day rental periods. Currently there are 74 bicycle stations where you can collect and deposit bicycles, however Clear Channel has said that they will double the number of stations within the next couple of years.

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[2] http://www.mediavision.se/Templates/News1.aspx?PageID=d7505c09-3417-447c-9ffd-68b0f49d144e

[3] http://gigaom.com/2010/01/12/the-apple-app-store-economy/

[4] http://www.citybikes.se/sv/

[5] http://www.stockholm.se/

[6] http://www.clearchannel.se/Default.aspx?epslanguage=SV

[7] http://sl.se/

To use the bicycles you hold up your card to a reader that is attached to each of the stations and this will unlock a bicycle for you, the screen will also show a number that represents which bicycle that has been unlocked. If there are not any bicycles available at that particular station the screen will show nearby stations containing available bicycles. As mentioned above, you can rent the bicycles at a maximum of 3 hours at a time. If however you exceed this time limit you get a warning, if you collect 3 warnings your card is blocked. You immediately get 3 warnings if you exceed 5 hours of loan at one single occasion.

1.2 Aim and objectives

The aim was to design an interface for the iPhone that can ease the use of these bicycles and stations with mobile technology and thereby increase the use of the system. Furthermore, mobile phones are an essential part of our lives and therefore they can be used as a platform to provide information and make a change. The focus was on how an interface should be designed to persuade and encourage change.

To achieve this aim, two key objectives were set up:

- *Examine if people want to use such an application*. By establishing needs and behaviors from the user, the aim is to broaden our understanding of the market.

- *Design an application that meets the users' demands*. Developing different prototypes of the interface and testing these on users through user tests and focus groups is the main focus of the thesis.

2 THEORETICAL BACKGROUND

In this chapter the different fields of knowledge of which the work is based on are presented. It begins with behavior and attitudes and persuasive technology, and finishes with guidelines of how to design an application. Alongside, literature on the programming of the application was also studied, mainly Objective-C and the iPhone SDK.

2.1 Theoretical framework
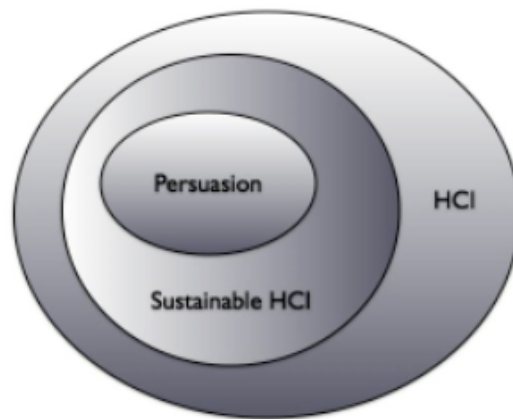
Figure 1 - Theoretical framework, starting with HCI leading to persuasion.

This is a thesis within media technology, and the field of HCI (Human Computer Interaction). Several methods used during the process of the thesis are methods used within that field, often presented in HCI literature. HCI can be used to reach more sustainable living, hence the name sustainable HCI. Within sustainable HCI literature persuasion is a major theme, and how to design systems that attempt to persuade users to behave in a more sustainable way (DiSalvo, et al., 2010). Furthermore, the authors discusses an amount of articles they reviewed, and that many of these refer to the theories of persuasive technology (Fogg, 2002). These guidelines have been followed during the working process of this thesis.

2.2 Persuasive technology

The term persuasive technology can be described as "any interactive computing system designed to change people's attitudes or behaviors" (Fogg, 2002). Persuasive technology is a research field that explores how ICT (Information and Communication Technologies) applications can be used to change people's beliefs and how they behave. It is the result of the combination of the principles of persuasion, which are described more thoroughly in the book *Influence: the Psychology of Persuasion* (Cialdini, 2007), and technology. By combining these, the product can be an effective tool to increase awareness and inspire people to change behavior.

There are several kinds of persuasive applications on the market today, and many with environmental focus, which will be described more detailed further ahead. There are a few applications similar to the interface designed for this thesis. These are examples of applications that encourages the user to reduce their personal carbon footprint, and choose a more environmental friendly way to travel. Nowadays, when almost every person in the country owns a mobile phone[8], people use them as an aid in their everyday lives. ICT has made information highly accessible, since the mobile phone has contributed to a new, always connected lifestyle. The phone provides a world of possibilities, offering the user everything from surfing the web to listening to their favorite music.

Fogg describes a persuasive technology tool as "an interactive product designed to change attitudes or behaviors or both by making desired outcomes easier to achieve". This is the ultimate goal with our interface; to persuade people to use the service. With an effective application that adds functionality, this would increase the reliability of the service.

In order to analyze applications regarding their persuasive capabilities, Fogg presents several types of persuasive technology tools. Some of the techniques are:

- Reduction
- Tunneling
- Tailoring
- Suggestion
- Self-monitoring
- Surveillance
- Conditioning

Two of these were applied to the interface: reduction and tailoring. The decision to use the power of language to reach a higher level of persuasion was also made.

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[8] 97 % of the population owns a mobile phone, PTS-ER-2009:28, Post och telestyrelsen 2009-10-28
http://www.pts.se/upload/Rapporter/Tele/2009/2009-28-Individundersokning-2009.pdf

2.2.1 Language

How the application communicates can be a strong persuader. By making the application more human-like by using language it will feel more welcoming and trigger responses from users. Giving praise is a good way to produce persuasion, but it should be mixed with neutral messages, since it has been proven that praise has a stronger influence if the user does not know when to expect it (Fogg, 2003). How the language is presented is also an important factor. By including it in dialog boxes or personal push notifications it can trigger social responses.

2.2.2 Tailoring

Tailoring is the idea that applications become more persuasive if they are adapted to the user. By adding a more personal touch to the application based on what context it is in and earlier choices by the user, it will reach a higher persuasive level. If a message is composed to seem personally addressed to the user, it is likely to attract attention. Mobile phones are commonly used by one person, therefore they can be personalized and are a good platform for tailored persuasion. Tailoring has become a common element on the web today, with major sites like Youtube[9] and Amazon[10] adapting to the user, showing relevant suggestions based on earlier choices and sending out e-mails that seem to be addressed to them personally.

2.2.3 Reduction

By using the principle of reduction, technology that is usually complex seem simpler and easier to use. This gives the user a feeling of high self efficiency and thus it can lead to motivation to continue a behavior. Concealing unnecessary details increases the usability of an application. It is vital in mobile applications where screen space is limited and the necessary functions need to be highlighted and easy to perform.

[9] http://www.youtube.com

[10] http://www.amazon.com

2.3 Behavior and attitudes

Since an increasing number of people have mobile phones and they are getting increasingly advanced, it certainly is a powerful channel for persuasion. Mobile devices are continually being designed to motivate and influence people, and it is an emerging trend that changes the way we live and work. This was something to aim for when designing the interface made for this thesis; by making it available on the market the idea is to get more people to start using the bicycles. Usability is the key.

ICT can be used for changing behavior and attitudes. To do that, knowledge about human behavior is necessary. Many studies have been done on the subject, about what factors come in to play when people make decisions in their every day life. In the article *A Behavior Model for Persuasive Design* (Fogg, 2009), a model for understanding human behavior called the *FBM* (Fogg Behavior Model) is presented. The model describes behavior as a product of three factors: motivation, ability and triggers.
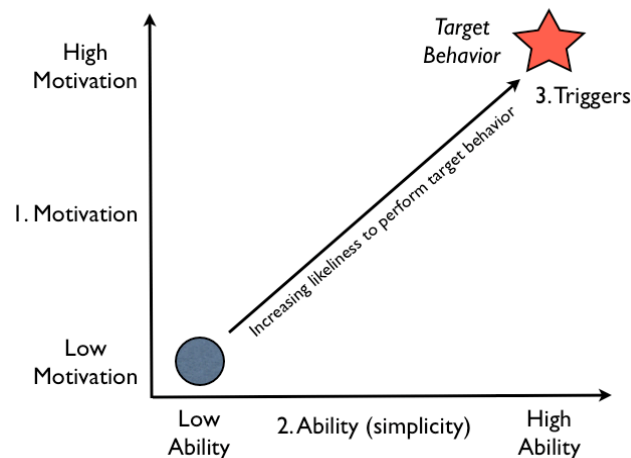
Figure 2 - The FBM (Fogg, 2009).

The model shows that the three elements must converge for a behavior to occur. If it does not, at least one of the three factors is missing.

2.3.1 Motivators

There are different elements of motivation. In the FBM, Fogg describes three motivators: Pleasure/Pain, Hope/Fear and Social Acceptance/Rejection. These are connected, for instance people are willing to take a flu shot (pain) to avoid getting the flu (fear). Mobile devices can be used as motivators, such as Nike Plus[11], which displays information about the latest jogging sessions and therefore enables the user to compare them. This motivates the user to beat the last record. The actual running can be exhausting (pain) but if the record is beaten the user will feel pleasure.

2.3.2 Ability

Ability is related to simplicity. By simplifying the usage of products, it increases the ability for the user. Products that require learning new things often fail. Therefore, simplicity is an important factor in persuasive design. Many examples of this can be found, for instance the 1-click shopping at Amazon. By making shopping easier, people will in turn buy more things.

2.3.3 Triggers

Timing is an important element in behavior change. *Kairos* is the opportune moment to persuade.
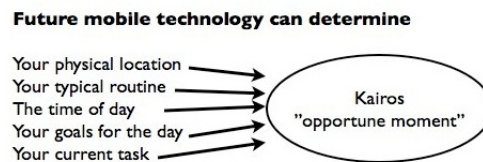
Figure 3 - Kairos, the opportune moment to persuade (Fogg, 2002).

It is about giving suggestion at the right time and the right moment, by doing this it can effectively change behavior. Mobile devices have great ability to detect that moment, since we carry them with us all the time and they are aware of their surroundings via the GPS function. Because of this, the possibility for giving an accurate trigger increases, especially for location based applications. An appropriate trigger in this opportune moment will most likely contribute to a certain

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[11] http://nikeplus.com

action. The trigger is vital; even with high motivation and ability, if the trigger is missing behavior will not occur. Triggers can be everything from an alarm that sounds to an announcement that a sale is ending. Successful triggers have three characteristics (Fogg, 2009):

- Notice the trigger.

- Associate it with a target behavior.

- The trigger occurs when we are both motivated and able to perform the behavior.

2.3.4 Psychology of persuasion

In the book *Influence: The psychology of Persuasion*, six types of "Weapons of Influence" are described (Claldini, 2007).

Reciprocity - If you do a favor or give something to someone you expect something in return, for the most part. People feel obliged to return a favor, this is why companies give out free samples.

Commitment and Consistency - If people commit to something, an idea or goal, they are more likely to finish that commitment than if it is only a thought.

Social Proof - People tend to do what others in their surroundings do. For instance if several people are looking up in the sky, people who are walking by will also start to look up.

Liking - People are more easily persuaded to buy something by people that they like, for instance if your friends are using a product that they themselves endorse you will more likely value their opinion higher than a sales representative. This is also applicable if a salesperson is likable.

Authority - Authority figures, e.g. police officers, politicians and celebrities, can more easily persuade people to do what they ask of them since they generally are respected.

Scarcity - If the demand is higher than the supply, for instance a limited time offer, people will be more inclined to buy the product.

2.4 Designing mobile interaction

Everyday we use different interactive products like a mobile phone, computer, ATM, coffee machine, etc. But how many of these are easy and enjoyable to use? In the book *Interaction Design* (Preece et al., 2002) it is examined what good interaction design is from the users' perspective. It is argued that to develop a successful system user input is key, and four basic activities of interaction design are defined.

Identifying needs and establishing requirements

You have to know your target audience to design something that helps people. This is vital for an application that has a user centered approach.

Developing alternative designs

Developing different design suggestions that meets the requirements from the users is the core activity of designing. The first step is to create a conceptual model that describes what the application should do, behave and look like. The next step is to create a physical model where all the ideas from the conceptual model are implemented.

Building interactive versions of the designs

To get input from the users you have to have a prototype that the user can interact with. There are different ways of achieving this, however it is not a requirement that the prototype is working. For instance, you can create prototypes made out of paper and then role play the interaction.

Evaluating designs

To determine the usability of an application you set up a variety of criteria, how well it fits the requirements, how many errors the users made, how appealing it is, etc.

Along with these four cornerstones three characteristics of interaction design process are defined. Focus on the user is a central part of designing a system. Setting up goals for user experience and specific usability issues can help the designer find structure in his work and ultimately making the right design decision according to the user. The need for iteration in a design process is important since you need to revise ideas considering new feedback during the process. These cornerstones and key characteristics were implemented in our process to obtain a pleasing work flow.

3 EXISTING APPLICATIONS

Since the idea of having rental bicycles available in larger cities is a growing trend, applications that keep track of the bicycles are also becoming more popular. In Montreal they have developed a service called BiXi for the usage of the bicycles, and in Barcelona they use a service called BCN. These two services both have a corresponding application to use with the system. There are also two applications that exists in Sweden. In the effort to design an interface that is both user friendly and functional, an evaluation of these four systems was made to find their strengths and weaknesses and use the conclusions from this in the design of the interface.

BiXi
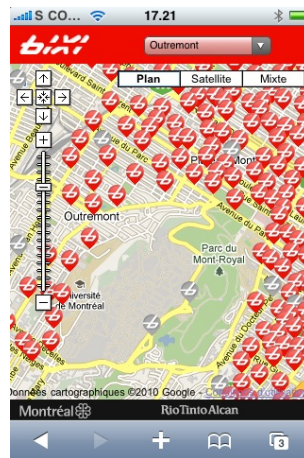
Figure 4 - The interface of BiXi.

This is not a native iPhone application, it is a web interface that you navigate through using your browser. This has both positive aspects as well as negative, for instance it is not restricted to a certain device, it works on both the iPhone OS and the Android platform, as well as any other platform that has a web browser. However the negative aspects are far more, for instance how slow it is. Since with every move you do on the map the web page has to update itself it can be very time consuming depending on how fast Internet connection you currently have and if you do not have any connection at all you will not even be able to launch it.

The web page can either be used on Google Maps or the browser, the difference here is that in the browser you can only see where the stations are located and not the status of the stations i.e how many bicycles that are available at that particular station. When in Google Maps, if you click on a station you can see how many bicycles that are available in real time. The web page does not show your current location, which has the effect that if you are trying to navigate between the stations and do not know your location this can be a problem. A positive aspect of the web interface is that you do not need to install any new application, it can be a bookmark in your browser and it does not glitch unless your browser crashes. If you use Google Maps to display the stations it also offers travel instructions to guide you. However since the interface does not find your location this implies that you input your location manually.

BCN

Figure 5 - The interface of BCN.

The application automatically fetches your current location and shows the stations that are the closest to you. The stations are displayed in a list with distance to the station in meters, color coded symbols to quickly see the status of the station and information about exactly how many bicycles of the total amount that are available. When the stations are displayed on the map you can click on them to see more information and also to add them to your personal favorites. The favorites is a smart function, not only does it quickly display the stations that are the most valuable to you (providing that you have added them to the list) but it also makes navigation quick and easy since you do not have the map to deal with. The map in this application does not have the same problems that the web interface have in BiXi, it is faster and not ultimately dependent on your Internet connection. When you do not have an Internet connection you are still able to see the map, although without the stations. The main problem with this application is that it is very unstable, during the evaluation session it crashed several times.

City Bikes
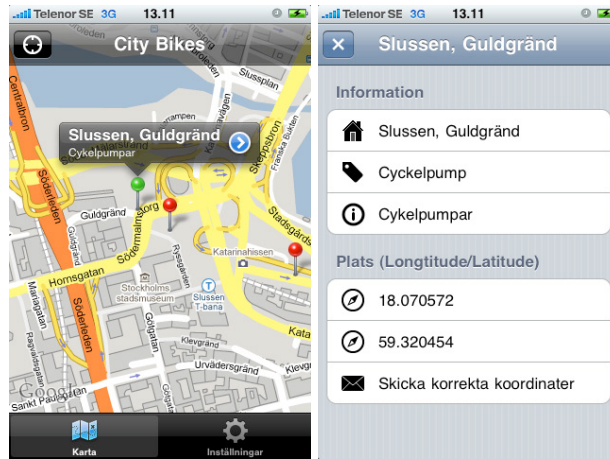
Figure 6 - The interface of City Bikes.

The map centers on your position and you can see the stations in your local area as pushpins. If you push the pins you get the address or the street name to the corresponding station, from here you can get the coordinates of the station and there is also an option to send the coordinates to your e-mail.

The application shows both stations and bicycle pumps located in the city, however this is optional and you can turn the feature on and off depending on what you want to see on the map. There is also an option to switch to a different type of map (regular map, satellite or hybrid).

CityBikes

Figure 7 - The interface of CityBikes.

The application fetches your current location and the map centers on your position. The stations are displayed as pushpins. When you push the pins you get the address to the corresponding station, although sometimes it is only the street name and not the whole address. The only button available is to update your location. The interface is simple, clean and easy to navigate but it lacks functions. The feature that separates it from the others is that you can see the distance to the nearest station. The map shows both stations and bicycle pumps, but there is not an option to turn either of these off.

3.1 Existing applications from a persuasive technology perspective

When analyzing these applications from a persuasive technology perspective, it instantly comes clear that the designers did not consider the persuasive aspect in their work. None of the applications except BCN includes nearly any functions at all, only a map which shows where the stations are. There are no signs of neither tailoring or the usage of language to persuade. BCN includes the functions that are vital, such as adding stations to favorites. When using this application it gives the impression that the designers focused on the functions vital to the user, and leaving the unnecessary out. This can be described as a form of reduction which is one of the cornerstones within persuasive technology. Overall these applications are not that elaborated, BCN excluded. By testing and evaluating them it gave us ideas and what to think of while designing the interface, what persuasive factors that had to be added to persuade users into using the application again.

3.2 Conclusion

Much can be learned from these already existing applications. There are several aspects to consider when designing such an interface. One of them is whether to make a web interface or a native application. Both of these have positive and negative aspects, for instance the web interface is slower than a native application and offers less functions. However, since it is a web interface and viewed in the browser of your choice it is not dependent on which platform you use. It was noted that the BCN application was far more unstable than the web interface found in BiXi. So the question is whether you want to reach a variety of users and have an interface that is lacking functions or to narrow it down, i.e to develop for a specific platform and focus on the quality of the application. The decision was made that the application was to be platform specific since there were many improvements to be made to the applications already existing in Stockholm. If a web interface was to be developed then it would have been limited in functions and would not offer any improvements over the existing ones.

There were several functions present in the different applications that were found vital. The feature to see your location and nearby stations with the distance displayed to the one nearest was very helpful since it gives you important information fast. The favorites tab found in the BCN application offers a way for the user to personalize the application and make it quick to find the desired station.

The option to display the map in regular map, satellite or hybrid is not necessary. It finds a solution to a problem that does not exist. Also the search function found in the BCN application might be good to use in Barcelona where there are many stations, but so far in Stockholm there are not enough stations to make this a vital function. There are other solutions to this problem, for instance an alphabetical scroll list.

4 METHOD
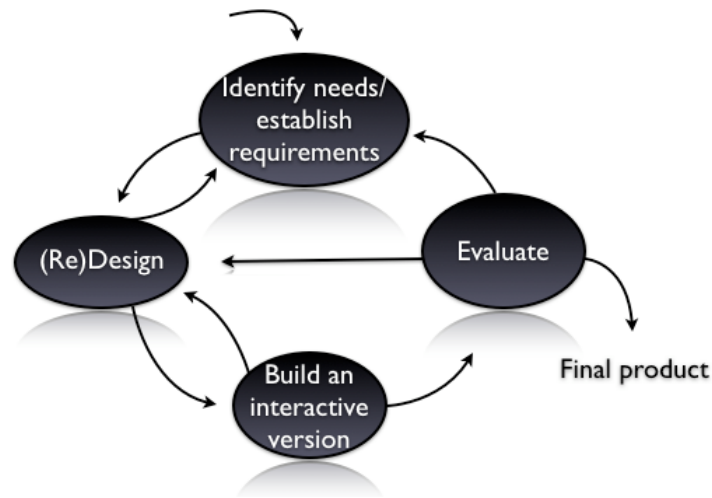
Figure 8 - Working iteratively (Preece et al., 2002).

The design process is not linear. When designing the interface, the methods within HCI were followed and the work flow was iterative.

4.1 Conceptual design

The design process consists of several steps, the guidelines of *conceptual design* (Laurel, 2003) were followed. To convey a visual representation of the design for the interface before the final interface is presented, we started with creating paper sketches. These were then used to create storyboards. The storyboards were then presented to the users who gave their feedback.

4.2 Questionnaire

To quickly gather data and to get a general idea about people's opinions about the interface that we were designing we created a questionnaire. The questionnaire was sent out to students on the Media Technology program at KTH and was anonymous. The results of the questionnaire were then evaluated and compiled.

In terms of design of a questionnaire there are several guidelines that were followed. First, the questions asked should move logically from one question to another so that the user does not get confused and can follow the progress of the questions easily. It is important to know whether to ask many open- or close-ended questions (Czaja and Blair, 2005). The idea of questions successively developing throughout the questionnaire applies to several different aspects. This led us to designing the questions so that they move from the general to more specific and from factual to more opinion based.

In the opening statement of the questionnaire we provided the users with a link to our blog[12] that we continuously updated during the design process. The link was provided so that users could get a better idea of what we were creating and subsequently answer the questions well informed. However, we noticed that some of the users were reluctant to use the link since some of the answers displayed a lack of understanding for what we were creating.

A total of 129 persons answered the questionnaire, and the majority were men in the age of 19 to 25 years old.

4.3 Focus groups

A focus group is a form of research where you gather a group of people and ask them about their opinions and attitudes towards a product, service, etc. This is a form of *participatory design* (Ehn, 1993). It is an approach to design where all the participants are involved in the process, making sure the product designed satisfies their needs and is usable. A moderator is assigned, who asks questions which the group discusses. It is up to the moderator to make sure that they do not diverge from the subject.

To evaluate the different iterations of the interface, two sessions of focus groups were conducted. The first focus group evaluated the second iteration of the interface and the second focus group evaluated the third. How the focus groups were conducted in detail is described in the prototype section of the thesis.

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[12] http://climaddicts.blogspot.com/

The first focus group performed was with four students from KTH. They were all from different specialization's and the age varied from 20 to 25, but since they were all students, this was a homogeneous group. A workshop was held with the participants where they could illustrate their ideas for how the interface should look like, this was followed by an evaluation of the current iteration.

The second focus group was also performed with four students from KTH, the age varied from 22-25 and the group was homogeneous. During this focus group we focused on evaluating our current design rather than doing a workshop based session since we already had a design that was a result from a workshop. In the group there was no one that had used the service before and also not everyone was all that familiar with the concept and how it actually worked hence we did an introduction to the service and what we were creating.

4.4 Usability testing

Usability testing is an almost irreplaceable practice when it comes to the design of a system, it gives direct feedback from real users that eventually will use the completed application. We used it to discover errors in our prototypes and to find things that we could improve. There were four different areas that we evaluated the users from.

- *Performance* - How efficient the system is, can we cut down the amount of steps needed to achieve the desirable effect?

- *Accuracy* - The amount of mistakes that the users made.

- *Recall* - Does the user remember what he has done and could he redo it later.

- *Emotional response* - How does the user feel about the system.

For the first iteration of the prototype, tests with a handful of users were conducted. The tests were conducted in such a fashion where the user tried the prototype and directly gave their feedback orally, this is a method called *think aloud* (Lewis, 1982).

5 DESIGN PROCESS

During the design process of our application we used three different approaches to get feedback from the users: usability testing, focus groups and a questionnaire. The different research complemented each other going from the very qualitative user tests to the quantitative questionnaire.

Four iterations were made during the design of the interface. These were based on the feedback received from user tests, the focus groups and to some extent the questionnaire. The prototypes had different levels of interaction incorporated into them.

5.1 First iteration
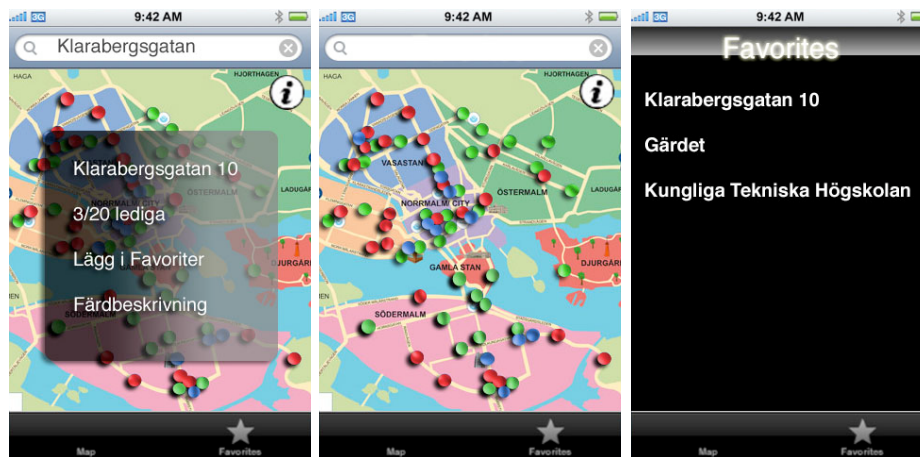
Figure 9 - Screenshots of the first iteration.

The first iteration of the design was images created in Photoshop. It featured a tab bar at the bottom containing two options: Map and Favorites. The Map view had the stations attached on the map with different color codings depending on their status. You could see the number of available bicycles at each station, find the route to that particular station and add the station to your personal favorites. We evaluated this version with user tests performed with one person at a time.

The think aloud method was used, and from the user tests that were conducted a conclusion was made that the interface could be simplified. Everything that the interface included could be reduced to one window where the user could navigate from. This led to the design of the second iteration.

5.2 Second iteration

Figure 10 - Screenshots of the second iteration, made in Xcode.

This iteration was made in Xcode. It featured one main view which was the map. At the bottom of the map there was a list of the stations sorted de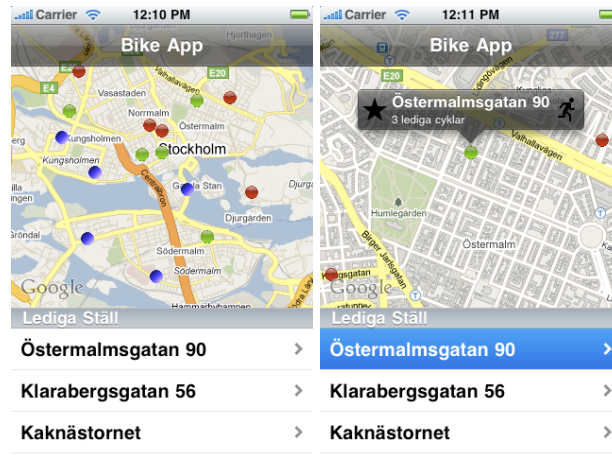pending on their status with the "free" stations being at the top of the list. Stations could be added to a favorites list by clicking the "star"-icon. By clicking the "running man"-icon, the application turns off and Google Maps is started which shows the route to the selected station from the current position. We evaluated this iteration with the help of a focus group. Several design ideas were discussed.

Since there is a possibility that the user not only want to find a route between the stations but also how to proceed after reaching the desired station, the idea of having a travel planner that displays the full route from door to door was thought of. This was endorsed by several of the participants and led to another idea where the application was integrated with SL: s already existing travel planner[13]. This has already been implemented to some extent on Stockholm City Bikes website[14] where you can see if the station is near the subway. One participant noted that riding your bicycle can be exhausting and suggested a feature that displays the distance between the stations.

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[13] http://www.sl.se

[14] http://www.citybikes.se/sv/Sida-med-info/

A function that all participants regarded as vital for the application was that it displayed your current position and the stations that are located nearby, this would accelerate the process when you want to find a station fast. Since you can rent the bicycles 3 hours at a time it was suggested that you would have a countdown on the screen that displays time remaining on the session.

Several of the participants wanted to use the application while they were on the bicycle and it was noted that it would be difficult to perform the regular pinching gesture to zoom the map at the same time as riding the bicycle. This led to the idea that the interface could feature a slider to zoom the map. Another request was a function where you could filter the stations depending on their status, this was to quickly get an assessment of where the stations that are important to you are located. To make the interaction efficient, it was argued by one participant to implement a number that would be displayed on the icon in the iPhone menu which indicates how many bicycles that are available at the nearest station. None of the participants liked the list that was incorporated in the second iteration of the application, it was deemed too small to get an overview of the stations. It was also difficult to navigate since it was considerably smaller than a regular list. The overall opinion was that a search function would be more suitable.

Considering the results from the first focus group, this prototype was ultimately rejected. The reason was that it was too much information displayed on one screen, the users found it difficult to get an overview of the stations from the small list at the bottom. Having the list on the same screen as the map also meant that the map was given less space, which was not positive.

5.3 Third iteration

Figure 11 - Screenshots of the third iteration. Map view to the left, Favorites tab in the middle and Stations tab to the right.

This iteration was a result from the first focus group and design implementations were made accordingly. This version was more elaborated than the first two. It had 3 tab views: Map, Favorites and Stations. In the map view you were able to sort the stations depending on their status, find the nearest station and the route to this station, add a station to the favorites tab and see your current location. The stations tab had all the stations sorted alphabetically, however there was not a search function, only the ability to scroll through the stations using an alphabetical list.

As requested by the users of the first focus group a slider was implemented that could be used to zoom the map with one hand instead of the regular pinching method. To easily see the stations that are important to the user in a given moment, sort buttons were incorporated that can filter between stations depending on their status. The user was able to filter between "Vacant", "Empty", "Full" and "All" stations, these were in turn represented by color coded pins attached on the map. The "Vacant" stations indicated that the station was neither empty or full, these were represented by green pins. The "Empty" stations were represented by red pins and indicated that the station did not contain any bicycles. The "Full" stations were represented by gray pins and indicated a station that was full and therefore did not have the option of depositing a bicycle. The ability to see stations that are located near your position was added to the design since this was requested by several users. This iteration was evaluated with another focus group.

The participants were asked what functions they valued the most if they were to use such an application. This was followed by a demonstration of the prototype and the users were also able to interact with it. Feedback from the participants was received from mainly three different angles:

- Is there any function that feels unnecessary or is there a function that is not implemented that we need to add?

- Is the design appeasing, should we move any of the buttons to make it easier for the user?

- Is there a certain function that would get you to use the service and so forth the application?

The main ideas that were discussed during the focus group were:

The filtering option was not obvious how it functioned, for instance if you filter the stations after "Vacant" it could imply that bicycles are available at the station but also that the station is empty. On that note, it also was not clear what the color coding of the stations meant, especially the red color was confusing since the participants associated the red color with something negative. The red coding in our interface indicated that the station was empty but the participants noted that this is not necessarily a negative thing. They argued that it depends on what your intentions are, if you want to collect a bicycle it is negative but if you come to the station to deposit a bicycle it is something positive.

It was suggested by the participants that there are only two different scenarios when using the bicycles. Either you want to deposit the bicycle at a station or you want to collect one. This notion led to an idea where you have two different modes in the application, one for collecting a bicycles and another for depositing. This would mean that the color coding of the station would shift between the two modes, for instance if you are in the "Collect" mode and want to collect a bicycle, the stations that have available bicycles, either half full or full would have a color that gives positive associations i.e green or yellow. However if you are in the "Deposit" mode the stations that are either empty or half full would give positive associations. This was vital for this function to work since you could not have the color red in two modes that means different things in each.

In the iteration used during this focus group, the filtering option only had one option at a time, for instance you could not sort the stations to show both "Free" and "Empty" stations at the same time. This was noted by one of the participants.

Since the time limit for using the bicycles is 3 hours the participants argued that it would be a good idea to have a notification in the application that notifies the user when the time is running out, for instance a push notification when there are 15 or 30 minutes left. The participants wanted the stations tab to have two different filtering modes, one where it categorizes the stations alphabetically and another where it sorts the stations depending on how far they are from your

current location. One participant argued that this was vital since if there are two stations, one 150 m away and another 250 m away but the latter is in the direction you want to go and the first one is the opposite direction, you would rather pick the station 250 m away.

It was also discussed a possibility to incorporate a function that would give you 3 hours free use of the service when you utilize the application for the first time. This would work as motivator for the users to start using the application and thereby hopefully increasing the number of users. A general conception during the focus group was that the participants were not able to see how the system was working today without an application. Since you cannot tell if there are bicycles available, you are not sure of getting a bicycle until you arrive at the station.
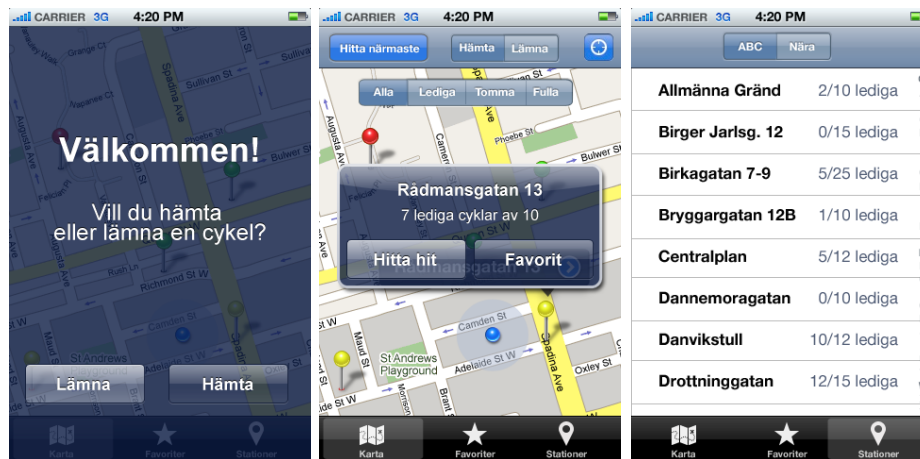
5.4 Final iteration

Figure 12 - The final iteration, with the added welcome screen to the left.

In the final iteration of the design there were only small changes made. The design ideas that were implemented in this iteration were made after the results from the second focus group were compiled. The main design decision was that you are able to switch between two modes depending on if you want to collect or deposit a bicycle. Within these two modes the color coding for the stations would change. The color coding from the previous iteration was altered, the semi-full stations went from being green to yellow. The full and the empty stations would switch between being represented by green respectively red pins depending on which mode you are in. This color coding was adopted from the second focus group where the users wanted the green pins to reflect something positive and the red pins to reflect something negative.

The user is able to choose several filtering options at the same time, meaning for instance that you can view both empty and full stations at the same time as you are hiding the rest of the stations. The stations tab was also modified, it has two filter modes, one for listing the stations alphabetically and another for listing the stations depending on how far they are from your current location. Finally, a welcome screen was added (see Figure 12) that uses language to make the interface feel more human-like and to engage the user directly into making a decision, whether to deposit or collect a bicycle, when launching the application.

5.5 Questionnaire

The most common way to commute within the city among the respondents were subway followed by going on foot. Commuting by bus was also a popular alternative, and using a car was the least popular. The responses on the question if the environment is considered when commuting were quite contradictive to the responses given on what way the respondents commuted. A great majority do sometime or not at all consider the environment.

When asking about the service, if the respondents were familiar with it and knew how it works, the answers showed that one fourth knew about it, and about 5 percent of the respondents used it on a regular basis or had tried it on occasion. The respondents who did use the service had the opinion that the applications available did not provide enough information and that the current system is not working as expected since there are not always bicycles at the stations.

The last topic investigated was about the application itself and if there was an interest in it. Most of the respondents were positive, and answered that they would have great use of such an application and would like to see features such as seeing how many free bicycles there is at each station, reporting damaged bicycles, search for bicycle routes, etc. Even among the respondents who did not use the service answers were given that they would use the application, and among the ones who used the bicycles almost everybody responded that they would like to have such an application. The main reason for those who answered that they would not use the application was that they did not use the bicycles and that they will not use the bicycles in the future neither. Some responded that they did not own an iPhone and that this was the reason for not using the application. One respondent exclaimed her interest in an application where you could pay for the bicycles directly in the mobile. She motivated it with (translated from Swedish):

"I am extremely interested in mobile payments and such and I appreciate to gather as much as possible of the administrative things in life in one and same place (e.g. the mobile phone) of the reasons that it is simple and comfortable."

This answer led to the idea of paying for the service via the application which is described in the *future development* section. Although the answers differed a bit from person to person, a few conclusions were made after the questionnaire. There is an interest for such an application and the respondents would undoubtedly use it if they were using the service. The respondents who currently are using the service would have a tremendous aid of such an application. There is also an interest to use the application on other platforms than the iPhone, for instance Android based phones.

The respondents do not generally care about the environment when they commute and it is not a defining factor when they choose their way to travel. It is common that the most comfortable way is chosen, based on the responses given on the questions regarding this topic.

5.6 Future development

What features can be added to the application? The feedback from the focus groups and questionnaire provided ideas of how to proceed with the development.

Pay for the service via your mobile phone

This was a request from users both from the questionnaire and the focus groups. It would either work as SL: s texting service, for instance 3 hours for 40 SEK or that you could pay the full amount of 250 SEK. You would then receive a code that you could use at the stations to unlock the bicycles.

See how many bicycles that are available in real time

This is a vital function of the interface designed for this thesis and it is possible to implement if Clear Channel provides a server that can be used to collect real time data from.

Integrate with SL: s travel planner

This feature was suggested during the first focus group. The idea was that it would be an extension to SL: s existing travel planner. In addition to subway and buses you would be able to integrate the bicycle stations in your search when you are commuting.

Countdown timer where you can see how much time you have left on the loan

Figure 13 - Countdown timer implemented in the design.

This was a request from the users to keep track of your remaining time. It would either work as a simple timer in the main window or as a push notification service that reminds you of the time remaining. This is an example of how to use language effectively in an application (see Figure 13).

Web application

The application is currently designed for the iPhone which means that many who use different platforms like Android and Symbian are being excluded. This could be avoided if a web application was developed which is not platform specific. However this has a few drawbacks. First of all, it is a lot slower than an actual application and secondly it is dependent on a constant Internet connection.

Share your bicycle route through social communities

The idea was suggested by one of the participants of the second focus group. The GPS in your phone would keep track of your travels with the bicycles and then you would be able to post this on a social community like Twitter[15] or Facebook[16]. This would work as a viral spread. However the idea would be difficult to make a reality since having the GPS constantly turned on will significantly reduce your battery life.

[15] http://www.twitter.com/

[16] http://www.facebook.com/

6 DISCUSSION

In this chapter the different ideas and concepts that have been used during the process of this thesis will be discussed.
As a reminder, the aim of the thesis was to ease the use of the service through mobile technology.
This will be discussed from six different angles:

- *FBM model applied on the interface.*

- *Our interface from a persuasive point of view*

- *Getting non users engaged*

- *Carbon footprints*

- *Compete with other users*

- *Attitudes towards service*

The chapter finishes with criticism of methods used during the work process.

6.1 FBM model applied on the interface

Ability - Since the application is iPhone based, the user needs an iPhone to be able to use it. The interface designed simplifies the usage of the service by giving information about where the stations are located, how to get there, etc. This increases the ability for the user.

Motivation - Motivation is the intrinsic motives to use the system, for instance to exercise more. Our prototypes do not look at this aspect.

Trigger - A commonly used trigger is to offer the user a reward for using the application, for instance you could get to rent a bicycle for free when using the application for the first time. This was suggested by the participants of the second focus

group. 7-Eleven uses this in their application for iPhone[17], where you receive a free cup of coffee for downloading it, and random offers appear when using it. By implementing this, it would make people want to use the application again.

6.2 Our interface from a persuasive point of view

The interface made for this thesis is focusing on the vital functions and leaving the unnecessary out. This is a form of reduction, and as mentioned above, this gives the user a feeling of high self efficiency and thus it can lead to motivation to continue a behavior.

While using mobile applications it is common that people often do other things at the same time. The reasons for this are numerous; often you need to maneuver it with one hand, if you are out shopping, in company of others, etc. Therefore, the first 30-60 seconds are crucial for these kind of applications (Ribot, 2009). During these initial seconds, it is of great importance to catch the users' attention otherwise they will stop using it. Our interface engages the user directly by welcoming you (the use of language to persuade) and forces one to make a decision instantly, by letting the user choose what mode to proceed with (fetch or deposit bicycle).

The favorites function is a form of tailoring. By putting the most commonly used stations in a list the user is able to adapt it to his or her preferences.

6.3 Getting non users engaged

Reaching out to the targeted audience is one thing. However, there is another goal to reach for: engaging the non users. These are the people with no interest in technology and no intentions of using it to change their traveling habits, and most likely do not own an advanced mobile phone. How can they be engaged? Since we have limited our work to the iPhone we could develop a web based version, which you could reach either via your computer or mobile phone. As with BiXi, this has a few drawbacks, since it is much slower than an actual application and is completely dependent on an Internet connection. Furthermore, the application could be released in versions for Android and Symbian, to reach out to users on other mobile platforms.

Right now, the bicycles work as moving advertising signs, and the project is primarily financed by the advertisement. Putting advertisement on the bicycles promoting the application would definitely raise curiosity about it. The most common way a product or service spreads is through word of mouth, when users are telling other people about it. This

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behavior is difficult to control as a designer, the focus should lie on making it eye catching and interesting. Then, hopefully, people will talk about it. This should be the main focus while developing. Only when a large user base is built up which is devoted to change their habits, then the real power will make its appearance.

For the distribution of the interface only a few "Weapons of influence" can be used, the main one being Social Proof. If people notice other people using the application it could contribute to a great spread. Liking can also be used, if a friend is using the application and is satisfied with it, the chance increases that your curiosity will lead you to use it. Implementing a function where you can share your bicycle routes and such via e.g. Facebook and Twitter is a form of free marketing which would contribute to this.

6.4 Carbon footprints

Zapico et al., (2009) defines a climate persuasive service as:

"ICT applications that change personal attitudes regarding climate change and/or that change behavior towards reducing greenhouse gases emissions."

The focus has been on the design of the interface and what methods to use to persuade people into using it. However, It is worth mentioning the environmental aspects. The greenhouse effect is an everlasting topic of discussion, and if we continue to deplete our natural resources and treat our planet the way we do now, the discussion will go on. By getting people to use the application, which will have a positive impact on the environment, a contribution is made to the overall goal to reduce people's carbon footprints. This will be favorable to the greenhouse effect. Having said that, our application would fall under the climate persuasive services category.

Zapico et al. also discusses public transportation. One of the main reasons the individual carbon footprint is increasing is the personal car usage, since it is a more comfortable way to commute. With ICT applications designed to help and persuade people to choose public transportation, hopefully there will be a change. Our interface will simplify the usage of the bicycles and therefore persuade people to use the service. It contributes to the well being of the city since there will be less gas emissions and people will get exercise while commuting.

6.5 Compete with other users

Our will to cooperate, compete and compare with others is a strong motivator used for persuasion (Fogg, 2003). As previously mentioned in future development, the possibility of having people sharing their bicycle route through social communities could be a possible way to get people engaged and competing with each other. Cycletracks from Treehugger[18] is an application where you can record your bicycle routes and share these with others. This is a possible feature to implement in our design.

If the application was to affect the service in a positive way and people in turn would use the service more frequently then this would have a small albeit positive effect on the environment. Since the service exists in Stockholm, which is a relatively small city, the effects on the environment will not be overwhelming. To be able to compete with people from different cities in the application, it could affect the environment positively in a worldwide perspective. This can be described with the principle of *social facilitation*, which means that people have a tendency to perform better when being observed by others (Zapico et al., 2009). It is often referred to as *audience effect*, and in this case the users are being observed via social communities, which awakens the "commitment and consistency" principle (Cialdini, 2007). Following this principle, the users will be increasingly dedicated to stick to their goal.

6.6 Attitudes towards the service

During the first focus group, the service itself was discussed. In this group, it was only one of the four that used the service on a regular basis. The others were familiar with it and how it works but had not used it, although they all had a positive attitude towards it. The participants would use the application if it was made available, given that they were using the service. However, the application was not a sufficient reason for the participants to start using the service. This depended on other reasons, for instance the location of the stations was a main issue. It is hard to notice them when you do not know where to look and they are not spread out equally around the city. Also it is crucial to have a station that is located near your residence.

There are some conclusions that can be made from the results of the questionnaire. From the total of 129 respondents, there were only 5 percent that had used or is currently using the service and only 32 percent were familiar with it. Even with these statistical figures, the attitude towards the service has been consistently positive when conversing about it during the focus groups and when reading the responses from the questionnaire.

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[18] http://www.treehugger.com/

6.7 Criticism of method

The research that has been made is very much qualitative, the user tests and focus groups was performed with a handful of users. However, many people answered the questionnaire but it is not enough to represent the opinions of the residents of Stockholm. The questionnaire was sent out to students at the Media Technology program at KTH. This might seem misleading considering their dedication to technology, but these can be seen as early adopters and other people will follow the trend later on.

Fogg argues that users tend to put their faith in technology and so forth believes the information that it gives them. This means that if the information in our application is not correct i.e the bicycles are not there when the user expects them to be the user will lose faith in it. This would be followed by an abandonment of the application from the users.

When designing the second iteration of the interface Xcode was used. The goal was to continue the design process the same way, since it provides interaction in the iPhone simulator. But after the second iteration was made we realized that this would be too time consuming and that we would not be able to finish in time.

7 CONCLUSION

This thesis began with the idea of using technology, in this case mobile phones, for a service, Stockholm City Bikes. The aim was to ease the use of the service for existing users and possibly catch the interest of nonusers to utilize the service. It is a challenge to change people's behavior for the better since it is often less comfortable than the other option, but with the use of technology and a dash of persuasion this is a possibility. The focus was set on a mobile application as an aid when you want to rent a bicycle. The interface was designed and evaluated to answer the question of how to create such an application to persuade and encourage change.

Through the research conducted which included user tests, focus groups and a questionnaire a final design was made of the application. Throughout this thesis, with results contributed from focus groups and user tests, it has been argued that this is a design that meets the users' demands and that it has the contents that are necessary for such an application. However, it is vital to offer better stability than the BCN application to succeed. The hope is that the guidelines followed in this thesis will be of interest for other designers when developing persuasive mobile applications for sustainable traveling habits.

The application itself will not get people to use the service, however with the feedback from the focus groups and questionnaire, the users of the service are likely to use the application. By providing the application, it simplifies the usage of the service and hopefully this will lead to a continued devotion from the existing users. This is confirmed by the questionnaire and the focus groups.

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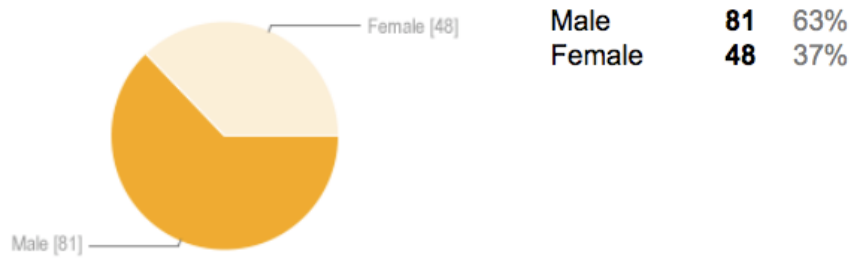
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Appendix A: Questionnaire

Age

10-18	**4**	3%
19-25	**95**	74%
26-35	**28**	22%
36-50	**2**	2%
50+	**0**	0%

Gender

Male	**81**	63%
Female	**48**	37%
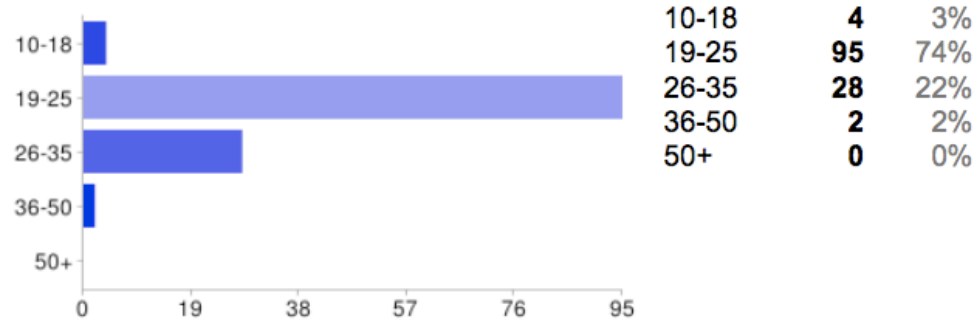
Do you consider the environmental aspects when you choose how to commute?

Yes	**28**	22%
Sometimes	**63**	49%
No	**37**	29%
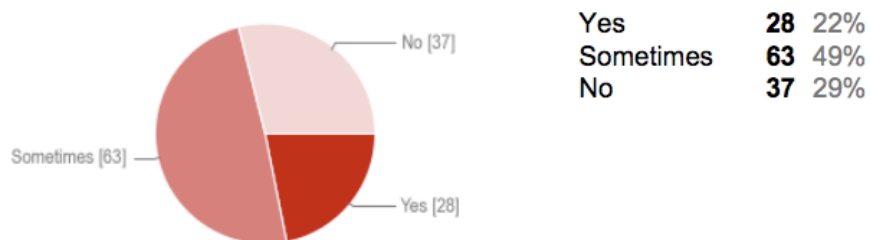
How do you commute within the city center today?
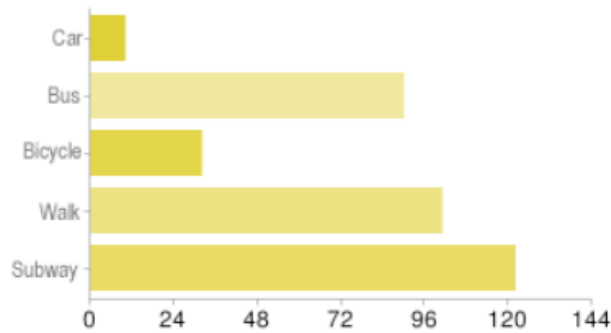
By car	**10**	8%
By bus	**90**	70%
By bike	**32**	25%
By foot	**101**	78%
By subway	**122**	95%

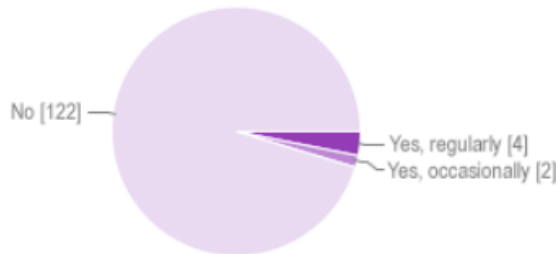People may select more than one checkbox, so percentages may add up to more than 100%.

Are you familiar with Stockholm City Bikes and how the system works?
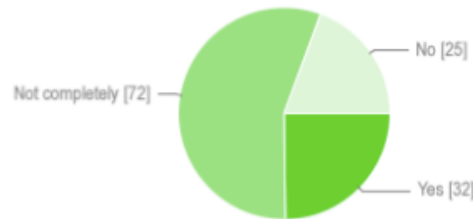
Yes	**32**	25%
Not completely	**72**	56%
No	**25**	19%

Have you ever used the service?

Yes, regularly	**4**	3%
Yes, occasionally	**2**	2%
No	**122**	95%

The questionnaire finished off with two open-ended questions. They are here presented, along with the answers that were the most relevant for the work process (in Swedish):

If yes, how do you think it works in the current situation? What is good / bad, and what needs improvement?

"Jag har ju aldrig fått någon information om hur tjänsten fungerar. Det var bara nyligen jag fick reda på att man ska skaffa kort för att kunna låna en sådan cykel. Visste inte ens vad företaget bakom projektet hette förrän nu, Alvedon-cyklarna ger större ledtråd än Stockholm City Bikes."

"Funkar bra. Lite jobbigt ibland när man är osäker på var det finns stationer, eller när stationen är full när man kommer fram. I och för sig lika jobbigt när en station är tom när man behöver en cykel."

"Jag tycker att det fungerar bra. Hittills har det alltid funnits cyklar på stationerna när jag behöver låna och lediga platser när jag har velat lämna tillbaka en cykel. Men en app där man kan se antal cyklar i ett visst ställ i realtid skulle vara toppen. Gärna även en funktion där man kan komma i kontakt med kundtjänst om man behöver rapportera en cykel som är skadad, punkterad el dyl och gärna att sådana rapporteringar syns i appen. Förslag på cykelväg i appen skulle också vara bra."

"Man kan aldrig räkna med att det finns en cykel vid den station man tänkt sig, så man måste planera för förseningar. Ibland är cyklarna trasiga eller dåligt pumpade."

"Några cyklar fungerade inte att få ur stället och tjänsten där man ser hur många cyklar som finns lediga på respektive ställ fungerade dåligt, systemet sa att det fanns en cykel kvar på Karlaplan men när jag kom dit visade det sig att den cykeln inte gick att få upp ur stället.
Annars är det en skitbra idé, speciellt plus för det studentvänliga priset!"

"Det funkar rätt bra. Fler stationer behövs dock."

Would you use such an application that we are designing?

"Ja, om den fanns för Android."

"Kanske om det fanns möjlighet att jämföra cykeltid med SL-alternativ."

"iPhone appar för såna här saker är perfekta! Sällan man är hemma vid datorn gissar jag då man kommer på att kolla var det finns cyklar."

"Ja om jag nu hade använt cyklarna så hade det varit guld värt att ha en sådan applikation. Att kunna ta reda på var det närmsta avlämningsstället vid min destination ligger är en väldigt bra idé."

"Om jag hade velat använda en av cyklarna, hade jag gärna velat använda mig av ett sådant system. Lättare att planera om man vet hur många cyklar och vart de finns från situation till situation."

"Jag vet inte exakt vad ni utvecklar men om det handlar om betalning över iPhone så skulle jag definitivt använda den OM:
1. jag hade en iPhone
2. jag skulle använda de där cyklarna
3. lösningen var enkel/snabb
4. betalningen processades på smart sätt, exempelvis via telefonräkingen eller ännu bättre direkt till bankkontot

Motivering är att jag är extremt intresserad av mobile payments och dylikt samt att jag uppskattar att samla så mycket som möjligt av livets administrativa funktioner på ett och samma ställe (e.g. mobilen) av enkelhets- och bekvämlighetsskäl. Jag skulle troligen inte använda applikationen om den var länkad till ett separat prepaid-konto (alltså inte mitt existerande bankkonto). Det är för krångligt och har visat sig vara ganska impopulärt i Europa överlag, speciellt om bankkontobetalningsfunktion finns tillgängligt."

"Alla applikationer som förenklar vardagssaker är bra. Tex använder jag sj"s stationen då jag ofta åker tåg. Om jag använder cyklarna är det väl bra att ha en applikation som kanske visar saldo, tillgänglighet, support mm då man inte alltid har tillgång till cykelstationen direkt."

"Mycket möjligt. men jag har ju ingen iPhone, så det blir svårt. varför tänka iPhone-app? bara för att alla måste göra iPhone-appar? känns vettigare att tänka mobil-lösning i stort och sedan kanske göra ett case med iPhones. vilka är det överhuvudtaget som använder de här cyklarna i dagsläget?"

"Varför inte, låter smidigt att slippa leta efter en station bara för att, när du väl hittat en, upptäcka att den står tom."

"Jag hade absolut använt appen om jag utnyttjade cyklarna."

"Om jag redan hade använt tjänsten så ja, iallafall om jag hade haft en telefon som kunde hantera applikationer. Applikationen hade dock inte fått mig att använda cyklarna mer."

"Om jag hade cyklat i stan hade jag använt appen."

"Nej tyvärr, har en Symbiantelefon."

"Ja självklart! Men ni får inte glömma oss som inte äger en iPhone. Sedan skulle jag använda den om jag bodde mer centralt och kände att jag hade mer användning av just alvedon-cyklarna."

"Ja det hade jag. Anledningen till att jag inte använder dessa cyklar idag är just problemen med att hitta platser att ställa av dem."

"Kanske, det är sällan jag cyklar. Men om det var enkelt och om jag behövde en cykel skulle jag använda den!"

"Jag skulle säkert använda applikationen men eftersom det blir en iPhone app så kommer den vara oanvändbar för mig och andra som inte använder sig av en sådan telefon."

"Det hade jag definitivt gjort om jag kommit till en tom cykelstation och behövt en cykel. Eller om jag behövde en cykel och kunde se vart närmaste lediga cykel befann sig."

"Idén med applikationen låter väldigt bra! Jag har dock ingen iPhone (använder Android) så jag skulle tyvärr inte kunna använda den, om ni inte gör en applikation till deras marknad också. Om jag skulle kunna använda en sådan applikation så skulle det helt klart vara intressant."

"Ja. Jag har testat en av de tre stockholm city bikes-apparna som finns i appstore. Men det var mest för att testa. Jag har inte haft ett egentligen intresse i att hyra/låna en sådan cykel."

"Ja, jag har laddat ner den appen som jag hittade på iTunes till min iPhone, men i den finns ju bara info om var cykelställen är någonstans - info som jag ju redan har i vanliga kartan från city bikes. Det jag saknar är hur många cyklar det finns i varje ställ (uppdaterat i realitid), möjlighet att rapportera skadad cykel, samt ev söka efter bra cykelvägar."

"Säkerligen! Det skulle det göra det enklare än vad det är i dagsläget."

"En sån app skulle göra det mer troligt att jag skulle använda cyklarna för då får man snabbt reda på vart cyklarna finns."

"Jag tror det skulle funka bra. Om jag hade haft en iPhone skulle jag säkert använt mig av appen. Har tidigare funderat på att använda citybikes till och från skolan, men de olika stationerna passar inte mina destinationer så bra. Men jag tror att vid mer spontana resor så är det här systemet utmärkt. Det låter jättesmidigt om man är i stan och vill ta sig till en ny plats att bara kolla upp närmaste station etc."

"Definitivt! Jag tycker GPS-funktionen är väldigt smidig och den har hjälpt till i många lägen."

"Ja absolut, det vore skönt att se hur många cyklar som finns vid en given station innan man går dit. Dessutom vore det bra att få hjälp att hålla reda på var stationerna finns utan att behöva bära med sig kartan."

"Ja om den var lätt att använda och om man kanske kunde vinna eller få något erbjudande om man använde den som seven elevens app eller Waynes coffe."

"Mycket möjligt, men det viktigaste är priset. Däremot vore det bra om den på förhand kunde hjälpa mig se var jag kan t. ex. lämna tillbaka cykeln osv."

"Det är jag övertygad om. Det låter helt perfekt för då behöver man aldrig vara osäker på om man kan hämta eller lämna en cykel. Enda problemet är att jag inte har en Iphone."

"Låter som en riktigt mysig liten app. Jag hade absolut använt den om jag någon gång tänkt hyra en cykel. Kanske inte i Stockholm, men är en del i Köpenhamn, en riktig cykelstad. Där hade jag definitivt använt en sådan app. för å hitta ställ(stationer) etc."

"Ja det hade jag nog gjort. Känns som en bra ide att veta vart dem finns och hur många!"

"Jag gillar iPhone apps. Jag stödjer utvecklingen. Jag tror det kan underlätta för användandet av cyklarna. Ös på!"

"Ja, jag har själv tänkt att jag skulle vilja att en sådan tjänst fanns. Jag har dock ingen iPhone och tycker att ni borde sträva efter att tillgängliggöra infon på flera sätt, t.ex. via en enkel mobilsajt som går att nå från alla telefoner med wap/ gprs och varför inte även via sms?"

"Kanske, jag har inte stenkoll på hur systemet du fungerar men som jag har förstått det så måste man ladda på pengar på ett kort för att få access till cyklarna. Då orkar inte jag iaf men er applikation skulle jag gärna används om jag skulle använda cyklarna."

"Om jag hade behov av att använda alvedoncyklarna så skulle jag vilja att er applikation fanns. Verkar smart."

Appendix B: Focus group 1 discussion topics

Translated from Swedish. The focus group was based on these questions but led to other topics of discussion.

Introduction:

- A small presentation of our work to the participants.

Focus on the service:

- How many here uses the service on a regular basis?

- What is good and not so good with it?

- Would you consider using it?

- Why are you not using it?

- What could influence you into using it?

- What has influenced you into using it? Any special reason?

Focus on the design (Workshop):

- How would you design your own application? What functions would you implement?

On this topic we asked the participants to simply draw paper sketches and then explain their train of thought. After this was carried out and discussed, which led to further design ideas, we showed our own interface asking them how we could improve it.

Appendix C: Focus group 2 discussion topics

Translated from Swedish. The focus group was based on these questions but led to other topics of discussion.

- Introduction. A small presentation of our work.
- Spontaneous reactions from participants, discussion.
- What kind of functions are the most vital for an application like this?
- Are there any functions that are redundant?
- Are there any functions that we should add?
- Is there anything in the design that you would change? Buttons on different locations, etc.
- What could influence you to use the service?
- What could influence you to use the application?
- What could be a good trigger to use the application? How would a reward system look like?
- Is it a good idea to implement other functions in the application e.g. a countdown timer which displays remaining time on the loan or a payment system?

Appendix D: Technical specifications

The second iteration of Easy Rider is an application developed for the Apple iPhone made in Xcode. The application consists of one main view that displays a map and a list. The map displays the available stations as pins that are color coded depending on their status. If the user pushes one of the pins, detailed information about the station is displayed along with two buttons. The star button takes you to the favorites view, although it is not currently possible to add stations to the favorites. The running man button quits the application and starts google maps that shows your current location and the route to the desired station.

The list displays the available stations in descending order depending on their status, with stations that you are able to both deposit and collect a bicycle at the top. When the user pushes a station in the list the map centers on that station.

The code is available on our blog:

http://climaddicts.blogspot.com/2010/06/technical-specifications-for-second.html

To open the prototype in Xcode click the maptable.xcodeproj file, this should open Xcode. From here you can press CMD + ↵ to build and run the project in the iPhone simulator.