Design and development of a travel planner for Android devices

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Abstract

Softhouse Consulting Öresund AB is the company who developed the ticket purchasing part of the Swedish public transport company Skånetrafiken's application. Nowadays, there are a lot of travel planners available in application stores, which means that the design and functions are different for the applications. Therefore, Softhouse was looking for an attractive proposal for a simplified way to purchase a ticket. To delimitate the master thesis, the developed travel planner is directed towards Android devices.

Introduction

The main objective of this master thesis is to design and evaluate a new travel planner that can be used in Sweden, irrespective of county. The travel planner should be user friendly and enable quick ticket purchasing. A vital part of this master thesis is to include the user at an early stage of development and through design iterations refine the design of the travel planner.

The following article describes the development process of the travel planner prototype together with a summary of the final prototype design.

Approach

In the startup phase of the master thesis research was conducted to get a broader understanding in the area and a perceptive in the designs of the travel planners that are provided in today's market. This research also resulted in the main target group of the master thesis. The main target group and the smaller sub target groups were a big influence during the master thesis. They were able to affect the design and the development of the prototype through a survey, two different focus groups and usability tests. The feedback given by the test subjects was a big influence for the different design iterations.

Final design

Based on the user tests, a final design of the travel planner was developed. The design is centered on an icon menu, which can be seen throughout the whole prototype, *Figure 1*. The colors, icons and buttons used in the prototype follows the Android standard.

Figure 1. Main menu with an active ticket.

The search function
The layout of the search function is kept to a minimum, *Figure 2*, and results of a search are shown in an appealing design, *Figure 3*. The search function is heavily based on the user's GPS-position and the current time. The search results visualize the route of the bus and the current position of the bus in the flow chart. The color is coordinated according to the bus color. The red border around the chosen travel plan is shown since the second bus is delayed. An informative text can also be seen at top of the view together with the new departure time of the bus.
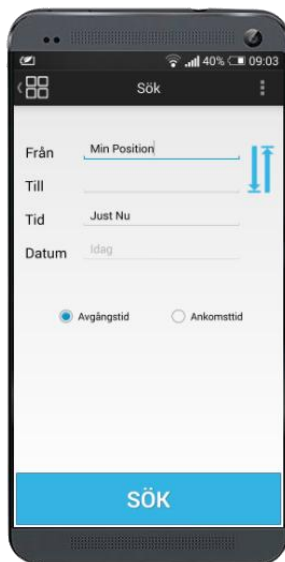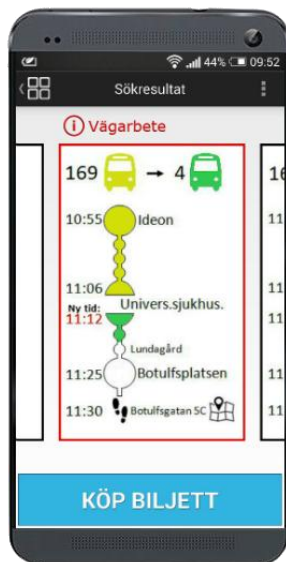

*Figure 2.*Search view.   *Figure 3.* Result view.

Card functions
A fundamental idea of the master thesis is to take advantage of the existing functions, such as NFC, in an Android device and integrate it with the prototype. The NFC function is used when a user wants to add a bus card to the application, *Figure 4*. With the usage of the NFC function the prototype will automatically read useful information about the bus card and thus facilitate the user. However, due to security reasons, this function is not available when the user wants to add a credit card. Hence, the user has to manually enter e.g. the credit card number.

To ease the user, there are various card functions in the prototype such as load up and block a bus card, *Figure 5*. Functions such as change password and delete card are available for both bus and credit cards.

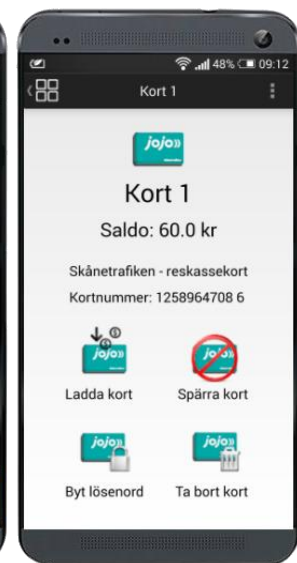*Figure 4.*Adding bus card using NFC.   *Figure 5.*Bus card view.

Ticket purchasing
The prototype enables ticket purchasing through three different ways. All the possibilities start at different places in the application, but leads the same ticket purchasing view, *Figure 6*. The user can purchase tickets directly from the ticket button in the menu, from the search result or repurchase an expired ticket. The view seen in the picture is a result from a search related purchase, the route is seen under the zone field. When the user purchase a ticket from the menu the zone field will be

automatically filled in with the user GPS-position and also the default ticket type.

When the purchase has been made the ticket is shown, *Figure 7*. To visualize that the ticket has been bought for the specified route, the destinations, which the user entered earlier, are shown beneath the name of the city. The arrow to the right of the destinations enables a quick linkage to the search result of the specified route. A ticket bought directly from the main menu will only state the zone that the ticket is valid in. The valid ticket is also seen in the menu, *Figure 1*.

GPS function, the prototype will suggest the nearest bus stop and the fastest way, i.e. the next departure, to the specified destination. As a result, a view similar to *Figure 3* will be shown.

Figure 8. Take Me Home view.

*Figure 6.*Purchase ticket view.   *Figure 7.*A valid ticket.

Take Me Home

A function which is included in the prototype is the "Take Me Home" function. The concept of this function is to ease the user by fasten a specific search, which can be regarded as a favorite destination. When using this function for the first time, the user needs to enter a specified address or a bus stop, *Figure 8*. Then using the user's current