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DVT DRIVESTATS
USABILITY STUDY

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https://github.com/AxelInd/COS301_DriveStats

CLIENT: DVT

Version 1.0

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Testing the Drivestats application

Introduction

In South Africa over 10000 people die on the roads annually. Students at the University of Pretoria (Team Antz) were approached by the company DVT with the intent of addressing this problem.

The problem of reckless driving has become so severe that, in 2011, the South African province of Limpopo has claimed that 32% of all deaths in that year were related to transport and road-safety (Department Of Statistics, 2011). With this in mind, DVT tendered a proposal to the University of Pretoria for the creation of a mobile application to increase road safety across the country.

As a team of enthusiastic and conscientious drivers, we are proud to be part of the design and implementation of the DVT DriveStats app which is designed to raise awareness for the quality of a user's driving.

Process Followed

Hypothesis: The DriveStats application will allow all drivers to easily determine if they are good drivers in relation to other drivers.

Test-Design

A usability test was conducted on the 27th of October.

Core decisions throughout the usability test were based on the DECIDE framework (Preece, et al., 2015) and based on an implementation of said framework as described in terms of final product evaluation (Zeepedia, 2012).

Prior commencement of the testing, a series of 4 tasks of varying complexity was developed and chosen. The time taken for a given user to complete these tasks was selected as a simple, informative and easily quantifiable measure of the intuitiveness of the product. The questions were kept in the same order for every user, thus ensuring the order effect acted equally on all users.

Due to the logistical complexities of drawing a genuinely random population sampling of users from the University of Pretoria, it was decided that asking acquaintances of the design team represented an appropriate means of selecting users. The decision was made that 8 "model" users be asked to take part in the evaluation. The choice of 8 users, rather than 6, was made to ensure that, even if one or more users were unable to attend, the sample size would be sufficiently large to provide meaningful results (Nielsen, 2000).

Manner in which the test was conducted

All 8 users were able to attend the testing and met with the design team 5 minutes prior to the commencement of the testing.

Every member of the design team had been informed that they should not give the users any insight into the specific nature of test or the tasks they would be asked to perform, as this may have skewed or invalidated some of the data gathered.

The users were given a brief overview of the testing process, making clear that data would be used only for the purposes of the study, and that all users would remain anonymous. A brief overview of the Drivestats application followed. The users were told that they would be evaluated one at a time on their speed in completing a variety of tasks related to the Drivestats application and that the time they take to complete task will be recorded. An emphasis was placed on the fact that it was the application being tested, rather than the user. After the times were recorded and signed off on by a marker the users were given the form to complete rating how difficult they felt each task was.

It is worth noting that, to ensure the anonymity of the users, they were not asked to sign a consent form relating to the use of their data. Rather, the questionnaire itself made it clear that its completion represented consent regarding the use of data gathered – an alternative means of obtaining permission widely used in surveys and testing (korbedpsych, 2000) (Steinberg & Schnall, n.d.).

Tasks Performed by users

Overview

4 Tasks were selected, each requiring completion of a number of different steps. All Tasks were performed on a Sumsung Galaxy Note 10.1 running android 4.4.2 with the latest version of the application installed. While completing the usability test forms the users were allowed to freely examine the application.

Tasks

Initial State: The users were given the device with the login screen open.

1. **Login:**
   The user had to push the login with google plus button and then pick a specific account to log in with.
2. **Start Trip:**
   The user had to push the start trip toggle button to start the recording process.
3. **Stop Trip:**
   After 5 seconds of starting the trip the user had to stop the trip and then wait to review the score that was achieved.
4. **View trip history**
   From the main screen the user had to navigate to the trip history screen and re confirm the score they just received.

NB: After the first set of users completed their tasks, the app was reverted to the original state by the developers to ensure consistent testing.

Evaluation Methods

Usability Evaluation

Number of Users Failing to Complete a Task Successfully in the Absence of System Errors

This data provides information on the complexity of a given task and, when interpreted in the context of the demographic data collected, may point to incorrect assumptions made by the design team regarding the intuitiveness of the task across user groups.

The hypothesis of this test emphasised the intuitiveness of the Drivestats application across demographics, poor data in this respect would be strong indicator of overall failure.

Number of Users Failing to Complete a Task Successfully because of System Errors

Although, not specifically part of the hypothesis being tested, the number of errors found in the system and their frequency is important for 2 reasons. First, it directly relates to the ease of use of the application. Secondly, the number of times errors occur directly detriments user experience (Sauro, 2012). Knowing which errors occur most provides an indicator of their relative priority.

Number of Users Making a Particular Error

Although not strongly quantitatively tested for (due to the unknown number of ways a user may fail to complete a task), recurrence of certain misunderstandings and incorrect assumptions provide important information on how to improve the intuitiveness and usability of the product's user interface.

Non-User Cognitive Walkthroughs

Prior to the usability test, several members of Team ANTZ chose to attempt cognitive walk-through evaluations where-in one member would describe a task and details about the hypothetical user attempting it. As a team, the remaining members would then attempted to determine what actions would most likely be taken by the user and if those actions represented a path present in the final product.

Both of the above user-less evaluation methods led to the discovery of several small but important bugs and, to a lesser extent, to a general optimisation of the application itself. The details of these alternative evaluations are not included in this report but may be communicated to interested parties at a time of their choosing.

Results

Basic Testing Justification

All testing was performed by a single group of 7 typical users.

All questions and tasks the users were required to complete pertain to confirming or falsifying the hypothesis following:

The DriveStats application will allow all drivers to easily determine if they are good drivers in relation to other drivers.

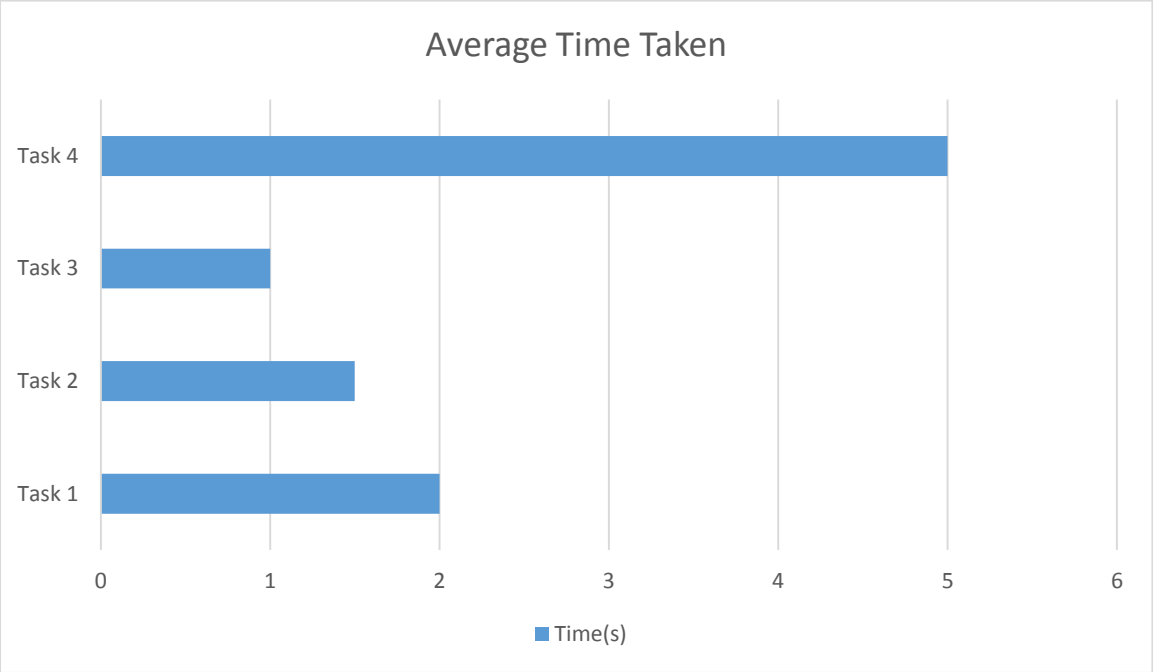
Testing Results

Table Outlining and Describing the Information Gathered From the Usability Test of the Drivestats System

All results were obtained using a sample size of 8.

Task	Description	Average Time Taken
1	Login with google	2
2	Start a trip recording	1.5
3	Stop the trip recording	1
4	View the trip in the trip history	5

Average Steps per Task



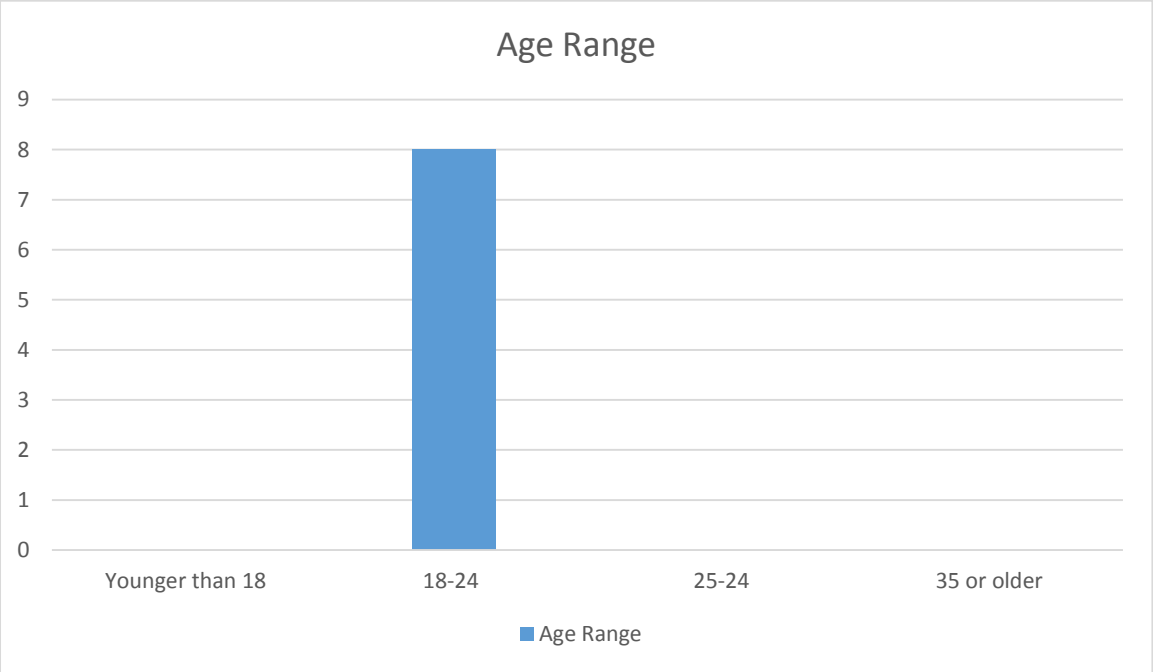
Questionnaire Results

Data obtained from questionnaires. Interpreted without comparison to other questions within the questionnaire except where otherwise explicitly state.

Age Range

Please specify your age

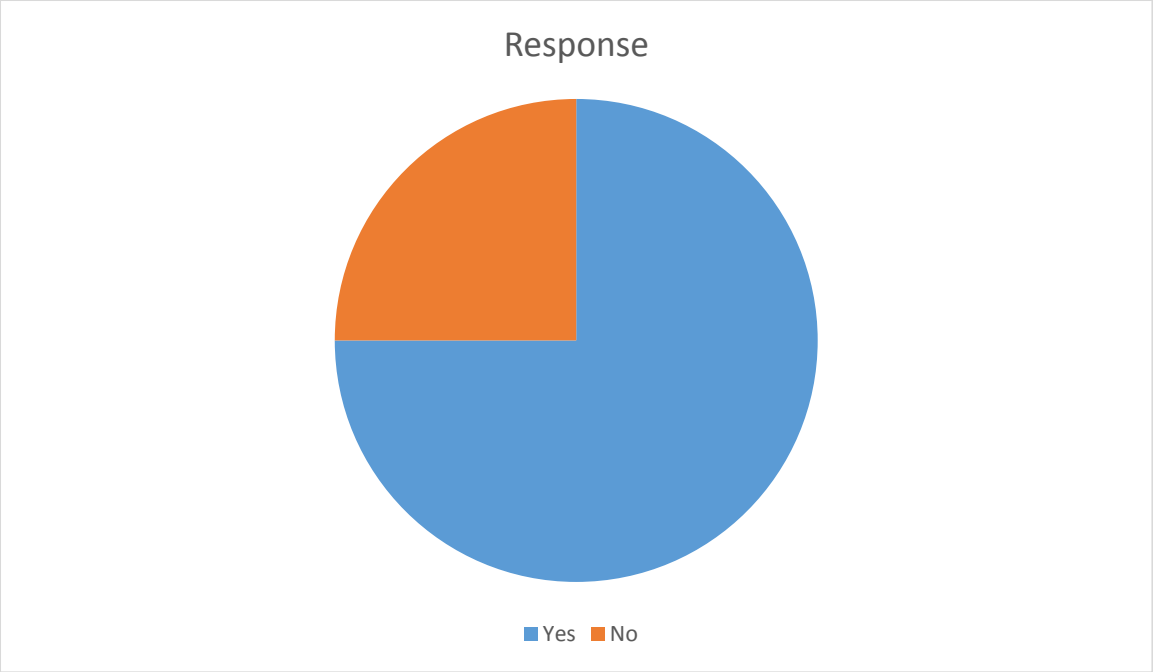
Age Range (years)	Number of Respondents
Younger than 18	0
18-24	8
25-24	0
35 or older	0



Car Use

Do you regularly use a car?

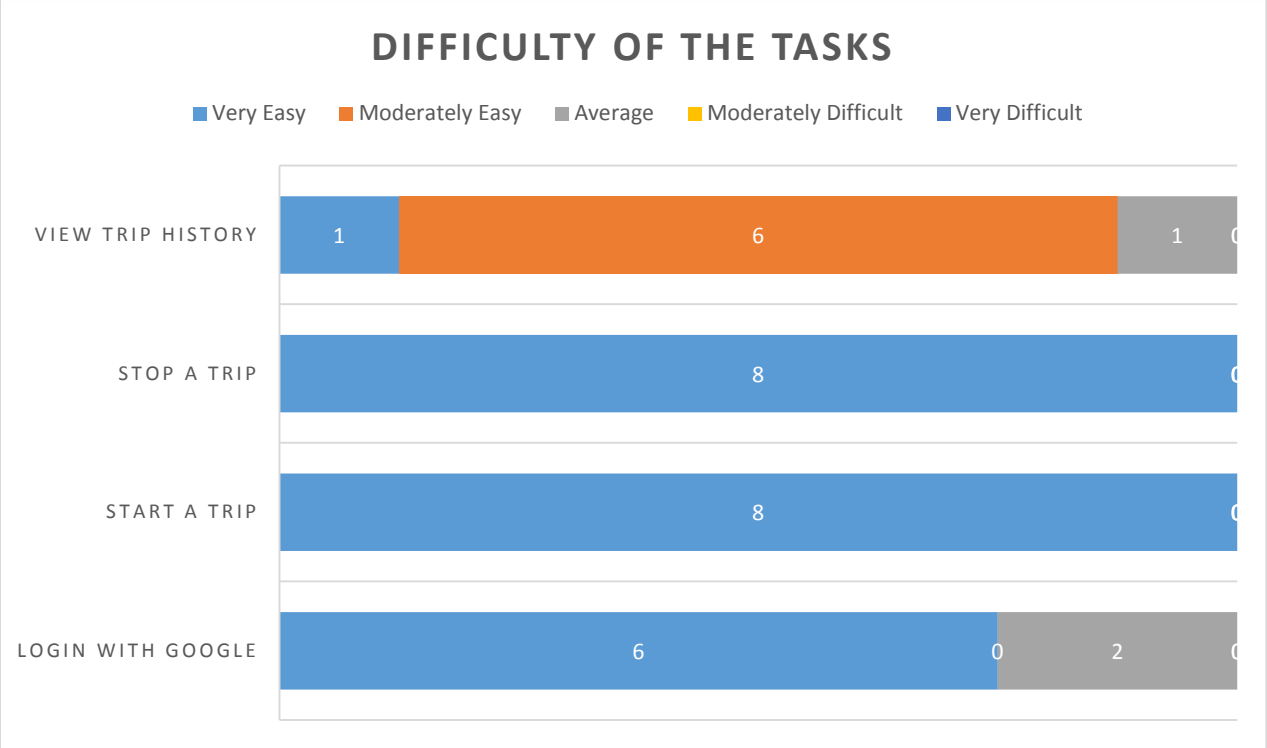
Response	Number of Respondents
Yes	6
No	2



User Difficulty Experience

Please rate the following tasks of the application based on how difficult you, as a user, found them.

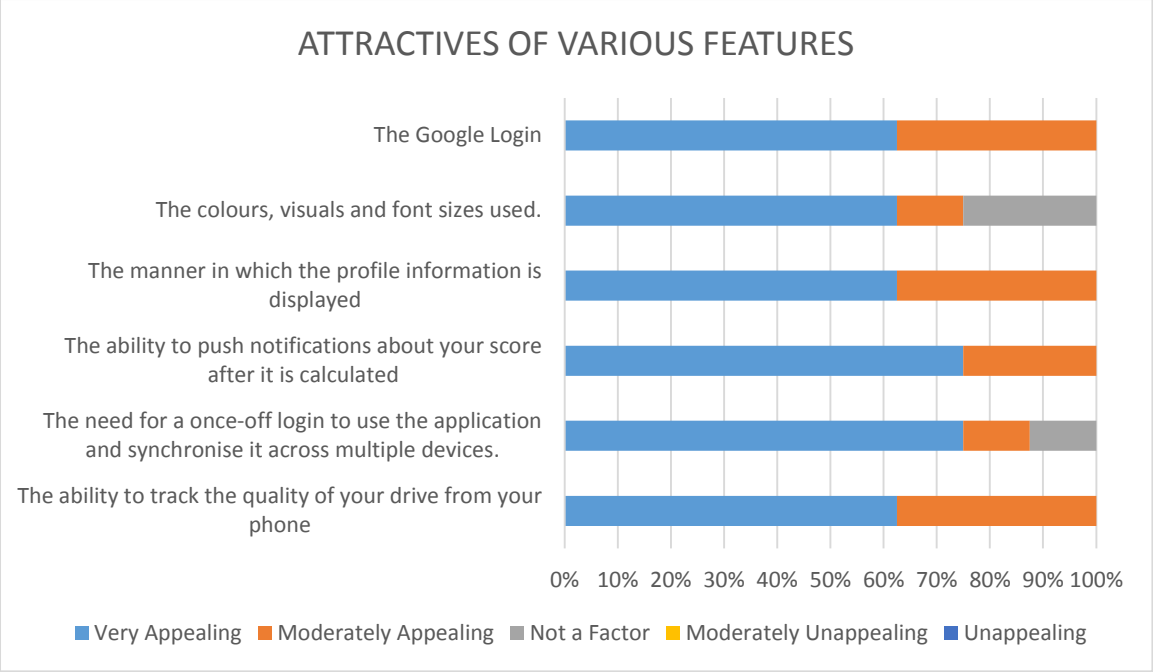
task	**Very Easy**	**Moderately Easy**	**Average**	**Moderately Difficult**	**Very Difficult**
Login with Google	6	0	2	0	0
Start a trip	8	0	0	0	0
Stop a trip	8	0	0	0	0
View trip history	1	6	1	0	0



User Appeal

Please rate the following characteristics of the application based on how appealing you, as a user, found them.

Sample Size = 7	**Very Appealing**	**Moderately Appealing**	**Not a Factor**	**Moderately Unappealing**	**Unappealing**
The ability to track the quality of your drive from your phone	5	3	0	0	0
The need for a once-off login to use the application and synchronise it across multiple devices.	6	1	1	0	0
The ability to push notifications about your score after it is calculated	6	2	0	0	0
The manner in which the profile information is displayed	5	3	0	0	0
The colours, visuals and font sizes used.	5	1	2	0	0
The Google Login	5	3	0	0	0



Conclusion

The data gathered offers a clear indication that the drivestats concept appeals to a majority of drivers and that the current implementation is easy to use, with all users able to complete all the tasks in a reasonable amount of time.

One user while filling in the questionnaire started a trip and then forced closed the application which lead to unexpected results. It may be prudent to make use of the Android Device Administration API to let the app run as a security privileged app (Google, 20 May 2010) to prevent it from being force closed again.

The Google login was appealing but it may have taken the users longer than normal to complete the task as dummy accounts were used instead of the users own private accounts.

The data proves that the start trip and stop trip mechanism is simple and really easy to use as all the users could start and stop very quickly and easily.

Of concern is the users that took long to open the trip history. 2 users opened the settings instead of the trip history and overall this task took the longest to complete. 1 user in particular mentioned having labels on the buttons to reduce ambiguity.

It is the belief of Team ANTZ that the product, with some slight tweaking to the interface, will prove very popular which will lead to a useful and successful product in the future.

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