# A Usability Study of the Travellers and Option panel in the DB Navigator App for iOS

[redacted]

7th March 2019

Word count: 1085

## 1 Introduction

The problem I investigated occurs on the DB Navigator app for iOS on the iPhone. The first time a user opens the app there is a panel called "Travellers and options" (Figure 1) indicating where the user has to click to change the number of travellers and other options like reductions or only certain types of trains. Once the user has selected this, the field changes. It now shows the selected Class, Number of passengers and types of trains selected. (Figure 2)

The affected user group are therefore users who infrequently change the settings of their app. Within this group especially users who use the Accessibility settings to display larger text are affected. How much they are affected depends on the font size they have selected and whether or not they enabled "Larger Accessibility Sizes"(LAS) (Figure 3). Enabling this feature should cause "the text inside a wide range of apps, including [...] and even some third-party apps, is converted to a larger, easier-to-read size. Apps adapt to accommodate larger font sizes so text remains legible and clear as it grows."(Apple, 2019)

If LAS is not enabled and the text exceeds two lines, the last line is only partly visible (Figure 4). In the case that LAS is enabled, the larger the text the more the visibility decreases, since the window stays the same size. Furthermore, there is no way to move the text in order to see the hidden words.

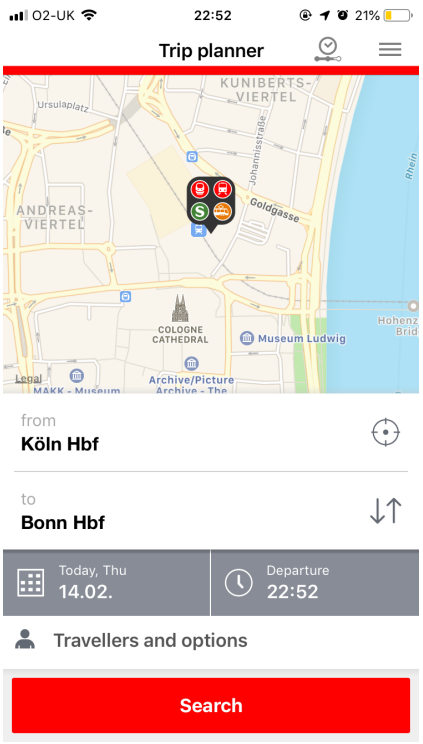


*Figure 1.* Trip Planner interface without any pre-selection.

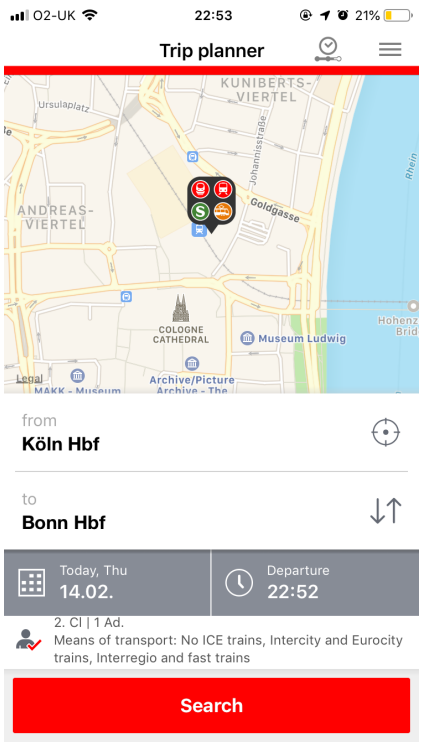


*Figure 2.* Trip Planner interface with pre-selection.

Users will be confronted with this problem when planning their travels, booking tickets or checking delays. They might do so in advance, hectic between switching trains or on board to see how many stops there are left until their destination. The tasks the app has to fulfil and its context of use can therefore differ greatly (Abran et al., 2003). In 2018 there were 2.6 million instances of people using the mobile travel information of the DB Navigator per day and a total of 28.3 million mobile tickets sold over the whole year (Fuhrmann, 2019). This makes the app prone to be used by users of a wide variety of behavioural factors, such as different degrees of vision (Ritter et al, 2014).

# 2 Method

Testing usability for transport apps is difficult, since they are usually used in a setting very different from a lab (Hörold et al. 2014). The realistic setting of the task is influenced by factors such as movement, interruptions, multitasking or noise (Tamminen et al. 2004), whereas a lab setting is most often quiet and makes it easier to concentrate on the task.

Maya et al. (2014) evaluated methods and equipment for usability studies in public transport and recommended using a combination of objective and subjective data collection. I therefore decided to rely on screen capturing as well as a post-test interview. I used the screen capturing to measure efficiency - how long it took the participants to fulfil the task and effectiveness - the counts of wrong clicks. The post-test interview gave the participants the opportunity to comment and thereby gave insights into user satisfaction.

I recruited students from my programme who have lived in or travelled through Germany as well as one participant currently living in Germany. All participants were iPhone users, had the current version of the app (Version 18.12.13) on their phone and had used the app before. Out of my four participants one used LAS. The app is available in English and German and the participants used it in the same language they would normally. One participant started without any preset settings. The other ones started with their standard setting: 1 Adult, 2nd Class and only regional transport. From there their task was to add another passenger with a Bahncard 50 for the second class and finish by clicking search. They did not have to change the route.

I tested the participants on three different settings:

1. No pre-selection - the app shows "travellers and options" (Figure 1)
2. With pre-selection - the app shows the number of travellers and other selections (Figure 2)
3. With pre-selection LAS - app only shows parts of the text (Figure 5)

# 3 Results

The results clearly indicate that it is more challenging for users who already used the app before and have a pre-selection. Time has more than doubled

Table 1

*Results*

| Settings | Participant | Time in seconds | Faulty Clicks |
|---|---|---|---|
| No pre-selection | 1 | 18 | 3 |
| With pre-selection | 2 | 31 | 3 |
| With pre-selection | 3 | 47 | 4 |
| With pre-selection and LAS | 4 | 73 | 8 |

from participant 1 to participant 3. All of the participants first clicked on the first traveller and none of the participants scrolled to the correct location on the first try (Figure 7). The faulty clicks increased for participant 4 since the text in the traveller panel was not fully displayed, they only clicked on it by accident when they tried to scroll to read all of the text. Subsequently, the text for the railcard selection was not increased and proved difficult to read (Figure 8). Lastly, they clicked on the traveller panel several times afterwards, to ensure that they made the right selection, as the panel did not indicate what they had selected.

In the interview all participants expressed their dissatisfaction with the app. All criticised the size of the traveller and options panel, the ticker to select the railcards and wished for a simpler interface to add other passengers. Additionally, Participants 2 and 3 would have liked an indicator to indicate that the traveller panel is clickable. Participant 4 said that they would definitely not use the app again and that it would require a complete redesign for them to be comfortable using it. Furthermore would they have stopped using the app immediately if they were actually looking up something for themselves.

# 4 Discussion

The results of this study are alarming. Even when none of the accessibility settings are changed, is it challenging to use the app. Users reliant on these features are faced with complications and could be unable to use the app. This would exclude them from buying tickets on the go.

In order to improve the usability of the app, I would make the following changes:

1. Make the map optional and open in new screen if clicked on. (Figure 9)
2. Make panels scrollable and large enough to display the largest font (Figure 9)
3. Add arrow icon to indicate the traveller panel is clickable (Figure 9)
4. Use - and + to add or subtract passengers (Figure 10)
5. Make separate panel for railcards, which opens a new window with all possible reductions and a search bar (Figure 11)

I have contacted the developers of the app through their feedback function within the app to inform them of the inaccessibility of the app, but have not received any feedback yet.

# List of Figures

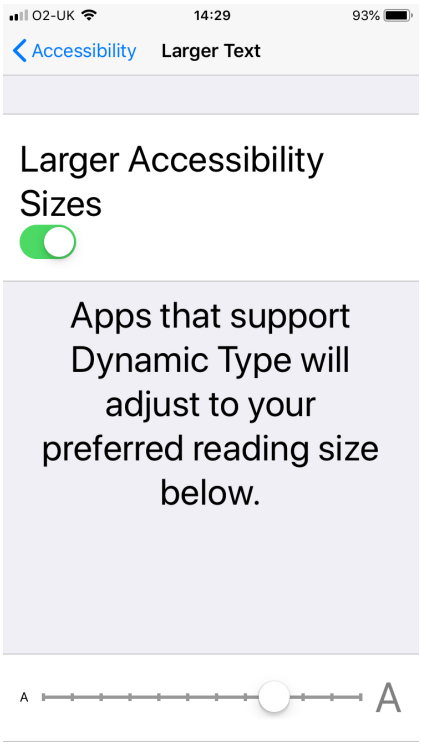


*Figure 3.* Interface in the general setting of the iPhone to enable LAS.

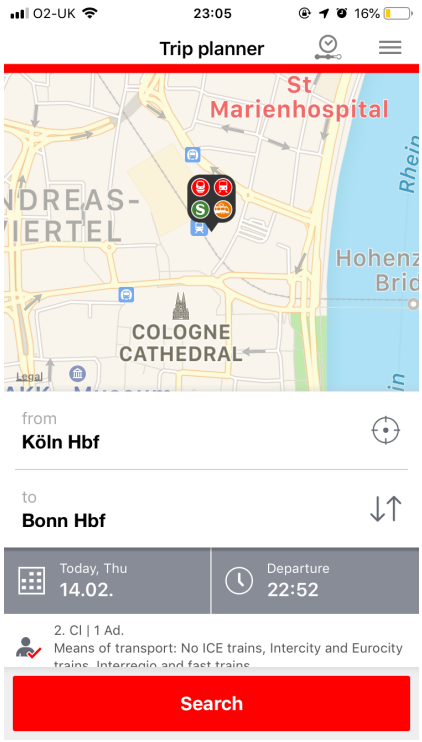


*Figure 4.* Trip Planner interface with increased font size but no LAS. Last line is only partly visible.

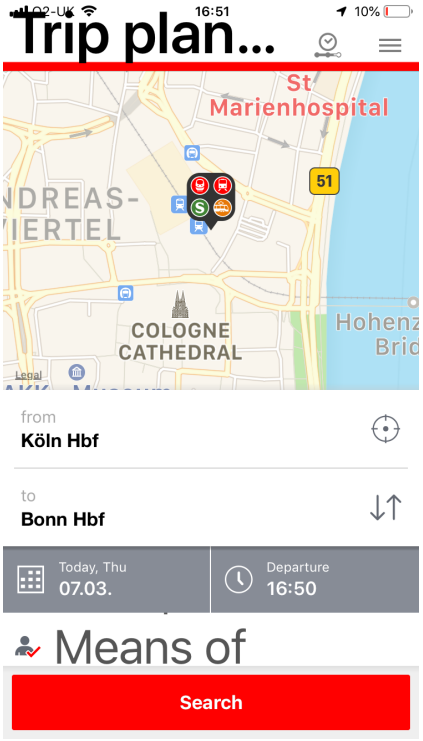


*Figure 5.* Trip Planner interface with further increased font size and LAS.

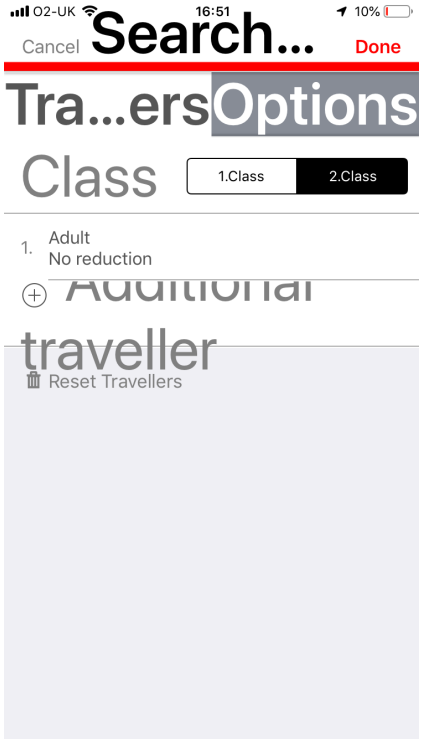


*Figure 6.* Search Options interface with further increased font size and LAS.

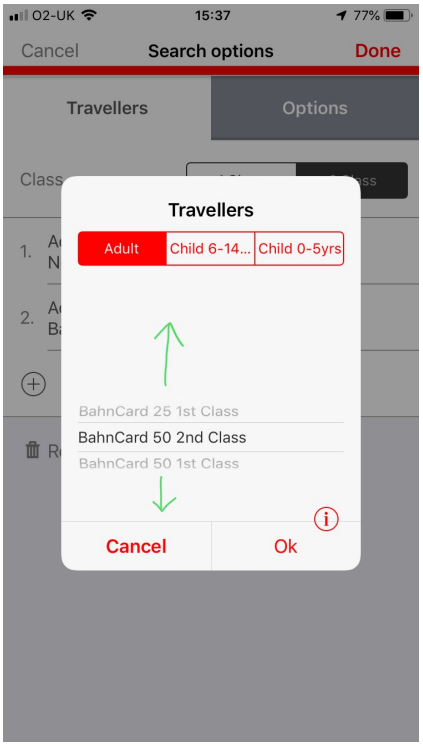


*Figure 7.* Faulty scrolling occured for all participants.

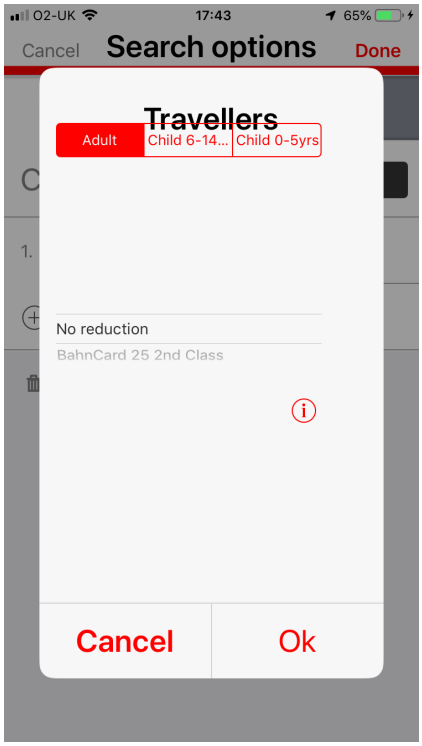


*Figure 8.* No increase in font for participant with LSA

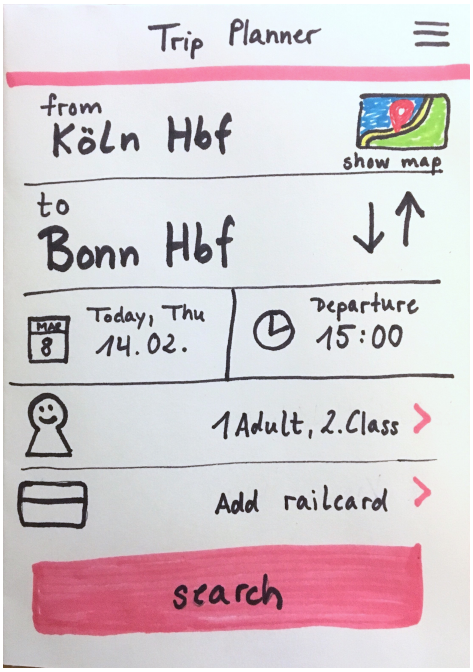


*Figure 9.* Proposed interface for the Trip Planner.

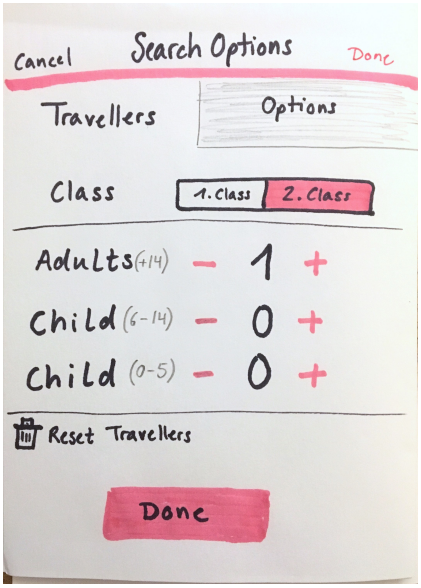


*Figure 10.* Proposed interface for the Search Options.

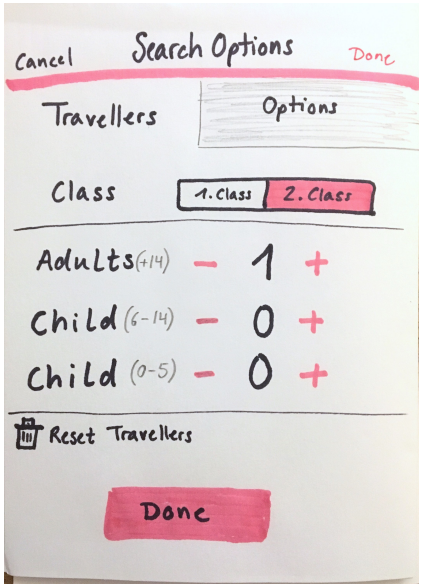


*Figure 11.* Proposed interface for Add Railcard.

## References


Abran, A., Khelifi, A., Suryn, W., & Seffah, A. (2003). Usability meanings and interpretations in iso standards. *Software quality journal*, *11*(4), 325–338.

Apple. (2019). *Vision accessibility - iphone.* Retrieved from `https://www.apple.com/accessibility/iphone/vision/`

Fuhrmann, A. (2012). *Mobiler fahrkartenverkauf boomt: 75 prozent mehr handy-tickets über db navigator gebucht.* Deutsche Bahn AG. Retrieved from `https://www.deutschebahn.com/de/presse/pressestart_zentrales_uebersicht/Mobiler-Fahrkartenverkauf-boomt-75-Prozent-mehr-Handy-Tickets-ueber-DB-Navigator-gebucht-3730982`

Hörold, S., Mayas, C., & Krömker, H. (2014). Guidelines for usability field tests in the dynamic contexts of public transport. In M. Kurosu (Ed.), *Human-computer interaction. theories, methods, and tools* (pp. 489–499). Cham: Springer International Publishing.

Mayas, C., Hörold, S., Rosenmöller, C., & Krömker, H. (2014). Evaluating methods and equipment for usability field tests in public transport. In M. Kurosu (Ed.), *Human-computer interaction. theories, methods, and tools* (pp. 545–553). Cham: Springer International Publishing.

Ritter, F. E., Baxter, G. D., & Churchill, E. F. (2014). Foundations for designing user-centered systems. *London: Springer. doi*, *10*, 978–1.

Tamminen, S., Oulasvirta, A., Toiskallio, K., & Kankainen, A. (2004). Understanding mobile contexts. *Personal and ubiquitous computing*, *8*(2), 135–143.


## A Participant Information Sheet and Consent Form

# Participant Information and Consent Form

**What this study is about**
The purpose of this study is to understand how people use the DB Navigator App on iOS. Your participation in this study will help me investigate the usability of this product for a usability study in my class The Human Factor at the University of Edinburgh.

**Your participation in this study is voluntary**
You can take a break at any time. Just tell the researcher if you need a break. You can leave at any time without giving a reason.

**Information I want to collect**
I will ask you to show me how you use the product. I will watch how you do various tasks and I will ask you some questions. I will record the phone screen during the session and I will take notes to record your comments and actions.

**How I ensure your privacy**
The data will be stored on a password protected computer, to which only I know the password. The recording of your session will be treated as confidential and will not be shared outside of my usability study submission.
I will submit a usability study that may include your comments and actions but your data will be anonymous. This means your name and identity will not be linked in my usability study to anything you say or do.

**Your consent**
Please sign this form showing that you consent to me collecting these data.

I give my consent (please tick all that apply):

□ For people to observe me during the research.

□ For the session to be recorded.

□ For people on the design team to watch the recording in the future.

Please sign below to indicate that you have read and you understand the information on this form and that any questions you might have about the session have been answered.

Date: _____

Please print your name: _____

Please sign your name: _____

If you want to withdraw your consent in the future, contact me through my information below and I will destroy any personal data I hold about you (such as the recordings). Otherwise, I will delete your personal data after this semester (31.08.2019).