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Annexes

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Annex 1: Design indicator experiments

1.1 Subjects

In the experiment 304 train passengers leaving Amsterdam Central Station participated.

When the train left Amsterdam CS, the passengers were asked if they were willing to participate in the experiment. Only those trains having sufficient time to the next station were selected. For the passengers the following criteria were applied.

- The first passenger sitting in the front or the rear of the train was selected.
- Only passengers traveling alone were selected.
- Only passengers not busy were selected (e.g. reading passengers were skipped).

Table 1. The number of passengers per indicator type (trains and destinations) and per variant (having double trains/ destinations and without doubles)

	Having double trains	No double trains	Total
Trains indicator	50+40	39+23	152
Destinations indicator	40+50	23+39	152
Total	190	124	304

The first number indicates the number of passengers that worked with that indicator as the first one. The second number indicates the number of passengers that worked with that indicator as the second one.

Table 1 presents a table with the number of passengers for each indicator.

1.2 Materials

A trains indicator (a list of trains arranged using departure time) and a destinations indicator (a list of destinations arranged alphabetically) were used. In addition, for each indicator there was a 'double trains' version and a 'single trains' version. In total, there were four indicators in the indicator experiments. One half of the subjects worked with the trains indicator first and the destinations indicator as last. For the other half of the subjects the destinations indicator was the first one.

The experimental indicators present the information of the Amsterdam Central Station indicator on a normal working day between 13:00 and 14:00 hours. There were the following differences between the real life indicator in Amsterdam Central Station and the experimental one used by the passengers in the train.

- For some trains the information on the experimental indicators was shortened. 'Brussel zuid' was shortened to 'Brussel' on the experimental one. 'Naarden-Bussum' was shortened to 'Naarden'. 'Zandvoort aan Zee' was 'Zandvoort'. These abbreviations were needed for two reasons. At one hand the experimental indicator should have a size that fits on the lap of a passenger. At the other hand the text on the experimental indicators should not become illegible because of the size of the characters.
- Only trains departing between 13.00 and 14.00 hours were on the experimental indicator. At 13.00 hours the indicator in Amsterdam Central Station presents trains from 13:00 to 14:50 hours.
- Inland trains only were used.
- Only trips to destinations mentioned on the indicator were used for searching departure time.

It is supposed that all these changes together make the experimental indicator more easy to use. The results therefore will be an underestimation. Passengers performance with the real Amsterdam Central Station indicator will be worse than with the experimental indicators.

For each indicator five destinations were asked. The experimenter selected these destinations from a random list. See Annex 2.

1.3 Procedure

- The first question asked focused on travel behaviour: travel frequency, the destination and how the passenger informed himself about the departure track of the train he is sitting in. The experimenter also asked if the passenger had seen and had used the Amsterdam Central Station indicator.
- Then the experiment started presenting a trains or a destinations indicator. The experimenter asked time of departure for five destinations.
- After this the indicator was taken out of sight of the passenger, the experimenter asked how the information on the indicator was arranged.
- The experiment was repeated with the other indicator (trains indicator or destinations indicator). Again departure time of five trains was asked.
- At the end the experimenter asked to compare the two indicators and assign a school mark to each one.

1.4 Search time

Search was registered and defined as the time between the presentation of the destination to find and the moment the passengers mentioned the departure time of the train to that destination.

1.5 Errors

The answers were classified as ‘good’, ‘wrong’ and ‘don’t know’. The answer was ‘good’ when the train was calling the destination mentioned. Even when there was a better solution, e.g. by changing trains.
‘Wrong’ means this train does not lead to the destination asked by the experimenter even not with changing trains.

1.6 Delay

'Delay' is the time between arrival of the first arriving train and the train the passenger mentioned. The mean delay is the total of the delays divided by the number of passengers that searched departure time for that train.

1.7 Passenger evaluation

After having search for five destinations on a trains indicator and five destinations on a destinations indicator passengers were asked to assign a school mark (minimal 0, maximal 10) to both indicators.

Annex 2: Random list with destinations

In the indicators experimenets passengers were asked to find departure time of trains. For selecting a destination the experimenter used the random list below. This list includes alle destinations mentioned on the indicator. The experimenter started at the top and for each destination needed for the next question of the current or next passenger he took the following destination of this list.

1. Arnhem
2. Enkhuizen
3. Maastricht
4. Den Helder
5. Zwolle
6. Dordrecht
7. Rotterdam
8. Eindhoven
9. Enschede
10. Haarlem
11. Zandvoort
12. Heiloo
13. Alkmaar
14. Brussel
15. Naarden
16. Woerden
17. Maarssen
18. Hengelo
19. Vlissingen
20. Heerlen
21. Zaandam
22. Amersfoort
23. Gouda
24. Weesp
25. Almere

26. Den Haag
27. Groningen
28. Hoofddorp
29. Schiphol
30. Beverwijk
31. Roosendaal
32. Hilversum
33. Nijmegen
34. Castricum
35. Breukelen
36. Utrecht
37. Hoorn
38. Uitgeest
39. Leeuwarden

Annex 3: Table of contents: Software psychology

Shneiderman, B., (1980). Software Psychology: Human Factors in Computer and Information Systems. Cambridge, Massachusettes: Winthrop Pub. Incompany.

Annex 4: Table of contents: Designing the user interface

Shneiderman, B., (1993). Designing the User Interface: Strategies for Effective Human-Computer Interaction. Reading etc.: Addison-Wesley Publ. Company.

Annex 5: Structure of: A web-based handbook

Neerincx, M.A., Ruijsendaal, M., Flensholt, J. & Wolff, M., (2001). Usability engineering for payload interfaces in space stations: handbook and example. In D. Harris *Engineering Psychology and Cognitive Ergonomics* (pp. 61-68).

Communication Level Guidelines	
Compatibility	Minimise the amount of information re-coding that will be necessary.
Consistency	Minimise the difference in dialogue both within and across various user interfaces.
Memory	Minimise the amount of information that the user must maintain in working memory.
Structure	Assist the user in developing a representation of the system's structure so that they can navigate through the interface easily.
Integration	Provide an integrated interface in which the different components are attuned to each other according to the current task.
Feedback	Provide the user with feedback and error-correction capabilities.
Interaction load	Minimise the effort that is required for dialogue actions.

Annex 6: Table of contents: Encyclopaedia of Ergonomics and Human Factors

Karwowski, W., (2001). International Encyclopedia of Ergonomics and Human Factors. London: Taylor & Francis.

Table of contents, Part 2 Human Characteristics