



Newcastle University
School of Computing Science

CSC3003 : Interaction Design

Usability Analysis : Tyne and Wear Metro Ticket machines

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Introduction

The Tyne and Wear is a rail system standing in the North East of England since 1980. Nowadays, this Metro is use for more than 100,000 daily ridership, over sixty stations. To use this Metro, people have to use tickets. In every station, you can find machines that allow you to buy tickets. There is not only one ticket, and several purchase options are available. In this documents, we'll first discuss the accessibility and the usability of those machines. Then we'll try to provide a new design, according to the notions we studied in this module.

1 Usability and accessibility of the Tyne and Wear Metro Tickets machine

This section will describe and study the actual tickets machine available in Tyne and Wear Metro stations in Newcastle. The figure 1 shows you a picture of the actual tickets machine.



FIGURE 1 – Tyne and Wear Metro Tickets machine

The machines is kind of a big box, with a screen, some buttons under it, some reading on the sides and a compartment for collecting ticket.

1.1 Goals

The purpose of the machine is to provide tickets for the Metro train station. Several kinds of tickets are available. There are two options for a ticket : the destination you want to go, and the validity time of your ticket. The machine might be able to set those options, and provide the good tickets.

1.2 Usability

1.2.1 Niel's principles

1.2.2 Dix et al's usability principles

1.3 Accessibility analysis

1.3.1 Perceptibly

Information presentation : All the informations are displayed with text, and colored buttons. There are 3 display zones :

- The screen : The actual screen displays informations in two colors : black background, and orange-yellow writing.
- Metro lines on the left : This shows where the stations are and explains the zones system.
- General informations on the right : It explains the rules of the rail system, what is allowed and not, ...

Under the screen, you can find the buttons for tickets selection. Buttons are organized to help people easily find the ticket they want.

Assistive technologies It doesn't seem to have help for people. There is no way to zoom on the screen, and buttons look quite the same. There is no depth system, for example headphones support, that could help people.

1.3.2 Operability

Action needed : To get a ticket, three actions are needed :

1. Click on the button corresponding to the ticket you want to purchase (one of the buttons below the screen).
2. Insert the coins (and only coins!) corresponding to the price of the ticket.
3. Get your ticket and your change from the collecting box, below the buttons.

That's only three actions. The ticket selection might be quite confusing. To pay for your ticket, you can only use coins. No notes and cards payments are allowed, which can be quite annoying for the user. The price is displayed on the screen. There is no way to get several tickets on the same set of commands. You have to start again to have another ticket, even if it's the same as the first.

We also study users input and output :

Money

Collecting box We also study users input and output : To collect your ticket, you have to use a "door" on the machine, where the ticket is released. Most people need to do an extra movement to collect the tickets, and going close to the ground. It's not that easy to see what's in the box when you're standing up.

1.3.3 Simplicity

The simplicity of this machine is quite obvious.

1.3.4 Forgiveness

During the execution of the three actions, only the two first need to allow forgiveness. There is, below the screen, a cancel button. If you are executing one of the first two actions, pushing this button cancel everything that has begun (remove ticket selection, giving money back if coins were inserted).

1.3.5 Output

1.4 Issues summarize

Even if those machines achieve the goal they are asking for, and some of the designs used are quite efficient, there are some issues that we can point out. Here are some issues that we found about this new machine :

- Collecting box position
- Payment only by cash
- Screen position and display

2 Redesigning of the Tyne and Wear Metro Tickets machine

2.1 Requirement specifications

2.2 Physical description

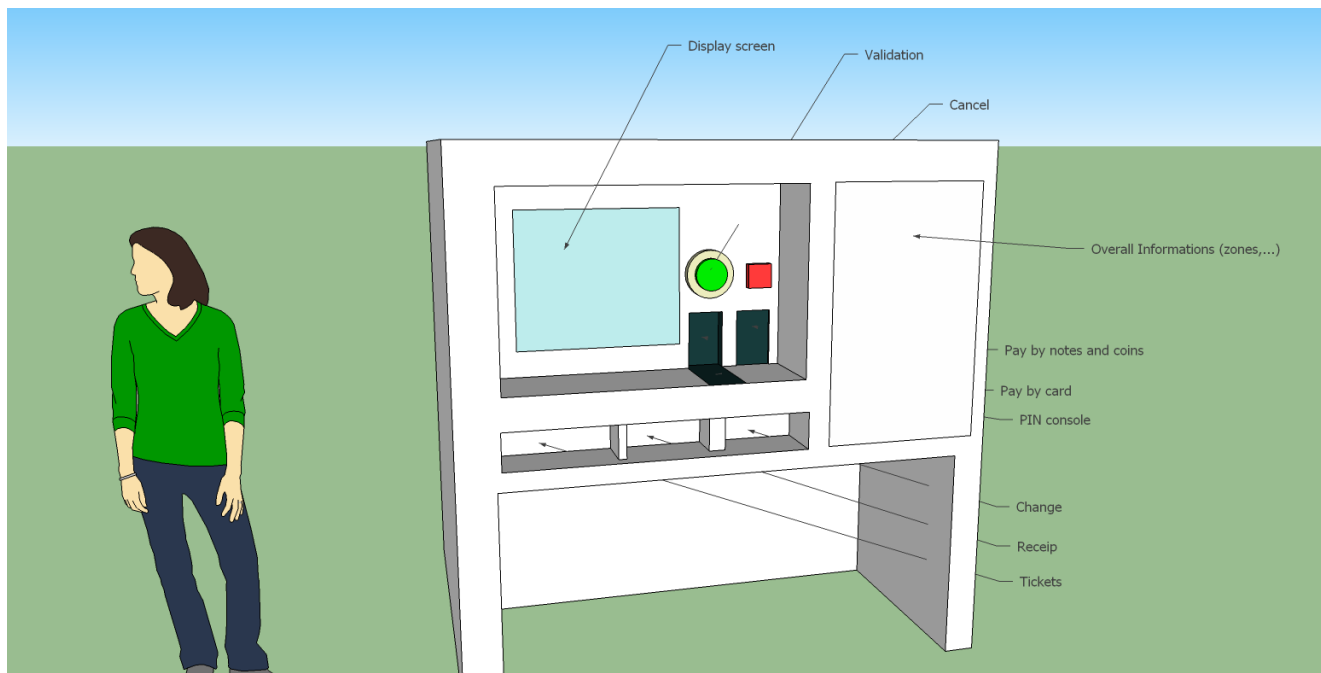


FIGURE 2 – Tyne and Wear Metro Tickets machine, new design

FIGURE 3 – Tyne and Wear Metro Tickets machine, user interface

2.2.1 input

Buttons rotative button, cancel button, validation. Card : cards insertion, pin code. Change : coins and notes headphones : Nothing around it.

2.2.2 output

Screen Tickets Receipt Change Sounds

2.3 Software design

options separations.

Conclusion

The actual metro tickets station that you find in Newcastle clearly have some issues, for classic users (no notes, no cards, ...), and for people with disability (position and size of the machine, no handle of headphones,...). For most of people, those issues are transparent, but they still exist, and some people can have real trouble getting a ticket.

Designing a new Metro tickets machine is not that easy when you try to fix all of that issue. However, lying on the principle we saw in lectures, we manage to create a machine more usable and accessible for passengers. To be sure of that, the next step would doing an evaluation of this design. The evaluation would help validate (and correct if needed) the design we made.

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