Inocrowd presentation

Walking Light

**Team**

We’re a team of 6 students enrolled in the MSc Systems and Computer Engineering from Instituto Superior Técnico <pôr as fotos com cargos>

**Solution Concept**

(slide 4)

Before we start, it’s important for us to mention that since we’ve first submitted our concept to InoCrowd, we’ve been developing our solution, adding or changing features, so the product we’re presented now may present a few changes.

(Slide 5)

Our solution for the proposed challenge starts on an interface technology that works as an interactive touchscreen display, on a large-scale framework.

We first developed this idea based on already existing technology, such as the Sensacell flooring, developed by the Sensacell corporation.

Using this pressure activated technology, we can create a platform, by combining panels of the interactive flooring.

Slide 6 - 11

This interactive flooring will use led lighting and its pressure sensor to mark a user on the platform as valid or invalid depending on whether they validated their ticket or not, by creating what we’ve called a “halo” on the floor with a colour code that we will explain next.

When a user enters the interactive flooring, he obtains the halo in the default colour that is orange – this indicates that the user has not yet tried to validate his ticket.

From that moment, the platform will generate a trail that connects the user to the closest validation point, as a way of indicating the user what he must do in order gain the green light. Due to the tracking capabilities of the platform, as the user moves around the platform, the arrow can adapt and adjust, and it will not lose track of the user’s position.

When the user approaches the validation point, and steps inside the marked circle on the ground, if he validates his ticket successfully, the platform will link the person detected inside the circle to the status of a validated user, and the halo will change colours – to green.

SLIDES 12 - 14

If, for instance, the user tries to validate a card that has no titles, the validation machine will read that card as invalid, and the platform will (after a few tries, considering that sometimes, cards can fail to be read correctly) change the user’s halo to red – meaning he has not validated a valid ticket.

SLIDE 15 - 17

If a person does not have a card and simply stands on the platform, without using the validation points, the technology has a timer linked to the halo, meaning that after around 1 minute of idle/default (orange), that user’s colour will change to red – meaning he has not validated a valid ticket.

sLIDE 18 -21

We understand that if the user steps outside the platform, when we walks back in, he’ll be marked as a non-validated user again. However, and because the ticket of Metro do Porto is valid for one hour, meaning that through that hour the user can validate as many times as he wants without spending titles, we don’t believe that having the user validating again in a significant issue, since most people wait for their train on the platform and rarely leave after validating.

SLIDE 22-24

As a way to unnecessarily track as invalid people who are leaving the train and stepping in the platform, the technology will be adapted in a way that the platform will only track users who are moving in the direction of the train.

SLIDES 25

But how does this connect to the revisors and security personnel?

As it is clear, by having colours attached to each person on the platform with a simple colour code (such as red, green and orange) makes it easy for any security personnel to quickly identify those who are fare-evading, or attempting to.

However, and because sometimes in a full platform, it’s not easy for a revisor to identify every invalid user on the platform, we found that the platform by itself could be combined with an app made especially for security personnel and that can be merged with their current system.

This app has a feature that allows to visualize the platform on a scheme, on the app, so that the revisor can see in real time if there are invalid users on the platform, how many they are and where they are.

Slides 26 - 30

This system was validated by our user research, and improved in design iterations, where we organized interviews, focus groups, formative user studies and usability testing to make sure that user’s felt comfortable and found our solution intuitive and effective.

It was through user research that we also found that a lot of user have fare-evaded, not because they intended to, but because they forgot or were in a hurry to catch the subway. This was actually validated when two members of our team went on the trip to Porto to study the infrastructures and understand the system, and caught the subway, forgetting to validate their tickets.

Slide 31

Once inside the subway, users lose a chance to validate, and inspired by our user research we decided to introduce in our project a suggestion: that additional validators are installed inside the carriages of the train – similar do the system used in bus transportation.

Validators inside can be embedded in the walls of the carriages, similar to the NFC technology, not representing a clutter of space.

Slide 32

We understand that this would encourage people to always use the subway without validating their tickets, and only validate inside the carriage when a revisor approaches. To control this problem, we added to the app a feature that allows revisors to shut down inside validators before inspecting the subway.

Slide 32-35

Our overall solution of combining the platform and the app, while introducing users with a new chance for validating their tickets, will not imply a change of the current security monitoring software. It will however represent infrastructural changes in the sense that we would have to install new validators inside the trains and move the current validators in place to the edge of the platform.

Because our solution revolves around visualization in real time, and it makes use of already existing technologies, it’s open to integration with other solutions you may find important to include.

Slide 36 – 39

**User Research**

Before better developing the solution, it was crucial to have a deeper understanding on our users, and how our concept could affect them.

Our goal was simple: understand the users. What were their motivations, needs, goals and expectation? The research should provide enough information to establish their profile, context, tasks and experiences.

What we needed was a behavioural research allowing us to develop a persuasive design.

The chosen methodology involved:

**Enquiry** – we needed big, raw data to establish statistics and patterns.

**Field observations** – studying the behaviours of users in the environment and context.

**Flash Interviews** – approaching people on the field, obtaining quick and first-hand data.

**One-on-one interviews** – lengthier interviews, in a semi-structured approach, providing more insight. It was important to us that we did not simplify our users as numbers and patterns, but as actual individuals with opinions and experiences.

**Focus groups** – part of our qualitative research, and crucial for a free-flowing and open feedback completely directed towards our rough concept.

From this initial but complete research we were able to establish essential information about the customer segment.

Slide 40

Most users who have fare-evaded reported feelings of fear and anxiety.

Towards people who did not validate their card, most users reported that they felt bothered and judgemental. The remaining felt indifferent towards that situation.

Slides 41-42

As a second phase of user research, we needed to create personas that could represent our users – as though we were sampling our end-users.

We identified 5 different representative personas, and for each persona we created two different scenarios: one without our solution (problem scenario; the current situation) and another with our solution implemented (design scenario).

This “persona and scenario” methodology helped us to synthesize our user research as well as have a clearer understanding on how the product would affect end-users’ routine and behaviours.

Slides 44

To increase our insight on the scope of this project, two members of our team went on a trip to Porto, to use the Metro of Porto in order to better observe the functionality of the system, the infrastructure context, users’ behaviour and obtain footage for later analysis.

This was also very helpful to visualize our solution on the field, and better understand how it would fit (or not) the current infrastructures.

SLIDES 45 – 47

**Design process**

Our design process was based on an iterative methodology, where we have a cyclic process of analysing, testing and refining a product. This process greatly improves the quality and functionality of the design as we revisit the product multiple times with new feedback.

We have a total of three expected iterations, two of them have already been executed, meaning we will still work on improving our solution for the next 2 weeks.

Slides 48 - 49

**Budget sketch**

Link for values: <https://activefloor.com/en/the-price-of-interactive-floor/>

We have two main ideas for suppliers: *brightlogic* and *sensacell*.

As a way of generating revenue from the platform, we suggest the use of idle space of said platform for ads and sponsorships.

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**Deliverables – as is**

* Unity Simulation, adapted to VR, allowing us to demonstrate the future behaviour of our solution in action, in an interactive environment.

< incluir video da simulação>

* App for revisors to monitor the platform and shut down the inside validators, that can be merged to fit their current system.

As of now, the simulation already demonstrates the full functionality of our solution. The app is merely demonstrative of what the future functionality will be like, and does not yet include the feature that allows revisors to visualize a scheme of the platform, since this phase is still in development.