Group 3: Usability strategy

To make sure the app can be used by all prospective users, a good usability framework needs to be in place. Usability as defined by the International Organization for Standardization, the ISO, is "the extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use". With this usability guide, the intended users, as well as the extent to which the products satisfies this definition from the ISO, will be elaborated upon.

1.1 Intended Users

There are two main groups of users: the firefighters and the building users, which includes the building's first responders. The firefighters will always be adults who do not necessarily have any knowledge of the building yet. Additionally, it can be assumed that they do not necessarily have a lot of knowledge on pathfinding or 3D-modelling at its core. For this group, the most important parts of the app will be the routes into the building, as well as any equipment that is available in the building itself.
The building users can be in any age group, depending on the exact building. In our example building, this building will most likely house adults between the ages of 18 and 70. Like with the firefighters, this group of users on average will also not have a lot of technical knowledge. For them, the pathfinding and the exits will be the most important part of the model. Since the goal of this project is to create an app, the users need to at least be familiar with how to use a pc or a smart phone on a superficial level, which is safe to assume is true.

1.2 Functional requirements

The final goal of this project is to create an app that can be used by both the firefighters and the building users. Because of this, it's important that the route is clearly visible and that the different parts of the building are recognizable enough. Additionally, the users are most probably not too familiar with coding or the more technical details of the model. Thus, it is important that the interface is straightforward and it's possible to easily navigate through the model.

In their work "Interaction Design", Preece et al. (2011) name the following five aspects as so-called usability goals:

- Satisfaction
- Efficiency
- Safety
- Learnability
- Memorability

To make sure the app is usable by the envisioned users, these five aspects all need to be considered. First, there is the satisfaction, which simply explains whether the app fulfils its goal or not. To meet this aspect, we need to have a working, well-adjusted model with a proper grid that shows the shortest path.

The second aspect is efficiency, which is closely related to satisfaction. This is also a rather important part of this app, as it needs to be quick and to the point. Having too many distracting functions will likely lead to confusion, so this aspect is on par with satisfaction in importance.

The third aspect is safety. Considering the goal of our app, this specifically is an important aspect to consider. Our app deals with life and death situations, which means that for it to be used properly,

the margin of error cannot be too large. It especially needs to be taken care of that the fire sensor data is correct, since the route will be calculated and re-calculated based on that.

The fourth aspect is learnability. Considering our prospective users will not necessarily know a lot about pathfinding or 3D-modelling, there should not be too many details about that involved and the entire app should be straightforward enough to learn.

The final aspect is memorability. Because our app is focusing on being as intuitive and straightforward as possible, not a lot of memorizing will be involved. The only thing that could possibly require memorizing are the usages of the different buttons. Thus, memorability will be the least important factor in this product.

1.3 Methodology for usability analysis

To make sure that the aforementioned usability factors are actually implemented, there are a collection of methods that can be used at multiple stages of the process. Below will be a collection of the methods used during this project at the different stages. The different methods are taken from UsabilityNet (2020).

1.3.1 Planning and feasibility

At this stage, stakeholder meetings will be done. There is a large collection of stakeholders involved, including the commissioner CGI, the fire brigade and the building owners. Meetings with these different stakeholders will be set up as much as possible to see which functionalities they want implemented in the project, as well as which data they can provide.

1.3.2 Requirements

For the requirements, two methods will be mixed to get a good idea of the requirements, i.e. the requirements meeting and the context of use method. As mentioned above, stakeholder meetings will be held during the planning phase. This includes talks about the functionalities needed in the app, which is a requirements meeting. Although the explanation technically requires a full workshop, that is currently impossible to do due to the Corona situation. Instead, separate meetings with CGI and the firefighters will be held, combined with the aforementioned stakeholder meeting. Secondly, the context of use method will be used, based on the possible users and their needs.

1.3.3 Design

For the design, inspiration will be taken from other similar models and videogames. Here, the points mentioned by the different stakeholders will be taken into account. To make sure that there is a consistent design, a list of design guidelines is created beforehand.

1.3.4 Implementation

At this stage, two groups will work in tandem, with one group focusing on the modelling and one group focusing on the programming. To make sure that these correspond well to one another, new versions of both the model and the scripts are created and exchanged between the team members at all times. This corresponds most closely with UsabilityNet's Rapid prototyping, with new versions coming out quickly after one another.

1.3.5 Testing and measurement

The product will eventually be tested by its potential users. Due to time restriction, only CGI managed to test the app in time, but ideally the fire brigade and other first responders should test as well. This will mainly be done using a subjective assessment, which has a strong focus on the aforementioned satisfaction- and efficiency criteria. The results of this testing session can be found in section 1.4.

1.3.6 Post release

As this prototype only includes one specific building, a lot of the post-release patching will be done in the form of adding more buildings. Additionally, time restrictions do not allow for much testing, so most of this will need to be done post-release as well.

1.4 Testing results

Below is a rubric containing the assessment of the final products, based on the two most important distinguished target groups. This includes some functions that are not actually in the final product, but that were either part of the original plan or were later added as recommendations during the process. The different functions are rated based on the design aspects mentioned in section 1.2.

	Satisfaction	Efficiency	Safety	Learnability	Memorability
Group 1: university visitors/users					
Wayfinding	8	5	n.a.	7	5
Identification of Rooms	n.a.	n.a.	8	7	6
Safety objects	n.a.	n.a.	n.a.	n.a.	n.a.
Group 2: first responders					
Entry	4	7	8	7	8
Wayfinding dynamic	8	9	8	8	7
Passing of actors	n.a.	n.a.	n.a.	n.a.	n.a.
Reversed track	n.a.	8	8	8	8
Safety Objects	n.a.	n.a.	n.a.	n.a.	n.a.
Inspection	8	4	7	8	9

References

- Preece., Rogers. and Sharp., 2011. *Interaction Design*. 3rd ed. Indianapolis: Wiley.

- usabiliTEST. 2020. *Methods Table | Usabilitynet*. (online) Available at: <https://www.usabilitest.com/usabilitynet/tools-methods> (Accessed 29 June 2020).