

Goal & Method

To design the entrance it is necessary to work in a schematic way to make it easier to organize things and to inform other subsystems on the progress of the entrance. First, research is done about the theming in a queue, what story is being told in the entrance and what the requirements should be. A storyline is made to get a better view of what can be implemented in the entrance. The requirements are used as guidelines to keep in mind the the entire process and they will be implemented in a N² diagram and the system. Finally it is considered if it is technical feasible, conclusions are drawn and some recommendations are given

Our goal is to design the entrance of the Thumbelina ride in such a way that it is more attractive for the visitors and it should fit within the system attraction. This poster will inform about the design process and propose some ideas. In broad terms, it covers how a queue can be made more attractive, how these aspects be implemented in the entrance and which interfaces cover other subsystems and how to tackle this.

Abstract

To cheer up the visitors in the queue there is chosen to thematize the queue. The story of the ride will be implemented in the queue. This way the visitors will immediately dive in the world of thumbelina and become enthusiastic. For this subsystem there is chosen to focus on thumbelina her life before she is kidnapped. This includes how she is born, her life and her true love, the prince. An infographic of the

storyline can be found in the handout.

To please the visitors, it is decided to split the story into three rooms, so you will not see everything immediately, but the tension is built up. Each room shows a part of her life and tries to involve the visitor. With the storyline and information on how to make queuing fun in mind, requirements were set up.

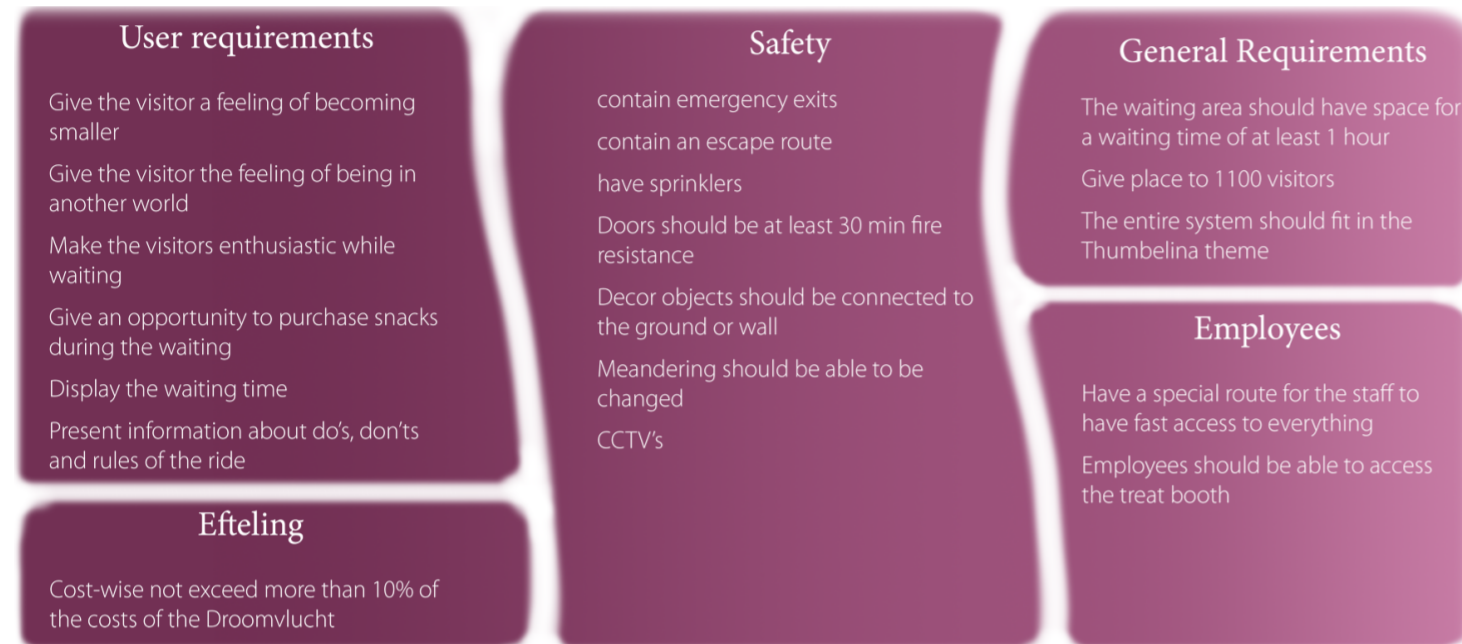


Figure 1: requirements

Interfaces

To have a better overall view of what should be done and with which subsystems should be communicated, some diagrams are made of the interfaces. First a general system diagram is made. This diagram shows the entrance as a subsystem and which general things have to be taken into account. Next to the entrance other subsystems are stated, which also relate to these

things, so it becomes clear where the communication takes place and in which direction is visualized with arrows.

Next to the general system diagram two N2 diagrams are made to have a clear overview of all the interfaces between subsystems and in the entrance itself. These can be found in the handout Interfaces.

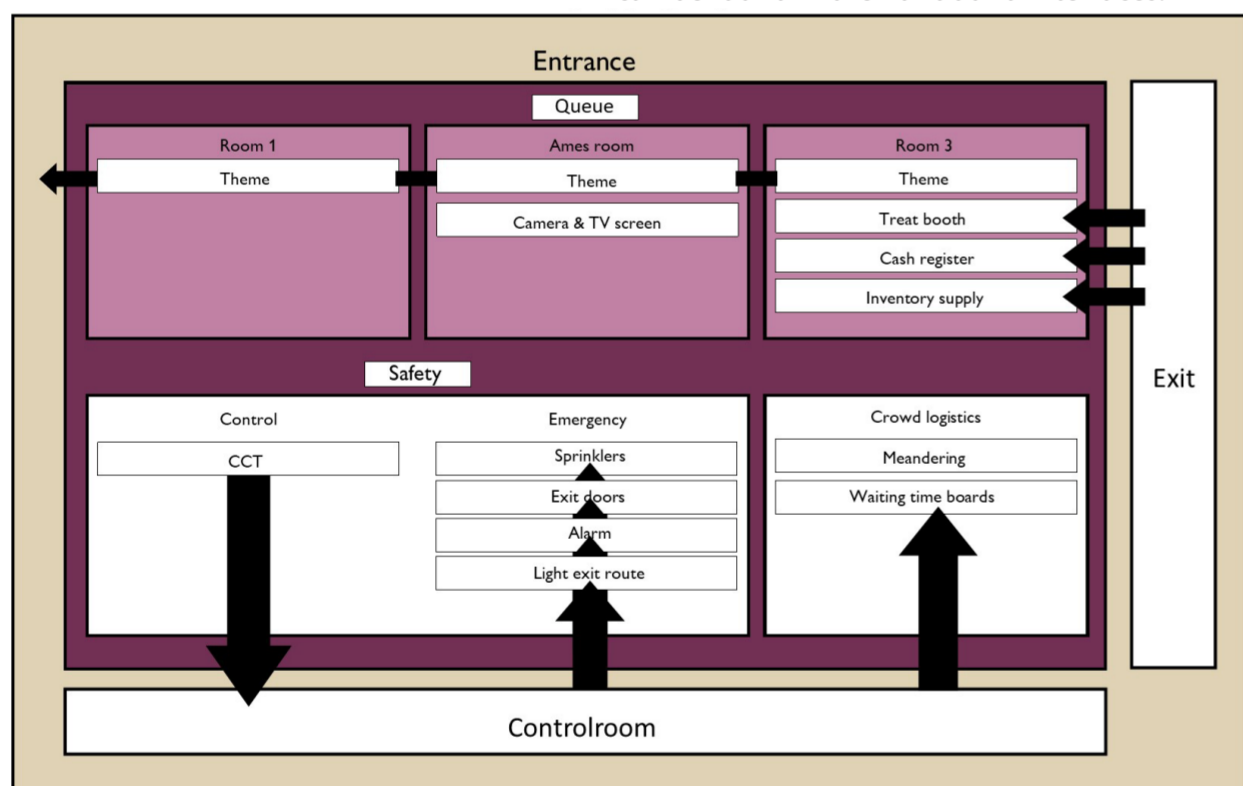


Figure 2: system

Test plan

The test plan of the Thumbelina ride will be executed by the System engineering team. They will test whether the subsystem entrance itself suffices and if it collaborates well with the other subsystems. However for the interfaces between functions of the entrance itself should an extra test plan be made. This test plan will test the experience of the visitors in two ways.

First it should test if the visitor is less annoyed and likes the 'new' design of queuing instead of regular ones. Secondly, it should test if the visitor experiences each room in the required way, is it clear that you enter a fairy world and become smaller and are all the objects and visuals clear.

Technical feasibility

Cost estimation

A rough cost estimation was made. Some of the following subcategories were taken into account: the building, music rights, meandering, themeing, paint, CCTV's and the treatbooth inventory. The costs for only the entrance was estimated on 7,2 million euros. An elaborated calculation can be found in the handout Cost estimation.

Development plan

An elaborated development plan can be found in the handout development plan. In short these are the plans:

- Research about safety
- Research about the decor in room 1 and 3
- Storytelling
- A 3D model/ presentation of the entire entrance should be made
- The test plan should be elaborated and performed.
- An exploratory budget has to be made

Requirements

The requirements mentioned are divided in five categories. During the design process everything into account, but not everything is accomplished. The requirements applying to the employees and user requirements are completely implemented.

All the requirements of the Safety have been included, but are not worked out. The sprinklers, fire resistance doors, CCTV's and fixed objects are used in our system. However there is not decided on details, such as where and how many sprinklers should be placed, which fire proof doors will be used, how do we mount the objects to the floor or ceiling etc. Our requirement that it should not exceed the costs of Droomvlucht can not be assumed or rejected, because the costs of Droomvlucht's entrance are unknown.

Some general requirements on the other hand are rejected. The waiting area does not have enough space for 1100 visitors and can't provide a waiting time of at least 1 hour. Some solutions for these problems are suggested in Recommendation.

System architecture

A visitor first comes inside the attraction with a big door, this is in the style of Efteling. Inside there is enough waiting room for around 750 people. The aisle in the waiting room has a width of 85 cm, which is based on door measurements, because most doors are between 83 and 88 cm width.

Safety

For the layout of the entrance, a lot of waiting area is needed. In case of an emergency the gates have to be easily opened, this is easy accessible because the ropes of the meandering can be opened easily. Furthermore, a panic rod is used for easy opening of an emergency door. This is already incorporated, due to the fact that the ropes can be opened. Besides, the escape doors are fire resistant for at least 30 minutes. Lastly, there should be two emergency routes, in case one of the routes is blocked due to the emergency. That's why we incorporated 2 emergency doors in each room.

Crowd Management

Professor G.K. Still (queueing theory) names three causes of crowd disaster: design, information and management. For us it is important that the design has the basic crowd management logics; avoid crossing and opposite crowdflows and bottlenecks.

Information is also important. A crowd that knows how long they still have to wait, is easier to control than an uninformed crowd. Furthermore an information board at the beginning of the attractions ensures that the crowd knows what they are waiting for and they can see how long the waiting time is.

Lastly, management. That is done by employees and the control room. This is something that we only have to take into consideration by staff routes. If there are problems, staff has to be on spot very quickly. We used 1,5 people per m² as an indication of our maximum number of people in the waiting area.

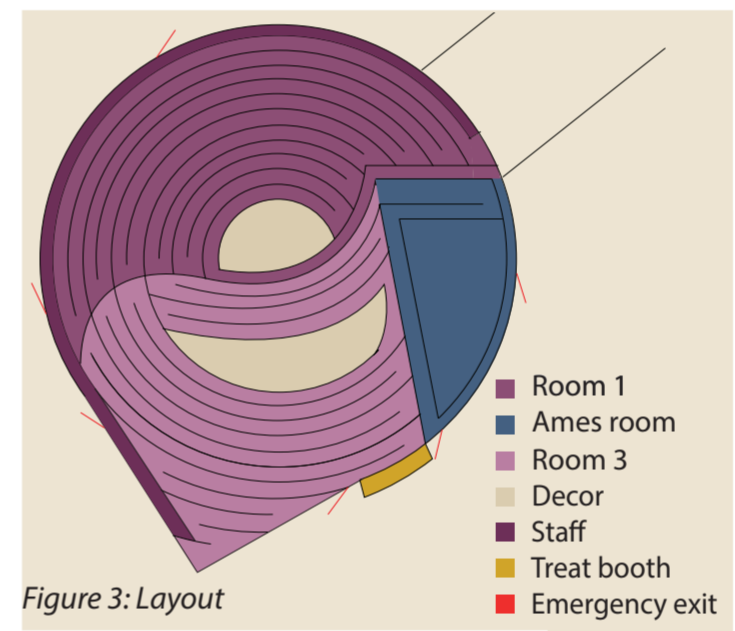


Figure 3: Layout

Appearance

The appearances contain not only the different rooms, but also the door, meandering and ceiling. To get more information on how to make queuing more fun the handout thematization can be read and for more images, see the handout appearances.

First room

This is the room where nature in normal size is shown and fairies on the ceiling. Small flowers and some grass visuals painted on the walls and we can see the birth of Thumbelina. In the middle of this room a fake tulip field is exposed, within one tulip Thumbelina.



Figure 5: wall paintings



Figure 6: Information board

Ames room

An ames room is a room with an optical illusion. It appears that a person is standing on the same distance, but in fact stands further to the back. That's why people look very small next to other people. A lot of ames rooms have square tiles on the floor that give the illusion of a straight floor, while the tiles are not straight at all.

In the attraction we would hang up a camera at the 'viewing peephole' and big screens that show the people walking through the ames room. In that way everyone can see that people shrink.

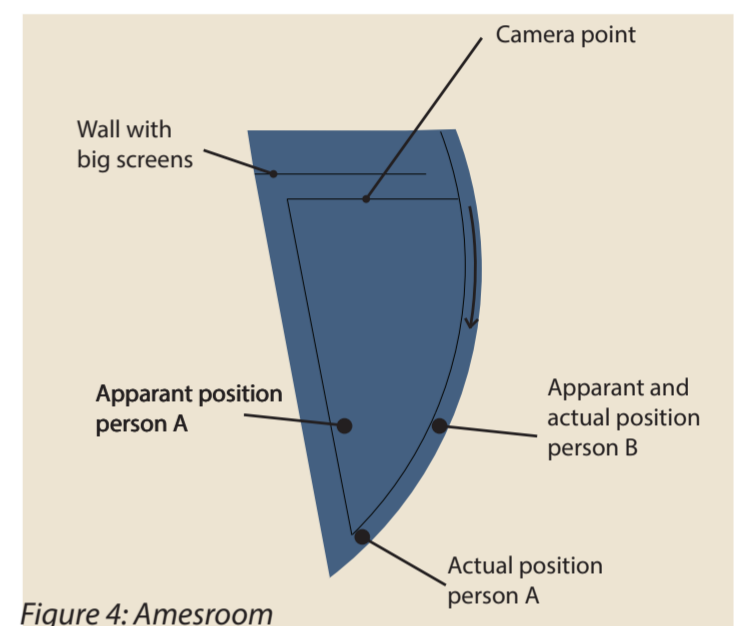


Figure 4: Amesroom

Waiting time

When estimating 1,5 people per square meter, there is space for a total of 750 people. One ride takes 4,833 minutes. The total waiting time is equal to 43,15178 minutes.

Third room

This is where everything is very big and the visitor sees the world as Thumbelina. There will be a decor setting in the middle, where 5 fairies are 'singing' and moving back and forth to amuse and give a real experience to the visitors. The entire wall is covered with large flowers as can be seen in the wall paintings image. There is also a bee, which welcomes you in the Thumbelina world and Thumbelina and the prince are introduced.



Figure 6: wall painting

Conclusion

Our goal was to design the entrance of the Thumbelina ride in such a way that it is more attractive for the visitors and should fit within the system attraction, which is achieved.

To make the queue less boring there is chosen for the use of storytelling, multiple rooms, a treat booth and thematization. Every room has visuals, decor or an interactive aspect and the doors, meandering, walls and ceilings are in theme.

Recommendations

For more explanation the handout Recommendations can be read. In short these are the recommendations when the project is continued:

- Make the ride accessible for visitors in a wheelchair

All the references can be found in the handout References

The theme can be found in the entire attraction and the bee that is used in room 3 is also implemented in other parts of the attraction. Interfaces with the loading dock, control room and the exit are taken into account and adjusted to create a smooth flow of people, detect emergencies and have a supply for the inventory of the treat booth.

However the entrance can not be made yet, because it is technically not feasible yet.

- Add an extra waiting area to achieve the minimum amount of 1100 visitors
- Take another look at the possibilities regarding a shocking flow. To achieve this read the handout, thematization, meandering.