SYSTEMS OVERVIEW

The Attraction must:

people per hour.

tored by employees.

lance.

the exit.

System Requirements

Comply with safety standards.

• Allow for easy crowd control and surveil-

Tell clear and coherent story of Thumbelina.

• Be able to process a between 800-1200

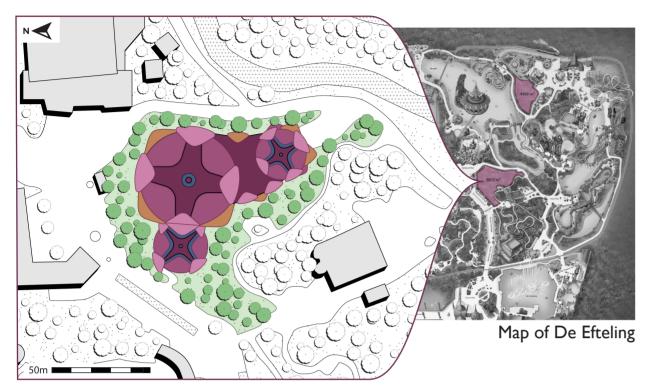
Be immersive from queuing all the way to

• All (sub)systems of the Attraction must be able to be accessed, controlled, and moni-

• Be suitable for ages of 6 and above.

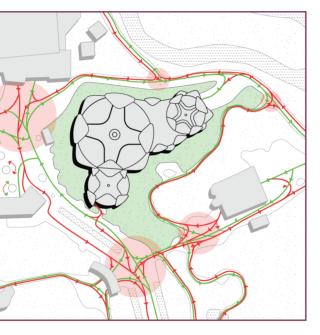
Location Choice

The location and orientation of the Thumbali- De Efteling were large enough for the Thumna ride within De Efteling was chosen based balina ride. The second priority for location on multiple factors. The top priority for the was the proximity to similar rides. The Thumlocation was to have sufficient space to be balina ride targeted users from the ages six able to fit the ride in the park. Based on the and above. This eliminated one of the two budget, the average footprint of a ride in De areas, as it was located in the heart of the thrill Efteling is about 5000 m². Extending the park rides, for older users. The second area was is not possible due to the surroundings then selected based on the most available already being occupied. After analyzing and space and also being closer to similar rides. calculating two areas of forest space within



Orientation & Flow

The orientation of the entrance and exit was decided based on modelling the flow of people in the surrounding areas along with the influence of other attractions, catering, and merchandise stores. The ride entrance is tucked away, so it is not conflicting with the main centrepiece castle and prevents areas of high congestion. Additionally, visitors will be able to see the ride entrance from across the park over the river. The exit is situated in the lower left corner, allowing riders to re-enter the flow of visitors in a less busy area. The main drawback of this exit is that it does not give the user the option to return guickly to the attraction entrance, however with the style of ride this was not considered an important factor.



Exterior

The exterior of the attraction is designed to mimic the bud of a flower. The colour palette and materials have taken inspiration from existing attractions at the Efteling to ensure it is coherent with their brand identity.



N² Diagram

The N² Diagram shows the interfaces between the various subsystems with outputs horizontally and inputs vertically. A global approach has been taken so the exact part of the subsystem which deals which this interface is not considered. From the N² diagram it is clear that the Mechanics and Operating system contain the most interfaces and become the backbone of the whole ride.

Cont P						
o of De Efteling	Entrance	Ordered flow of people into groups	Riders are immersed in the optical illusion of being shrunk			
	Informs the queue of the waiting time	Load platform		Monitor whether peo- ple have entered the ride, informs ride whether it is safe for the ride to start		
			Ride I: Decor & Layout	Inform of position, and technical problems		
	Informs outside visi- tors of ride status	Monitors loca- tion of ride. When aligned, inform platform to allow visitors to enter ride	Informs location of ride.When in position, inform objects to move, and initiate SFX	Ride 2: Mechanics & Operating system	Monitors location of ride.When aligned, inform platform to allow visitors to leave ride	Signals ride has ended to initiate story
				Monitor whether peo- ple have exited the ride, informs ride whether it is safe to leave	Unload Platform	Grouped flow of peo- ple dispersing out
				Inform Safety and status of visitors exiting the ride		Exit
Integration & Test (Plan)						

The Integration & Test Plan considers the integration of the subsystems during the construction of the Thumablina ride. Before construction, the subsystems will have conducted their own internal integration and test plan. First, the plan begins with the validation of the subsystems' components. The phases below have a separate goal within the plan, representing different steps of the integration process. Finally, the validation phase tests the fully constructed ride, approving the system as a whole.

Phase I: Subsystem Validation

Goal: Ensure theoretical integration of subsystem interfaces. Verification:

• Using the Master plan layout and Master N2 diagram, verify the layout and physical interfaces are aligned between subsystems. From building regulations, ensure that emergency exit and services meet specifications.

Testing:

Clear Land

- Virtual model of attraction infrastructure used to simulate the subsystems functioning together.
- Visitor flow is tested to ensure 800-1200 visitors per hour

Validate the subsystems fulfill their requirements.

Approved

Build Control Ride 2: Infrastructure

Room

Phase 2

Goal: Foundations are complete. The control room and Ride Infrastructure are integrated.

Verification:

Build

Foundations

- The ride and control room are built in the correct location and the relevant electrical connections are made.
- Control room has infrastructure in place to accommodate for the subsystem information as it is added.

Testing:

- The ride structure is mechanically safe.
- The ride with 'test' carriages.
- The ride controls through the control room.
- Safety and emergency situations.

Rejected

Average time of ride.

Approved



Approved

Phase 4

Unload Platforms respectively. The ride decor is integrated

• The Entrance and Exit room are built, are in the correct

location and the relevant electrical connections are

Decor functions and does not interfere with the ride.

• Communication with the control room and information.

Approved

Interfaces between Entrance and Load Platform, and

• Functionality of shrinking and growing illusions.

Goal: Entrance & Exit are integrated into the Load &

Verification:

Rejected

 The Load and Unload platforms are built, are in the correct location and the relevant electrical connections are made to the ride and control room.

Platforms perform as required.

Testing:

- Controls of platforms through the control room.
- Interfaces between platforms and ride.
- Safety and emergency exits on the platforms.

Load Platform

Unload Platform

with the Ride Infrastructure.

made with the control room.

Exit and Unload Platform.

Rejected

• Emergency exits.

Verification:

Testing:

Phase 5

Goal: Ensuring Entrance and Exit are integrated with the exterior decor.

Verification:

• Landscaping and pathways are built, are in the correct location and align with the entrance, exit and emergency exits.

Testing:

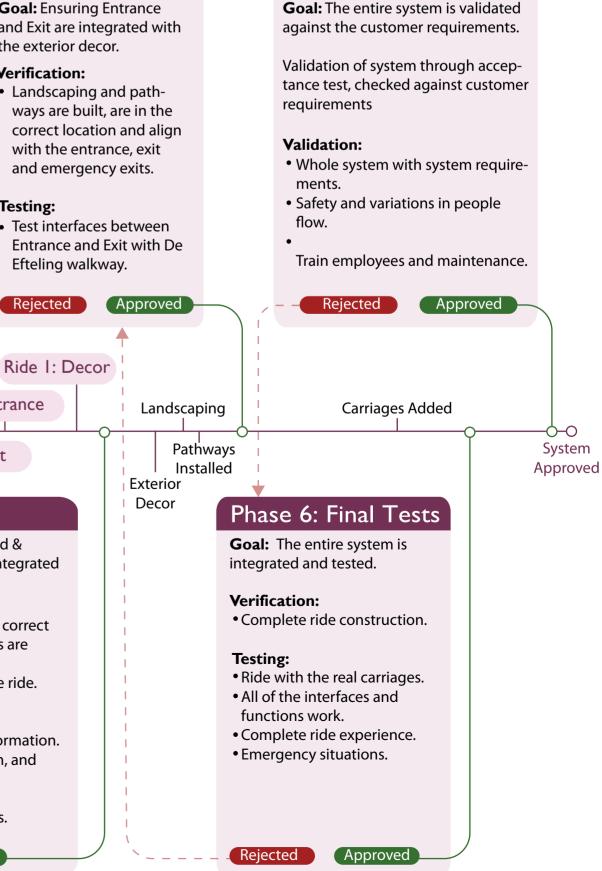
Rejected

Entrance

Exit

 Test interfaces between Entrance and Exit with De Efteling walkway.

Phase 7: Validation



UNIVERSITY OF TWENTE. Cfteling

Peter Hepburn S2197626 & Julia Cyrkel S2053489