

Cretaceous Gardens Controller

Requirements Definition Document

RDD Version 1.0

Team #3

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CS 460 Software Engineering

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1 Introduction

2 Definition of Terms

This section details all terms used in the document for the sake of minimizing ambiguity as much as possible among team members, between teams, and between the client and the team. Remaining with the interest of preserving the integrity to our communication, the following terms may be altered, reduced, or augmented to better reflect what it is that everyone is attempting to say.

3 Objectives

We came up with four main objectives that we believe are critical to this specific system. We believe if we design the software around these objectives that it will produce the best and most appropriate product.

3.1 Safety

The main objective of this product is to build a CGCS which focuses on safe and reliable experience to our customers. Whether we talk about the electric fences or self-driving cars, ensuring safety is the highest priority. We want the visitors to feel safe in every way possible and therefore, all these necessary measurements are taken into account by the CGCS.

3.2 User Experience

We want the user to have an amazing experience. Since this is a park to witness the amazing T-Rex, the user experience should be top notch. We will achieve this by focusing on the details of every interaction with the user. This involves easy token purchases and intuitive interaction with the vehicles. The user experience must be reliable.

3.3 Maintainability

The entire CGCS and all nodes that it controls will be designed with maintainability in mind. The system will understand the state of its health and report on it. Every node of the system will be designed this way and the CGCS will understand the health state of all systems. The system will have redundant infrastructure to maintain the system with minimal downtime specifically focus on the electric fence.

3.4 Efficiency

When it comes to efficiency, the CGCS will make sure that both the software and hardware components are highly efficient and functional. Whether we talk about self-driving cars, pay kiosks, camera system, gps, or electric fences, the CGCS must be efficient in interacting with them. This will be possible when all the other objectives are met.

4 Overall System Organization

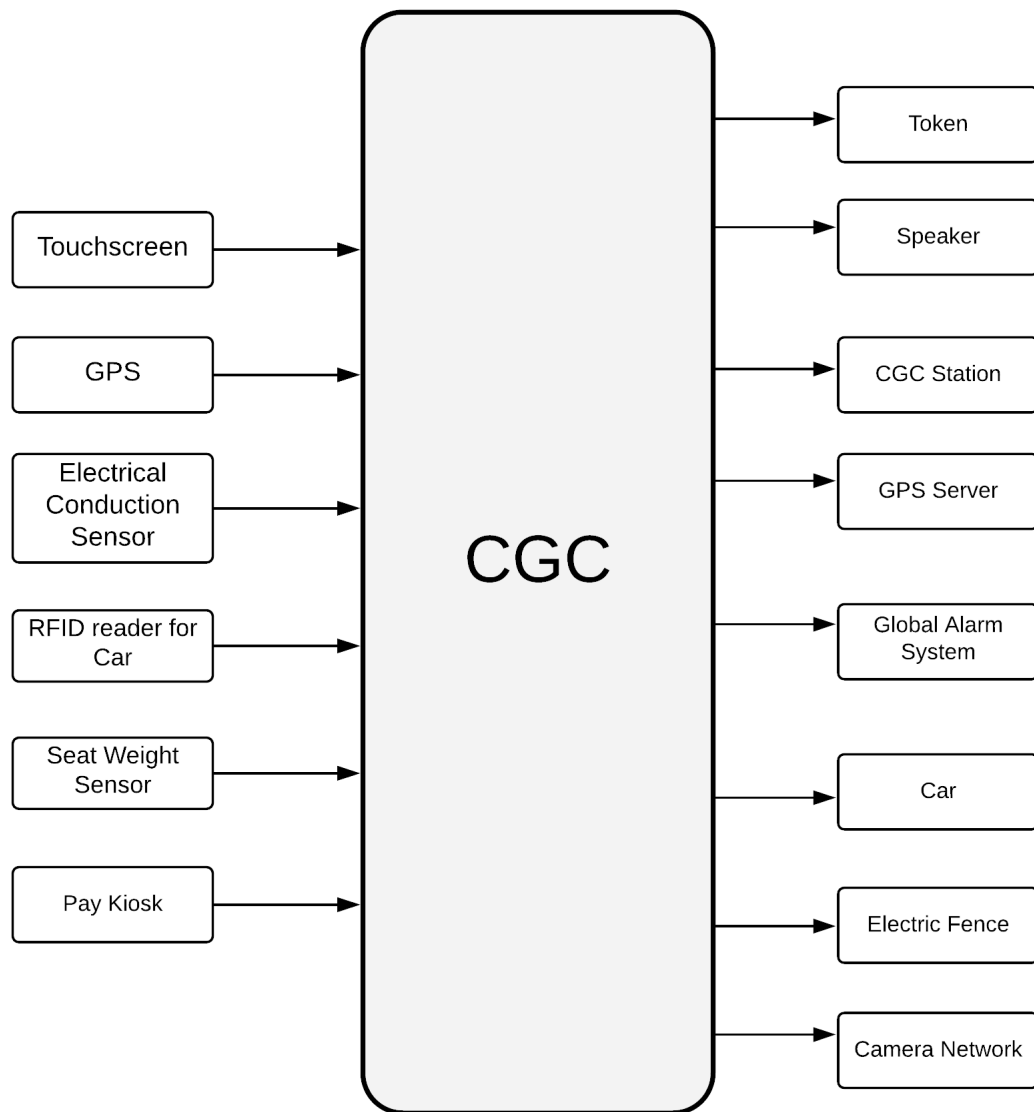


Figure 1: A black box of high-level inputs and outputs of the *CGCS*

5 Interfaces

We have broken our interfaces up into main systems. these interfaces may be composed of their own sensors but they do not interface with the CGCS. The following list of interfaces list their sensors, hardware, and features.

5.1 Pay Kiosks

The purpose of the the Pay Kiosk interface is to connect the physical Pay Kiosks to the CGCS. It is composed of sensors and is designed to do specific feature

Sensors

Touch Screen: used to sense user interaction

Credit card: accepts all major credit/debit cards

Cash receptacle: accepts and analyzes cash

Hardware

change dispenser: dispenses appropriate change to the visitor buying a token

Token dispenser: dispenses token with unique ID to user

Features

Token builder: this features will take the payment and the filled out user form and build a unique token for the visitor.

Maintenance: this feature will let the employees manage certain issues associated with the pay kiosks and also will let the employees see the health of the machine.

5.2 System Interfaces

System Interfaces provide all the sensors that are related to safety. The main purpose of these interfaces is to ensure that the ECS properly operates and safely carries its passengers to their respective destinations.

5.2.1 Alignment Sensor Interface

The alignment sensor interface will ensure that each elevator cabin is properly aligned to the floor before the elevator cabin can open its doors. This interface will concurrently work with the door sensor interface. Once the floor is detected, this interface will send its signal to the door sensor to open the doors. This will ensure that the passengers get to their destination safely without getting injured.

5.2.2 Door Sensor Interface

To further talk about safety measures, the door sensor interface is required, which will help protect our clients from any mishap. This interface will provide specifications for handling the mechanism of opening and closing the doors. In the case of any obstruction, this interfaces specification will also prompt the door to open immediately and wait a fixed amount of time until the danger is clear.

5.2.3 Fire Alarm Sensor Interface

In order to ensure safety, one very important interface is the fire alarm sensor. The fire alarm sensors are wired throughout the hotel. There will be fire alarm sensing in the ECS which will prevent both elevator cars and elevator bays from functioning if the fire alarm is activated. This state will be valid until the Emergency key is detected.

5.2.4 Keyhole Panel Interface

The keyhole panel interface will provide functionality to specific clients such as Executives and Firefighters. The 20th floor button will have a special status and it will only work if an executive key is detected. This interface will be very simple and straight-forward to use for our special clients as it will only require a key to unlock more features in the elevator.

5.2.5 Speed and Acceleration Sensor Interface

The speed and acceleration sensor interface will be responsible for following the states regulations and protocols. This interface will help in ensuring that the elevator cabins in the ECS do not go over the minimum and maximum

speed. This interface will also provide the specifications for acceleration sensing which will be relatively based on the weight each elevator cabin carries.

5.2.6 Weight Sensor Interface

Each elevator cabin in the ECS will be equipped with weight sensors to ensure safety. This interface will provide specifications for the safety requirements as well as being responsible for letting the clients know whenever some specific elevator cabin has reached the weight limit. (Note: each elevator cabin has its own weight capacity limit, therefore, if one elevator cabin has reached the weight limit, this will not affect other elevator cabins).

5.3 User Interfaces

User Interfaces provide all the necessary options that the passengers need. They are meant to be simple, straight forward and easy to use.

5.3.1 Button Panel Interface

When it comes to assisting the passengers inside the elevator cabin, an important interface is the button panel interface. This button panel interface will provide all 20 different floor buttons as well as closing the door and opening the door buttons.

5.3.2 Keyhole Panel Interface

The keyhole panel interface will provide functionality to specific clients such as Executives and Firefighters. The 20th floor button will have a special status and it will only work if an executive key is detected. This interface will be very simple and straight-forward to use for our special clients as it will only require a key to unlock more features in the elevator.