

# Cretaceous Gardens Controller

## *Requirements Definition Document*

*RDD Version 1.0*

Team #3

17 October 2019

**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<sup>1</sup> 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

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<sup>1</sup>Objectives by Anas and Siri.

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

The CGCS will be the centralized system<sup>2</sup> and it will manage all the other associated components. Figure 1 shows the black box diagram of CGCS. The CGCS receives inputs from the sensors as well as user interfaces and emergency systems such as Global Alarm System and responds to them through appropriate output actions as described below in the diagram.

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<sup>2</sup>System Organization by Anas and Siri.

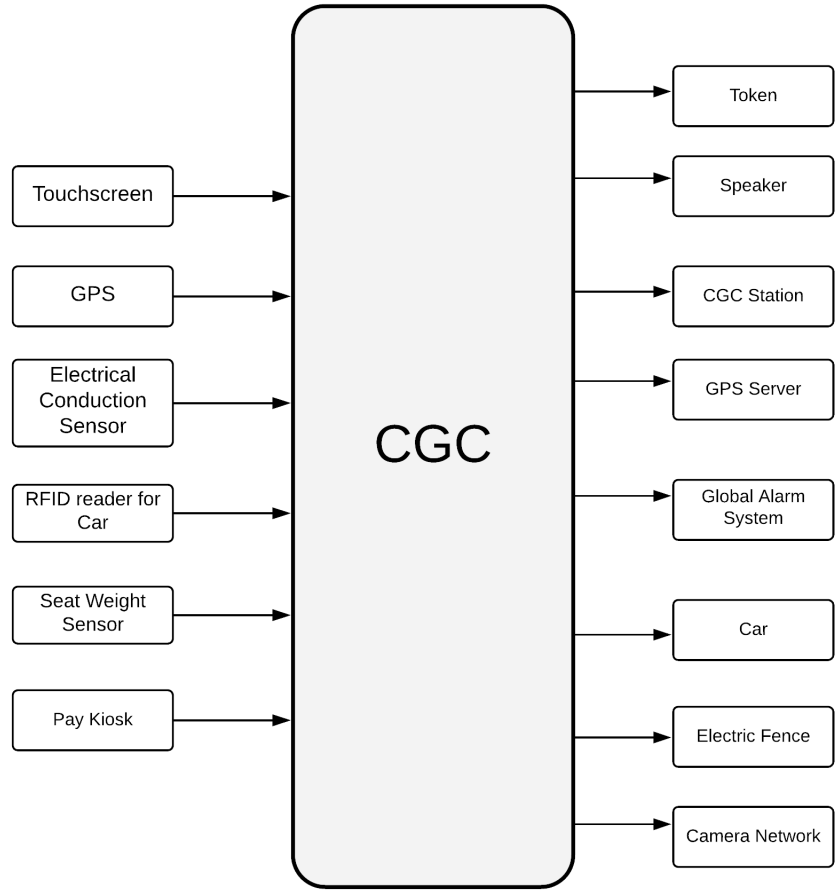


Figure 1: A black box of high-level inputs and outputs of the *CGCS*.

## 5 Interfaces

*We have broken our interfaces<sup>3</sup> 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 Token

*The Token will act as an interface to multiple systems. It will provide valuable information about the visitor and also interact with the visitor.*

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<sup>3</sup>Interfaces by Siri and Anas.

## Sensors

**Touch Screen:** used to interact with the users.

**GPS:** the Token will contain a GPS to sense the location of the token.

## Hardware

**RFID:** the RFID chip will be programmed with a unique ID and used for multiple purposes included access to various systems and areas.

**Speaker:** the token contains speakers as hardware for alerts and instructions.

## Features

**Location/Map:** utilizes the GPS to provide location services.

## 5.3 Car

*There will be an interface with all the cars. The autonomous car will be built utilizing a partner. We will work closely with them to provide access to specific sensors and features.*

### Sensors

**RFID reader:** that covers the proximity of the car and is used to grant access and count how many tokens are currently in the car.

**Seat Weight Sensor:** used to determine if there is someone sitting in the seat.

**Camera:** used by the car for autonomous driving and also connects to CGCS for a needed scenario.

**Mic:** used to sense voice for use in an intercom.



## Hardware

**Speaker:** used to alert guests.

**Automatic Door Locks:** this will be initiated when the car is determined to be moving.

**Wireless networking:** for communication purposes to communicate with the CGCS.

## Features

**Maintenance System:** allows for health checks and health status communication of the car.