Objectives:

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.

1. 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.

1. 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.

1. 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.

Interfaces:

1. User Interfaces:
2. Sensors:
   1. Token Sensor:
3. Hardware Components:
   1. Pay Kiosks
   2. Electric fence:
   3. Car
   4. Cameras
4. 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*

* 1. Sensors
     1. Touch Screen - used to sense user interaction
     2. Credit card - accepts all major credit/debit cards
     3. Cash receptacle - accepts and analyzes cash
  2. Hardware
     1. change dispenser - dispenses appropriate change to the visitor buying a token
     2. Token dispenser - dispenses token with unique ID to user
  3. Features
     1. Token builder - this features will take the payment and the filled out user form and build a unique token for the visitor.
     2. 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.

1. 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.*

* 1. Sensors
     1. GPS - the Token will contain a GPS to sense the location of the token
     2. Touch Screen - will be used to interact with user
  2. Hardware
     1. RFID - The RFID chip will be programmed with a unique ID and used for multiple purposes included access to various systems and areas
     2. Speaker - The token contains speakers as hardware for alerts and instructions.
  3. Features
     1. Location/Map - utilizes the GPS to provide location services

1. 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*

* 1. Sensors
     1. 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
     2. Seat Weight Sensor - used to determine if there is someone sitting in the seat
     3. Camera - used by the car for autonomous driving and also connects to CGCS for a needed scenario
     4. Mic - used to sense voice for use in an intercom.
  2. Hardware
     1. Speaker- used to alert guests
     2. Automatic Door Locks - this will be initiated when the car is determined to be moving
     3. Wireless networking - for communication purposes to communicate with the CGCS
  3. Features
     1. maintenance system - allows for health checks and health status communication of the car.

1. Camera network

*The camera network interface is incharge of communicating with every camera, the redundant network links to each camera, and the DVR system that keeps recording of all cameras per retention policy. It will report on its health.*

* 1. Sensors
     1. Cameras - Records video.
  2. Hardware
     1. DVR - stores and retains video.
     2. Hardwire Ethernet (redundant uplinks) - used for network communication with CGCS
  3. Features
     1. maintenance system - allows for health checks and health status communication of the camera network
     2. Viewing - ability to view any camera feed.

1. Electric Fence

*The electric fence interface will ensure that the visitors are safe from the attack of T-Rex. It will provide features for maintainability, and sensing options to reduce the risk of any damage.*

* 1. Sensors
     1. Electrical Conduction Sensor - senses for electricity going through electric fence. It has the ability to trigger when there is no electricity.
  2. Hardware
     1. Electrical Fence Panels - special kind of physical panels that allows conductance of electricity going through it.
     2. Hardwire Ethernet (redundant uplinks) - used for network communication with CGCS
  3. Features
     1. maintenance system - allows for health checks and health status communication of the electric fence

1. Global Alarm system

*The global alarm system controls what gets played on a network of speakers for emergency related or informative needs.*

* 1. Hardware
     1. Speaker -the global alarm system communicates with a network of PA speakers
     2. Hardwire Ethernet (redundant uplinks) - used for network communication with CGCS
  2. Features
     1. maintenance system - allows for health checks and health status communication of the Global Alarm System

1. CGC Station

*The CGC station is a device and interface that interacts with employees. It contains a user interface to analyze and interact with the nodes that the CGC can communicate with or monitor.*

* 1. Sensors
     1. Microphone - used to pick up voice to interact on the intercom. It can also be used to send announcements out to the Global Speaker System
     2. Touch Screen - used to interact with employee with a provided GUI interface
  2. Hardware
     1. Speaker - can be used with the intercom
     2. Hardwire Ethernet (redundant uplinks)
  3. Features
     1. maintenance system - This one is unique in the sense that it can communicate with all other maintenance systems and initiate system checks.

1. GPS Server

*The GPS server interface provides locations of all the active and surrounded GPS devices that it needs to interact with.*

* 1. Features
     1. keeps track of all GPS devices and their longitude and latitude
     2. third party service to provide GPS services