

C3 - Evaluation of the Technical Design Document

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Executive Summary

Servr is a system that aims to improve the department store shopping experience while increasing revenue for department store proprietors. Servr improves the department store shopping experience for customers by allowing customers to continue shopping after their cart becomes full without having to manually check out their items. Servr accomplishes this task by using automated carts that can be remotely called by the customer. When a customer has filled their cart, they scan a nearby QR code in the store. A central control system in the store dispatches a roboticized empty cart that autonomously navigates to the user's position within the store.

Once the new, empty cart arrives at the user's location, the user takes the new cart and dispatches their old, full cart to the cashier's location, where it will be safely stored until the user is ready to check out. In order to allow customers to easily scan the store's QR location codes, call empty carts, and dispatch full carts, the Servr system provides a mobile app that allows the user to perform all functionality required by the system using their phone.

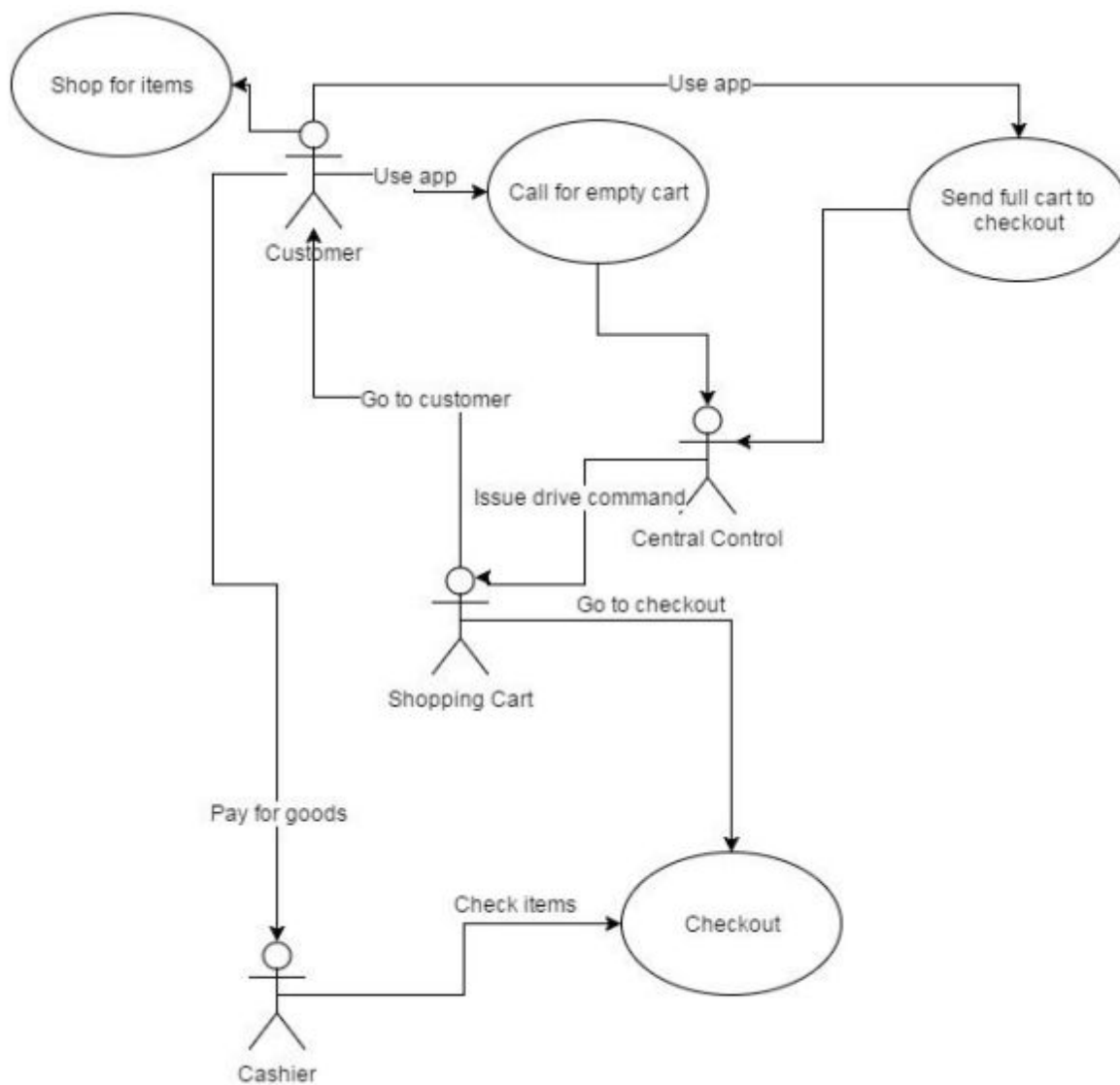
QR codes are placed at regular, known locations throughout the store. When a customer scans the QR code, the Servr system is then able to pinpoint the user's exact location. Once the user's location is pinpointed, the system dispatches an automated cart to the user's location. Carts are capable of collision avoidance, and can navigate to the user's location without assistance if no insurmountable obstacles are encountered. When the user dispatches their full cart to the cashier, the same automated system is used to navigate the cart to a cashier location. Carts are associated with a user through information entered in the app, so that when the user comes to the checkout station, cart identification is trivial.

Servr saves department store customers time by allowing them to continue shopping when their cart becomes full. At the same time, Servr increases the revenue of department store proprietors by allowing customers to shop for longer without checking out their purchases.

This document details suggested changes to the Functional Specification and Management Plan (S3A) and Manual (S3b) put forward by the developers of Servr.

S3A Annotations

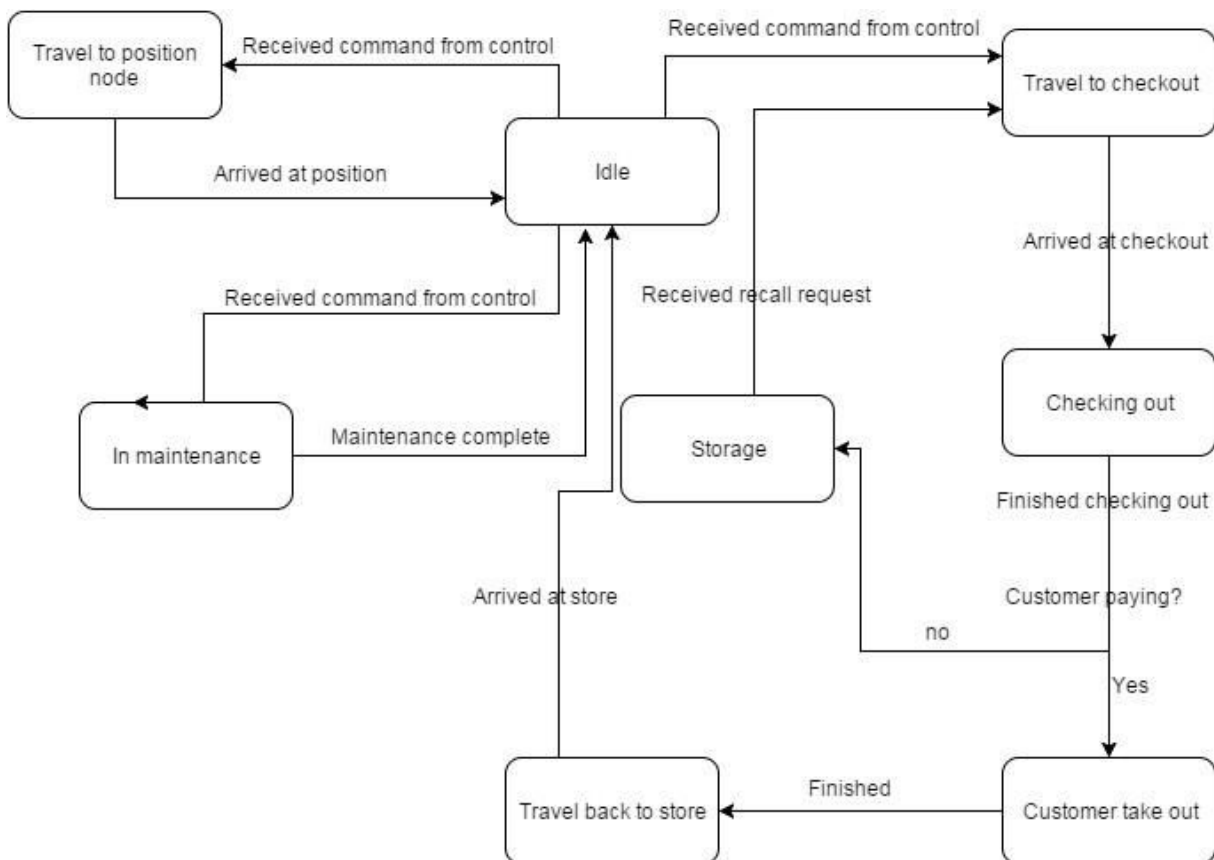
User Interaction



The customer uses the mobile application to request for a new empty cart to their location or to send their existing full cart to checkout. The system determines the location of the customer and an available self driving cart is dispatched to them. The user

marks the existing full cart with unique identification and the cart leaves for the checkout station and waits till the customer is done with shopping. When the customer is ready to checkout, they can use their unique identifier to bring up their checked total as well as recall the cart full of their goods. ***User Interaction Change: The cart robots should bring full carts to the checkout, but this then needs to pass through a cashier for payment. The current diagram has unpaid and paid goods at the same point(checkout).**

Cart State Diagram



The cart can be in a number of different states. The states are changed in response to commands received and context such as current state. Idle is the state the cart is most often in. Idle state allows for actionable responses to commands received from the control center. A cart will experience all the states multiple times during its typical

lifecycle. ***Please clarify purpose of the Storage state and how it differs from Idle state. They both appear to be “sitting” states that require receive commands.**

Sample Interactions

An intuitive way to envision how the system operates is to think of the system as if it were another person whom the user was talking to. Under this assumption, the following are sample dialogs which explain the overall operation of the system:

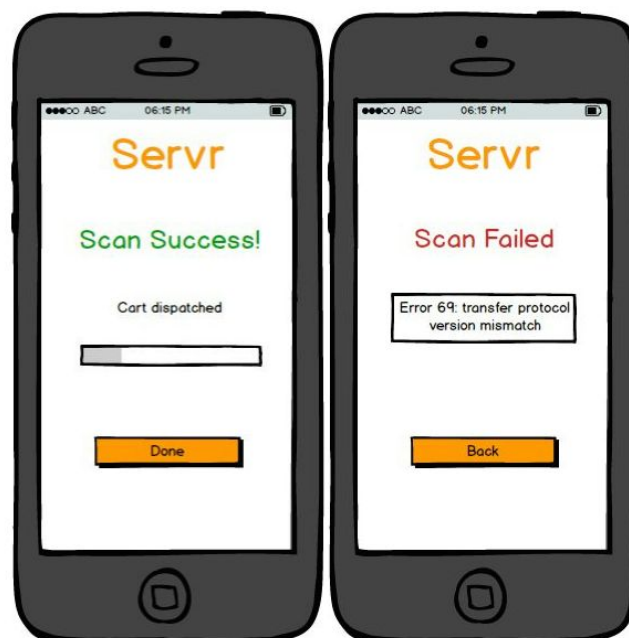
User: Please send a cart. Here is my location.

System: Please wait. A cart has been dispatched to your location.

System: A cart has arrived at your location. Please mark the cart as ready for future checkout by swiping your phone.

***Clarification needed: Does swiping act as marking the cart as full? Or a confirmation of received cart? If the latter, the system response is not needed at this point.**

App



When the scan is successful, a screen like the one depicted on the left is shown on the user's phone. When the scan fails, the screen on the right is shown and the user must collect a cart manually. ***Customers might not understand technical language such**

as in the error message displayed. If the customer needs to manually collect a cart, please also consider explicitly displaying this message in the app.

S3B Annotations

Use & Care Guide



Models: 001.ab772c

RoboDog Shopping RoboCart Management System
Almost Games Ltd.

***The logo and “Robodog” system name are impressive and reflect our branding vision**

Requesting an Empty RoboCart

Users can use the application to have an empty RoboCart delivered to their location in the store.

1. Open the “Servr” application
2. Press the scannerbutton
3. Position the phone near one of the many position nodes located in the store aisles.
4. Wait for a confirmation signal
5. One of two cases will occur depending on the user's current state
 - Case 1: The user does not have a linked RoboCart An empty RoboCart will be delivered to the user's location

Case 2: The user has a linked RoboCart The system will assume the user's linked RoboCart is full and automatically dispatch it. An empty RoboCart will then be delivered to the user's location. ***A confirmation should be required before dispatching the full cart in cases of the cart not being full(customer places items back on shelf) or the customer changes their mind.**