Kiersten Schmall, Kylie Norwood, and Elijah Ives

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Project Initial User Requirements - **Updated**

Client is the Schaper Sandwich Shop. There is currently one location of this business. The client is considering starting a delivery service in order to keep up with competitors. The client wants to franchise their business. The client also wants to dominate the sandwich business. To do so, it is believed that rather than create a traditional delivery service, it would be better to put the entire sandwich shop in a truck and have the truck drive to customer houses to deliver sandwiches. A sandwich truck will have the entire ability of a brick-and-mortar store.

The client wants to also update their menu. The client has specialty sandwiches that their customers love. They will also determine the best (most desirable) menu based on customer surveys. The menu must contain sandwiches that can be prepared in the limited space of the truck.

The basic operation of a truck will be as follows:

- Customer places an order by phone or online website or in person.
- Menu on truck will include customizable sandwiches, specialty sandwiches (which allow modifications), sides (e.g. chips), and drinks. Truck will also function as a deli, allowing customers to order cold-cut meat in bulk.
- Order preparation must be as close as possible to delivery time so as to keep the sandwiches as fresh as possible. If two people order at the same time, truck fills the order closest to its current location.
- The orders are prepared and packaged for delivery.
- When a destination is reached, an employee takes the order to the customer's door and collects payment.
- If the truck has no orders, it will patrol neighborhoods and make road side sales.
- If the truck runs low of a product, it will schedule a stop at a supply center to restock (gas included) which will be located at the center of the delivery area and gas station. The Delivery area will have a 10 block radius.
- The truck has a driver, an order taker and deliverer, and an order preparer (3 people total) If and order is being Delivered the driver acts as a secondary Ordertaker.

The client wants a software system that will run the business of the truck. To test the concept of a mobile sandwich shop, the client wants a simulation of the operation of the truck. The software must:

- Allow for order entry, order editing, and order cancellations.
- Scheduling of order preparation and packaging. Will use a number system to keep track of orders, unless customer as an account. Then it is possible to remember orders, recurring customers and even payment information.
- Keep track of the cash register that only accepts bills up to $20 as of now. The starting amount in the register would be $200 (may change).

Other Technical Aspects/Low Priority Ideas:

- Accept cards (hoping as a primary), largest bill will be a 20
- Consider traffic - we will try to address this idea later in the process
- If there are no orders, have the software direct the truck to the distribution center (can restock when not busy)
- There should be control as to how the preparer should make the orders in order to be as fresh as possible

Tasks Completed:

- Orders will be put in a file, will be read, and processed in that order
- The neighborhood will be a square (20 blocks by 20 blocks), print
- Driver will have to follow the route given by the software
- Customers must be able to keep track of the location of the truck.
- The address of the customer is used to determine the route the truck will follow. This route is updated each time an order is placed. Routes must not cause indefinite postponement of deliveries.
- Each order is placed in a queue of orders such that each order will be ready before the time the truck reaches the delivery destination. Priority queue now prioritizes by order times.
- Generate 100 random order times to test system.
- Generate a file that will contain addresses and the order times.
- Computes and outputs the length of the truck's route, but does not show route yet.
- Displays a simple simulation of the truck's movement.
- Generates cost effectiveness of the route used by the truck.
- Neighborhood size can be adjusted easily if desired
- Simulation will remove a house when the delivery is completed

- Schedule delivery times and the truck route **(currently random).** There must be an easy way to change the heuristics used to create the routes so that the company can experiment with different strategies **(currently strategy)**.

The client knows that the requirements for this operation are not complete and is relying on the software development company it hires to help flesh out additional details (or even ideas) regarding the mobile sandwich truck.

Story #1:
Blocks range from 0 to 19. Houses range from 10 to 90, 110 to 190, and so on East is our X axis and corresponds to the horizontal streets, and South is our Y axis which corresponds to the vertical streets. The neighborhood is a square and the distribution center is at 910 South 9th St. Each block is a quarter mile square and the houses are equidistant, but we can consider the distance to be measured in “units”. The truck is currently at a fixed location: the distribution center. Distance should be the road distance rather than the shortest path through the target since we can't drive through houses. The addresses are stored in a priority queue where the highest priority is the distance the address is from the truck.

Story #2:
Create a simulation of the truck moving through the neighborhood and making stops at each order location.

Story #3:
Add an order to the randomly generated data. Compare the costs of two different routing techniques for the truck.