

Design Research Report

SALT - Sales And food Log Tracker

 Helping small restaurants operate efficiently through data.

CSE 440 AA

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Team

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Problem & Solution Overview

Sam the server is frustrated. Twice this month he has been asked to come to work on his day off. Much like last time, Sam was given little notice by management. Every so often, the restaurant is hit with unexpected traffic. Management lets them know that there was a local event that's left lots of hungry customers at their door. Sam the server is proactive and frustrated, he combs through sales in the past two years and finds that the same event occurred last year around the same time.

Restaurants have to deal with varying amounts of customers and varying order from customers on a daily basis. A restaurant's ability to adapt to the dynamic environment directly affects the food wasted.

Computers, better than humans, are able to comb through large amounts of data. Using visualizations, they are able to simplify and inform users. Our proposed solution allows restaurants to track the food ordered by customers and the food ordered by the restaurant. Provided the data, our proposed solutions further helps our customers reflect on food waste and gain actionable insights.

Design Research Goals, Stakeholders, and Participants

During our design research, we completed a total of 4 interviews with chefs, owners, and head servers. We noticed a general theme that food waste is not a problem in restaurants due to ample ways of tackling it including: specials, upselling, portion sizes, staff meals, quick ordering cycles, and freezing with frying. Fundamentally their goal is to optimize selling the food ordered and maintaining happy customers. We discovered that depending on management's ability to employ tricks like reducing the size of the plate, iterating on the menu with seasons, encouraging

servers to upsell and ordering based on predicted customers, restaurants did a better or worse job optimizing. The breakdowns we discovered occurred were in communication between the front and back of house, tracking food preferences from season to season and tracking events from year to year.

Goals

The goal of our research was to understand how is food waste managed in small restaurants. We broke this overarching goal into smaller more defined goals:

- How do small restaurants plan meals and track their pantry?
- How do small restaurants track food waste?
- Who are the people working in small restaurants and what are their day-to-day tasks?
- Are there any other pain-points that are related to managing food-waste in restaurants?

Stakeholders

The stakeholders for this project would be small restaurants in areas around University of Washington, Seattle. These would involve restaurant owners, managers, chefs, servers, and any other personnel in small restaurants that are involved in taking food orders or meal planning.

Design Research

We chose to do interviews with 3 - 4 participants for our design research. Due to the time constraints and health code, we were unable to conduct a longer journal study or a contextual inquiry.

Participants

Participant 1: Sam the College Student

Worked as a server, head server, and assistant manager for two restaurants in Seattle over the course of 2 - 3 years. We conducted a video call for an hour around 6pm. Sam is a tech savvy graduate from UW. He graduated last year and has several years of experience working in multiple roles within the food industry.

Interview over video call following the interview protocol defined by the team.

We chose to interview Sam because he served as a server, head server, assistant manager and cook at two different restaurants over a period of multiple years. His breadth of experience allowed us to get insights into the world.



Participant 2: Chef Dave at the Sorority

With an experience of over 27 years working in the food business, Chef Dave has worked in coffee shops, owns a catering company, and is also the chef at a sorority.

We interviewed Chef Dave in the sorority kitchen while he was preparing to cook dinner. We decided to interview Chef Dave as he cooks for a large group of people and has years of experience being in the food business that includes working in small restaurants.

We chose to interview Chef Dave because he was available as our first participant. He helped us better understand basics before we got to the other 3 participants.

Participant 3: Sanyali - Thai Food Restaurant Owner at Roosevelt Way

Sanyali has been working in the food business since 1996. She and her family started the Royal Palm Thai restaurant in 2005. The restaurant is run by her family, where her husband is the head Chef and manages the pantry, she is the manager and helps in the kitchen. Other family members such as her sister and niece too work at the restaurant.

We met Sanyali at the Royal Palm Thai restaurant at 5 pm. That was the time when there were no customers and Sanyali had some time to talk. Interestingly, the first time we visited her at 3 pm the same day, Sanyali and her family were eating lunch at the restaurant.

We chose to interview Sanyali due to her depth of experience as an owner of a restaurant that fit our target customer profile.

Participant 4: Kara the Portage Bay Manager at the Roosevelt Way Branch

Kara has been working in the food business for over 5 years and has been a manager at Portage Bay for the last 2 years. She comes from a family that owns restaurants.


We interviewed Kara in person at Portage Bay after their working hours. While her team of servers and other kitchen staff were cleaning the space, Kara offered to talk to us.

We chose to interview Kara due to Portage Bays success locally with 4 stores. She demonstrated a lot of ideas and experience other interviews did not provide.

Design Research Results and Themes

Below we address five common themes that emerged in our design research after interviewing four participants with different background.

- First, the business model and food served at a particular restaurant will influence their process of planning meals, ordering food, and tracking or reducing food waste. For example, from our interview with Sam, he told us that in a sushi restaurant, fish is the main cost and goes bad quick; therefore, the main focus is on prolonging the fish lifespan, reducing fish waste, and structuring the menu around the fish available. Furthermore, a chain restaurant will have different processes than a single restaurant because it has more centralized organization and may even have a centralized kitchen, like Portage Bay that we spoke with. Lastly, food preparation is different in different types of restaurants. Some of the people we interviewed, such as the manager at Portage Bay, told us that their restaurants pre-cook food to be served later, while others, such as the Thai restaurant we interviewed, pre-cooked almost nothing.
- Second, paper or thinking is mostly used to plan food orders. The planning is often done retroactively instead of proactively. For example, Mio Sushi where Sam worked, we learned that often things are ordered after knowing they are almost out or already out, as opposed to ahead of time. Some restaurants have a system in place for this, such as the Thai restaurant that breaks large food containers down into small ones and keeps track of how many small containers are left to know when to order more.
- Third, similarly to planning food orders, there are already systems in place for tracking food waste, but these systems are largely on paper/in memory and there are no existing tools used. For example, Portage Bay does not keep any sort of waste log- they would just eye-ball the amount of food being wasted, since they were often on the floor interacting with customers. While restaurants tend to keep track of food trends over the years, and note how many customers come in each day so they can reference that number in the future, these logs are done on paper or spreadsheets, or even mentally. Restaurants, without a concrete system, can find themselves a victim of events bringing unexpected numbers of customers. For example, Mio Sushi before Sam stepped in, was cut off guard multiple times off season with large events where they could not fulfill customer orders.
- Fourth, there are several strategies currently being employed in terms of tackling food waste. One strategy is encouraging the customer to waste less food. For example, at Portage Bay, small serving spoons are used at the buffet bar to encourage customers to take less. Also, at Portage Bay and from our interview with Sam, we found that one



strategy is promoting specials and having staff meals with leftover food items helps reduce food waste. This tactic was a common trend in all of the small restaurants we interviewed. Wasabi in Seattle would promote competition between employees to upsell items that were plentiful. Shopping often allows restaurants to only buy small amounts of food as needed, which further reduces waste. As well, depending on the frequency of the ordering cycle, some foods took multiple ordering cycles to go bad; therefore, those foods would never be wasted.

- Lastly, communication issues can lead to problems with food waste. Depending on the restaurant, roles for throwing food away and ordering food would be divided. For example in Mio Sushi, the servers threw away the kegs while the managers ordered them. Unless the servers were confident to approach the manager, the manager was not informed how much was thrown away. The chef is responsible for ordering the food while the servers are responsible for upselling the food. If the chef does not communicate with the servers in time which food are low, plentiful, and out then food would be wasted like in Wasabi.

Answers to Task Analysis Questions

Who is going to use the design?

Currently, we are trying to targeting all the people involved in the process of ordering food, planning out and selling out food. In order words, we are targeting anyone who works at the restaurant, including servers, chefs and restaurant owners.

What tasks do they now perform?

Based on the interviews we conducted, there are different areas of tasks that are performed. In food food and ingredient ordering and preparing period, owners or chefs order the appropriate amount of food regularly (on weekly basis or bi-weekly basis). During the day, they track how much different food are left, and they react to it. For example, if one certain type of food has significant amount left, it will be served and recommended as that day's special.

What tasks are desired?

We learned from servers that it would be desired that forecasting food shortages or food waste one or two days ahead of time gives them room to upsell and curb the effect. We learned from managers that they are sometimes surprised by surges of customers due to events. We found out that frequently accessing data in the last years helps them predict surges. It would be helpful for them to plan for these events. We learned chefs that it's useful to know the orders from past months and past years to plan the menu.


Restaurant owners, chefs and servers currently track food using spreadsheet, paper or simply by remembering things. Ways to organize and collect data would be helpful.

How are the tasks learned?

The tasks are learned through trial and failure. Every restaurant has a different customer portfolio and different management. Managers through days of overstocking or undeserving learned about trends. Chef's learn from years of experience of effective menu items in certain cities and restaurants. Chef's overtime learn to build new menu items that sell well from overstocked food and communicating that as a special to the servers.

Where are the tasks performed?

Depends on the task, it might be performed in kitchen or office. For example, to track how much fish is left, the tracking is performed in the kitchen or storage place. To calculating and preparing for the ingredients and food for the next week, the task might be performed in an office.



To communicate with the chef or manager concerning overstocked food or food shortages, it's done reactively or at the beginning of shifts.

We desire that the task of tracking will be done throughout the day with servers performing the task on phones. We desire assembling the order to be done automatically with small adjustments with our software in the office. We desire that servers know immediately about a food shortage or abundance via their phone.

What is the relationship between the person and data?

From a restaurant owner's perspective, the data to track food is a way to track the profit and how the business is performing. From a chef's perspective, the data of how much each type of food is left means what type of food to be cooked. For example, if there were a lot more fish left than expected, that fish becomes today's special and will be recommended by servers to customers. To servers, it is a way to tell what food to recommend to customers.

What other tools does the person have?

Currently, based on the data we collected by conducting interviews, there are three types of tools that are used: spreadsheet, paper, or by simply remembering things.

How do people communicate with each other?

Because of the restaurant environment, the owners, chefs and servers mostly communicate with each other by talking face to face. Depending on the communication, some of it was through paper. For example, orders are communicated by passing paper. Food shortages are sometimes communicated face-to-face and sometimes through papers printed by managers on a per shift basis.

How often are the tasks performed?

It depends on the restaurant. One restaurant we interviewed performs the tasks twice a week. It might not be the case for other restaurants.

What are the time constraints on the tasks?

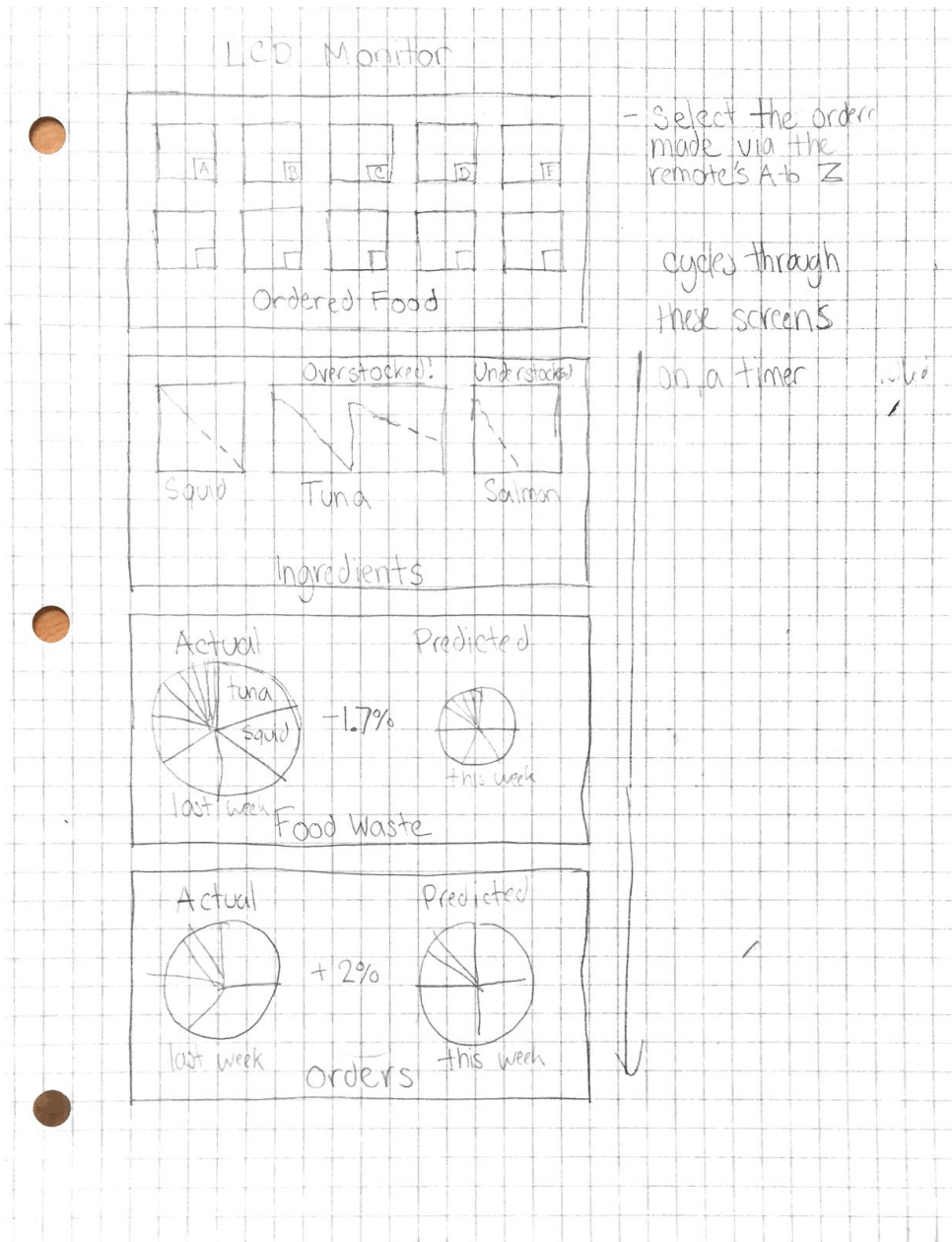
The most important time constraints are items that have hard expiration dates. For example, when fish hits the hard expiration date, there is no other way besides throwing it away.

What happens when things go wrong?

The most common things that happen are out of necessary ingredients, having too much food leftovers or food waste, or food goes bad.

Propose Design Sketches (3 ideas)

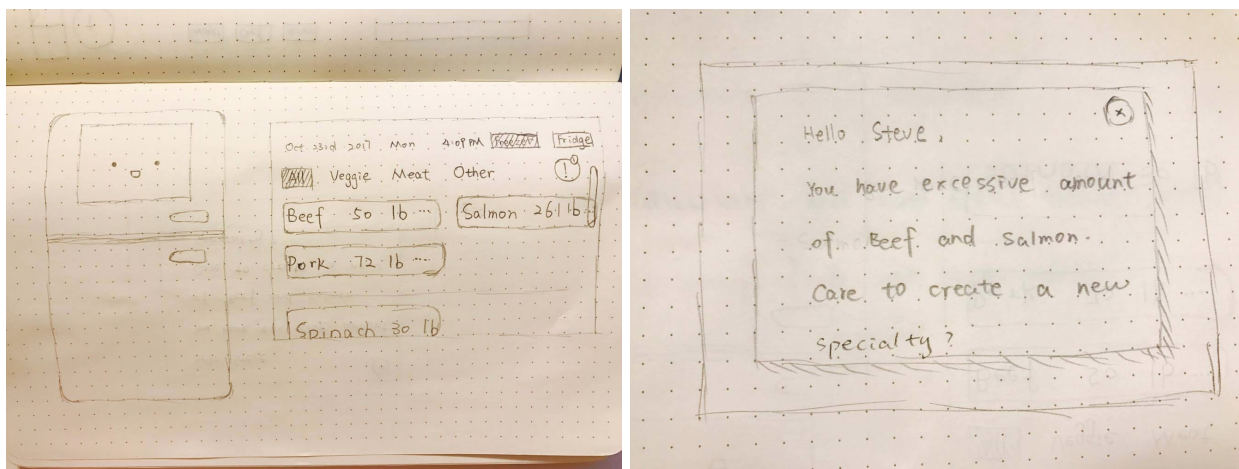
Sketch 1: Command Center



The command center is an LCD monitor control via a remote. It will display multiple pieces of information, such as food ordered, status of ingredients in the kitchen, and trends from past

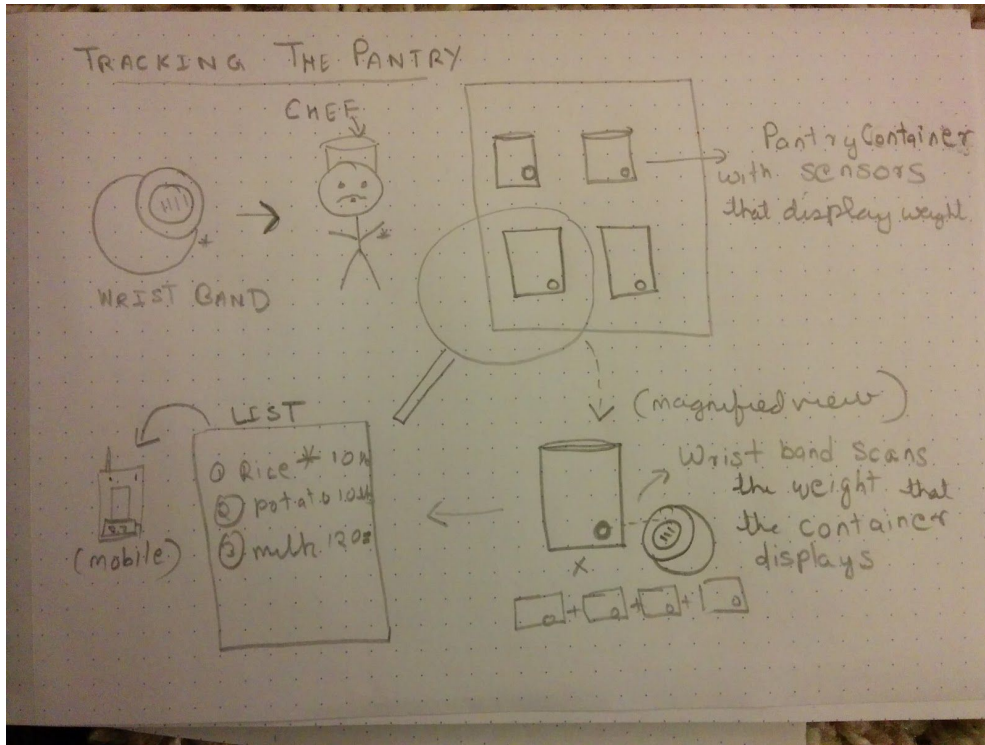
orders. It supports the task of upselling the food because servers can know real time forecasts for certain critical foods a day or two ahead of time. Sam the server can start selling certain menu items to prevent wastage. Furthermore it allows to tracking of food. Given that the command center has data on customer orders and weekly food orders, it estimates and tracks daily food waste. Steve can view the daily food waste on the command center. Third, it lets the restaurant check back on food ordered each day. The command center comes with a remote that allows anyone to scroll through past data. Kara can easily search up any particular dish at any particular day. Fourth, the command center tracks raw ingredients as well as popular dishes. Steve and Sally can remake the menu based on wastage of ingredients and the popularity of dishes. And last, the LCD monitor keeps track of food in the pantry via food orders and weekly stock updates. Steve does not have to manually keep track of food in the pantry.

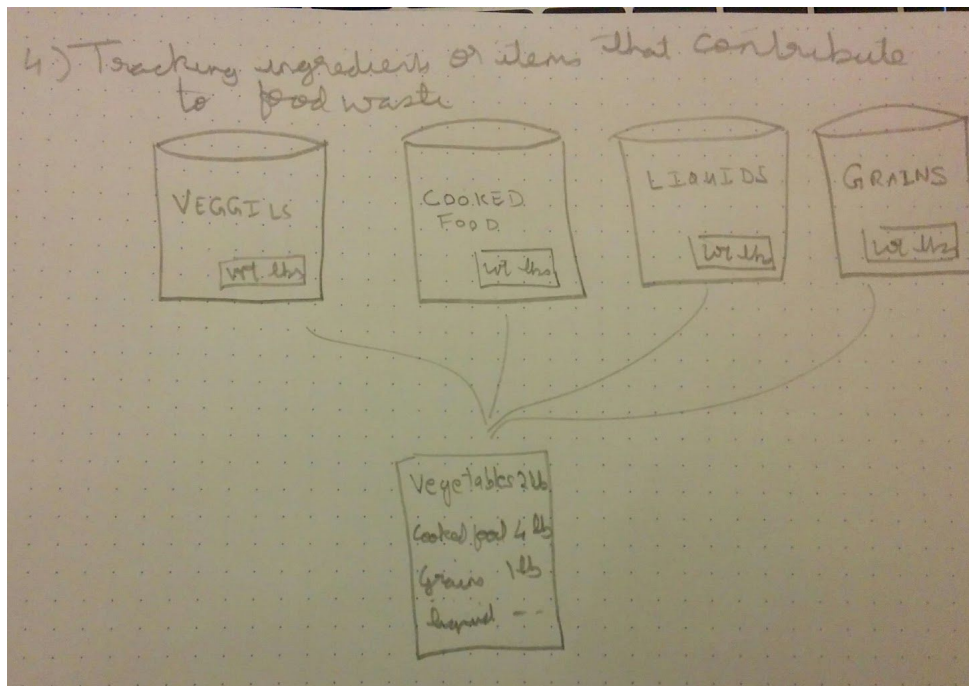
Sketch 2: Smart Fridge




The smart fridge weighs the kind and amount of food stored inside of fridge, and categorizes them into Vegetable, Meat, and others. It shows how much each type is left in the fridge. It supports the task of tracking food in pantry, because it can scan and weigh the food inside of it. It also will help in remaking the menu because when certain types of food have an excessive amount, the chef will often think about creating a new specialty to upsell the food. Smart fridge shows excessive amount of food notification when needed. The specialty can be added to the menu. Furthermore, it aids in upselling food because when certain type of food has extra amount, servers would be notified to upsell it to customers. And finally, it can be used to create a comprehensive shopping list. The fridge will have a screen on the front where different members can come type in their lists, and then the lists will be automatically compiled into one.

Sketch 3: Wristband and Sensors





This design is an ecosystem of a wristband, food containers with sensors in the pantry and garbage bins with sensors. It will help in tracking the stock of food in pantry and what needs to be ordered. The containers in the pantry have sensors that sense the weight of the contents and display the weight. The chef or any other kitchen staff member scans this weight displayed using the wrist band. This data tracked would be stored in a digital format that would be quite close to the way chefs keep a track of the pantry in notebooks or in their mind. This would also be synced with a central computer in the restaurant that would store the pantry records. It will also help in tracking food waste from pantry and garbage bins. To track what's being thrown out of the pantry, the chef scans the weight of the container from which they are throwing food away. To add to this there is a separate garbage bin to store food waste. This garbage bin has a weighing



scale that displays the total weight of the bin at the same time displays how much of stuff is being dumped into it every time. Third, it will be able to track dates to suggest items that need to be used first. The containers with sensors will help track the date on which the contents were added in the container and would display alerts in terms of the number of days the food has been stored on the containers. These sensors will sync this data with phone app and raise alerts for the chef to upsell a particular item. And lastly, it can track the main food ingredients that contribute to food waste. It would have 4 food waste containers to categorize food waste for vegetables, grains, liquids, and cooked food. These containers would have sensors to detect weight. Making these categories would help understand major sources of waste.

Selected Design

The design we selected is design one “Control Center”. Design one suggests that a remote is used to track the food ordered. For this assignment, we propose to adapt that design to include a smart phone or app instead of a remote. The two tasks we are narrowing in on are tracking data of food ordered and reflecting on/analyzing that data. We chose this design as this solution seems the most feasible in terms of technology and the cost it would involve for a small restaurant. As well, in all our interviews, a common task or pain point that restaurant personnel hit upon was looking at previous year’s data and then making decisions about how much food to prepare and what to prepare. While most of the small restaurants that we did research in still do this, they only capture the total sales for every day. All they have as data to refer back to is a total sales figure. Our research does validate that getting actionable insights on aspects beyond the total sale for a day would help in better meal planning and further curbing food waste. Thus, our design focuses on helping the restaurant personnel capture this data for how much of what is sold each day and also go back to see this data and get actionable insights for planning meals.

Scenarios

Task 1: Track what and how much food sold today, so the data can be useful in the next quarter/year

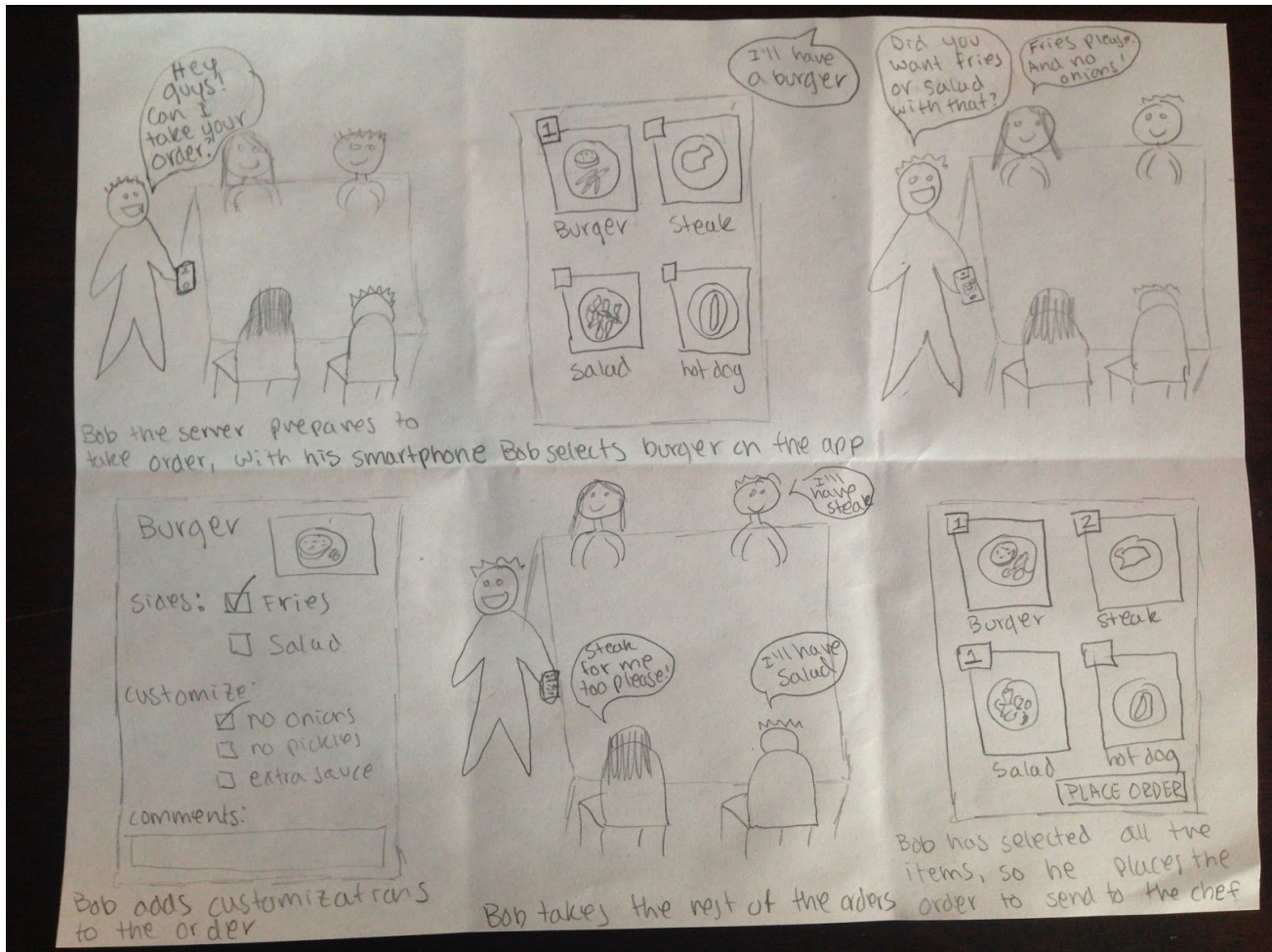
In order to keep track of what are sold, there are many ways to achieve the goals. After brainstorming, the scenario demonstrated in the storyboard down below is one of the solution to do so. In this scenario, waiters makes the order in their smart phone. After successfully placing the order, the kitchen prepares the food and the data of what food were sold and how much were sold are captured in the system. The pro of this solution is that it requires cheap interaction. All the data are captured and rather accurate. There is no need of data input manually after the order is being made. The con is that designing a whole new language system that accommodate the customized orders in all different restaurant is rather difficult. Also, depends on the equipments the individual restaurant owners own, as well as the effort made to cross-platform design and our time constraints, there is a chance that this step of design might be modified in the future design process.

Task 2: View data from last quarter/year

For the purpose of accurately anticipate how much food to order in, one way to achieve that, which was brought up several times in interviews, is that looking at data from the same day, last year or last quarter, can help predict what to order and how much to order. In this scenario, when the restaurant owner or the chef is about to predict what to order, they would look at the data that was captured before, navigate to how much and what food was order at the same day last year or last quarter, and make a prediction. The data helps them order a lot more accurately. As in without this product, they would have to look over the data on spreadsheets or on paper, and our design product can help simplify this process and present and visualize the data to help users achieve their goals better. The cons of this design idea is that it may takes a long time for users to get the data they want. However, since they have already done it on paper or spreadsheet, it should not be too much a problem to them.


Storyboards

Task 1: Track what and how much food sold today, so the data can be useful in the next quarter/year




Task 2: View data from last quarter/year


① I'm chef John. I'm ordering food for my restaurant for the next week.



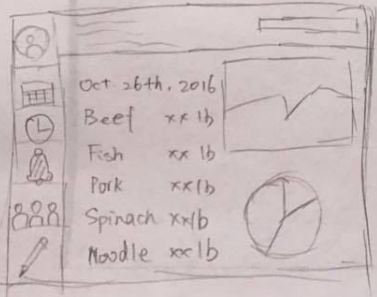
② But how much should I order? Today is Oct. 26th, 2017



③ So I check how much and what food were consumed on Oct. 26th, 2016

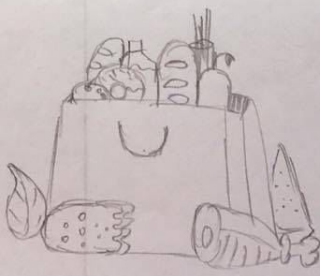


④ Looks like same day last year, here are the amount of food consumed.



Date	Item	Quantity
Oct 26th, 2016	Beef	xx lb
	Fish	xx lb
	Pork	xx lb
	Spinach	xx lb
	Noodle	xx lb

⑤ So I ordered food according to the past data.



⑥ And it's the exact right amount for this year!

