Undergraduate Thesis Prospectus

Revolutionizing Food Delivery Services with Home Cooked Meals

(technical research project in Computer Science)

International Adaptations of Food Delivery Technology

(STS research project)

by

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October 31, 2019

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Technical Project: Revolutionizing Food Delivery Services With Home-Cooked Meals

INTRODUCTION

For our Capstone project, we are not working for a pre-existing organization but rather for our Professor who is acting as our client while we work on the HomeEats initiative. The HomeEats initiative is the default project pre-approved for our class.

SYSTEM DESIGN

Our team will be developing a web application called HomeEats, which will serve as a food delivery service, similar to UberEats and Grubhub, but tailor made for home-cooked meals. HomeEats will allow consumers to finally have the ability to access fresh, home-cooked meals without having to go buy ingredients or prepare the dish themselves. Unlike other food delivery platforms, this convenience does not come at a sacrifice of food quality or fresh ingredients. To use the platform, consumers create an account on the site, enter their location and instantly view a large selection of dishes being cooked by amateur cooks in the area. They can view all the ingredients in the dish, the type of cuisine it originates from, estimated preparation time, and background on the chef, including reviews from previous customers. Once they select the dish they want, customers purchase the dish directly online, at which point the chef will be notified that an order has been placed and begin cooking. Home chefs will be able to specify when they are online and available to cook, how many orders they can take at a time, and in the case of a bulk order being placed in advance, they will have a few hours to choose whether or not to accept the order.

This application will be built using primarily Django, which is a popular framework based in the Python programming language often used for web applications of this scale. Our application will also connect to a PostgreSQL Database which will store all the information on

the site from cooks and customer user accounts to dishes, reviews, and purchases. In order for our team to simultaneously contribute to the project, all of our code will be hosted in Github, an online software development platform. The project will be completed over the course of the Fall and Spring semesters of the 2019-2020 school year through our CS Practicum class and our client is Ahmed Ibrahim, the course professor. This is not a project for an external company, it is an internal project not meant for profit.

Our team will meet with our client bi-weekly at the end of each sprint cycle. For our purpose, a sprint cycle is a two-week development period where each team member is tasked with a feature to implement or work on. The purpose of the sprint cycle is to allow for continuous planning, focused development, and short-term goals that the team can set and strive to reach. For example, a sample sprint goal may be implementing the customer landing page where they can browse through dishes. The following sprint goal may be adding filters to the dishes to allow for improved site navigation. These chronological short-term goals will lead up to the long-term goal of launching a fully functional site, allowing customers to order meals directly from cooks in their area, and give full administrative control to our client. HomeEats fits into the health and social dimensions of the food delivery app market by providing the same convenience and ease of use without sacrificing food quality.

SYSTEM REQUIREMENTS

Gathering system requirements are very important because it provides a solid foundation for the system and gives the project team a clear roadmap of the development cycle and how to prioritize tasks based on time and importance. For our application there are three main user categories: the cook, the admin, and the customer. Below are our requirements split up by category as well as necessity.

Minimum Requirements

Admin Users.

- As an admin, I want to approve any cook account before it is created, so that I can guarantee the customers a reliable experience
- As an admin, I want to make sure any updates to a cook's personal account information are reviewed, to maintain their accuracy
- As an admin, I want to be able to review reports and reviews, and potentially ban users or cooks, to keep the site safe from bad actors
- As an admin, I want to be able to view the orders that a cook has received.
- As an admin, I want to be able to view all accepted orders with total amount paid including amount going to the cook and HomeEats.
- As an admin, I want to be able to view cooks' cancelled order history with reasons.
- As an admin, I want to be able to set which reasons a cook can give for cancelling an order.
- As a system administrator I want to ensure that a payment option is selected prior to an order being processed, so that I can ensure meals are paid for before a cook begins to prepare the dish.

Cook Users.

- As a cook, I should be able to apply as a cook with my First Name, Last Name, Address, and Kitchen License
- As a cook, I should not be able to login to my account unless my application has been approved

- As a cook, I should be able to set what plates are available as soon as I log in, so that I can quickly get online and start receiving orders
- As a cook, I should be required to enter/edit my name, email, phone and address, so that I can be contacted in many ways
- As a cook, I should be able to add a new dish to my list of available dishes
- As a cook, I should be able to set a picture, ingredients, price, time to deliver, name, and type of food
- As a cook, I should be able to set which dishes I'm willing to make, so that I don't have to make dishes that I don't have their ingredients.
- As a cook, I should be able to report customers and their reviews, in order to protect my reputation from unfounded criticism and ban disrespectful or malicious customers
- As a cook, I should be able to make a separate account if I want to order through the site, so that I don't get confused between things I've ordered and things I have to cook
- As a cook, I should be able to set my own delivery range centered at my address, so that I am not pressured to deliver outside of my comfort zone
- As a cook, I should be able to tag food as vegan, allergy, etc. so that customers can choose foods which are suitable for them
- As a cook, I should be able to set a certain mileage I'm willing to travel so that I can have quick and efficient delivery service
- As a cook, I should be able to set a limit on how many meals I can make in a specified time frame, so that I don't get overbooked
- As a cook, I should be able to set when I am open and closed, so that customers can't attempt to order food from me when I am not available

- As a cook, I should be able to accept or reject meal orders so that I have control over what meals and how many meals I am making
- As a cook, I should be able to set an estimated cooking and delivery time, so that customers are aware of an approximate waiting time

Customer/Diner Users.

- As a customer, I should be able to see the ingredients in the dishes I plan to order
- As a customer, I should be able to see a picture of the dish I plan to order
- As a customer, I should be able to see the cost of the dish I plan to order
- As a customer, I should be able to see the estimated time of cooking for the dish I plan to order
- As a customer, I should be able to view the type of food I plan to order (e.g. Chinese, Thai, Indian, Mexican, etc.)
- As a customer I should be able to sort the dishes by price
- As a customer I should be able to sort the dishes by rating
- As a customer I should be able to only see dishes from cooks who can deliver to me
- As a customer I should be able to sort the dishes by the type of food I plan to order (e.g. Chinese, Thai, Indian, Mexican, etc.)
- As a customer I should be able to rate the food I purchase on a scale of 0-5 stars
- As a customer, I should be able to favorite a cook or a dish, so that I can easily find the cook or dish again
- As a customer, I should be able to review the dishes that I order, so that other customers are aware of the quality of that dish

- As a customer, I should be able to see a delivery status that indicates started cooking, on the way, and delivered so that I know when to expect my food
- As a customer, I should be able to set multiple addresses so that my food can be delivered to a location, even if I am not yet there
- As a customer, I should be able to see an average rating for each dish if the data is available
- As a customer, I should be able to cancel an order that has not started cooking yet so that I don't waste food and money if I change my mind
- As a customer I want to be able to tip the chef preparing my dish so that I can reward and encourage my favorite chefs.

Desired Requirements

Admin Users.

- As an admin, I want to be able to view revenue reports that can be adjusted to a specific timeframe (week, month, quarter, semi-annual, annual, custom).
- As an admin, I want to be able to view cooks' online time and offline time per week.

Cook Users.

- As a cook, I should be able to set a limit on how many meals I can make in a specified time frame, so that I don't get overbooked

Customer/Diner Users.

- As a customer, I should be able to order at least 3 hours in advance

Optional Requirements

Customer/Diner Users.

- As a customer, I want to be personal information to be anonymous when messaging the cook, so that my information is kept private
- As a customer I want to be able to message my cook to be able to customize the order to my liking.

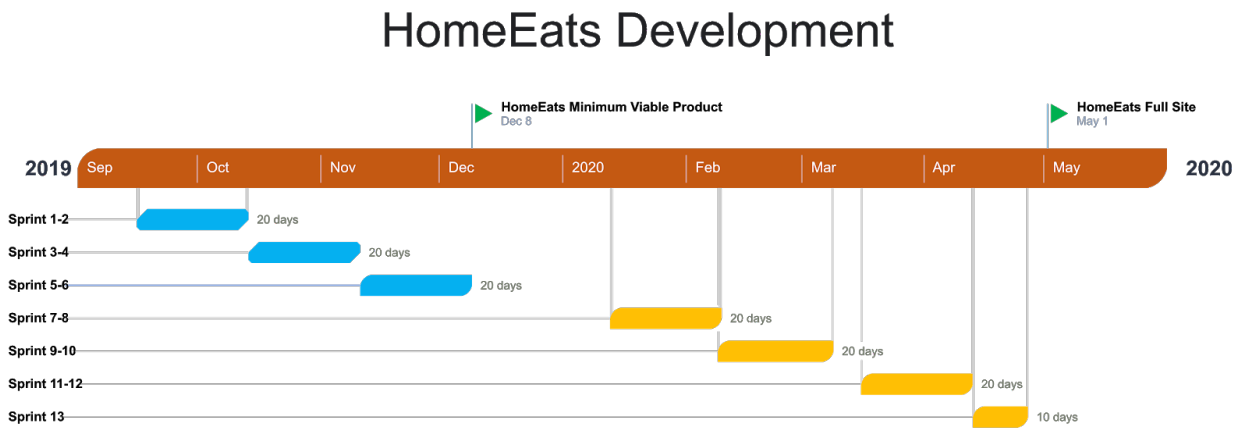

Figure 1: HomeEats Development Timeline (Created by Saboo, 2019)

Introduction: STS Research

Advances in food delivery technology have provided great support to large and small food businesses as well as to busy individuals who simply lack the time to worry about their daily meals. Contributing to one of the largest industries globally, food delivery technology has recently made great advances that conform to growing societal impatience and the ever-growing need for speed to delivery. To truly understand the global impact of food delivery technology, emphasis must be placed on the analysis and reporting of findings related to the similarities and

differences in many food delivery applications and networks and how they were introduced and adopted into different cultures around the world. As specific food delivery applications and networks are discussed within the context of their largest consumer bases, we will uncover why these applications were successful or unsuccessful innovations within their societal contexts. The most critical aspect to consider are the fundamental differences in the preexisting food industries of these societies and how those differences impacted the emergence of food delivery networks and their operations. These major demographical differences include but are not limited to cost of living, cost of labor, population density, food sanitation and traffic control. Through this analysis, we will be able to show that in order to develop breakthrough technology, the best design for the technology will not prevail unless it can also conform to its societal context.

Frameworks

There are two major STS frameworks that will prove essential to explaining the cultural and societal influences on the success of a technology. The first is Social Construction of Technology (SCOT), introduced by Wiebe Bijker and Trevor Pinch as a constructivist theory that emphasizes the importance of taking into consideration the societal context in which a piece of engineering is introduced in order to evaluate its possibility for success. The main idea of SCOT is that the success of an innovation is not simply a result of the fact that it works better or is fundamentally better designed than other solutions, but is a result of the societal context that that promotes the solution and its level of conformity with the society it is introduced to. SCOT is essential to showing how food delivery systems had to be designed differently around the world, conforming to different societal boundaries in order to become a lucrative business. A fundamental concept of SCOT is to analyze the relevant social groups that are either directly or

indirectly involved in the design and success of a solution within a societal context. The analysis of customers, delivery drivers and the business shareholders will prove to be a critical part of using SCOT to show how technological advances must conform so societal limits in order to be successful.

Actor Network Theory (ANT) was first developed in the early 1980s by Michel Callon and Bruno Latour, meant to explain material and semiotic relations, and how they form a network to act as a single entity. Actors in an actor-network can be an any essential piece that makes or breaks the value or purpose of a network. ANT is interested in explaining how actor-networks get formed, what holds them together and what can cause them to fall apart. ANT will be used to explain the key stakeholders in the business of food delivery networks, and how dependencies amongst them are essential to consider in the design of the network in order to be successful. In addition, exploring more external, non-obvious actors will also help in understanding the complexity of actor-networks and their impact on technological advances in a society. Comparing and contrasting different food delivery networks around the world and actors that are essential to their success will tie into SCOT theory about the success of not the "better" design, but the one that most conforms to societal boundaries.

Thesis Plan

One of the strongest consumer-based forces in any industry is brand loyalty. In the United States, UberEats is one of the most successful food delivery applications and networks all serving 100+ major cities all due to brand loyalty. Building trust with a consumer base is an essential and extremely difficult task that companies must go through in order to push a society towards adapting a technology they are not used to. Uber is a great example of this, as they introduced their ride technology that completely shifted the transportation industry by moving

many consumers away from public transportation and taxicabs (Staff, 2018). Later, they decided to shift their focus into dominating the food delivery industry, in which their ride technology serves as a great basis to build on. Uber essentially grew off the knowledge that if their consumers trusted them to drive you safely around any city during any time of the day, their consumers would trust them just as much to deliver great quality food within a reasonable amount of time (Staff, 2018). Uber built this trust by adapting to the culture of fast-paced city lives through ease of use and punctuality. First, Uber operates on 100% cashless transactions. This is essential to customers in the United States as very few young consumers still hold paper cash in their wallet and essential to drivers as there significantly less opportunity for error in any of their transactions. Second, Uber has extremely accurate delivery/drop-off times with an intuitive tracking system that allows riders to view the status of their driver's arrival and drop-off (Staff, 2018). In major US cities where punctuality is essential to a society, these features prove essential to those who live extremely busy, fast-paced lifestyles. As Uber has displayed, in addition to many other companies, taking a predominantly customer-based focus in developing technology proves successful: Uber now holds about 75% of the US market share in ride-hailing.

Now consider a consumer base that runs almost exclusively on cash: India. Differing from the ease of use that cashless applications such as UberEats provide in the US, Swiggy and Zomato, the leading food delivery systems in large Indian cities such as Hyderabad or Bengaluru had to figure out a way to become equally as competitive without being able to use the "better" technology of cashless service. Usability engineers can all agree that cashless service easily provides the more seamless and easy experience for a customer, but in a society where cash is almost the exclusive form of payment for basic needs such as food and groceries, food delivery system engineers need to adapt to this social norm in order to provide the most convenient

experience to delivery drivers and customers. Consequently, Swiggy uses a cash on delivery system with an insurance policy for delivery drivers and restaurants, but also limits their potential losses from unethical consumers with a maximum limit for cash on delivery (Anand, 2019). Due to widespread cases of fraud and corruption in India, cash seems to prevail as the leading form of payroll and payment in large dense Indian cities, making the success of food delivery applications highly dependent on their usage of cash transactions.

In these large Indian cities, customers are equally as impatient as those of the United States or any other major cities around the world. This is an important similarity across many different kinds of societies in which time is money. Large Indian cities are notorious for their lack of proper traffic control and monstrous amounts of traffic throughout business days, so it seems as though Swiggy should be unreliable in making timely deliveries. However, two important aspects of society that explain another reason Swiggy is successful are cost of labor and cost of living. India, being the country with the highest population living under the poverty line, has many citizens willing to work tirelessly at the low pay rates of delivery drivers. This extremely low cost of labor allows Swiggy to flourish off the sheer number of people that are willing to make these small amounts from delivering food (Bhattacharya, A, 2018). Consequently, the cost of delivery is also significantly cheaper than in other nations. The cost of living also happens to be fairly low so that even menial labor is enough to survive, attracting a large group of individuals to perform food deliveries as a full-time occupation, a key difference in the Indian society versus wealthier nations.

Another aspect to consider is the latency of the emergence of successful food delivery applications in India in comparison to other countries. This is where dependencies between internal actors (stakeholders in food delivery applications) and external actors (key influences

outside the food delivery network) come into play to explain how these networks are able to form and what can cause them to fall. Google Maps, the leading name in the satellite-based road mapping and route planning industry, is a key external actor in food delivery networks. Many food delivery systems use a Google Maps plugin in order to provide route planning and destination information to food delivery drivers. A major problem that Google faces in large, dense Indian cities such as Hyderabad is that there are many smaller, unpaved roads that are extremely hard to map via satellite and document (Bhattacharya A., 2018). In the United States, however, every road and every residence is mapped in detail, both through documentation and satellite, making it all the easier for maps technology to be more widely used, hence, food delivery applications came into prominence much sooner. As satellite mapping technology expanded and was able to more accurately pinpoint roads and intersections, the Indian public was able to adopt the technology as being a reliable source for navigation. This actor was a key limitation for the growth of food delivery networks in India.

Although India and the United States provide a good contrast for the basis of this argument, there are many more food delivery networks and applications to discuss that will be essential in showing how SCOT and ANT interact to explain societal contexts for critical innovations. These key societal constructs, in addition to others, will be explained in more detail along with SCOT to emphasize how customer-based design and its implication within societal boundaries makes a certain innovation successful. In addition, we will further explore the complexity of actor-networks involved in developing a successful food delivery system in order to show how consideration of the relevant social groups explained in SCOT theory is also equally as important in expanding on an engineering idea.

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