SW Engineering CSC648-848 Spring 2023

Team 3

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Milestone 1

Date Submitted:	3/13/2023
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1.)

Executive summary:

People at universities often find themselves stuck when searching for their next meal. Food options on campus are likely few and far between, and have the potential to taste like the ever-dreaded dining hall food. Students and instructors alike find issues managing their food habits when heavy workloads and packed schedules take precedent. As students of San Francisco State University, we find ourselves trekking back and forth to Stonestown Galleria just so we can get access to more options, wasting our time when it's most valuable to us. Other than the inconvenience of food locations and availability, the food available is not always affordable, which is a major issue for students and important for everyone. The inconvenience of our current options and the lack of affordable options are the primary driving forces of our team project.

As students, we wanted to provide a solution to these issues when we came to discuss what GatorGrub will be. We propose a service which will strengthen the connection between SFSU students, faculty and staff to their local food scene, as well as offer this primary user base with features which make their lives easier and solve the problems related to getting food on campus. GatorGrub considers the needs of our local restaurants by helping them reach their customers and persuade customers on the edge with exclusive deals on their next meal. GatorGrub aims to provide these users with a selection of local restaurants offering delivery.

Customers who don't have the time to leave their classroom or study area can get their food delivered to any room on campus, allowing their workshops and group study sessions to be uninterrupted by rumbling tummies. Customers can also decide whether they want their food delivered to one of several safe pickup spots throughout SFSU's campus. This feature benefits students who want to get food safely, without worrying about who they will encounter on the long walk to Stonestown or further out. GatorGrub also enables its users to get deals on different local restaurants. This will incentivise more sales, making restaurant owners and delivery drivers content and strengthening GatorGrub's infrastructure.

Our team is dedicated to this project, because of the convenience it could bring directly to us and our community. We are well structured, with a Team Lead at the top to allocate work among the section leads and overlook the entire project. The Back End Lead is responsible for developing the back end with the help of one Back End Developer. Similarly, the Front End Lead is responsible for developing the front end with the help of one Front End Developer. We're concerned with the issues related to student health and happiness, and we know that food is one of the factors which can strongly affect it. We think GatorGrub is the next step forward for the SFSU community.

2.)

Personae:

SFSU Student:

About Kate:

- 20 y/o SFSU Junior
- Lives on campus
- Grocery store employee
- Hobbies: Digital art, Hiking, Anime

Kate is a serious student and an equally serious eater. She spends most of her day chasing deadlines and working on homework assignments, unless she's in class or back at her dorm to rest. Kate also works part-time at Trader Joes in Stonestown to make sure she can support her living expenses. She already has tuition and her dorm paid for, but everything else like the internet, her phone plan and food is her responsibility, so she has to be mindful with the money she spends.

Goals:

- Create an optimal study environment, with food easily and quickly accessible.
- Find ways to save on everyday expenses like food.

Frustrations:

When Kate's trying to get a project done, food is the last thing she wants to think about. However, she knows that if she isn't satisfied, then she can't perform as well in the classroom or at her desk studying. As a student she also doesn't have enough money to pay for food delivery every time she has a serious due date coming up.

Scenario:

One night Kate has a presentation she has to prepare for the following day's class. It's getting late and she needs something to eat for dinner. Before she could leave the building, her friend, who lives two doors down, calls her name. She told Kate about GatorGrub, a new food ordering and delivery app targeted at the SFSU community. She recommended it because it offers students a cheap and easy way to access food.

Kate had planned to study that evening and prepare instant ramen if she really got hungry, but after checking out GatorGrub, she changed her mind. She was able to order her food to a safe location, which was convenient enough to pick up without wasting too much study time.

SFSU Faculty:

About Jane:

- Age: 30
- Location: Works on campus
- Profession: Works full time as a professor in SFSU
- Hobbies: Reading, growing plants

Jane feels inspired when she's able to teach her students something new. She teaches three sections of an introductory course for her field, because she wants to give new students a solid foundation they can build up from. On top of this she's also managing a graduate level research project which requires its own fair share of attention, both for her students and her personal research goals. Managing lectures, class notes and project deadlines sometimes puts an overwhelming burden on Jane.

Goals:

- To better her craft as an instructor
- To improve her workflow so she doesn't have to work overtime

Frustrations:

Jane struggles with time management and grading, so she wants to spend as much time as she can on grading assignments and responding to emails while she's on campus. This leaves her without time for herself and her own needs such as lunchtime, where she only has a fifteen minute break to get fed before her next section begins.

Scenario:

Jane, with the help of the SFSU food delivery application, she can now order food from the SFSU campus/sfsu approved restaurants and have it delivered to her building and room number. So she no longer has to spend time walking to an eatery and ordering.

SFSU Staff:

About Mary:

- Age: 34
- Location: Works on campus
- Profession: Academic Adviser
- Hobbies: Cooking, hiking, watching sports

Mary is an academic adviser for students at SF State. She's great at her job because she loves interacting with all the professors in the different colleges and hearing about their studies. Mary is always helping students figure out which path is right for them and often finds herself going over her time allowance to make sure the students get the support they need.

Goals:

- Eat healthy
- Maintain a specific diet
- Help her advisees succeed in their chosen path.

Frustrations:

Oftentimes Mary has a hard time finding food that fits her diet and can't spend time commuting to the ones that do while working. She drinks coffee to keep her up in the morning, but if she can't get some real food in her system by 2:00 PM, she's going to crash. This means she has trouble focusing on her students and makes her less enthusiastic to hear about the interesting studies of each college.

Scenario:

Long days in the office are typically paired with coffee, because no one has the time to step out for too long and pick up a meal. Mary finds herself with the dilemma of needing to decide whether to help students or take her lunch break. Her coworker Roy tells her about a

new food ordering app some students came up with which benefits SFSU staff members too. With GatorGrub, Mary is able to find food more easily and it's deliverable to her work location.

GatorGrub Admin:

About Emma:

- Age: 23
- Location: Works remotely at home in Milpitas
- Profession: Graduate student in CS
- Hobbies: Lap swimming, brunch with friends, board games

Emma has already completed her bachelors and is pursuing a higher degree at San Jose State University. Emma's lifestyle is fairly sedentary while she's in between jobs, affording her consistency in her daily schedule. To get out of the house, she often travels to different universities and meets new people who work in her field, as she's devoted to her studies, and is always hearing about new projects popping up. This is especially true, because Emma has been going to a lot of job fairs at these various universities she visits. Emma knows a couple of friends that are always working on projects and she helps them network.

Goals:

- Supporting herself while pursuing her graduate degree.
- Finding an easy gig that can make her some money.
- Doing something that aligns with the career path she's chosen for herself.

Frustrations:

Emma finds difficulty in finding jobs around where she lives, since her options typically expect more time than she's able to give, considering the time she needs to spend studying for her upcoming degree.

Scenario:

Emma takes up an offer from her friends at SF State who are developing a new food ordering service. Other than the school and extracurriculars, Emma's schedule is fairly open for new job opportunities. Something that requires little time, but also allows her to practice her skills and be productive with the rest of her time.She's been told that all she has to do is run the

back end restaurant verification process. The steps were simply explained to her and she just had to confirm the business actually exists and that the menu items provided resemble the ones from the menu of the location. After she's satisfied, she can give the green light for new sat

GatorGrub Driver:

About Jared:

- Age: 22
- Location: Lives on campus
- Profession: Graduate Student
- Hobbies: Online video games, Fixie bicycles, collecting funko pops

Jared works hard and plays hard. His primary focus is his journalism degree and internship. He devotes most of his time to these two, because he sees himself as a successful entertainment journalist in the future. He's fueled by his interests in gaming, pop culture and entertainment, inspiring him to push his journalism career towards a focus on the gaming and related tech industry. Sometimes he overspends on his hobbies, as fixie parts and funko pop figures are expensive.

Goals:

- To graduate with his degree in Journalism
- To be healthier

Frustrations:

- Jared lives off campus in an apartment in San Francisco. With rent and general QOL being so high, he needs an extra source of income to make up the difference. However, his schedule is unpredictable and he cannot commit to a fixed shift-schedule. As a result, he has found it hard to become a part-time employee.

Scenario:

- By becoming a delivery driver for GatorGrub, Jared can work whenever he has time and doesn't need to commute long distances to an office building. He can use his bike to bypass rush hour traffic and even achieve his fitness goals on the many hills of San Francisco.

Restaurant owner/manager:

About Marcus:

- Age: 47
- Location: Restaurant is near SFSU
- Profession: Restaurant Owner
- Hobbies: Cooking, Swimming, Reading

Marcus has over 30 years of restaurant experience. He started cooking with his parents at age 9 and officially started working for his dad's restaurant at age 16. Starting from the kitchen, he learned management skills in college and from his father. After acquiring his father's business and helping him retire, Marcus developed his restaurant and got it to function as efficiently as a well-oiled machine. His devotion to food made him want to step away from the restaurant and run a food truck that visits SFSU campus, where he can be the chef.

Goals:

- To be able to increase business sales and profits
- To give more exposure to their restaurant
- To create food people enjoy

Frustrations:

- Since there are hundreds of restaurants all over the city of San Francisco, it is hard for Marcus to gain more exposure to his restaurant. He can't park his food truck in a spot that's easily noticeable to most students. Marcus wants a new way to gain and retain customers while on campus.

Scenario:

- One day, Marcus hears news of a new app called GatorGrub for food ordering services. He decides to take a look at what features and benefits there are. He sees that he can register his restaurant to be mainly focused on catering to people from SFSU. He determines that this could be a great business opportunity to gain more traction to his restaurant.

Use cases:

1. Kate (**SFSU student**) wants to study in the dorms, but also wants to get a bite to eat without leaving her work for too long. Using the GatorGrub service, Kate is able to pick up her food at a safe location nearby the dorms and is able to go back to studying right after picking it up. Because the food was in a safe location, Kate had felt peace of mind when going to pick it up. Also, because the location was on campus, Kate didn't have to spend too long to go and pick up her food from a restaurant all the way in Stonestown.

2. Long days answering student questions can make managing Jane's (**SFSU faculty/staff**) lunch difficult. It makes it easy when her food can be delivered straight to her. When she wants something for lunch that's easy to manage, Jane opens up GatorGrub. After searching for and selecting the food she wants for lunch, she can log in or register using her university email (lazy registration). Then she's able to set up the delivery location to be in her classroom, which she has to teach in for the next two and a half hours. After providing payment information and placing her order, she's able to wait for it to be delivered straight to her. With lunch out of the way and her stomach satisfied, Jane can go back to enjoying teaching class.

3. Jared (**GatorGrub driver**) wants to find different ways to make money while on campus. They have access to different types of transportation, due to their class schedule. They want to make money regardless of this, so they register as a driver for GatorGrub. As a delivery person they shall decide whether they want to accept an order, allowing him to choose orders he can complete with his particular transportation modality. When he sees an order, he can find out the restaurant where he has to go and the delivery address. If he decides to accept it, he will be provided with the order information for pickup.

4. Marcus (**restaurant owner**) wants more people to eat from his restaurant and give it more exposure. With GatorGrub, he will be able to do just this. He will be able to register his restaurant to cater to people specifically from SFSU. As such, he will not have to compete against hundreds of other restaurants in other food service apps. He is able to offer promotions to this group of customers to increase sales.
5. Emma works as a **GatorGrub admin**, so she knows the daily ins and outs of running the restaurant verification process. When she wakes up she can check the newly submitted applications on her laptop. One by one, each submission is verified to see if the restaurant is real and if the food on the submitted menu is similar enough to the food served by the restaurant in question. Certain details should be directly matching, like the address and phone number of the restaurant, while menu items and prices may be different due to the restaurant's policy on take-out and delivery. After she processes the restaurant, a notification is sent to the **restaurant owner**, letting them know the result of their restaurant's review.

3.)

List of main data items and entities (data glossary/description):

- Customer Entity:
    - Customer ID Number (PKey)
    - CustomerName
    - CustomerEmail
    - CustomerPhone Number
    - CustomerPassword
- Driver Entity:
    - Driver ID Number (PK)
    - DriverName
    - DriverEmail
    - DriverPhone Number
    - DriverPassword
- Restaurant Entity
    - Restaurant ID Number (PK)
    - RestaurantName
    - RestaurantEmail
    - RestaurantPhone Number
    - RestaurantPassword
    - RestaurantAddress
    - RestaurantCuisineType
    - RestaurantPriceTier (updated by trigger)
    - RestaurantHours (Hours of operation, specifically for pick-up/delivery)
    - RestaurantPrepTime (how many mins to prepare avg order)
- Restaurant Menu Entity
    - Restaurant Menu ID (PK)
    - Restaurant ID (FK)
- Menu Item Entity
    - Menu Item ID (PK)
    - Menu ID (FK)
    - Menu Item Name
    - Menu Item Picture
    - Menu Item Price
    - Menu Item Description
- Order Entity
    - Order ID Number (PK)
    - Customer ID Number (FK)
    - Driver ID Number (FK)
    - Restaurant ID Number (FK)
    - OrderTime
    - DeliveryTime (OrderTime + RestaurantPrepTime + Google Maps Journey Time)
    - DeliveryLocation

        - Shall be either a desired address, building and room, or a “safe pickup spot”
    - OrderSelections (CSV, menu item: ID, quantity, notes)
    - OrderNotes
    - OrderDiscounts
    - OrderPrice
- Review Entity
    - Review ID (PK)
    - Restaurant ID (FK)
    - User ID (FK)
    - Message
    - Rating Number

4.)
Initial list of functional requirements:

Unregistered Users:

1. Unregister users shall search the restaurant to look the menu
2. Unregister users shall review the feedback of the restaurant
3. Unregister users shall search the map from their location to the restaurant

Including all of the above unregistered user features, registered users (from here on just users) shall also do the following:

4. User shall see the menu price
5. User shall write the feedback of the restaurant
6. User shall upload the pictures
7. User shall choose the way they want to deliver (to the specific location/safe pickup spot)
8. User shall sign up with SFSU email
9. User shall send a message to customer service if need
10. User shall see if their food delivered or not

Admins:

11. Admin shall review restaurant applications and provide the appropriate response.
12. Admin shall view the client account
13. Admin shall ban and warn the client account, if client do inappropriate things with the account

Restaurant Owners:

14. Business users shall upload the food pictures and prices
15. Business users shall write the feedback of the their restaurant
16. Business users shall accept/reject the order
17. Business users shall contact the customer users/ deliver users
18. Business users shall send notification to deliver users when orders was ready
19. Business users shall send a message to customer service if need

Driver Users:

20. Deliver users shall accept/reject the order
21. Deliver users shall send notification to users when food was delivered
22. Deliver users shall see the map of pickup point
23. Deliver users shall see the map of delivery point
24. Deliver users shall contact users if need
25. Deliver users shall send a message to customer service if need

5.)

List of non-functional requirements (performance, expected load, security requirements, storage, availability, fault tolerance...):

1. Application shall be developed, tested and deployed using tools and servers approved by Class CTO and as agreed in M0
2. Application shall be optimized for standard desktop/laptop browsers e.g. must render correctly on the two latest versions of two major browsers
3. All or selected application functions shall render well on mobile devices
4. Data shall be stored in the database on the team's deployment server.
5. No more than 50 concurrent users shall be accessing the application at any time
6. Privacy of users shall be protected
7. The language used shall be English (no localization needed)
8. Application shall be very easy to use and intuitive
9. Application shall follow established architecture patterns
10. Application code and its repository shall be easy to inspect and maintain
11. Google analytics shall be used
12. No e-mail clients shall be allowed. Interested users can only message to sellers via in-site messaging. One round of messaging (from user to seller) is enough for this application
13. Pay functionality, if any (e.g. paying for goods and services) shall not be implemented nor simulated in UI.
14. Site security: basic best practices shall be applied (as covered in the class) for main data items
15. Media formats shall be standard as used in the market today
16. Modern SE processes and practices shall be used as specified in the class, including collaborative and continuous SW development
17. The application UI (WWW and mobile) shall prominently display the following exact text on all pages "SFSU Software Engineering Project CSC 648-848, Spring 2023. For Demonstration Only" at the top of the WWW page nav bar. (Important so as to not confuse this with a real application).

6.)

Competitive Analysis:

Analysis of features across competition:	Ez Cater	Grubhub	Uber Eat	DoorDash	GatorGrub
Easy Search	✔	✔	✔	✔	✔
24/7 Customer Service	✔	✔	✔	✔	✔
Easy Map Direction			✔	✔	✔
Class to Class Delivery					✔
University Student / Faculty Discount					✔
Safe Pickup Spot					✔

GatorGrub, our delivery app, will provide a variety of benefits to university students and faculty members. For starters, it will offer our customers exclusive discounts on a variety of products and services. As a result, our student customers will be able to save money while also having their purchases delivered directly to their classroom. This incentivises more sales, satisfying both restaurant owners and GatorGrub drivers looking for jobs.

Another benefit of GatorGrub is that it will provide class-to-class delivery. This feature will be especially useful for our students and faculty customers who have classes in various buildings or locations on campus. Our customers will no longer have to waste time walking or commuting between classes, nor will they have to worry about carrying heavy bags or waiting in restaurants. With GatorGrub, our customers can simply place an order and have it delivered directly to their next class location.

Additionally, patrons can get their food delivered to a safe pickup spot on campus. For students and staff who want to save money on delivery and are willing to take a little walk within campus grounds, safe pickup locations are available in well traveled and secure parts of campus so people can get their food at a more reasonable price, with peace of mind knowing they'll be safe. (Potential locations: Caesar Chavez Student Center, Mashouf Wellness Center, Village Plaza (Dorms), UPN (near Stonestown), etc.)

7.)

High-level system architecture and technologies used:

- Server Host, Instance size (CPU and RAM):
    - Google Compute Engine, 1vCPU, 2 GB RAM
- Operating System and Version Number:
    - AlmaLinux version 9.1
- Database and Version Number:
    - MySQL version 8.0.32
- Web Server and Version Number:
    - Express.js version 4.18.2
- Server-Side language and Version Number:
    - Node.js version 18.14.1
- API's:
    - Google Analytics Reporting API v4
    - Google Maps JavaScript API
    - Google Routes API

Search functionality implementation:

Our search functionality will be fairly simple. Our database will store each restaurant along with metadata such as location, cuisine, price information, restaurant name, and price tier. This way we can organize restaurants by categories for users to browse. When a user wants to search using an input field, we will take the input, sanitize it and plug it into SQL queries for retrieval. We could use the LIKE function to perform a fuzzy search. We can implement indexing and implement pagination to optimize search functions.

8.)

Team and roles:

Shauhin Pourshayegan	Team Lead, Github Master
Hieu Ma	Front End Lead
Preetham Ramesh	Back End Lead
Lin Tun	Front End Developer
Derrick Liang	Back End Developer

Work distribution:

- M0 edits: Hieu
- Executive summary: Shauhin
- Personas & use cases: Shauhin, Derrick, Hieu, Preetham, Lin
- Data glossary & search functionality: Preetham, Derrick
- Competitive analysis: Lin

9.)

Team Lead Checklist:

- [x] ~~So far all team members are engaged and attending team sessions when required~~
- [x] ~~Team found a time slot to meet outside of the class~~
- [x] ~~Back end, Front end leads and Github master chosen~~
- [x] ~~Team ready and able to use the chosen back and front end frameworks and those who need to learn are working on learning and practicing~~
- [ ] Team lead ensured that all team members read the final M1 and agree/understand it before submission
- [x] ~~Github organized as discussed in class (e.g. master branch, development branch, folder for milestone documents etc.)~~
- [x] ~~NEW: Use of any GenAI tool like ChatGPT: say if you used ChatGPT or like and how and for what segment of Milestone 1 (brief paragraph). As per class policy: this is allowed as a help BUT you cannot copy and paste its output and claim it is your own text, you need to put it in quotes or modify it, and only for short sentences You also are responsible for accuracy of your submission, so any ChatGPT content needs to be checked by you.~~