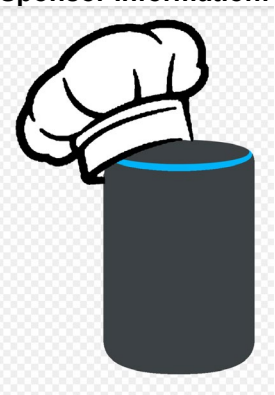
CS486C – Senior Capstone Design in Computer Science

Project Description

Project Title: MealWrite	
Sponsor Information: 	Jenny Hoffmann, PhD Peripheral Arterial business leader at Gore Entrepreneur and founder jenniferehoffmann@gmail.com 928-202-8116 Martin Sector Principal Technologist at Gore Chief Technical Officer themartinsector@gmail.com 480-392-6930

Project Overview:

Have you ever wondered what to have for dinner? Millions of people and families wonder what to make each night. The overall goal of this software project ist o take the question mark out of "what's for dinner?" for good!

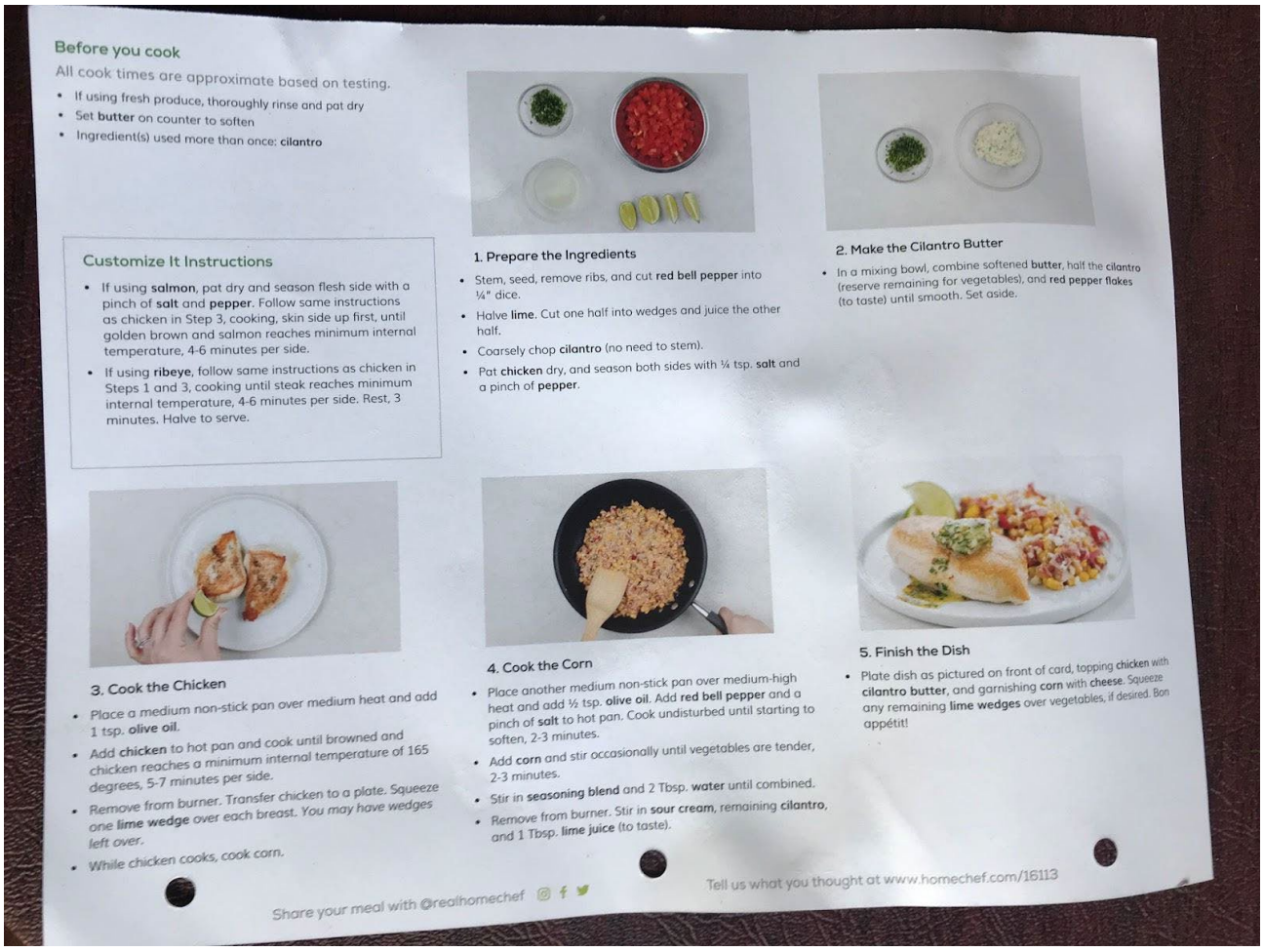
MealWrite is a start-up to make last minute, healthy cooking stress-free. The idea came to me from a recent real life situation: I have two daughters, ages three and five, and I also have a full time job at Gore. I subscribe to meal delivery services (such as Hello Fresh, Home Chef, and Blue Apron) but, one day, my meals didn't arrive on time. After a long and busy day at work, I just wanted something easy to make for dinner without having to get fast food! Since my meals didn't arrive that day, I looked at delivery apps like Uber Eats but delivery would take at least an hour and my kids couldn't wait. I then looked in my fridge and pantry but couldn't find inspiration. If any of this situation resonates with you, MealWrite is for you!

The idea of MealWrite is to make home cooking more approachable. Many people assume cooking is time consuming and difficult. I want to break those assumptions and make cooking doable for more people. The idea is to have an app that can talk you through the meal preparation experience by using a smart voice assistant, like Amazon's Alexa. Ideally, the app would also connect with local grocery stores so that the ingredients can be obtained locally rather than flying ingredients across the country, like with meal delivery services. Alexa would manage the steps and timers for you so that at the end, everything is ready at the same time! While there are competitive apps that track ingredients, store recipes, and deliver food, none is making the cooking process more approachable.

The meal delivery services market has rapidly grown to $16 billion in 2019. It is expected to grow about 17-18% per year, to double in market size over the next seven years. I see that the MealWrite app could be the next disruption to home cooking, which has become even more important through the global pandemic.

Envisioned Solution: A smart mobile application that helps plan *and execute* cooking.

To understand how the MealWrite app would work, let's take an example of how meal delivery services typically work. Here is an actual recipe from Home Chef:



Before you cook

All cook times are approximate based on testing.

- If using fresh produce, thoroughly rinse and pat dry
- Set **butter** on counter to soften
- Ingredient(s) used more than once: **cilantro**

Customize It Instructions

- If using **salmon**, pat dry and season flesh side with a pinch of **salt** and **pepper**. Follow same instructions as chicken in Step 3, cooking, skin side up first, until golden brown and salmon reaches minimum internal temperature, 4-6 minutes per side.
- If using **ribeye**, follow same instructions as chicken in Steps 1 and 3, cooking until steak reaches minimum internal temperature, 4-6 minutes per side. Rest, 3 minutes. Halve to serve.

1. Prepare the Ingredients

- Stem, seed, remove ribs, and cut **red bell pepper** into ¼" dice.
- Halve **lime**. Cut one half into wedges and juice the other half.
- Coarsely chop **cilantro** (no need to stem).
- Pat **chicken** dry, and season both sides with ¼ tsp. **salt** and a pinch of **pepper**.

2. Make the Cilantro Butter

- In a mixing bowl, combine softened **butter**, half the **cilantro** (reserve remaining for vegetables), and **red pepper flakes** (to taste) until smooth. Set aside.

3. Cook the Chicken

- Place a medium non-stick pan over medium heat and add 1 tsp. **olive oil**.
- Add **chicken** to hot pan and cook until browned and chicken reaches a minimum internal temperature of 165 degrees, 5-7 minutes per side.
- Remove from burner. Transfer chicken to a plate. Squeeze one **lime wedge** over each breast. You may have wedges left over.
- While chicken cooks, cook corn.

4. Cook the Corn

- Place another medium non-stick pan over medium-high heat and add ½ tsp. **olive oil**. Add **red bell pepper** and a pinch of **salt** to hot pan. Cook undisturbed until starting to soften, 2-3 minutes.
- Add **corn** and stir occasionally until vegetables are tender, 2-3 minutes.
- Stir in **seasoning blend** and 2 Tbsp. **water** until combined.
- Remove from burner. Stir in **sour cream**, remaining **cilantro**, and 1 Tbsp. **lime juice** (to taste).

5. Finish the Dish

- Plate dish as pictured on front of card, topping **chicken** with **cilantro butter**, and garnishing **corn** with **cheese**. Squeeze any remaining **lime wedges** over vegetables, if desired. Bon appétit!

Share your meal with @realhomechef

Tell us what you thought at www.homechef.com/16113

In this example, the flow chart of meal preparation takes about 35 minutes of cooking and the vegetables are done about 10 minutes before the chicken, which means the vegetables get cold!

MealWrite can arrange the steps to take less than half the time! MealWrite will also manage the timers so that the chef doesn't have to stress over next steps or when things are finished. The new approach is:

By using a computing device (e.g., tablet, laptop, or voice assistant), the chef can ask questions, never needs to reference a recipe, and can have time to clean the kitchen and set the table.

Minimum Viable Product

- An app that can load, manage, and retrieve a recipe/coach operation (RCO) as a module
    - Among other components, this would include ingredients, quantities, preparation/cooking times, common FAQs for the recipe, and basic ingredient substitution
    - This module must be adaptable to a wide variety of recipes and cooking conditions and, looking toward the future, adaptable to downloaded RCO modules
    - Initially allows for manually loading at least three RCO modules, managing the modules in a reference page, with future possibility of loading and/or accessing more

- An "engine" app (the presentation program) that uses a computing device to assist/coach meal preparation, created from an RCO module; this will include:
    - Answer basic technique questions and unit conversions
    - Allows the user to select a meal, set a desired start time, and indicate a number of diners
    - Alerts at appropriate time in advance of meal, and walks through each step of the recipe, including prompting with ingredient amounts as they need to be added
    - Manages all preheat and cooking timers
    - Conducts overall time-management to ensure all dishes are complete simultaneously!
    - Identifies gaps in active cooking time to clean up, set table, etc.
    - The app is configured initially to provide verbal prompts

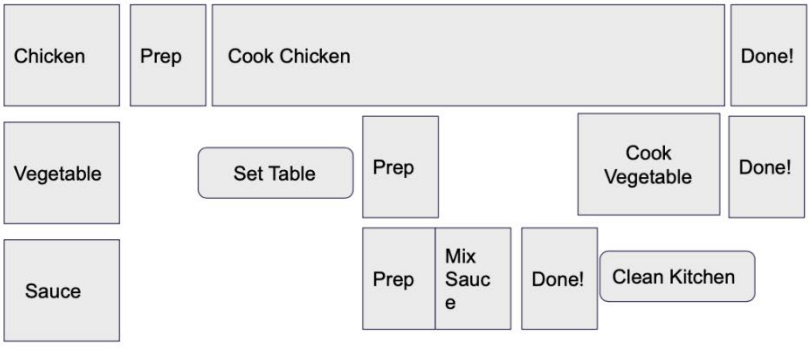
Stretch Goals

- A future conversational interface with a smart voice assistant such as Alexa and/or uses an Alexa or equivalent interface
- The app verifies all ingredients and equipment
- The app communicates with a crowd-sourced cloud system to access other RCO modules
- The app can connect to a local grocery store system to obtain ingredients. User can uncheck which ingredients already available. The ingredients would be auto-populated from the recipe that the user selects
- The app tracks food expiration dates on newly purchased perishable items to prompt for use before spoilage
- The app saves common users, such as family members, and can store their likes and dislikes
- The app adds advertisements for beneficial kitchen products, highlighting the value: ("using this food processor, you can save 5 minutes of cooking time on this recipe") or seasonal ingredients ("fresh fish available at Bob's Fish Shack!")
- The app adds gamification, such as teaching new cooking techniques with clear advancement benefits outlined ("would you like to learn sauce making instead of purchasing jarred sauce?"), which unlocks additional recipes
    - Gamification can keep track of a score for achieving new chef levels
    - App has team goals so you can compete with family and friends
- The app tracks food savings, such as how much food you avoided wasting and how much money you saved

<u>Impact</u>

This app can make cooking healthy, approachable, stress-free, local, and cost effective to complete novice users. Figuring out what is for dinner is a challenge that everyone faces. Meal delivery services have proven

the market opportunity for home cooking services and MealWrite has the potential to disrupt this large, fast growing market while making an impact on daily lives.



Your kitchen is clean, your table is set, and all food is hot and ready at the same time!

Knowledge, skills, and expertise required for this project:

- Computing device app/user interface design/programming
- Recipe database framework design
    - onboard database operations
- Basic cooking skills (optional!)
- For stretch goals:
    - Smart Voice Assistant interaction design (Amazon Alexa, etc)
    - Interaction with crowd sourced server/client/data management
    - Interaction with grocery store order access system(s)
    - Interaction with online advertisement system(s)

Equipment Requirements:

- development platform and software/tools freely available online.

Software and other Deliverables:

- A strong as-built report detailing the design and implementation of the product in a complete, clear and professional manner. This document should provide a strong basis for future development of the product.
- Functioning prototype smart voice assistant app (Alexa, Google Home or other) and companion cell phone app (any platform), plus any server-side database/apps required for function.
- Complete professionally-documented codebase, delivered both as a repository in GitHub, BitBucket, or some other version control repository; and as a physical archive on a USB drive.