Prototype Report

Software Engineering and Professional Practice

Ahmed Ibrahim Aljasim

Essam Umar Sheikh

Badr Jamal Hariri

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Summary

After much careful consideration and discussion, Essam's EDR was unanimously agreed upon to be most viable because it aligned the most with our group's goals and timeframe. The other EDRs involved developing collaborative-household grocery ordering features which would require writing and integrating complex functions for discounts and categorization even on a simplified level. We managed to accomplish all the goals that were outlined in the EDR, mostly maintaining the same core idea without drastic changes. This included making a UI using JavaFX to simulate using the SSH app and camera for the frontend, as well as including Gradle with our base language being Java. The backend primarily consisted of Even though each member was assigned to a specific part of the project they should work on, we often consulted each other by sharing ideas and receiving / giving constructive feedback to one another. All things considered, the group was able to overcome all difficulties and barriers faced by the project, with all of us feeling like we'd honed our existing skills whilst learning new ones throughout the development of the prototype.

Report

Backend: The backend is composed mainly of classes that are aimed at imitating the SSH features. All the files are interconnected with each other, with App.java being the "central" file. The Camera.java class is supposed to mimic the SSH camera where the users could capture an image of their fridge to detect the ingredients available, the actual function picks a random number and selection of ingredients present in the predefined recipes.csv file. The detected ingredients are then assessed by the App and RecipeMatch to display the topmost relevant recipes, sorted by how many ingredients match the ones detected in the fridge. Data displayed includes recipe names,

ingredients, preparation steps, and cooking time. The system showcases a concise simulation of our prototype without the need for hardware or complex functions, using the aforementioned classes as a solid foundation for the main function. Overall, the design aligns with the EDR goals of demonstrating feasibility whilst maintaining simplicity and practicality.

Frontend: The frontend of the prototype was designed with the goal of providing a clear and concise user interface in mind, showcasing the core functionality of the SSH recipe suggestion system. It was made using JavaFX, with a structured layout and labeled sections paired with interactive buttons that allow users to simulate getting the ingredients from their fridge and edit recipes. The primary interface includes two primary sections: the list of ingredients as well as the matched recipes table. Users are able to replicate ingredient detection through the “Get ingredients” button, which uses the Camera class to fetch a random selection of ingredients displayed on the left side of the window. To the right in the center of the screen, the matched recipes section dynamically updates to show the top recipes sorted by matching ingredients after each capture. The table displays columns for recipe names, ingredients, steps, cook time, and percentage match, making recipe comparison and selection straightforward. Under the main table, the “Add Recipe” and “Hide Recipe” buttons allow extended recipe management as mentioned in the EDR. Our frontend manages to balance functionality and usage to demonstrate primary features in a visual manner.

Planning: Development of the prototype was based on a structured planning process that ensured cohesive teamwork and progress. The planning began with our first team meeting, where Essam’s EDR was collectively selected due its feasibility within the project’s time frame. The recipe suggestion system, utilizing JavaFX for the user interface, was decided to be the most viable option. In the meeting we also established the github repository to allow for version control and continuous integration. The following meetings were pivotal in refining our technical and project goals, with the second meeting involving us cloning our repository and reviewing github workflows. A technical plan was drafted and later formalized with specific task assignments during meeting number four. Essam was in charge of JavaFX and the App.java development, whilst Ahmed built the backend components like the Camera and RecipeMatch, and Badr managed UI planning for the initial layout. The development process was complemented by regular synchronization points. The fifth team meeting marked a milestone where our team fixed a Gradle compatibility issue with JavaFX, finalized the frontend and backend, and implemented containerization and testing. Badr polished and debugged the UI, Ahmed oversaw the overall report whilst consulting other members, and Essam resolved technical blockers. Our primary tool for issue tracking and collaboration was github, with our group's commitment to clear communication and

adaptive planning ensuring a functional prototype that best displayed the features mentioned in the EDR.

Team Meeting 1

06 December 2024 / 2 pm - 6pm / Essam's Palace

Attendees

Essam, Ahmed, Badr

Agenda

Discuss which EDR is the most viable

Start making assumptions on how to plan and implement the prototype

Notes

- Essam's EDR was found to be the easiest to implement. The recipe suggestion feature seems the most viable in the 7 day timeframe we have from the deadline. The other option was making a group grocery order system which would need seemingly complex mathematical functions to implement discounts and offer categorization across shops.
- Ahmed and Badr need to revise their knowledge in Git, Github and Gradle
- Essam has already made a github repository for the group which implements the Gradle build system, continuous integration and continuous deployment.
- The recipe suggestion implementation should include a GUI to display the results potentially with Java FX. SQL could be used to create a recipe database in conjunction with java and a small scale server could be implemented with templates from last years Full Stack Development module.

Next Meeting Agenda

Discuss how to implement the prototype in more detail and create a structured method to plan the project according to info provided in the lectures. Essam has provided detailed notes on all the methods described in the lectures.

Team Meeting 5

11-12 December 2024 / 6 pm - 8am / Main Library

Attendees

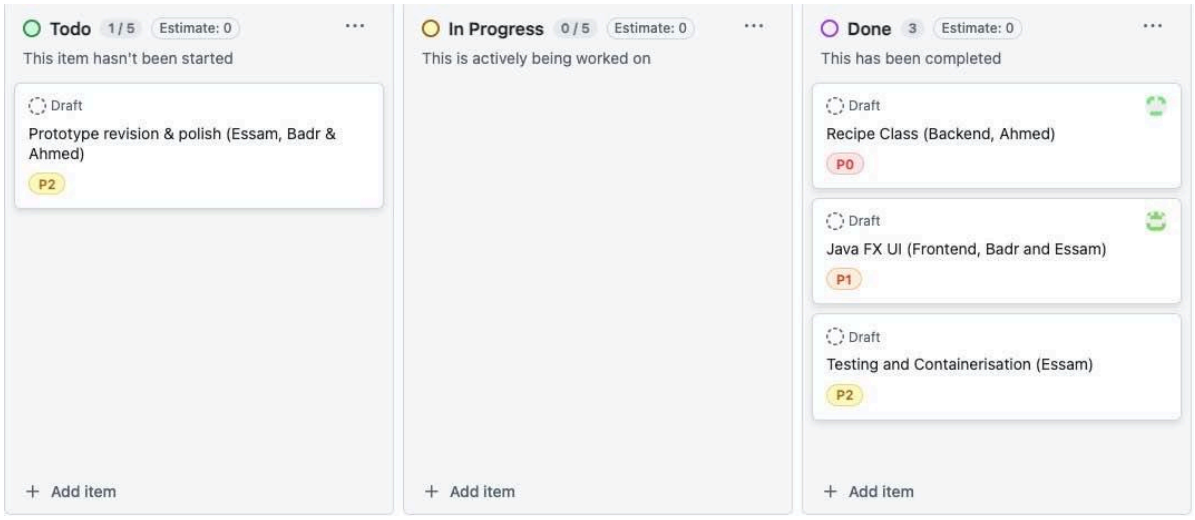
Essam, Ahmed, Badr

Agenda

- **Gradle replacement (due to compatibility issues with JavaFX)**
- Writing the report and our respective reflections
- Finalising the front and the backend
- Implementing tests and containerisation
- Polishing everything up
- Extensively revising our planning

Notes

- We had discovered our version of Gradle was not compatible with JavaFX causing a major set back that was taken care of by Essam
- Badr was finalizing our initial proposed UI with the respective layout
- Ahmed was overseeing the Prototype report while whilst communicating with other members for feedback
- Essam implemented testing and containerisation
- Revising our Prototype before final submission



Reflections

1. Badr:

- Reflection on Essam

Essam has been a key figure in the success of our project. He took the initiative to set up the repository, ensuring that all our work was well-organized and easily accessible to everyone on the team. His ability to keep the team together and on track was evident, especially when it came to managing meetings and ensuring that everyone was clear on their roles and responsibilities. Essam was proactive in assigning tasks, which helped distribute the workload evenly and kept us all focused on specific areas.

One of the most valuable contributions Essam made was helping the team improve our skills with essential tools. Whether it was setting up version control or guiding us on best practices for collaboration, he ensured that we were all equipped with the necessary resources to work efficiently. His leadership and organizational skills were key to keeping the project moving forward and ensuring that deadlines were met.

In terms of areas for improvement, I think Essam could benefit from delegating more tasks, especially when the workload becomes overwhelming. While he was highly involved in every aspect of the project, sometimes he took on too much responsibility, which could be avoided by assigning team members to take ownership of tasks.

- Reflection on Ahmed

Ahmed was an essential part of our team throughout the project. He played a crucial role in developing the backend and setting up the camera functionality, which helped the overall project function smoothly. His ability to tackle complex tasks, such as integrating the camera system and working with databases, was impressive. I appreciated how he always approached problems with a positive attitude, quickly coming up with solutions even when faced with technical challenges.

However, I believe there are areas where Ahmed can further improve to make future collaborations even more productive. While his technical skills are strong, I feel that refining his understanding of more advanced coding techniques and best practices would greatly enhance his ability to handle more complex scenarios. Specifically, working on improving code optimization and refactoring techniques could be beneficial for reducing redundancy and increasing efficiency in the backend. Additionally, while Ahmed is highly focused on getting the job done, I believe improving communication during the planning and decision-making stages could help align team efforts more effectively.

Looking ahead, I would suggest that Ahmed work on enhancing his ability to explain his technical decisions to the rest of the team. This would ensure that all members are on the same page and help avoid misunderstandings when integrating various parts of the project. With his technical strengths and a bit of focus on communication and advanced coding techniques, I believe Ahmed can continue to be a valuable asset to any future project.

2. <u>Ahmed:</u>

-Reflection on Badr

Badr demonstrated strong enthusiasm and determination to contribute to the project. He was especially effective in focusing on the frontend, ensuring that the user interface was not only polished and functional, but also aligned with the group’s vision for the

prototype. His work on the interface reflected his creative potential and adaptability. However, Badr faced some challenges with time management and availability, which occasionally restricted effective engagement in group meetings and collaborative tasks. These issues were somewhat compounded by some difficulties in grasping the most technical aims of the project, particularly in the backend. Despite these challenges Badr still approached his objectives with enthusiasm and willingness to learn, displaying abilities to adapt to feedback and refine his work as needed. His contributions to the frontend were critical in making a user-friendly interface, making sure that the visual aspects of the project matched with its functional goals. His work highlighted his capability to balance design ideas with practical implementation. While time management and technical understanding were areas for improvement, his work attitude and commitment to our project played a key role in our achievements. Working towards a stronger foundation in technical skills as well as improvements in time management and communication would have enabled him to contribute more effectively to future projects.

-Reflection on Essam

Essam was a key technical leader throughout the project's journey, contributing a wealth of knowledge and problem-solving expertise to the table. He played an instrumental part in addressing complex technical challenges, like resolving the Gradle compatibility issues and debugging integration errors after many hours of work. His capability to quickly pick up on new concepts and adapt solutions from prior experience was a valuable asset, ensuring the prototype met its goals and objectives within our timeframe. However, Essam's proactive attitude towards working on the project sometimes led to an imbalance in work distribution. While his intent was to ensure constant progress of the project and deliver a robust prototype, this occasionally excluded the rest of the group from engaging deeply with the more technical aspects. This overreach somewhat limited the opportunities for collaborative learning, which could have strengthened the team's understanding of the project. Essam's leadership and technical contributions remain invaluable, consistently facilitating group discussions whilst providing constructive feedback and solutions. This ensured the group stayed aligned with the prototype's goals. His dedication and commitment were noticeable in his ability to multitask effectively, but fostering more balanced collaboration to enhance everyone's understanding would greatly enhance the group dynamic.