Online Food Ordering Service: My Uni Order System

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***Abstract*— Internet innovations have become a platform for people to practice multiple online services including the online food ordering system using a Mobile application. This field had massive growth in the last few years. However, there is a lack of an online ordering system service for university students to order groceries or food from on-campus restaurants and stores. After applying the in-depth comparison, Flutter was chosen as a front-end programming language and Dart as a back-end language. Android studio as an interactive development environment, Firebase database as a database management system, and Apple system as an operating system. A rapid application development model was applied to the system development methodology. A comprehensive My Uni Order system was developed to fill the gaps in online order service to assist university students. However, the function of credit cards and banking transactions needs to be embedded for future research to increase the significance of the application to suit the current environment.**

Keywords—food order system, online ordering system, online delivery service

I. INTRODUCTION

Recently, there has been a significant advancement in an online food delivery system based on mobile applications. There were 4.5 billion internet users globally in 2020, and the food delivery service was used by more than 110 million people just in the United States (Fatin, 2020). The size of the food delivery services business has expanded quickly since 2014 (Lan, Hong & Shuhua, 2016). In fact, with the current Covid-19 global pandemic, this online food delivery system helps in reducing crowds and physical food lines which enhances social distance behaviors (Candra, 2021).

The service is provided by many platforms in Malaysia, including Food Panda (Aparrow, 2020), Grab (Wee, 2021), Hello, and others. This food delivery business delivers food to a specific customer address (Manuel, 2020). Unfortunately, due to specific delivery limitations, most food delivery services are unable to deliver the ordered food to student residences. Most college students are therefore compelled to pick up their food in a specific location, such as a lobby. This practice increased the number of people in the food-picking area and increased the time it took to pick up the food. Therefore, this study's objective is to propose a platform for university students to place food orders from on-campus cafes and stores that may deliver them to their dorm rooms.

II. LITERATURE REVIEW

Workers and college students have increasingly used food delivery services because of the market's expansion. It is predicted that this trend will continue in the years to come, especially for the younger generation that needs to work hard and diligently for their career improvement (Candra, 2021).

The global pandemic's impact on food delivery businesses is depicted in Figure 1. Restaurants that transport food can survive quarantine and choose to keep this service available in the future. Indeed, the growing popularity of online ordering, as depicted in Figure 2, and the fact that the gap between them is closing every year account for the high demand for mobile applications from restaurants (Manuel, 2020). A survey of US customers conducted in March 2020 found that 41.7% of respondents approved the concept of ordering food online and preferred it to alternative methods.

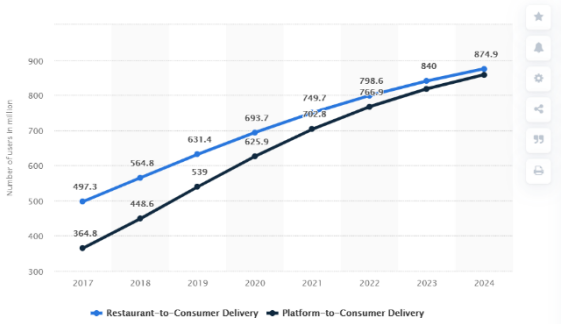

Fig. 1. Example of a figure caption. (*figure caption*)

Platform consumer delivery (WishDesk, 2022)

People also choose to request food delivery when they are at work and request delivery to the workplace (52.4%) (Manuel, 2020). Some people are not ready to go out to buy food (51.4%), and some are due to lack of time or lack of sufficient skills in cooking (39.8%). There are also who are attracted to online delivery sales promotion (34.5%) (Yosua & Nowshath, 2021), experience bad weather (26.0%), want to experience food delivery service (18.8%), and some take it as a habit (12.9%) (Lan et., 2016). In fact, trade, business, restaurants, and supermarkets have significantly increased in the internet markets environment.

III. METHODOLOGY

There were technical research and software development methods conducted for this study. The technical research conducted includes the programming language (Fauerbach, 2021), interactive development environment (Lotte, 2021), database management system (Wickramasinghe & Raza,

2021), and operating system to be applied to My Uni Order System. Meanwhile, there are several kinds of software development methodologies that can be applied (Stickland, 2021). All methodologies have advantages and disadvantages, depending on the need for the project to be implemented.

A. Technical Research

An in-depth comparison of pros and cons was conducted for identifying the most suitable programming language (Atha, 2021), interactive development environment (IDE), database management system, and operating system to be applied for My Uni Order System. The main objective of the program must be determined in terms of the programming language, which must also be compatible with all systems and have resources readily available to help if problems arise during development. Understanding the system's complexity and how it is geared toward various people after development is also crucial (GeeksforGeeks, 2021).

- *Programming language:* Whether for web or mobile applications, the front end is the visible portion that the user interacts with directly (Lotte, 2021). Responsiveness, performance, and design simplicity were used as comparative criteria for determining the front-end programming (Fowler, 2021). Flutter, which utilizes Dart, and Reacts Native, which uses JavaScript, were two of the most frequently used front-end frameworks (Lotte, 2021). Flutter was selected based on an in-depth comparison because it excels in a number of aspects (Mrocskowska, 2022). The two most important are the ease of learning and that Google itself provides a lot of design libraries (Sanna, 2020). This expedites the process, in which connecting to the backend is also simple (Thomas, 2021). Additionally, there are internal-developed design elements that make it simple to add and change designs. Dart was chosen as the language used in the backend for developing the proposed program for several reasons, which is its distinction from Python in the field of software development and its ease of connection with Flutter, due to Google's full support for it, as well as the speed of Dart programmatically and its great ability in the field of mobile applications, especially Cross-platform.

- *Interactive Development Environment (IDE):* Android Studio was chosen to be the application used in building the program. This is due to the fact that the main application is supported by the flutter programming from Google. It also has a lot of exceptional features that distinguish it from most other development environments. Android Studio has the ability to compile the code very quickly and immediately change the program (Kukhnavets, 2021). Thus, the developer does not need to build the program every time he wants to see the result of the change that has been worked on (Ghanci, 2021). In addition, Android Studio has a fast Emulator and is rich in useful features such as testing the application on many devices and different types available that the developer can choose from (Ghanchi, 2021).

- *Database Management System:* Because it is the quickest to implement and the most appropriate database for mobile apps, the Firebase management database system was selected. Furthermore, firebase is strongly advised for flutter apps that run on smartphones with both iOS and Android operating systems (Vyas, 2022). Additionally, it is secure due to its use of Google's most recent secure cloud database system (Barman, 2021). Additionally, Firebase has a potent tool for database-stored data analysis (Sykutera, 2021). Overall, this results in a high performance for the app and a satisfying user experience.

- *Operating System:* The developer has decided to create the suggested mobile application on the Mac operating system. The Apple system was chosen since it already has all the required software. In addition to having better programs, Apple computers typically feature better tools and apps and operate more smoothly than Windows. Additionally, the system offers cross-platform application development that can be used to develop any phone operating system, including iOS and Android. Whether it is safety or the straightforward and hassle-free experience that Apple offers with this system, this designed system aids in many ways. In addition, the majority of flutter developers like working on Macs because of the availability of the right tools that work perfectly.

B. System Development Method

The system development life cycle methodology is a collection of repeatable methods and procedures that, when followed, show how to get desirable results (Dutta, 2021; Baashen, 2021). These methods have demonstrated value in assisting software development teams in producing high-quality software (Egeonu, 2022; Gaille, 2020). In order to manage the project with the highest level of efficiency, effective projects require good planning and the definition of a working system that will be followed during the development of the system (Davis, 2021; Lucid, 2018b). The development methodology is a crucial element in any project's success (Estuate, 2021).

Because it is adaptable and simple to use, rapid application development (RAD) was chosen. Additionally, it provides an approach for developing mobile applications that is more consistent (Cox, 2022). Indeed, the accomplishment is better so that the project can be finished quickly and the initial iterations may be tested subsequently (Chien, 2020; Miller, 2021). This cuts down on mistakes, enhances how things are handled, and cuts down on the time that would otherwise be squandered (Demchenko, 2020).

Four stages make up RAD: requirements planning, user design, build, and transition (Lucid, 2018a; Martin, 2021a).

- *Planning requirement:* At this stage, the project's goals, deadlines, budget, and other specifications for the My Uni Order System are specified and finalized. The student who is the user of this system is not required to provide explicit demands because the amendment at any stage and in a variety of ways can be conducted. A questionnaire was used to gather data and quantitative techniques were used to analyse it (Cleave, 2022; Mcleod, 2018). For the purposes of this study, 21 questions were developed with one essay question and twenty optional questions. The questions were designed to clearly comprehend people's perceptions of home-delivery food.
- *User design:* The creation of prototypes begins after the mobile app has been defined. The developer works on the app until it is finished, and this process is repeated frequently to meet the project's requirements. The usage of prototypes promotes student testing, engagement, and feedback. Users' feedback help in modifying requirements until the desired outcome is achieved. The developer uses the prototypes to streamline complicated system components, making them less error-prone and better prepared for upcoming mobile application updates.
- *Construction:* The developer codes the app at this step, and the experimental models are turned into real apps that run on both iOS and Android. This step can be repeated as often as necessary, allowing for the addition of fresh alterations. At this point, the developer can swiftly produce the final version because the majority of the issues were acknowledged and fixed in the prototype.
- *Transition:* This phase comprises data conversion, finishing up the app's necessary testing (Mouad et al., 2021), moving to the new system, and providing students with training. Final adjustments are also done, while the developer simultaneously searches for problems in the system to fix.

IV. RESULTS

The in-depth comparison applied to the technical part of the My Uni Order System mainly in choosing a suitable programming language, the IDE, the database management system, and the operating system. The employment of RAD model for system development is appropriate for this mobile application development. It helps the project be accomplished in a short period, reduces errors, and improves the way that is being dealt with.

A restaurant and store app as well as a student app make up the My Uni Order System. The restaurant and store apps allow users to register for an account, log in, add, and delete products as well as read menus (refer to figure 2 until figure 5). While using the student app, users can also create accounts, log in, and browse menus and items at restaurants. Besides that, users can also confirm orders and view those orders on the orders page, as well as add desired products to carts, look at the total contents of carts, add, view, or delete addresses, and browse addresses on Google Maps (refer to figure 6 until figure 9).

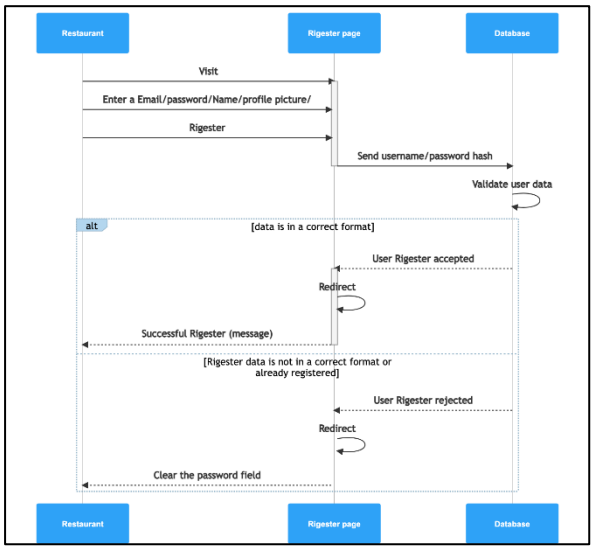

Fig 2. Restaurant registration sequence diagram

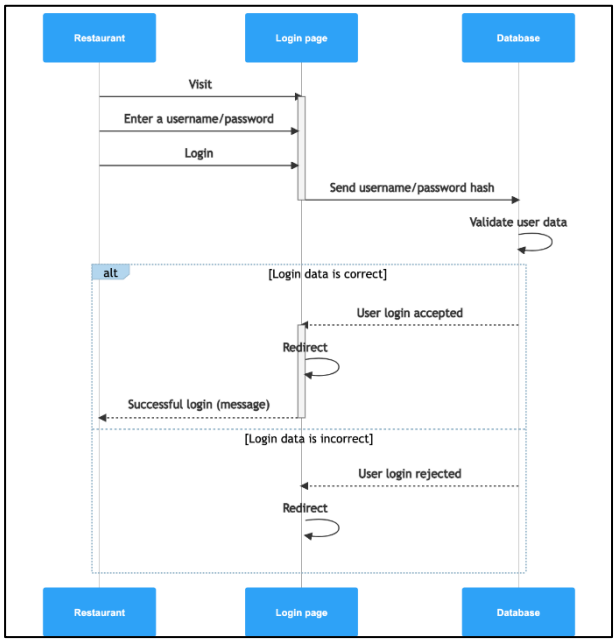

Fig 3. Restaurant login sequence diagram

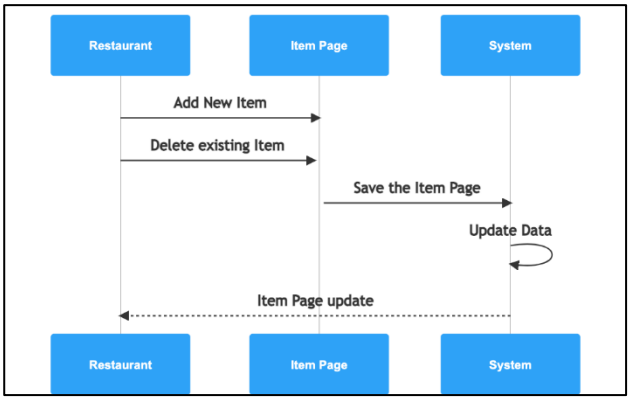

Fig 4. Restaurant Add/delete item sequence diagram

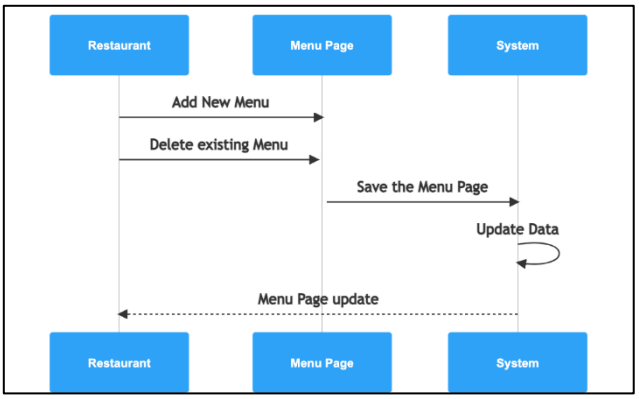

Fig 5. Restaurant Add/delete menu sequence diagram

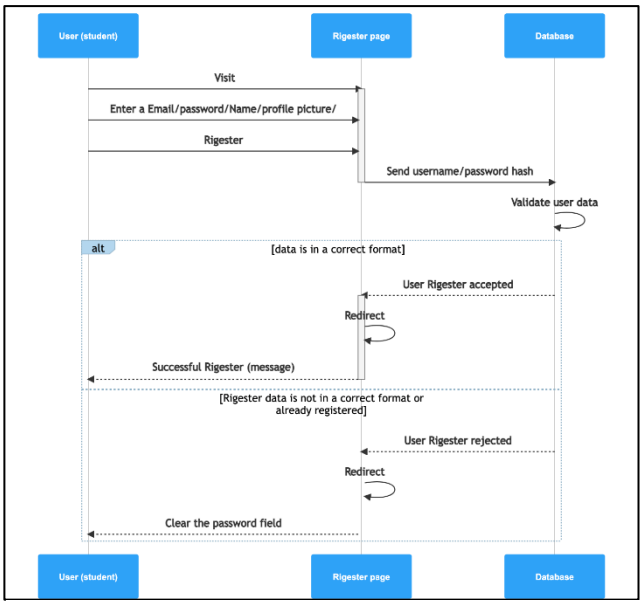

Fig 6. Student registration sequence diagram

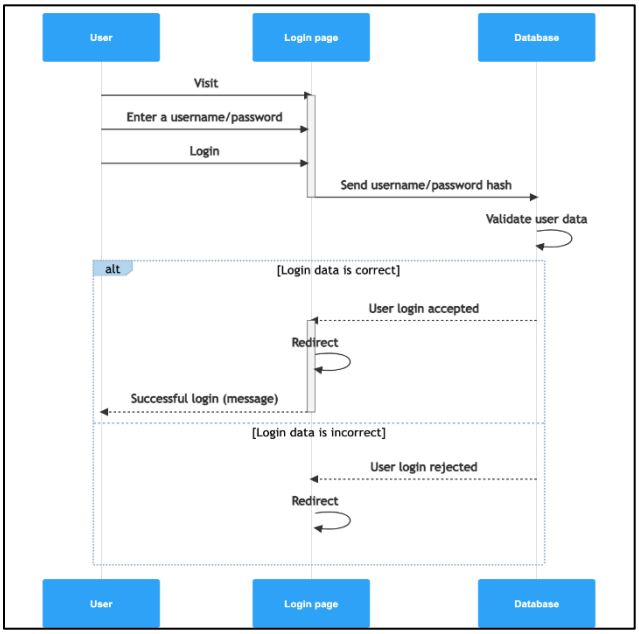

Fig 7. Student login sequence diagram

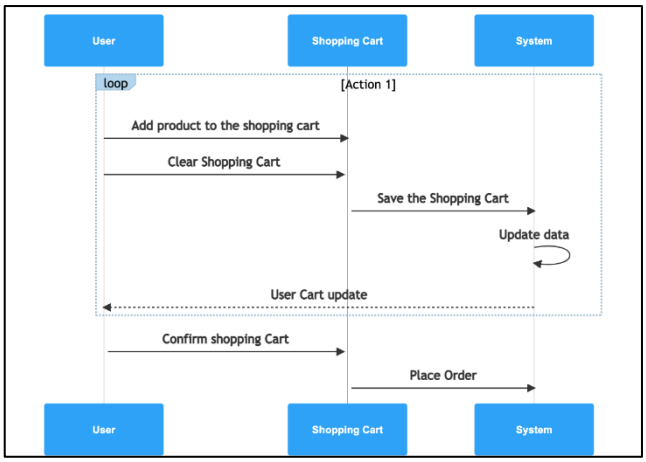

Fig 8. Student Add/clear shopping cart sequence diagram

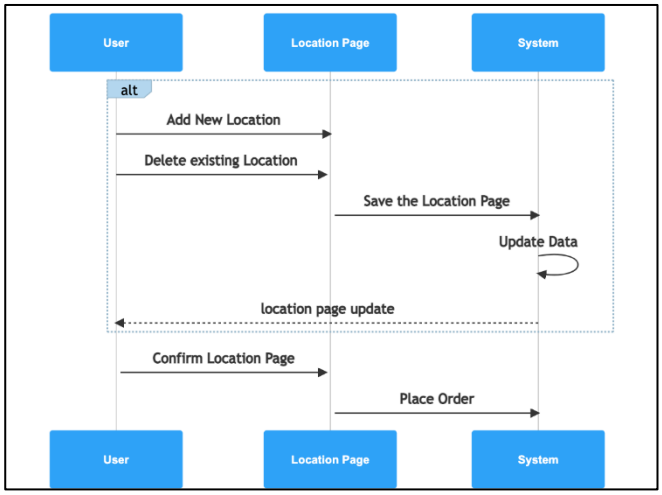

Fig 9. Student Add/delete location sequence diagram

V. Conclusion

My Uni Order System was developed to accomplish the study's objective. A comprehensive application was obtained with numerous advantages that are likely to help university students. Some of the capabilities such as the ability to add a place and have it appear on a Google Map will be helpful to the user. Besides that, there is some improvement for future research, especially regarding credit card and banking transactions. In fact, the inclusion of a third application for the delivery service will greatly increase the significance of the application. It will make the application fully integrated so that it can function in the current environment.

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