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Introduction

The restaurant delivery business has been a very active industry sector not just for business owners, but also for customers. Customer benefit from the convenience of an online meal ordering system. This framework enables both small restaurants to expand their business by lowering the cost of labour and allows for the efficient management of an online menu, which customers can browse and utilise to place orders with a clicks.

However, there are existing mechanisms in place to provide customers with meal delivery services. This method are used by local restaurants, where waiters or business owners tend to write down a customer's order with a notepad, either over the phone or in person. And, with the emergence of COVID-19 pandemic, restaurant owners try to minimise human contact because of the pandemic while still providing great customer service to their clients.

Few of the above mentioned constraints motivated the creation of this research, where customers will be able to make food order from the comfort of their home, according to the prototype model. With the online system, they can place food orders from their PC, tablets or mobile phones. The prototype infrastructure was made with interconnected capabilities to make the service outstanding for customers, this prototype design enables customer feedbacks, and it also includes a live chat incorporated to allow customers to talk to the restaurant staff in a timely manner. The system prototype is designed to overcomes the existing system challenges.

Aim & Objectives

The aim is to analyse existing systems and providing solutions by designing an online food ordering system for a single restaurant use that allows customers to connect with the restaurant over the web.

- **Objectives:**
- To Study existing works on proposed topic and improving on the existing systems.
- To design a responsive desktop and mobile views system.
- To design a trending food suggestion feature.
- To integrate a responsive live chat system.

System Design and Implementation

The perfect methodology for the project implementation is the Agile methodology, its project management characteristics attempts to reduce the tight framework set by other methodologies like the water fall methodology. The Agile methodology enables modifications and additions to project deliverables, which is ideal for the E-meals online service.

The major activities of system users (customers, admin, and restaurant staff), were illustrated using the Use case diagram, System model diagram as well as Class diagram. Due to the characteristics that matches the project design, the N-tier architectural design was chosen for the project. The database structure, which is the system's backbone, was built on a relational database management system (MySQL). The programming tools employed in the construction of this proposed design were appropriate.

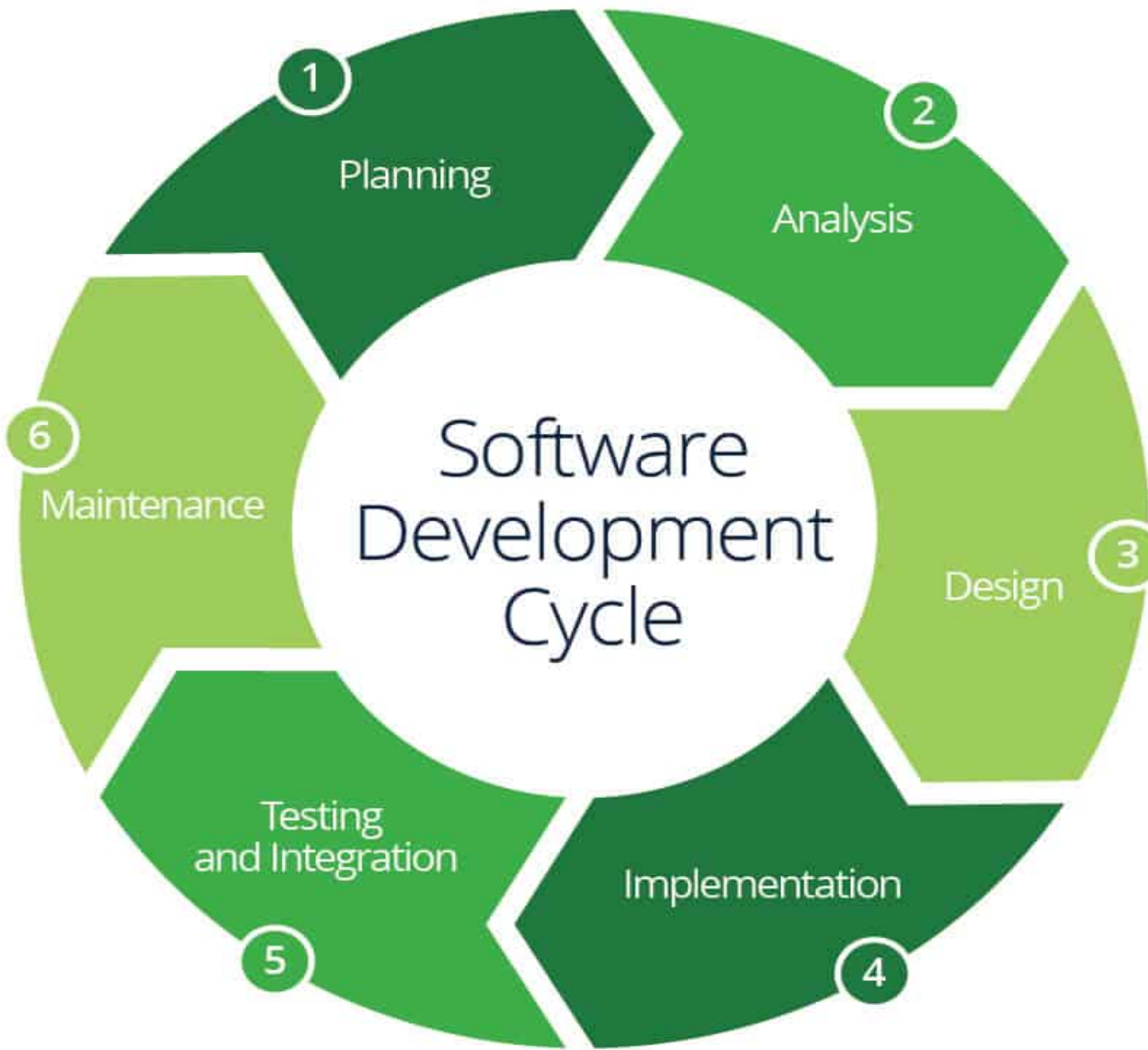


Figure 1: Software development lifecycle (Agile methodology)

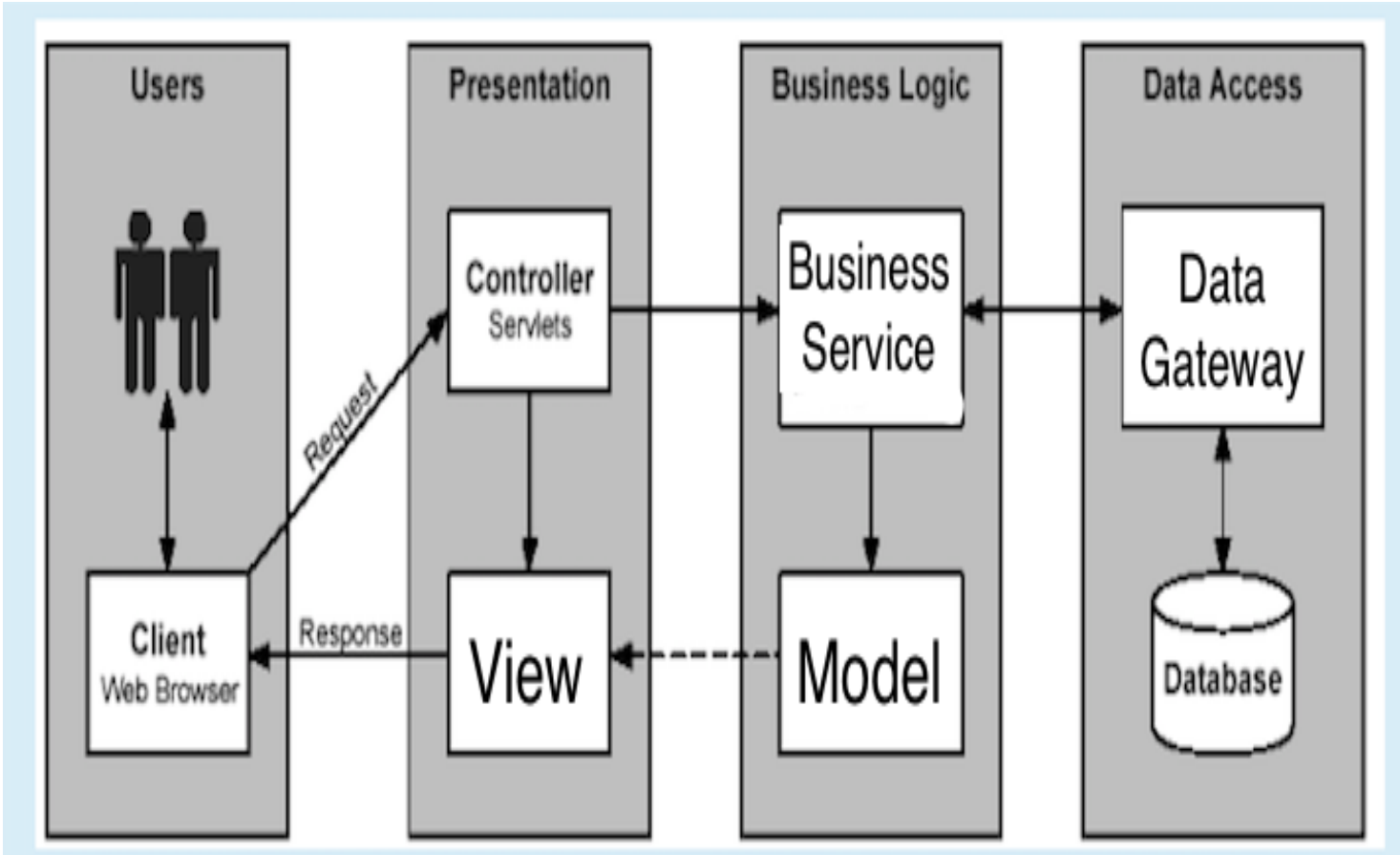


Figure 2: N-tier Architecture of the Online Web Application

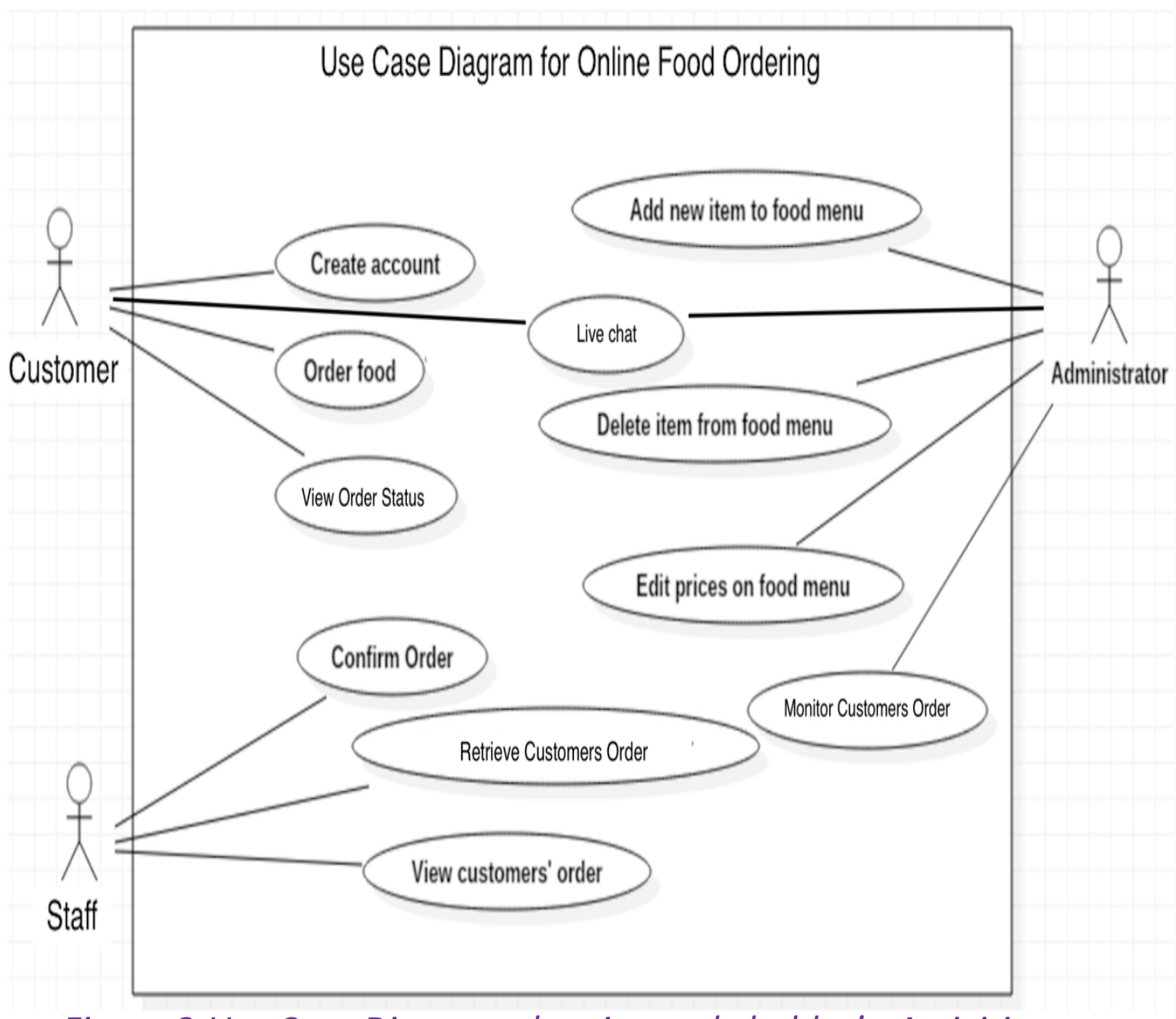


Figure 3:Use Case Diagram showing stakeholder's Activities

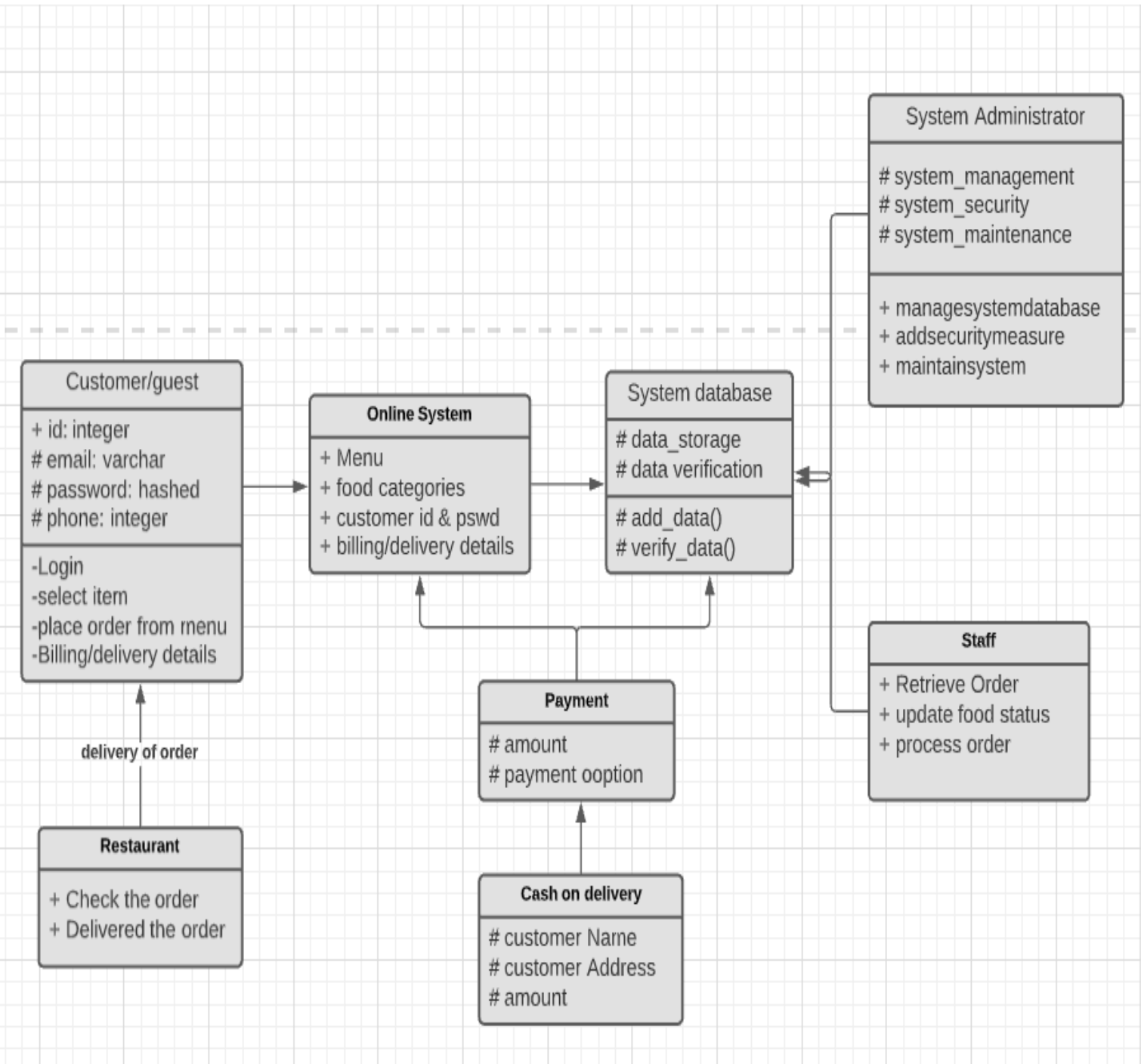


Figure 4: Class Diagram for E-meals Web Application

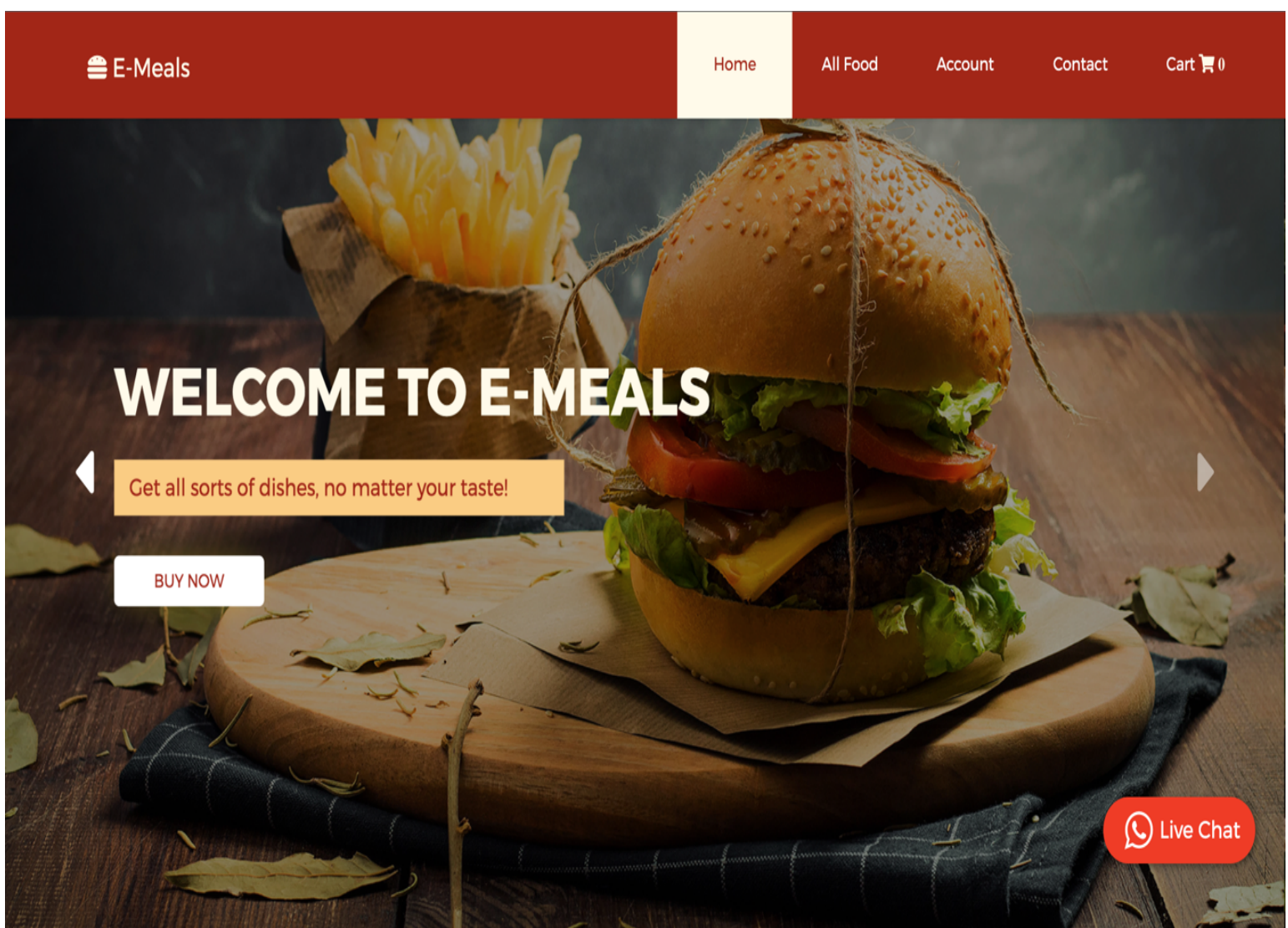


Figure 5: Landing page (Home page) of the Web Application

Online Food Ordering Web Application System for Restaurants

Conclusion

The project outlines the system design, implementation, testing, and evaluation of the E-meals system adopting various user feedback techniques (co-creation and use of questionnaire). The system is designed to limit the amount of human physical interactions among customers and restaurant staffs, especially during the pandemic. The study proposed developing a web application utilising appropriate tools and techniques, to better satisfy the customers, cutting-edge functionalities were integrated into the E-meals system.

Some of the limitations and future works, is that the system is designed for a single restaurant, and the system lacks online payment gate way, payment is made upon delivery.

Furthermore, the security weaknesses in this technology to accommodate large-scale systems will be evaluated in the future in other to enhance the system technology.

I am very much convinced that once the system is actively put to use, there will be several requests for new features that I had not previously considered but would be useful to have.

As a result, I feel the application may continue to evolve, which I think is a good thing.

Acknowledgments

First, I would like to convey my profound gratitude to Dr. Massie Stewart my lecturer and project supervisor for being my academic source of inspiration. My heart felt gratitude goes to my alma mater, Robert Gordon University, for the prestigious standard of education they are dishing out despite the covid-19 pandemic (lockdown). Also, I want to appreciate the academics at the school of computing, they were outstanding, and their positive effect is never forgotten. Ultimately, I would like to appreciate my family for their incredible encouragement and support.

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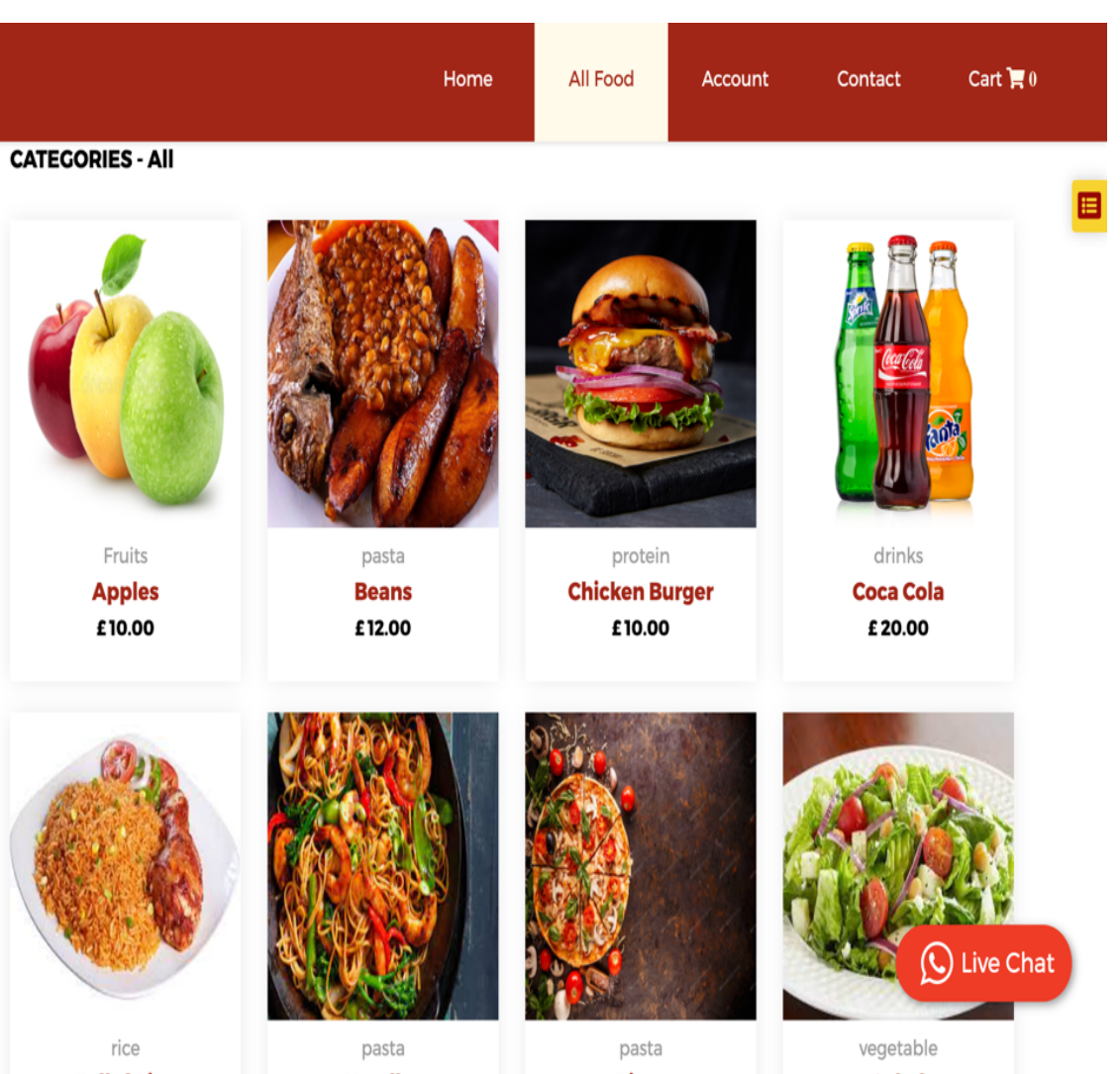


Figure 6: All food menu web page.

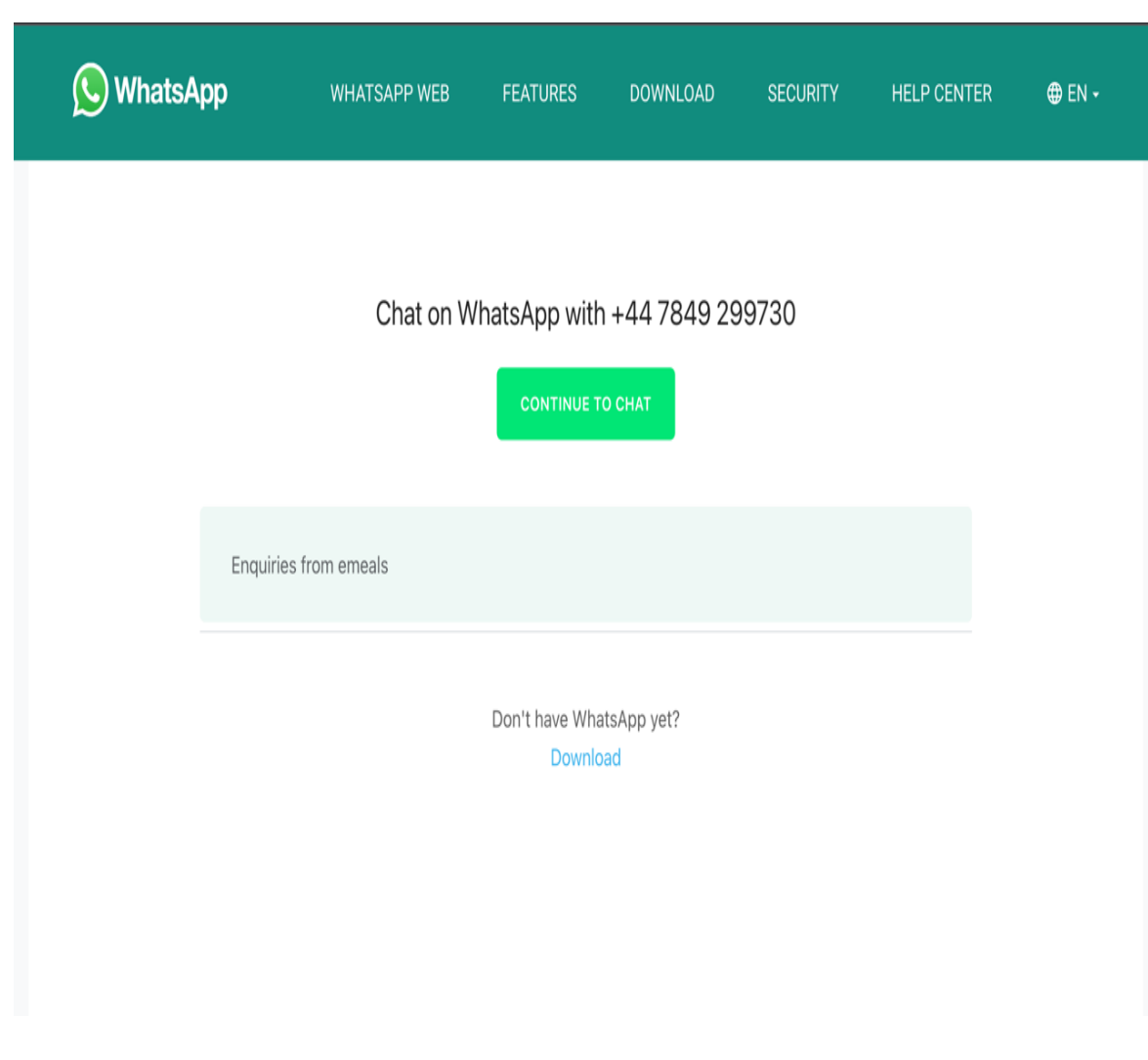


Figure 7: Live chat interface

The live chat enables customers to stay in contact with the admin in real time. The admin handles several management duties on the system, such as updating the food table and updating customer orders status.

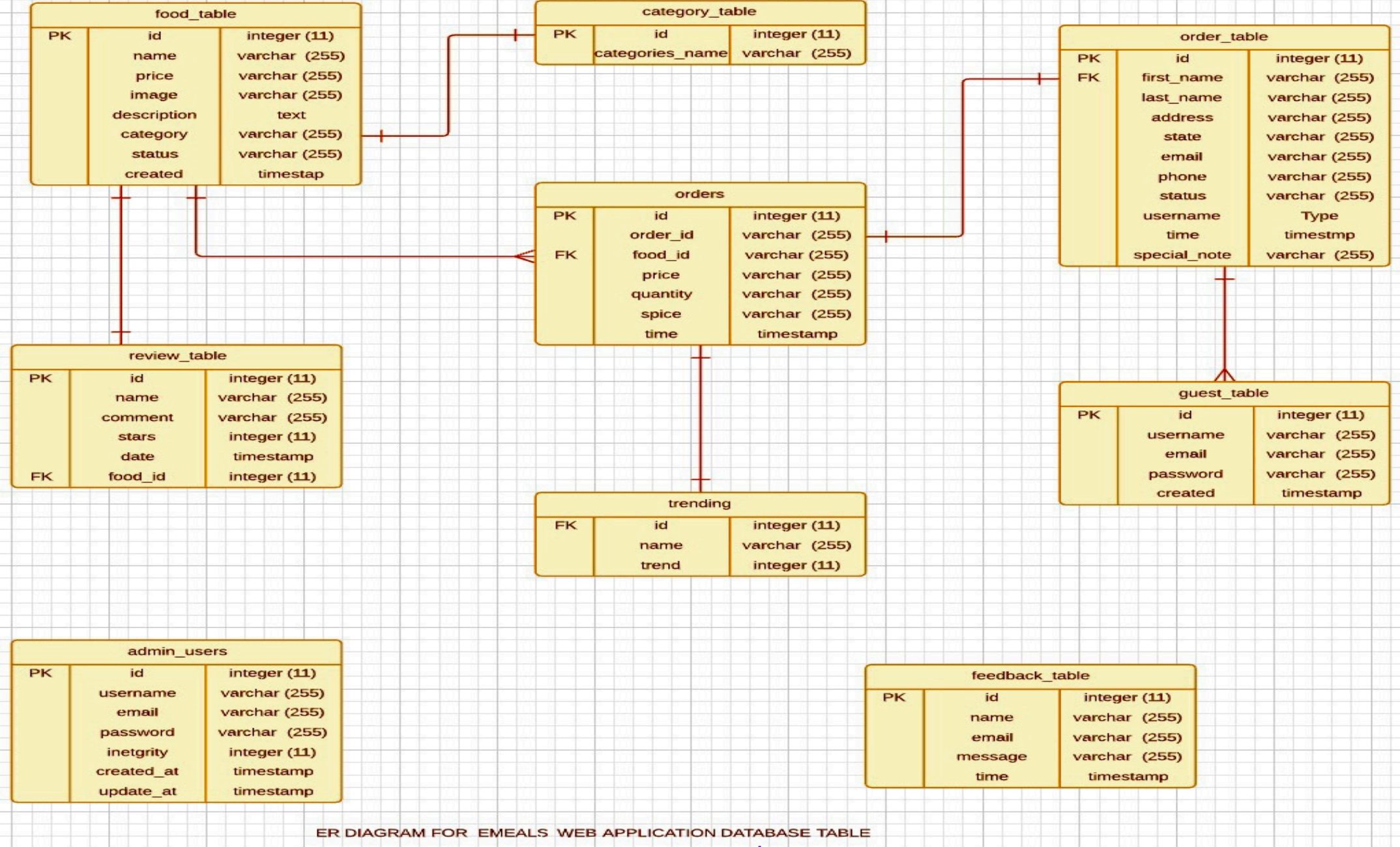


Figure 8: Database Design

In the area of reading content from the database and presenting it to the customer, PHP get request is used to fetch data from MySQL database via apache, which then displays the data obtained in an organised manner using HTML and CSS. Html is used to designate the paragraphs, text, various parts, and visuals, however CSS is used to style what HTML defines, giving it an attractive feel, for example, in the areas of colouring, text and overall content placement, outlook, and layout.

Testing and Evaluation

The goals of software testing and evaluation are to demonstrate that the developed system meets the user expectation as stated in the functional and non-functional requirements. Co-creation experiment was adopted with the use of questionnaire during the investigation report of existing systems. This technique entails soliciting individual perspectives from individuals with differing points of view.

The design and developmental process of the system was evaluated based on the functional requirement testing, and non-functional requirement testing stages. The system was also evaluated by external participants, with the use of questionnaire and consent forms. The system was evaluated based on three system criteria which are **system design**, **system performance** and **system usability**. After proper analysis of questionnaire outcome, it was shown that the software application passed the test criteria listed above.

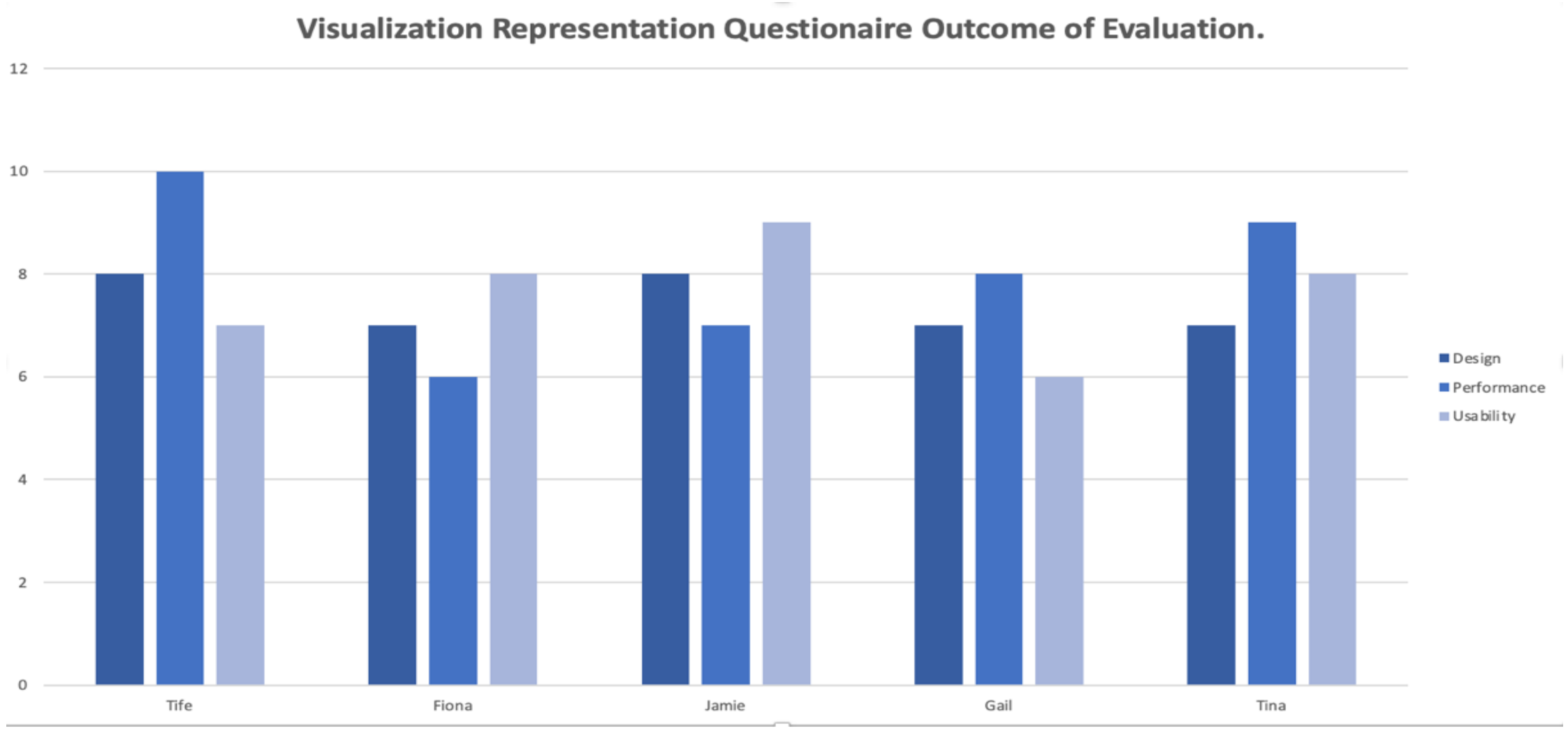


Figure 9: Visual Representation of Questionnaire Outcome.