SCHOOL OF ENGINEERING AND TECHNOLOGY

ASSIGNMENT / PROJECT SUBMISSION FORM

PROGRAMME : BSc (Hons) Information Technology (481BIT1)

SEMESTER : <u>Jan</u> / Apr / Aug 2025

SUBJECT : WEB 2202 Web Programming

DEADLINE : 26 FEBRUARY 2025 23:59 MYT

                 28 FEBRUARY 2025 23:59 MYT (Extended)

INSTRUCTIONS TO CANDIDATES

- This is a(n) individual / ~~group~~ project.

IMPORTANT

The University requires students to adhere to submission deadlines for any form of assessment. Penalties are applied in relation to unauthorized late submission of work.

- Coursework submitted after the deadline but within 1 week will be accepted for a maximum mark of 40%.
- Work handed in following the extension of 1 week after the original deadline will be regarded as a non-submission and marked zero.

Lecturer's Remark (Use additional sheet if required)
List down the name of the group members and the student IDs here.

I, <u>Lee Ming Hui Isaac</u> (Student's Name), <u>22057301</u> (Student ID), received the assignment and read the comments.

leeminghuiisaac, 17 February 2025 (Signature/Date)

Academic Honesty Acknowledgement

"I, <u>Lee Ming Hui Isaac</u> (Student's Name) verify that this paper contains entirely my own work. I have not consulted with any outside person or materials other than what was specified (an interviewee, for example) in the assignment or the syllabus requirements. Further, I have not copied or inadvertently copied ideas, sentences, or paragraphs from another student. I realize the penalties *(refer to page 16, 5.5, Appendix 2, page 44 of the student handbook diploma and undergraduate programme)* for any kind of copying or collaboration on any assignment."

leeminghuiisaac, 17 February 2025 (Student's signature / Date)

1. Introduction

[Provide a brief overview of your chosen topic, highlighting its purpose, and importance.]

Brief Overview of My Chosen Topic

In the not-too-distant future, businesses will have an online presence as society **transitions away from shopping at physical stores and relying on e-commerce websites to purchase everything**. Furthermore, there is a prevalence of young Malaysians willing to pay more for all-natural groceries without being present at distant grocery stores and wet markets to inspect the freshness of fruits, vegetables, and meat products, completely relying on the trustworthiness of sellers and vendors. As such, this is the primary justification on why I chose to develop a functioning and interactive **e-commerce website selling organic products** where businesses, farmers, and vendors **without the hassle of having a physical store or third-party complications**, capitalising on the trend where everything can be done from the convenience of comfort zone for **tapping into a new profitable potential business opportunity**. To further justify the necessity of this project alongside adhering to the United Nations' Sustainable Development Goal 3: Good Health and Well-Being, societies are able utilise e-commerce platforms to **improve accessibility** sourcing fresh, organic, and healthy produce conveniently, thus contributing to **making better dietary choices**, **reducing the risks of contracting non-communicable diseases**, as well as **ensuring healthy lives while promoting well-being for all at all ages** (Ministry of Agriculture and Food Security, 2024, p. 20).

(An image showing the tight spaces where customers have to navigate in Chow Kit Market at Kuala Lumpur (Sinseeho, 2024). Further justifying the need for this grocery-themed e-commerce website project where customers do not have to feel claustrophobic when shopping for fresh, organic produce.)

Purpose

The purpose of this project is to **enhance business reach** by providing businesses with a **convenient and efficient way** to serve customers with organic grocery products. Sellers operating at Malaysia's wet markets also **do not have to worry** about **limited customer reach** and **high overhead costs**, as this **grocery-themed e-commerce website** allows them to **expand their market presence** without the **constraints of a physical store** while **reducing operational expenses**, further enticing them to use this e-commerce platform to **advertise and sell their products** throughout Malaysia.

Additionally, it aims to improve the **customer shopping experience** by offering a **seamless** and **user-friendly interface**, as consumers can enjoy **the convenience of shopping** from **anywhere at any time**, offering a **new shopping experience** compared to brick-and-mortar stores and wet markets. Through a **seamless** and **user-friendly interface**, customers will find it **friendly** and **comprehensible** to understand the navigations whilst **saving time and effort** not visiting physical stores.

Furthermore, this project also **optimises operations** through **streamlining business processes**, **enhancing customer engagement**, and **improving overall efficiency**. For example, automated inventory management, secure payment processing, and data-driven insights. Similarly, businesses and sellers can view commonly purchased products by location, allowing them to **strategically locate themselves** to schedule a **faster delivering process**, hence leading to **improved customer reviews** and being able to **accommodate customers with certain limitations** to travel far for basic day-to-day necessities.

Importance

The importance of business having a grocery-themed e-commerce website is having to **promote healthier food options** among Malaysians while still being able to **profit from it**. This is because the National Health Screening Initiative 2023 has reported that 54.4% of Malaysians screened were either overweight or obese (32.6% overweight and 21.8% obese), and many want to **start anew by eating healthy** (Hassandarvish, 2024). Therefore, it can be predicted that the **demand for groceries will skyrocket** as society becomes more health-conscious and **presents a lucrative opportunity** to provide a service that caters to the demands of the affected population. In addition, having an e-commerce website allows businesses to **gather**

valuable information and data regarding customers' behaviour and preferences, such as demographics, purchase history, as well as product reviews and ratings. The reason for this is that online platforms can **track and analyse customer interactions** providing insights that are often **challenging to capture in physical stores**. As a result, this allows businesses to **make informed decisions and personalised offerings** to attract customers' attention to offer them to products they are interested in and have want to purchase them, sometimes at a discounted price. Placing the businesses with e-commerce website at a **significant competitive advantage**. Similarly, businesses having e-commerce websites can easily **scale to adapt growth**, allowing them to add new products and features **without signification infrastructure changes**, while being able to **reduce unnecessary financial debt** as they **do not need to invest in physical stores expenses**, such as rent, utilities, and maintenance, allowing businesses to **redirect resources wisely**, **improve business operations**, and **focus on expansion**.

(An infographic published by the National Kidney Foundation of Malaysia regarding the initiatives to eat healthy at Malaysians favourite place to have a quick meal, mamak stalls (National Kidney Foundation Malaysia, n.d.).)

2. Project Goals and Objectives

[Define the main objectives of the web project and highlight the key features/ functionalities it aims to deliver.]

Goals

The goals of this project are not only to **develop a fully functional** and **user-friendly grocery-themed e-commerce website** that allows businesses to operate their business online effortlessly but also **adhering to the United Nations' Sustainable Development Goals**, particularly goal three: Good Health and Well-Being in project development as well. **An easily understandable e-commerce website** that **supports local farmers and vendors** to **sell their organic produce** will be created for customers to **conveniently find and purchase** locally sourced products and access to nutritious foods that contribute to overall health. To achieve this, a **seamless online shopping experience** through **smooth navigation**, **secure transactions**, and a **straightforward checkout process** must be implemented for customers. Concurrently, businesses, sellers, vendors, and farmers can **access the e-commerce website anywhere and anytime** to update product listings, respond to customer inquiries, and process orders efficiently. Overall, **receiving an average user satisfaction rating of 4/5** is considered as the **baseline requirement** for customer and business review assessments on the e-commerce website's performance and usability.

Also, this project intends to **implement a loyalty program to reward repeat customers with healthy eating habits**, while aiming to **increase customer retention by 20% in the first year** of operations. The reason behind this goal is to **incentivise customers to sustain their nutritional dietary choices** by **promoting long-term**

wellness that **reduces their reliance on processed, unhealthy foods** and **dependence on Malaysia's overstressed healthcare** system plagued with preventable, non-transmissible diseases (e.g. cardiovascular diseases, diabetes, and obesity). To attain this goal, **points can be offered** for purchases and sharing affordable and healthy recipes that can be **redeemed for discounts and expensive, premium healthy products** to encourage customers to **resume shopping for fresh, organic** and **maintain their healthy eating habits**. This initiative also benefits businesses, farmers, and vendors to **build a strong customer base and foster relationships** through **creating a sense of customers' value** as well as **encouraging word-of-mouth referrals** for a sustainable, healthy future.

Moving on, having this project to **continuously receive updates with new features and improvements** represents one of my intended goals to see this grocery-themed e-commerce website transform from a university project to a potential business opportunity. This is due to the fact that having constant developments is necessary to **remain competitive** and **meet the demands of users**, **keeping them engaged and satisfied**. This goal further promotes the **necessity of innovative and improved healthy food options** catering to a multicultural society with a diverse range of unique consumption suggestions, ensuring the platform constantly updated with new recipes. For this goal to be realised, **regular surveys must be conducted at least once a month** and user **feedback received must be taken seriously to identify areas for improvement, then implementing updates and new features**, **demonstrating appreciation suggestions and criticisms**.

Objectives

1. ## Design a Responsive User Interface

   a. Create a **visually appealing and intuitive website layout** using Hyper Text Markup Language (HTML) and Cascading Style Sheets (CSS) while **ensuring responsiveness and accessibility**.

   b. Achieve an **overall 90% user satisfaction rating** collected from reviews, surveys, and feedback on website design and satisfaction.

   c. **Emphasis** on **website content, design, and overall usability**, especially the backend PHP: Hypertext Preprocessor (PHP) code that handles most of the website's functions.

2. ## Implement User Authentication and Authorisation

   a. **Develop a secure user registration and login system** using PHP with role-based access control to differentiate between customers and administrators.

   b. **Reach a 90% successful login rate** with proper role-based access control for both customers and administrators.

   c. Having registration forms, form validation, password security, and administrator/user access controls as key features.

3. ## Develop a Comprehensive Product Catalogue

   a. **Create a dynamic product catalogue** that allows administrators to add, update, and delete products alongside integrating with search and filter functions.

   b. To **reduce product management time consumption by at least 20%** and achieve high accuracy in search and filter results for product relevancy.

c. The grocery-themed e-commerce website must **include user-friendly product listings, search and filter capabilities, as well as proper content management**.

4. <u>**Create a Shopping Cart System**</u>

    a. **Implement a shopping cart** that allows users to **add, remove, and update products** with session persistence.

    b. **Decrease shopping cart abandonment** when customers have decided to leave the website due to complications **by 10%** while ensuring contents inside the shopping cart retain across devices and sessions.

    c. Implementation done through an **icon of a shopping cart indicating the total amount of products selected** and a **separate webpage displaying its contents and total price** needed to be paid.

5. <u>**Integrate Secure Payment Processing with Comprehensive Security Features**</u>

    a. **Integrate a reliable payment gateway** to **process transactions securely** and **handle sensitive payment information**, while **enhancing overall website security measures** – including encrypted passwords, session timeout protocols, and caching to optimise website performance.

    b. **Achieve a transaction success rate of at least 90%** while ensuring **compliance with industry standards**, particularly compliance with the Payment Card Industry Data Security Standard (PCI DSS) to **reduce the potential risk of fraud and information hijacking**. Also to maintain an **average website load time under 2 seconds and 90% uptime**.

c. **Integrate secure payment handling process** with **automated email notifications for payment confirmations, rejections, and cancellations**, as well as a **streamlined performance** for a smooth user experience.

6. <u>**Provide an Administrative Panel and Advanced Features**</u>

    a. **Develop an administrative panel** for managing products, orders, and user accounts, with features for viewing sales reports and tracking inventory levels, rewards/points distribution, and notifications.

    b. **Focus on improving administrative efficiency** by **lowering task completion time by 20%** while **receiving a minimum satisfactory rating of 80% from staff users**.

    c. **Having comprehensive administrative controls**, such as user and role handling, order and transaction management, as well as security and system monitoring, allowing administrators to **manage every aspect of the website** and **enhance overall operational effectiveness**.

7. <u>**Ensure a Reliable and Scalable Website**</u>

    a. **Conduct comprehensive testing** to ensure **functionality, bug resolution, and usability testing** for a positive user experience.

    b. **Integrate robust optimisation measures** to achieve **fast load times, minimal lags, and scalable hosting platform for reliable uptime**.

    c. Achieve an average **load time under 2 seconds**, at least a **90% test coverage** with **usability ratings on a minimum 4/5 scale** and being able to **sustain 90% uptime** under heavy traffic conditions.

    d. The essential components include **performance optimisation** through **caching and load balancing, scalable deployment to maintain**

reliable performance, as well as continuous monitoring for real-time performance tracking to quicky resolve issues and uphold system integrity.

Summary of the Project Goals and Objectives in a Mind map for Visual Understanding
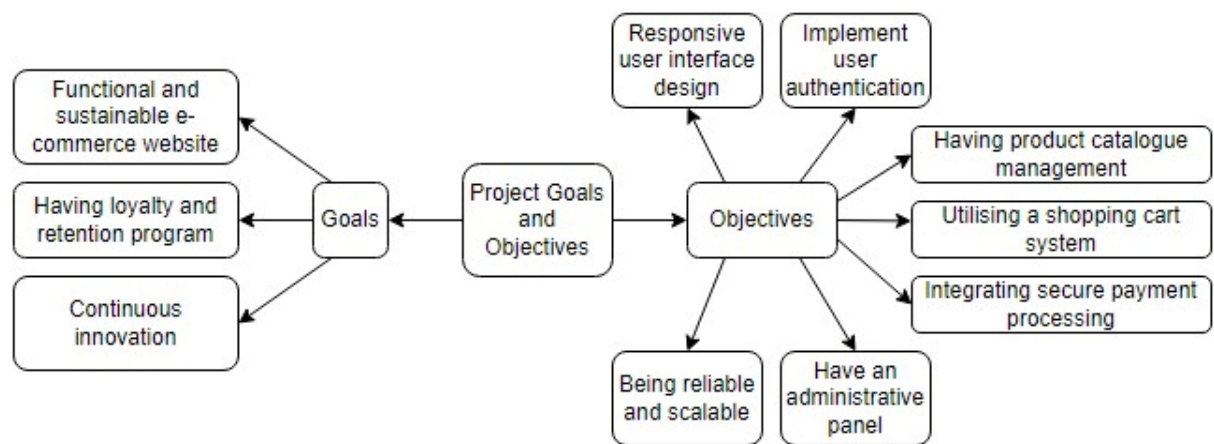
3. Project Scope

[Clearly outline the boundaries and limitations of your project, specifying what it will and will not cover.]

Boundaries

1. This project exclusively focuses **on developing a functioning and responsive e-commerce website**, **excluding any mobile application development**. This is due to time constraints, where this semester is only seven weeks long. However, I would like to further improve this grocery-themed e-commerce website as a potential business opportunity operating in the Malaysian market by gradually introducing new, advance features.

2. Only **crucial e-commerce features** such as **product browsing, shopping cart, user authentication, and secure payment processing** will be included. This is because I am still **inexperienced** in implementing **complex and advanced functions** present in well-established e-commerce stores, such as personalised recommendations search engines, customer service and artificial intelligence chatbots for support, as well as advanced analytics and reporting features.

3. The administrative panel will provide **basic management tools** for products, orders, and users but will **not include advanced business intelligence** that demand in-depth analytics and complex data visualisation capabilities. For example, administrators can only **add, update, and delete products, view simple sales reports, and manage orders.** Advanced enterprise functions such as interactive dashboards and predictive analytics will **not** be implemented.

4. **Standard security measures** will be implemented to protect against **common vulnerabilities** (like password hashing and SSL encryption), but continuous security monitoring and updates will **not** be covered due to its **extreme complexity**. For instance, the e-commerce website will utilise **secure coding practices** and **other suggestions for a project of this scale** but will **not** have a dedicated security operations management team to continuously monitor and manage security update patches (will be included as part of future maintenance).

5. The website will be deployed on a **single web server with basic hosting environment**, ensuring **scalability within reasonable traffic limits**, since a **simplified deployment** will **reduce technical complexity** and **produce less**

errors. This fully **utilises XAMPP** for **local development** and a **simple hosting solution** for public access. **No complex** cloud-based infrastructure or load balancing will be implemented, as this approach is **not cost-effective**, **spending a lot of time**, and **unnecessary** considering the current scale of this project.

Limitations

1. Due to **market preferences** and **development simplification**, **only payment gateways supporting credit/debit cards and electronic wallets** (eWallets, such as Touch 'n Go eWallet, GrabPay, and ShopeePay) will be integrated. This approach **excludes other payment methods** that are **less prevalent in Malaysia** and **pose an inconvenience** to both the customer and the business, such as international payment services and cash-on-delivery.

2. To ensure **consistency and uniformity**, this project only allows **customers and administrators** to have **role-based access** to their **respective interfaces**, but **no personalised or advanced user interface customisations** will be provided. To illustrate, customers will see a basic dashboard consisting of best deals, shopping cart, order history and account details, while administrators will see panels for managing products, orders, and payment confirmations.

3. This project will integrate **essential, basic search engine optimisation (SEO)** practices to ensure the **e-commerce website is discoverable** by including meta tags, descriptive URLs, and alt text for images. On the other hand, advanced SEO strategies are considered **out-of-scope** due to their **complications** and **limited implementation timeframe**. To provide some examples, comprehensive keyword research, backlink building, and content

marketing. This ensures that this project is **consistent with the aforementioned boundaries**.

4. To keep the project's scope manageable, **shipping calculations** and **live order tracking** will be **excluded** considering the fact that **third-party logistics** (e.g. GD Express, Pos Malaysia, and Lalamove) **demands elaborate configurations and continuous maintenance**. To overcome this limitation, shipping costs will be **determined using fixed-rates and simple in-house calculations** instead of data obtained from external logistic companies. **Order tracking will be a basic status update** rather than real-time integration.

5. The website will be **optimised for fast loading times** through **using basic techniques** like **code minification** and **image compression**, but advanced caching techniques, content delivery networks integration, or large-scale performance testing will **not be included** due to limited resources and time. This is to assure customers and administrators that the site **loads under 2 seconds on average**.

<u>Summary of the Project Scope in a Mind map for Visual Understanding</u>
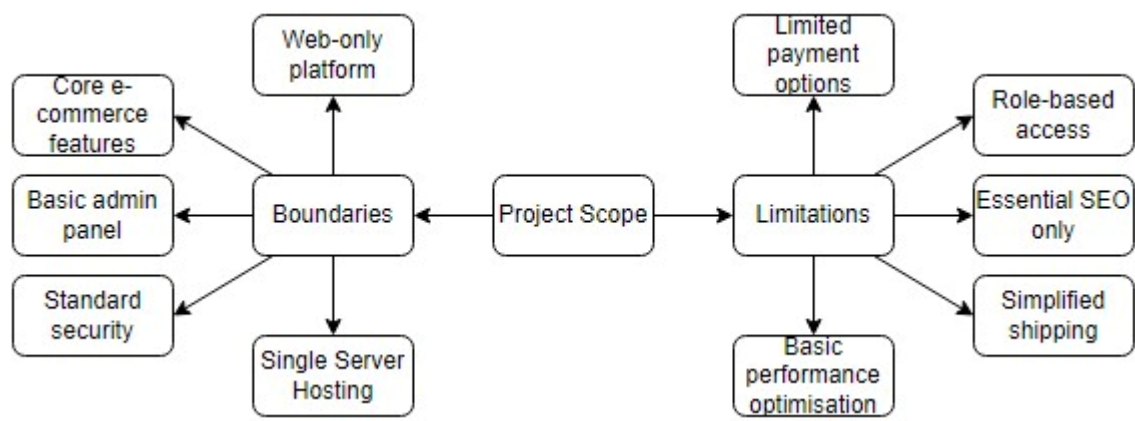
4. Timeline and Deliverables

[Break the project into phases, such as design, development, and testing, and provide an estimated timeline for completing each phase.]

Week	Date range	Phase	Deliverable(s)	Milestone
1	12 February 2025 to 16 February 2025	Planning and Design	1. Developing the project's plan and schedule. 2. Outlining the design of the code and its required parts.	Finalise the project's plan and design documentation by the end of week 1.
2	17 February 2025 to 23 February 2025	Front-End Development	1. Creating a user-friendly interface and clear navigation function for the project, preventing confusion. 2. Implementing a shopping cart function and a secure checkout processing page for users to add groceries to their shopping cart and review their selected products before paying safely. 3. Designing user authentication and account management pages for users to manage their personal details, order history, and delivery addresses.	Complete the basic front-end interface with key functionalities (shopping cart, checkout, and account management) by the end of week 2.
3	24 February 2025 to 2 March 2025	Front-End Development Testing, Bug Fixing, and Improvements	1. Testing cross-browser compatibility, such as Microsoft Edge, Google Chrome, and Firefox to ensure all functions	Achieve stable, cross-browser compatible front-end performance with critical bugs resolved

			are working properly.	by the end of week 3.
			2. Fixing user interface and user experience bugs commonly found in HTML and CSS files, preventing webpage errors.	
			3. Resolving unresponsive and problematic JavaScript codes that breaks the project's functionality and interactions.	
			4. Improving existing functions to support more complex features.	
4	3 March 2025 to 9 March 2025	Back-End Development	1. Setting up a database to securely store and manage product listings, user accounts, orders, and payment details.	Complete back-end development with database integration and secure user authentication by the end of week 4.
			2. Handling user authentication and role distribution (customers or sellers) to safeguard the login, registration, and account management process.	
			3. Building the order processing and payment system for users to place orders and make payments, while the sellers can view the purchased items before packing and shipping.	
5	10 March 2025	Back-End Development	1. Testing database queries and	Pass all back-end tests, with

			connections to ensure data retrievals, operations, and uploads work without errors. 2. Patching authentication and security vulnerabilities to prevent unauthorised access to sensitive data. 3. Fixing payment processing errors to ensure smooth and secure purchases. Order confirmations will be sent to the users after successful purchases. If not, an error notification will be sent. 4. Optimise PHP code efficiency, reduce server load, and refine database queries to improve website speed and reliability.	secure and optimised functionality confirmed by the end of week 5.
to 16 March 2025		Testing, Bug Fixing, and Improvements		
6	17 March 2025 to 23 March 2025	Overall Testing, Bug Fixing, and Performance Optimisation	1. Perform final testing to ensure all website functions are functioning across different devices and browsers. 2. Fix bugs that arise when codes are merged, resolving the system functionality and improve the user experience. 3. Check security measures to verify user data, payment information, and sensitive personal details are protected	Achieve comprehensive system testing results with all critical issues resolved and performance targets met by the end of week 6.

			and require permission to access them.	
7	24 March 2025 to 26 March 2025	Submission and Report Completion	1. Video presentation is recorded demonstrating the project's functionalities. 2. Complete final assessment report. 3. Ensure all relevant codes, files, and recording are attached before submitting.	Final submission package, including the video presentation, report, and all project artifacts, completed and submitted by 26 March 2025.

5. Reference(s)

Hassandarvish, M. (2024, July 2). 'Fat nation': Why do we have 54.4pc overweight adults in Malaysia? Doctors point to our food choices. *Malay Mail*. https://www.malaymail.com/news/life/2024/07/02/fat-nation-why-do-we-have-544pc-overweight-adults-in-malaysia-doctors-point-to-our-food-choices/142426

Ministry of Agriculture and Food Security. (2024, August 13). *National Food Security Policy Action Plan 2021-2025*. Retrieved February 26, 2025, from https://www.kpkm.gov.my/images/04-dasar-agromakanan/pelan_tindakan_dasar_sekuriti_makanan%202021-2025/Pelan_Tindakan_DSMN_2021-2025-min.pdf

National Kidney Foundation Malaysia. (n.d.). *Your Mamak Cheatsheet*. https://nkf.org.my/wp-content/uploads/2018/09/nkf-mamak-cheatsheet2.pdf

Sinseeho. (2024, October 5). *Chow Kit wet market Kuala Lumpur. Kuala Lumpur, Malaysia - Oct 5th, 2024: Morning activity at Chow Kit wet market in Kuala Lumpur, Malaysia*. Dreamstime. https://www.dreamstime.com/kuala-lumpur-malaysia-oct-th-morning-activity-chow-kit-wet-market-kuala-lumpur-malaysia-chow-kit-wet-market-kuala-lumpur-image343686553