# ENTERPRISE WEB SOFTWARE

# DEVELOPMENT

## COMP1640

Group Member

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## INTRODUCTION

This report aims to display excellent teamwork. The team's major aim was to develop a secure web-based system for gathering recommendations for improvement from employees at KMD University. We will present and document a secure web-based method for gathering staff contributions. The system will be overseen by a Quality Assurance Manager who will manage the process for each department and encourage staff collaboration. This website allows all staff (both academic and support) to submit one or more ideas.

Before visiting the website, all employees must agree to the Terms and Conditions before submitting. Any staff member can freely post documents to the website to support their suggestions for improving the school environment. At the moment of submission, all ideas may be classed using a list of categories to which the QA manager has access. Upon registration and login, staff can contribute articles and high-quality photographs.

The QA Manager can create new categories at any time and delete existing ones, but only if they have not been applied. All staff may see and comment on all submitted ideas. They may also offer a thumbs up or down to any suggestion, but only once per concept. Ideas and comments can be submitted anonymously, but the author's information will be saved in the database so that any incorrect ideas can be examined. All new ideas are disabled after a deadline for new ideas, although comments can be made until the final deadline.

## Database

In the digital age, universities face the challenge of managing vast amounts of data efficiently. To address this, integrating a robust database system is essential. This report outlines the design and implementation of a University Webpage with MYSQL as its core database. The rationale behind this choice, database schema design, and potential benefits for both administrators and end-users are explored. We decided to use MySQL which was chosen as the database technology for our university website due to its parallel compatibility with web applications and high performance rates enabled by InnoDB. This makes it suitable for small to medium project scopes.

2.1 Database Schema Design

A pivotal aspect of the project was the creation of a "Users" table within the MYSQL database. This table was meticulously designed to store user information securely, including hashed passwords and email addresses. The schema aimed to facilitate individual account allocations and role assignments, providing a foundation for personalized access to university resources.

2.2 Rationale for Choosing MYSQL

MYSQL was selected for its open-source nature, reliability, and scalability. The decision to utilize MYSQL aligned with the project's goals of creating a robust and cost-effective database solution. Its compatibility with various programming languages and proven track record in handling large datasets made it an ideal choice for our university portal.

* 1. Implementation

The implementation step included generating the appropriate database tables, such as "Users," as well as establishing secure connections between the web application and the MYSQL database. Hashing methods were used to encrypt and safeguard user passwords, ensuring that critical information was kept private. Security within the database was crucial. The user table contains sensitive information for both staff and students, with appropriate safeguards in place to ensure its integrity and confidentiality. MySQL employs robust authentication techniques to thwart malicious attacks. phpMyAdmin offers an easy-to-use interface for controlling user rights. Access was restricted to team members who need it to fulfil their assignments. The database designer and application developer were the only team members who had 'root' access to the database.

To implement the roles defined in client and user stories, each user in the database is allocated two values: RoleID and FacultyID. The website's RoleID determines which tasks a user can perform. For instance, access to certain areas of the application is restricted to specific RoleIDs, such as Admin, who can only access administrative pages and perform administrative tasks. For example, RoleId=4 is a staff who can upload contributions. The FacultyID identifies which faculty a staff member belongs to, allowing them to view, comment, and approve publications uploaded by their faculty. Similarly, the guest account associated with a faculty can only view contributions that match the FacultyID of the guest account. For example, the guest account for the faculty has facultyId=5, so it can only view contributions submitted by staff.

2.4 Features and Functionality

User Registration and Authentication: The online portal allows users to sign up with a valid email address and generate a password. The hashing techniques of MySQL guarantee that user credentials are securely stored and authenticated. Individual Account Allocation, such as the "Users" table, allows for distinct account allocations for departments and staff members, enabling customised access to appropriate resources. We established the role assignment. MYSQL's adaptability enables the assignment of roles to users, distinguishing between QA managers, administrators, and staff. Role-based access control enhances security while simplifying administrative obligations. Improved security. Hashed passwords increase the security of user credentials by reducing the risk of unauthorised access.MYSQL's scalability allows for smooth integration of a growing user base and increased data requirements. Enhanced User Experience: The MYSQL connection speeds up data retrieval, giving users a more smooth and responsive experience.

## Site design

Prior to delving into the wireframing phase of our project, a strategic decision was made to construct a comprehensive sitemap. This preliminary step was pivotal in orchestrating the layout of content before embarking on the actual design process. By establishing a well-thought-out sitemap, we facilitated a clearer understanding of content organization, enabling the creation of a user-friendly interface in subsequent design mockups. Recognizing the ubiquity of mobile devices in contemporary usage, particular emphasis was placed on ensuring the website's mobile friendliness. This preemptive approach not only aligned with user preferences but also underscored our commitment to accessibility across a diverse range of devices.

In addressing the project's pivotal need for an effective site design, our team consistently prioritized design considerations throughout the project life cycle. Comprehensive research informed the inclusion of key features aimed at enhancing the system's accessibility for all users. By incorporating these features, we aimed not only to meet current design standards but to exceed them, fostering an inclusive and user-centric web experience.

This iterative approach to design, coupled with a meticulous sitemap creation, set the groundwork for a visually appealing, intuitive, and accessible website. An integral facet of our website development process centered on the evaluation of visual appeal. Our meticulous approach aimed to guarantee adherence to HTML5 specifications and uphold a professionally designed interface. A paramount consideration in the design strategy was the selection of a consistent color scheme across all webpages. This deliberate choice not only aligned with HTML5 standards but also embraced a user-friendly approach, meticulously tailored to meet the specific requirements of our client. The chosen hues not only enhanced visual aesthetics but also contributed to an intuitive and cohesive user experience.

In our pursuit of a dynamic and responsive website, the adoption of frameworks played a pivotal role. The strategic use of ready-made frameworks, exemplified by the integration of Bootstrap, brought about substantial improvements in flexibility, responsiveness, and overall aesthetics. By leveraging the capabilities of Bootstrap, we ensured that our website not only met contemporary design standards but also provided a seamless and visually pleasing experience across a diverse range of devices.

This strategic incorporation of frameworks stands as a testament to our commitment to delivering a website that is not only functionally robust but also aesthetically pleasing and user centric. In the final stages of our project development, Bootstrap emerged as the framework of choice due to the specific programming language employed – ASP.net web forms in Visual Studio. The seamless integration of Bootstrap, pre-installed when creating a new project, not only streamlined the development process but also aligned with the established workflow. Originating from Twitter, Bootstrap not only offers a user-friendly interface but also adheres to essential web standards, ensuring the creation of accessible websites.

Addressing legal requirements, our project prioritized accessibility to preemptively mitigate potential legal ramifications, aligning with the Disability Discrimination Act (DDA). Integrating accessibility features into the website became a core consideration to accommodate users with diverse needs, including those with visual impairments, weak motor functions, and elderly users. Complying with web standards and legal mandates, we incorporated eligible text to facilitate screen reader accessibility and provided image captions for comprehensive text-to-speech descriptions.

The commitment to accessibility extends to customizable features, enabling visually impaired users to adjust the website's appearance according to their preferences. Implementing an inverted color scheme allows for greater readability and a personalized visual experience. By embracing Bootstrap and prioritizing accessibility, our website not only meets legal requirements but also exemplifies our dedication to creating an inclusive digital environment for users of all abilities across various devices.

3.1 Consistency in User Experience

Maintaining a consistent user experience throughout the MMS system is paramount for user engagement and ease of navigation. A uniform design language, including standardized fonts, color schemes, and button styles, ensures that users can seamlessly transition between different sections of the system without confusion. Clear and concise headings on each page contribute to the predictability of the user journey, helping them understand their current context and the tasks at hand. Furthermore, consistent iconography and terminology enhance familiarity, reducing the cognitive load for users.

3.2 Error Prevention and Handling

To enhance the user experience within the website system, a proactive approach to error prevention and handling is imperative. Clear and descriptive error messages should be implemented to guide users in rectifying issues effectively. Additionally, input validation mechanisms can be employed to catch errors in real-time, preventing users from submitting incorrect or incomplete information. This not only minimizes frustration but also streamlines the user's interaction with the system, promoting a sense of reliability and user confidence.

3.3 Efficient Navigation

Efficient navigation within the site system contributes significantly to user satisfaction and productivity. Implementing intuitive navigation menus, breadcrumbs, and a well-defined information architecture ensures users can effortlessly move between different sections or modules. Interactive elements, such as clickable icons and tooltips, can be strategically incorporated to provide additional context and guidance, enhancing the overall usability of the system. Prioritizing simplicity and clarity in navigation design fosters a positive user experience and reduces the learning curve for new users.

3.4 Refining Information Architecture:

Building upon the insights gathered from section sorting, the process of designing site structures involves creating and testing various information architectures to optimize user navigation and content accessibility. Our approach included the development and evaluation of multiple tree structures, each tailored to different participant ideas and labeling strategies. These structures aimed to enhance user engagement and streamline content discovery. The key iterations comprised:

3.4.1 Comprehensive Scenario Tree

This tree was designed to encompass a wide array of scenario topics, ensuring that users could easily access information across diverse contexts. By providing an extensive coverage of content, this tree aimed to cater to a broad range of user needs and preferences.

3.4.2 Minimalistic Content Tree

In contrast, we explored a minimalistic tree that focused solely on the top content frequently used or requested by participants. This approach aimed to simplify the user journey, emphasizing efficiency and reducing cognitive load by prioritizing only the most essential information.

3.4.3 Revised Content Trees

Iterative revisions were made to the tree structures based on user feedback and data analysis. These revisions aimed to strike a balance by covering the majority of content needed by users, aligning with their expectations and enhancing the overall usability of the site.By testing and refining these site structures, our goal was to optimize the user experience by presenting information in a logical and user-friendly manner. This iterative process allowed us to tailor the site's information architecture to meet the specific needs and preferences of our target audience, ultimately enhancing the overall usability and accessibility of the platform.

3.5 Enhancing User Engagement - Collaboration and Inclusivity

In our pursuit of fostering discretionary effort and instilling a deep belief in the University's mission among users, we explored innovative strategies centered on collaboration and inclusivity. The following ideations were developed:

3.5.1 Empowering User Control:

Providing users with a sense of control over the website was identified as a crucial factor in promoting engagement. Intuitive features and personalized settings were introduced to allow users to tailor their experience, fostering confidence and a sense of ownership in their interactions with the platform.

3.5.2 Transformative Design Philosophy

We envisioned a design philosophy that transcends the utilitarian purpose of the system. Beyond the routine task of uploading articles, the system was designed to inspire users to connect with and believe in the broader mission of the university. By incorporating visual elements, narratives, and messaging that resonate with the university's values, the platform serves as a conduit for users to align themselves with the institution's overarching goals.

3.5.3 Interactive Commitment Initiatives

To elevate user commitment beyond a mere role, we introduced interactive features aimed at building a sense of community and shared purpose. Collaborative forums, feedback mechanisms, and recognition programs were integrated to encourage users to actively participate in the university's ecosystem, fostering a stronger sense of belonging.

3.5.4 Results-Driven Usage Promotion

Going beyond mere performance metrics, our approach focused on promoting the system as a catalyst for achieving better results, both academically and personally. Emphasizing user satisfaction and minimizing criticism, the system was positioned as a tool that not only enhances professional performance but also contributes to the overall well-being and fulfillment of users.

3.6 Enhancing User Motivation - Aesthetic Appeal and User-Centered Design

In our quest to boost user motivation within the system, we recognized the significance of offering an attractive design that instills confidence and maximizes user experience. Several key motivators were identified:

3.6.1 Aesthetic Appeal

We understood the impact of an aesthetically pleasing design on user confidence. By incorporating visually appealing elements, such as a modern and user-friendly interface, we aimed to create an environment that users find engaging and inspiring. The strategic use of attractive design elements contributes to a positive perception of the system's capabilities.

3.6.2 Visual Stimulus through Images

Acknowledging the impact of visual stimuli, we leveraged the power of images to captivate users. Even simple visuals, when presented creatively with unique effects, angles, or frames, have the potential to leave a lasting impression. Incorporating images that resonate with users, such as those depicting university life or achievements, contributes to a sense of connection and engagement.

3.6.3 Strategic Use of Colors

Colors play a vital role in defining the user experience. By selecting colors commonly associated with students, we aimed to establish a natural and relatable atmosphere within the system. This deliberate choice contributes to a seamless integration of the system into the users' daily lives, fostering a more intuitive and comfortable interaction.

3.6.4 User-Centered Design Architecture

Adopting a user-centered design philosophy, our goal was to create structures and software that enhance the efficiency of data cataloging and facilitate swift access. This approach involves understanding user behaviors, preferences, and needs to craft an intuitive system architecture. By prioritizing user experience at every stage of design and development, we ensure that the system is not only visually appealing but also functionally efficient and user-friendly. By combining these motivators, we aim to build an integrated and user-centric digital environment that not only appeals to users visually but also provides them with useful tools and functions, thereby improving their entire experience within the system.

## Meeting Minutes

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| Meeting Time | What was Discussed? | What was Finished? | Tasks For Next Week | Attendance |
| Week(1)  9pm-11pm | - The first stage involved gathering information about each member and assigning duties to each of us.  - Discord is currently the main form of communication. We picked this app since everyone uses it and feels comfortable with it. Team Leader created a Discord channel for team communication.  - We want to use GitHub in the future to share papers, ideas, and so on | - Each member was assigned a role inside the group.  - We have finished the tools for this coursework and setup a discord channel to help with team communication. | - Consider choices for technology and do backlog research.  - Search for an agile scrum tool that includes user stories. | - All |
| Week(2)  9pm-10:30pm | - We decided on the technology for creating the website. The technologies used will MySQL for database and programming, CSS and HTML for design, and Bootstrap as a framework. | - We decided to share papers and code on GitHub, and use Visual Studio as a Scrum tool. | - Create accounts for each team member on GitHub and Visual Studio.  - Write some user stories. | - All |
| Week(3)  9pm-10pm | - We presented and offered feedback on each other's work. Reviewing user stories, making design decisions, and updating the database.  - The first draft of the database design required minor modifications. Discuss better colour schemes and more. | - Database development begins with developing the "login" page.  - We added user stories to the product backlog and documented customer questions. | - Separate the user stories.  - Creating a list of possible assumptions.  - Assign and prepare for Sprint's backlog. | - All |
| Week(3)  8pm-9pm | - We met between members in charge of design and backend to create a stronger wireframe and connectivity with other pages.  - We discussed having a backend developer construct a better database storage system to ensure that there are no errors. |  | - To improve database design.  - To continuously test system development as it is implemented. |  |
| Week(4)  10pm-11pm | - We met with everyone to discuss everything, including the database, framework, and design, as well as the development of user stories. | - Assumptions (statistics and exception reports) are discussed.  - Database checking  - More user stories are implemented. | - Concentrate on the tasks.  - Database login, and profile page implementation. | - All |
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