Group Project Proposal

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Concept Introduction

The objective of this project is to develop a web application that ranks universities in London; to help users choose a place of study that suits them best. The website will focus on ranking by social aspects such as crime rates, transportation links and societies available to join. In addition, there will be rankings by academic specifications such as courses, modules, and lecturers.

The website will take data from external sites to provide information on current crime rates and transportation links, we will achieve this using APIs. We will use a star grading system for ranking courses, modules, and lecturers, using data from existing sites to support this. This will include an option for users to leave a written review which can be verified to provide a level of validity. To access this, users will need to log in via their university credentials.

Stake holder & User needs

We identified our main stakeholders to be college leavers or those returning to education, as well as current students whose reviews will help shape the content of the application. We used this to construct 3 user personas to further comprehend how our site will be used.

A picture containing timeline

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Diagram

Description automatically generatedDiagram

Description automatically generated with medium confidence

To identify what our users’ needs were, we started by drawing on our own experiences as students, and what hurdles if any, we encountered when deciding on which university to join. We created a short questionnaire to build an idea of what things were important to us when using a ranking site. Some of the results were as follows:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Student 1** | **Student 2** | **Student 3** |
| How happy were you with the process of using a university ranking site and why? | I found it straightforward and easy to use. | It can be time consuming if you’re not sure what you’re looking for. | The process is simple . |
| What were the most important things you looked for on the site? | I was looking for the university that had the highest ranking overall. | Overall performance | Overall ranking and good social clubs. |
| What difficulties did you encounter on the site? | None. | There were too many filters to find what I needed. | There are a lot of click paths to find what I was looking for. |
| What information do you feel was missing, that would have helped make the process easier? | None. | Make it more personal, instead of filters have the option to take a quiz to match unis to your interest and ethics. | Not much information on transportation links or societies. |

We found that for a few users, their main use of a ranking site is to determine which university if best for them in terms of their chosen subject to study. In addition, they were also interested in more social aspects of university life. Some users wanted to see more information on things like transport links, nightlife, and societies available.

Prior Knowledge & Market Survey

We also looked at a selection of survey sites to try and identify how useful ranking sites are to the user and created a comparison chart based on this.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Survey Sites Comparison** | | | | |
|  | **No. of users** | **No. of questions** | **Question types** | **Accessibility** |
| **NSS** | 4.5 million users | 27 core questions in the survey.  Multiple choice. | Teaching on the course, learning opportunities, student voice and overall satisfaction | Text to speech plug in, videos on site, colour blind accessible. |
| **Opinion Panel** | 100,000 users | Number of questions varies per survey | Multiple choice with a counter. Pays users with vouchers on completion. | Images on site, alt tags on images and videos on site. |
| **YouGov** | 2 million users | Displays survey results in real time. Surveys for difference sectors. | Survey questions are created by users. | Good navigation and different language options. |
| **Toluna** | 4 million users | 10 questions | Surveys are designed by leading brands such as Amazon | Wider range of language options. Very responsive. |
| **IPSOS** | 3 million users | Varies | Point system on surveys and you can earn cash by taking surveys. | Good button design and touch screen options. |

**Table 1 – A comparison of some survey sites.**

In table 1 we show a comparison of different survey sites and how they work.

The table suggests that to build an in depth understanding of our user needs, further research would be required. We could start by improving our current survey to include more pressing question which could yield more detailed responses. The other options are to hold focus groups or interviews with potential and current students to get their views.

We then explored a few ranking sites to identify the pros/cons. We will use this in addition to feedback from our questionnaire to help build our site and incorporate as much of the ideal elements found.

|  |  |  |  |
| --- | --- | --- | --- |
| **University ranking site comparisons** | | | |
|  | **Complete University Guide** | **Studyin-UK** | **Education Index** |
| **Pros** | * Can filter by subject location. * Information on open days. * Articles for student support. | * Simple navigation menu. * Links to individual university sites. * Provides key information on each university. | * Easy to navigate. * Offers rankings from different companies. |
| **Cons** | * Can be a bit tricky to navigate the site. * Individual university pages a bit too busy with information. * Not sure where the data has come from. | * Homepage is very busy to look at. * No explanation of what the rankings are based on. * No option for filtering by subject or location. | * No option for filtering. * No information for what the ranking is based on. * Not sure if the information is up to date. |

**Table 2 – Comparison chart of university ranking websites.**

Table 2 shows a breakdown of the good and bad aspects of each university ranking site, this will help us understand from our own perspective what may work for us when building our web application.

From this, we identified our main competitor likely to be [The complete university](https://www.thecompleteuniversity) guide as it was the first site to come up on a Google search. The site clearly displays the ranking for each university on the homepage and has a breakdown of what the ranking is based upon (see below).

Graphical user interface, application

Description automatically generated

We did note the difficulty with navigating the site, which Studyin-UK has managed to overcome with a minimal navigation menu making it simple for the user to move throughout the site. This is something we aim to include with our web application in addition to a simple interface to make the user experience more pleasant.

To build on this we also investigated prior knowledge to build on our understanding of our chosen concept.

In a journal article written by Ellen Hazelkorn titled *University Ranking: there is room for error and “malpractice”* Ellen gives her opinion on how accurate university rankings are. She believes that “Rankings’ popularity is largely related to their simplicity – but this is also the main source of criticism. The choice of indicators and weightings reflect the priorities or value judgements of the producers”.

We can take from this that we will need to be mindful of what metrics we use to base our ranking of the universities on. It would also be useful to our users to provide the metrics we have used to produce the rankings as this may help to user to decide if the way we have ranked meets their requirements.

From our research, we concluded that it would not be challenging enough to create another ranking website as the market is saturated with this. However, we can improve this concept by adding aspects such as a simpler navigation system that improves usability of the site for the user.

Design:

# Normalization:

Normalization is a technique used in database design to organize tables in a way that reduces redundancy and dependency. It is a process of organizing the columns and tables of a database to minimize data redundancy and improve data integrity. This is done by dividing larger tables into smaller, more focused tables and defining relationships between them. Normalization typically involves dividing a database into two or more tables and defining relationships between the tables. The goal of normalization is to produce database tables that are efficient to maintain and update.

Normalization can improve our database management system (DBMS) in several ways. First, it can reduce data redundancy, which means that the same data is not stored multiple times in the database. This can help to save storage space and improve the efficiency of the database. Second, it can reduce the likelihood of data inconsistencies, which can occur when the same data is stored in multiple places and is not updated consistently. This can help to ensure that the data in the database is accurate and up-to-date. Third, normalization can improve the performance of database queries by reducing the amount of data that needs to be processed. Finally, normalization can make it easier to modify the structure of the database as the needs of the system change over time.

There are several guidelines for normalizing a database. These include the following:

1. Divide the database into smaller, more focused tables. Each table should contain data about a single subject, such as customers or orders.
2. Define relationships between the tables. For example, a customer table might have a relationship with an orders table, indicating that each order is associated with a specific customer.
3. Remove redundant data from the tables. For example, if the same data is stored in multiple tables, it should be consolidated into a single table.
4. Use primary and foreign keys to identify unique records and establish relationships between tables.
5. Normalize the data to the third normal form (3NF) or higher. This involves applying a series of rules to the tables to ensure that they are fully normalized and do not contain any redundant data.
6. Test the database to ensure that it is working properly and that queries are being executed efficiently.
7. Regularly review and update the database to ensure that it continues to meet the needs of the system.

UML Diagram

This is the final version of our UML diagram which details the design of our system:

Timeline

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The final UML design:

A picture containing timeline

Description automatically generated

Sequence diagram:

User creating a review on the website:A screenshot of a computer

Description automatically generated with low confidence

User interacting with the student forum: A picture containing graphical user interface

Description automatically generated

Activity Diagrams:

Activity diagram showing a user viewing a university then writing a review:Diagram

Description automatically generated

Student forum activity diagram:Diagram

Description automatically generated

Use Case Diagrams:

Original use case for admins and users interacting on the forum section of the website:

Diagram

Description automatically generated

Updated diagram:

Diagram

Description automatically generated

Prototyping

Low fidelity wireframe acts as our initial concept of the website, allowing us to visualize our concepts and ideas in early stage, to see if we have any improvements or innovations. Also, it helps us to focus on the functionality of the website instead of the look of it. At this stage, we asked a few of our classmates for their opinion with the concept of the website, and the low fidelity wireframe. (ADD)

Main PageDiagram

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Menu BarLetter

Description automatically generated with low confidence

University PageA picture containing diagram

Description automatically generated

Combining the suggestions and our discussion result, we have decided to carry out a mid-high fidelity wireframe to show how we have developed the concept of our website, layout, and content.

Main PageA picture containing shape

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High fidelity prototype

Home pageTable

Description automatically generated

Clicked on Menu (not logged in)Table

Description automatically generatedPressed on Menu (logged in)Table

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Pressed on Sign upGraphical user interface, application

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Pressed on Sign inGraphical user interface, application

Description automatically generatedUniversity pageGraphical user interface, text, application

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Graphical user interface, text, application, chat or text message

Description automatically generatedGraphical user interface, text, application

Description automatically generatedGraphical user interface, text, application

Description automatically generatedGraphical user interface, text, application, chat or text message

Description automatically generated

Forum pageGraphical user interface, text, application, chat or text message

Description automatically generated

Pressed om a ForumGraphical user interface, text, application, chat or text message

Description automatically generated

Forum pages for AdminGraphical user interface, text, application

Description automatically generatedGraphical user interface, text, application, chat or text message

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High fidelity prototype was made using <https://marvelapp.com> website

Full prototype can be found on https://marvelapp.com/prototype/9c5fc6i

As seen, some changes were made on a high-fidelity prototype:

1. We changed home page to have a table of universities ranked by different categories instead of having a list of them. We found it a lot more user friendly.
2. Menu was slightly changed too. We decided to only put the necessary links and make it simpler.
3. University page got an academic and social reviews sections (Simple ratings and descriptions on things like modules or crime rate)
4. We added Forum page where we display conversations/questions people have. We found that the websites that can have some sort of discussion are way more engaging, and forums allow lecturers to participate in showing the real picture.
5. All pages have the same header (home button, search bar and menu button). Having the same design throughout the website makes it more user friendly and the search bar is found to be helpful too (Vu, 2021).

Technical architecture

1. Data storage: The website will need a database to store information about universities, reviews, forums, and users. Our website will use MySQL.
2. User authentication and authorization: The website will likely require some form of user authentication to allow registered users to post reviews and manage their accounts. This could be implemented using a library such as Passport.js or by integrating with a third-party authentication service like Auth0.
3. 3.Server-side logic: The website will need a back-end server to handle requests from the front-end, retrieve data from the database, and perform any necessary processing. We will use a server-side language Node.js.
4. Front-end interface: The website will need a user interface for visitors to browse and interact with the content. This could be implemented using HTML, CSS, and JavaScript.
5. Search and sorting: To allow users to easily find and compare universities, the website will need some form of search and sorting functionality. This will be achieved by implementing the search and sorting directly in the server-side logic.
6. Caching: To improve performance and scalability, the website may want to implement some form of caching to store frequently accessed data in memory. This will be done by implementing caching directly in the server-side logic.
7. Deployment: The website will need to be deployed to a hosting platform such as a cloud provider (e.g. AWS, GCP, Azure) or a traditional hosting provider. The specific hosting platform will depend on the needs and resources of the website.

Scope

Functional requirements

On the homepage, it shows university ranking in London sorted by different aspects rating: Courses, Modules, Lectures, Crime, and Societies.

There are a few buttons on the navigation bar allow user to return to the homepage, visit the forum, search university on the search bar, change to dark mode according to the users' preference, and menu button. The forum button allow user to visit the forum, where registered user (only) will discuss about different aspect of universities e.g., campus accessibility. The search bar allow users to search for all the university in London they are looking, even those did not show up in the homepage ranking. The menu button which shows the option to manage an account (sign in / sign up > edit account details, log out) and submit a review where only a registered user can perform this action when they logged in. To active the menu options, user would have to first sign up or sign in. When user clicked sign up, a sign up GUI will pop up covering the homepage in the middle, user would need to enter their full name, major that they are studying, year, email, and set up a password. And when user clicked sign in, a sign in GUI will pop up, user would have to enter their email and password to sign in. If user forget or would like to reset their password, they can either do it in the edit account details after logging in or click on "forget your password?" on the sign in graphic user interface to reset their password.

On the university page, picture and full name of the university and overall rating will be shown, user would be able to view the reviews of courses, modules, and lectures when they scroll down the page. At the bottom of the page, user will be able to see the university's forum, where different registered user rate and comment on the university. And registered users can write and submit comments.

On the forum page, users would be able to see all the reviews for different university and registered user would be able to reply to the reviews expressing their opinions.

For admin account, ad min can remove any reviews and able to ban any user that violates the community rule. Any user that violates the rule would have their account ban for a week as a punishment, and any comments that are aggressive or insulting comments will be removed and user will be send a warning email to remind user be aware of what they post.

Non-Functional requirements

**Performance**: Even with large amounts of users the loading time for each page must be 5 seconds or less, as content of webpages are mostly from database.

**Scalability:** The website should still meet the performance requirements even with 500,000 visits to the website.

**Portability:** The website is available on Apple iOS, Microsoft Windows, Google's Android OS, and Linux Operating System with all web behavior and performance remain the same

**Security**: The website should be secured as it stores users full name and email addresses, user would have to log in to the account with their password.

**Usability:** The website should respond to user effectively and all webpages graphical user interface are designed simply**.** The error rate the users meet in using our website should not be higher than 5%

## Ethical Audit

There are several ethical implications to consider when creating a university ratings website with a student forum.

One potential issue is the reliability and accuracy of the ratings and reviews provided by students. It is important to ensure that the ratings and reviews are fair and unbiased, and that they accurately reflect the experiences of students at the university. This can be achieved by implementing measures to verify the identities of students posting reviews and by allowing students to provide detailed and well-reasoned explanations for their ratings.

Another ethical concern is the potential for bullying or harassment in the student forum. It is important to establish clear guidelines for acceptable behaviour and to enforce them strictly to prevent the forum from becoming a platform for bullying or harassment. This may include measures such as moderating the forum, requiring users to use their real names, and banning users who violate the guidelines.

To overcome these ethical issues, it may be helpful to establish a code of conduct for the website and the student forum, outlining the expectations for behaviour and the consequences for violating these expectations. It may also be beneficial to involve university administrators and faculty in the development and management of the website and forum, to ensure that the content and behaviour on the site aligns with the values and mission of the university.

Additionally, it may be helpful to establish a system for reporting inappropriate content or behaviour, and to have a dedicated team in place to review and address these reports in a timely and effective manner. By addressing these ethical concerns and implementing measures to ensure the reliability and safety of the website and forum, it is possible to create a valuable resource for students seeking information and support in their educational journey.

Project Management

We recognised the importance of managing our project effectively from the start to ensure we were consistent with our progress and met the deadline for our proposal. We used a mixture of different tools to ensure we managed our project effectively. We used Gantt charts from the website teamGantt, we used GitLab as a platform to share all our work.

To track our overall project progress, we used Gantt Charts to split up the project into a series of tasks. This meant we could easily track and monitor different areas of the project, for example we could monitor the design section of the project against all the other tasks, this allowed us to easily pick up individual task progress and decide and highlight areas where we were or were not falling behind on the project.

As shown by the Gantt chart we managed to stay on track and complete all the individual tasks set. We decided there were five key sections of the project to focus on, this includes Initial concept, market research and prior knowledge, design, prototypes, and scope. In addition, we allocated each of these sections to different team members to work on this project in a more efficient manner.

This decision was made during our second meeting as we wanted to ensure that we worked efficiently together as a team and that work was spread out fairly, so we decided that distributing ownership of tasks was the best option for our team.

For example, one team member worked on the design stage, another worked on the market research and prior knowledge section. The Gantt chart highlights the series of tasks the project was split into, and how we assigned each individual task to a team member.

Please find below Gantt chart and ownership table.Chart

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Table

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Ownership Table

Table

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There are always risks to consider during a project, and it's important to plan for and address these potential issues to achieve success and avoid missing deadlines. One way we were able to manage these risks on our project was through the use of GitLabs. This tool allowed us to upload and store our individual work, such as designs, prototypes, and sections of the report (as shown in the image below). It helped us to prevent risks like losing work or documents, or having files become corrupted. We divided tasks among team members, so we needed to merge our work together in some cases, such as when writing the report. For example, by using GitLabs and committing and reviewing our work, we were able to avoid file corruption or incorrect deletions.

We also stored all of our files on GitLabs to prevent data loss. For example, if someone's hard drive became corrupted, other team members could still access their work. Although we discussed the possibility of needing support from other team members in our team meetings, it turned out that this was not necessary, as shown by the completion of tasks on the Gantt chart. While we were able to mitigate some risks through these measures, it's always important to stay vigilant and continue to assess and address potential risks as they arise.

Graphical user interface, text, application, email

Description automatically generatedUsing GitLabs was a useful and effective way to manage risks and ensure the success of our project. It allowed us to store and share our work, preventing issues like lost or corrupted documents. GitLabs also enabled us to divide tasks among team members and work efficiently and provided a backup in case of data loss. As a result, it contributed to the successful completion of the project.

Evaluation

Based on the proposal, it can be concluded that the concept is achievable. The main objectives of our project are to develop a website that ranks universities in London based on both social and academic factors, and to provide users with a tool to help them choose a university that suits their needs. To achieve these goals, the website will gather data on crime rates, transportation links, and courses, modules, and lecturers from external sites using APIs, and will use a star grading system and user reviews to rank these factors. Furthermore, we have conducted research to understand the needs and preferences of the target audience and have studied existing university ranking sites to inform the development of our own website.

However, there are a few potential challenges that may arise in the development of our website. One potential challenge is ensuring that the data gathered from external sources is accurate and up to date. Another challenge may be verifying the validity of user reviews, which will likely require some sort of verification process to ensure that the reviews are genuine and not spam or malicious.

Despite these challenges, we believe that our concept described in our proposal is achievable because we have a well-planned and researched approach to achieving the project's goals.

The different stages of the proposal provided us with valuable insights into how to make the concept work. Research was conducted and insights were gathered from college leavers, those returning to education, and current students, which helped us understand the needs and preferences of the target audience and enabled us to design the website accordingly. We researched and compared existing university ranking sites to identify our key competitors and understand their features and functionality, this informed us in the development of our website. In addition, we researched prior knowledge on university rankings to gain a deeper understanding of the challenges and limitations of ranking universities and the factors typically considered when developing rankings. This information was crucial in helping to teach us how to develop a successful and useful website for users looking to choose a university in London.

As a group we were initially only meeting during our required time, this caused delays as not all of us were always present meaning sometimes information was missed which resulted in delays to our timeline for different stages of the project. We resolved this issue by organising meetings as a group outside of class hours to ensure we could keep each other up to date with developments and use that time to work together on different parts of the proposal.

Given that this was our first time working together as a group, it took some time for us to work out each other’s strengths and how we can best contribute to building this concept. This took away time that would have been used to do more in depth research to strengthen our concept. We would also increase the number of face to face meetings so that we could provide more detail to our concept.

Conclusion

In conclusion, our team has carefully evaluated the potential success of the project from both technical and commercial perspectives. The design process gave us insight into the interactions between various components, and the prototyping allowed us to better visualize the project. We have followed an Agile methodology, incorporating feedback from stakeholders throughout the process. The system overview and functional and non-functional requirements are crucial guidelines that will guide us through the development phase. We are eager to utilize the technologies and development methods we have identified to the best of our ability in the upcoming stages of the project.

References

Hazelkorn, Ellen (2019) University Rankings: there is room for error and "malpractice". [[Online](https://zenodo.org/record/2592196#.Y6S7mBXP23A)]

Vu, K.P.L., Proctor, R.W. and Hung, Y.H., 2021. Website design and evaluation. *Handbook of human factors and ergonomics*, pp.1016-1036.

Guide.freecodecamp.org. (2019). *Advantages and Disadvantages of JavaScript*. [online] Available at: <https://guide.freecodecamp.org/javascript/advantages-and-disadvantages-of-javascript/>

[ Accessed 11 Dec. 2022].

Redbytes: Custom Mobile Application Development Company [iOS, Android, Windows]. (2019). *15 Best Programming Languages For Mobile Apps 2019 | Redbytes*. [online] Available at: <https://www.redbytes.in/best-programming-language-for-mobile-apps/>

[Accessed 12 Dec. 2022].

Spencer, J. (2019). *Top 9 Advantages of JavaScript*. [online] MarkupBox. Available at: <https://www.markupbox.com/blog/advantages-of-javascript/>

[Accessed 12 Dec. 2022]

Kathy lund Dean (2014), It’s not just Rate My Professor anymore! Ethical issues with student evaluations of teaching [online], Available at <https://connect.aom.org/blogs/kathy-lund-dean/2014/01/21/its-not-just-rate-my-professor-anymore-ethical-issues-with-student-evaluations-of-teaching-set>

[Accessed 12 Dec. 2022]

Webaccess.berkeley.edu. (2019). *Top 10 Tips for Making Your Website Accessible | Web Access*. [online] Available at: <https://webaccess.berkeley.edu/resources/tips/web-accessibility>

[Accessed 15 Dec. 2022].

Bcs.org. (2019). [online] Available at: <https://www.bcs.org/membership/become-a-member/bcs-code-of-conduct/>

[Accessed 25 Dec. 2022].