CMP2408M (Team Software Engineering)

Group 10 Data Analytics

ASSIGNMENT 1 – Project Interim Report

Analysing University of Lincoln Student Sentiments

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Introduction

Many students struggle finding valuable information when searching for a university to apply towards for their undergraduate studies, our project aims to solve this problem. This report will analyse and share our ideas to resolve this issue. Topics such as the overall project proposal, market/domain research conducted, examination of the legal, ethical, and political considerations will be covered in this report. Finally, a comprehensive reflection of how we developed and worked as a group.

Project Proposal

This project aims to find valuable insights about the University of Lincoln by using the sentiments of students all around campus, whether these be positive or negative. This artefact will be a set of data displayed on a website, that allows users to view the data and our relations found between students' responses e.g., through visualizations such as word clouds. This should allow our discoveries to reach as many people as it can, and in turn helping as many people as we can. We are aiming this toward the university itself who will hopefully gather a better insight on students' feelings on the university and campus, as well as other relating areas. Which might lead to an improved university experience for all students.

There will be multiple stages to completing this project. First, we will have to gather data about the university from students. This will be done in a variety of ways to ensure that we have covered as many students as we can to ensure a truly diverse set. Secondly, we will be scraping data from all around the web. Predominantly we will be looking at websites that allow students to review their university experience although the team will also be scouring various social media to help in our search. Secondly, we will be sending around an online survey for students to fill out, and lastly, we will be actively looking for students to answer a survey on campus. We will be looking for opinions on a wide range of university services and relating categories, for example:

- Accommodation
- Student satisfaction rating
- Life in the city
- University facilities
- Lecture satisfaction
- Student support

After all the relevant data has been acquired, we will start cleaning the data. This will revolve around grouping similar replies together (clustering algorithm), spell-checking replies, and arranging the data in a database ready for analysis. This brings us to the next stage. Analysing the data in the relational database to try and find relationships in the data and finding the most common replies. This will be done in the hope to find the most positive and negative aspects of each area we have covered.

The last stage of this product will be the artefact itself: the website. This will be purely used to display the data found as well as any relationships and common replies we have had. This should be done in an easy-to-navigate way so that anyone can access the information we have procured, hence the use of the internet to spread our findings. Another primary concern will be to forward this to university officials in the hope of spreading awareness of student criticisms as well as praising the university on the areas in which it excels, encouraging the university to maintain these areas to the present standard.

We plan to give the data we have gathered, including a copy of the database and full access to the website, to the University for use in advertisement and improvement. The website will be advertised to students through social media and word of mouth to ensure its use as effective communication of the university's best features.

The data on the website will be easy to read and concise, whilst still contributing useful amounts of information. As an example, any reviews on accommodation will be turned into 'top-rated' lists

(decided on amounts of positive and negative feedback), with reasoning behind each choice considering the accommodation's features.

We recognise that a project of this size will be met with issues and unforeseen delays. To reduce the risk of being stuck on a task because of these, we are employing general practices (such as weekly meetings decided upon availability, completing jobs when every member has contributed and agreed, constant review of written reports etc.) and specific rules (for example, double-checked grammar and section completion by multiple members of the team). We hope that these attitudes will reduce negative contingencies over the course of the assignments.
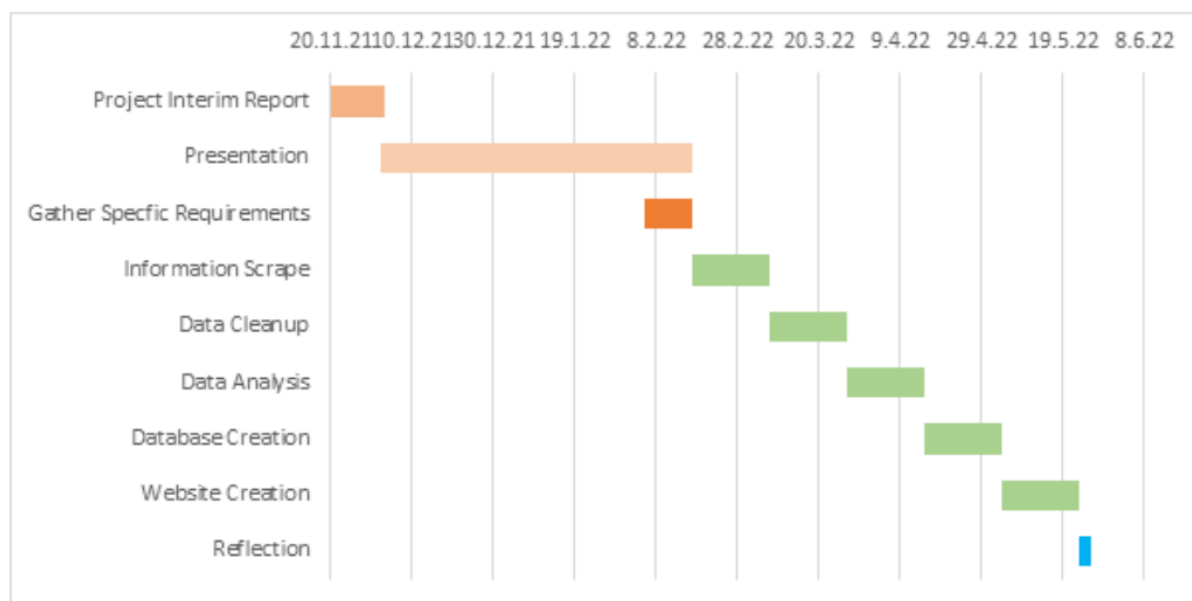
Market/Domain Research

The most essential information an interested secondary-school pupil wants to know about a university is the core basics such as the modules included on their course of interest, and most importantly, whether they will like the course and the university. The latter of these points is an almost impossible task as it is very subjective. Each member of the team (primary research) agreed that we struggled in making our university choices because we were unsure about how much we would enjoy the course, social life, and the city, rather than just how the course will be run. Thus, we have decided to create this site because we believe that there is no single website that has a clear collection of valuable data about any university for students and universities alike to view and benefit from.
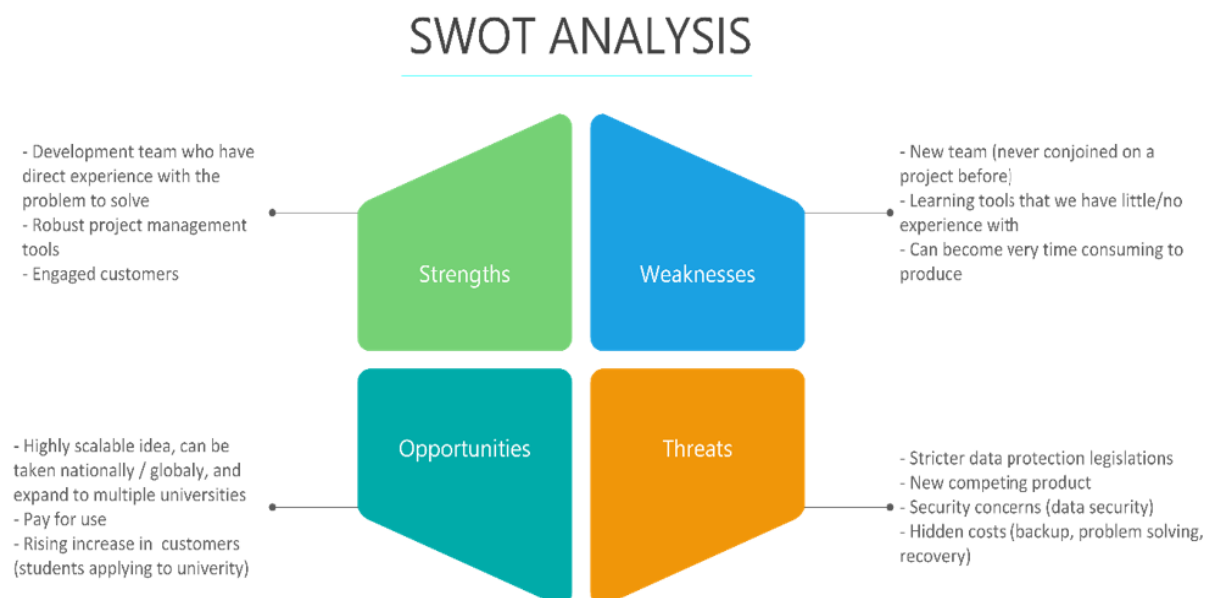
Places such as a university's website will include information on student satisfaction rate, course outlines, and available opportunities for individual courses - such as the University of Lincoln's website [University of Lincoln](#) - but doesn't make the experience simple or personal. There are also countless league tables to compare for all UK universities (www.thecompleteuniversityguide.co.uk, n.d.), but again this is very soulless and gives no more than a percentage on a few brief fields, such as graduate prospects and research quality and intensity; a student-to-be wants to know more than this when deciding about where to study for the next 3+ years.

This collection of key data we will be providing will help the University too. They will be able to see which aspects of university and course life are strong and weak and can therefore take steps to improve the satisfaction of students and make the University a better place to live and study.

To justify a demand we needed more research. Getting external information via qualitative secondary

research, shows many online sites/blog posts by university students who claim are "struggling to decide on a university course" (courses, Courses and Geography, 2021) and many university-oriented sites with blog posts trying to answer questions such as "what to do if you're struggling with university" (What to do if you're struggling with university? - Graduate Coach, 2020). After extensive research there is no clear tool online regarding clean data/information about universities and their courses/social life available for upcoming undergraduate students. Therefore, it is evident we will be filling a gap in the (UK) market.

Identifying our key stakeholders / buyer persona is also especially important to tailor our project. The primary stakeholders include students (consumers) and the university (organisation), these stakeholders will have the upmost interest in our project and will have the most impact. On the contrary, secondary stakeholders include the government, although this stakeholder does not have direct interest in the project the actions taken by the stakeholder could strongly influence the limitations/growth for our project.

SWOT ANALYSIS

Strengths
- Development team who have direct experience with the problem to solve
- Robust project management tools
- Engaged customers

Weaknesses
- New team (never conjoined on a project before)
- Learning tools that we have little/no experience with
- Can become very time consuming to produce

Opportunities
- Highly scalable idea, can be taken nationally / globaly, and expand to multiple universities
- Pay for use
- Rising increase in customers (students applying to univerity)

Threats
- Stricter data protection legislations
- New competing product
- Security concerns (data security)
- Hidden costs (backup, problem solving, recovery)

Legal, Ethical and Political Statement

There's an ethical balance to be found regarding any software development project. The opinions of collecting and distributing data of this scale, and sensitivity can vary depending on the perspective of whom it is viewed from; however, our intention of producing this comparative website is to allow both primary stakeholders, students, and universities, to benefit from the data collected whilst upholding high standards of ethics.

Software engineers shall act in a manner that is in the best interests of their client and employer, consistent with the public interest. Computer.org. (2017)

Primarily, as software engineers, we want to work in the publics best interest. The project is made to benefit and assist those prospective students making a judgement on where and how they spend the next few years in higher education. The data collected can clearly only be from students that have studied at the chosen university. Some questions for the data collection stage could relate to the university as a whole or some could be more specific; course-related perhaps, but not so explicit to ask about certain lecturers/staff members.

As a group, we have established our values to ensure that collected data will be presented in a means that is professional, thorough, and most of all, respectful. This will allow the universities to discover areas of improvement throughout their organisation in a positive manner; knowing there is no malice from our party when uploading our data.

We are keeping with the virtuous ethical framework while touching into Deontology as it is our duty as students at this university to help and improve the university as well as help it grow through enticing more students to come study here. For us, the consequentialist framework was unappealing as the team had unanimously decided to conduct our research respectfully and not research individual lecturers and their teaching styles as well as not publishing any personal details about the people of whom we have gathered the information from. Thus, giving this project a virtuous approach. (Vallor and Rewak, 2021)

Certainty around any UK legislation is currently unstable due to Brexit, the United Kingdom's transition out of the European Union. Aspects of GDPR, which is an EU legislation, have been implemented into the DPA; the UK's Data Protection Act 2018. Currently, the EU has allowed GDPR to be held in reserve in UK law however, this does not mean the legislation cannot change in the future due to a change of political party governing the country. There are a few national datasets relating to the education department and none can directly aid us in the collection of data around UK Universities.

The provisions of the EU GDPR have been incorporated directly into UK law as the UK GDPR. In practice, there is little change to the core data protection principles, rights, and obligations. *ico.org.uk. (2021)*

As a group, we are employing multiple strategies to ensure we stay within the lines of current legislation and law. The most important consideration for us is the Data Protection Act of 2018. This outlines the 'strict rules and legal protection for the ways in which people's data is used'. It also tells us 'The rights we have when finding out what data an organisation holds about us' ([Data protection - GOV.UK (www.gov.uk - 2018)](#).

We will only be using the data we gather for a specified and explicit purpose (to display features and reviews about the most positive aspects of life at the University of Lincoln to prospective students and provide the university detailed information about improvements to be made around campus). The data will also only be used for its necessary purpose (stored inside of a database and displayed on a website). The data will only be kept until the project is completed. None of the information we are gathering will fall under the section of 'personal and sensitive data' (e.g. race, sexuality, political opinions).

A change in governing body in the UK could lead to an adjustment of GDPR and the Data Protection Act. This has already happened in the wake of Brexit and within the last year. On 10th September 2021, the UK government decided to change the rules surrounding 'clarification to help organisations establish a legal basis for processing' data (Data Protection Report, 2021). Unfortunately, foreseeing these changes is a difficult process as they often take months to come into action and be decided by parliament. However, as a group, we are prepared to change aspects of our project in order to comply with any new regulations.

It is important to us that we consider the perspectives of all people involved with our work (including the university, past, present, and future students). People who have written about the university may wish to stay anonymous, which is why we have chosen to not gather data on who is writing the information, but rather only what the information is. The university would not want primarily negative material being advertised to prospective students, so we will display the data in a positive light as well.

Group Work Reflection

As a group we collaborated well with one another, despite the fact only two individuals had worked with any others before this project. Our high level of clear communication with one another was vital, we made sure everyone was aware of what everyone else was doing and if we had any roadblocks it was known. Another positive of our group was the high-level diversity. We covered a variety of the "9 clusters of behavioural attributes" (The Nine Belbin Team Roles, n.d.), which are key to a team's success. Everyone brought something different to the table, and this was evident during our weekly meetings when sharing ideas.

As individuals, working to a specific schedule and timetable has been a challenge because we all have different commitments and are available at different points during the week. In the future, anything planned for meetings will be done sooner and will be held to a stricter regime.

Group Member	Contribution	Contribution(%)
Alfie Newton	1, 2, 4, 5	15
Marcus Valerio	1, 3, 5	14
Max Bravetti	1, 2, 5	14
Mathews Joy	1, 3, 5, 6	15
George Finch	1, 3, 6	14
Remuse Manuel	1, 4, 5	14
Kyle Merrall	1, 4, 5	14
1. **Outlined each section as part of group work.** 2. **Project proposal research and write-up.** 3. **Market/domain research and write-up.** 4. **Legal, ethical, and political statement research and write-up.** 5. **Group reflection.** 6. **Communication between supervisor and group.**		

Thinking about our next steps, our team wants to make sure we have a clear idea of the implementation of the website and database, and that we know what specific pieces of information to display. Furthermore, what design processes and frameworks we will be making use of including mob programming, scrum, and Kanban.

Conclusion

In conclusion, we are striding to achieve a database populated with data that we have gathered, from multiple sources, about the university. We will display this data on a website, with the purpose of informing prospective students about the best aspects of our university and the city of Lincoln and informing the university on critiques that the students have.

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