The design of a web application to act as a hub of services for the transgender community in Liverpool

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TM470 – TMA03 – 4th July 2023

A person holding a flag

Description automatically generated with medium confidence

Figure A transgender flag being waved at LGBT gay pride march by ‘ink drop’ used under Standard License from Adobe

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# 1. Draft Project Report

## 1.1 Problem description

### 1.1.1 Title

The design of a web application to act as a hub of services for the transgender community in Liverpool

### 1.1.2 Description

There are many vital services available to the transgender community in Liverpool, but it can be a challenge to find them. This is particularly the case for new members of the community who may be in a vulnerable situation, as the point of coming out is a huge life change that may be accompanied by mental health issues and the loss of relationships. This is compounded by transgender healthcare facing profound ignorance (and in some cases outright bigotry) from many GPs, who may attempt to block or delay attempts at medical transition, alongside extreme waiting lists for appointments at Gender Identity Clinics.

The trans community attempts to solve these issues in numerous ways, mostly informal (e.g. by word of mouth in group chats), but two more formal ways are the Liverpool Trans Wiki (TransLiverpool Wiki, 2023) which catalogues and comments on many services that are available; and the Spirit Level peer support group which invites in guests from services to explain what they offer to the community. The proposed web app will seek to build on these solutions and incorporate this specialist knowledge into it.

The web app will be usable on web browsers and on mobile devices using HTML, CSS, and JavaScript and will utilize the OpenStack Trove DBaaS, consisting of several pages. Firstly, a page that contains a map which displays services on it, which will be filterable by type (e.g. mental health or peer support) and when a service is selected more information and contact details will be provided. The map will also provide directions from the user’s location to the selected service. Another page will contain a search function for a database which will return services based on user queries. There will also be a page that will contain an events calendar. The app will be designed such that information will be one way, to protect the user’s privacy and limit the amount of sensitive data stored by the app. Ethical considerations are vital for the project, since some users may not wish to be open about their trans identity and therefore would need to conceal their use of the app. This must be at the forefront of the final product to reassure users that their identity is safe.

The requirements elicitation will also explore another feature, a map which displays the location of gender-neutral toilets at businesses such as cafes, restaurants, and pubs. However, this will be considered for further work beyond this project and will be considered out of scope to keep the amount of development to an achievable level. The scope of the project is for services in Liverpool & Merseyside due to the ability to engage with services and their users directly and due to already existing knowledge. However, if successful the app could be expanded to cover the whole of the UK, it would be a matter of gathering the data rather than any technical challenges. Also out of scope would be online only services that have no physical footprint in Liverpool & Merseyside, some of these may be included in an ‘important links’ page but not as part of the core services covered by the app. The scope of the services included is that they must offer something specific to the trans community, rather than broader services (e.g. the CMAGIC & TSS counselling services would be included, but not the general NHS counselling service offered by Talk Liverpool.)

See if this need any additions in light of work done

Analysis of impact?

Review questions asked in TMA question

### 1.1.3 Resources

The resources focused on previously involved gathering feedback from services and members of the community, and while this is very important for a full release, for the purposes of this project it has been scaled back. While feedback is important, too much time focused on it would not leave enough time for other aspects of development. This aspect of the resources list has been condensed and other essential resources added.

* Representatives of services e.g. manager of a laser hair removal clinic
  + Can offer feedback about the events system and the ways in which users can contact their service.
  + May offer vital perspectives of how the app effects the community
  + **Risk** (medium impact, medium likelihood): They may be busy and do not wish to engage with giving feedback or may only engage in a limited way. To mitigate this, try to identify which people will be willing to provide feedback and be respectful of their time, to get as much out of any engagements as possible.
* Members of the Liverpool trans community
  + Different members of the community may have different needs regarding accessing services.
  + Could offer feedback on prototypes of the app.
  + May be a source of information about services that should be included.
  + The Liverpool Trans Wiki may an essential source of community information about the services, as it documents many of them.
  + **Risk** (medium impact, high likelihood): Feedback may be not useful or relevant. To mitigate this, care must be taken when designing questionnaires with a balance between closed and open questions.
  + **Risk** (high impact, low likelihood): They do not wish to engage with giving feedback or only engage in a limited way. To mitigate this, likely contributors will be engaged with early on. If necessary, a change to the project lifecycle could be considered.
* Programming languages
  + JavaScript – proficient enough to tackle much of the proposed features, but some learning may be required as it will likely extend beyond current knowledge.
  + HTML – reasonably proficient, significant problems are not anticipated.
  + CSS – only minimal experience, may need some time to learn and to use trial and error to achieve goals.
  + SQL – a small amount of experience that should be sufficient for a simple database, but for anything more complex some learning may be required.
  + **Risk** (medium impact, high likelihood): Attempting to code non-routine tasks may cause significant delay. To mitigate this, the schedule will be adjusted to include skills development as necessary, particularly for CSS.
* Visual Studio Code
  + A commonly used code editor that will be used throughout the project for all coding purposes.
  + **Risk** (low impact, medium likelihood): Since this is the first time using this software, there will be some adjustment time to using it. No mitigation should be required since the primary purpose of the software is very similar to other code editors, and any shortcuts learned will only speed up tasks.
* Cloud storage and version control
  + Microsoft OneDrive and GitHub can be used to backup files in the cloud and continue work between different devices. GitHub also provides version control with branching and reverting.
  + **Risk** (high impact, low likelihood): Data loss in the cloud, this could be due to several reasons including accidental deletion and server failure. This is not very likely but could be catastrophic to the project if significant amounts of work were lost. To mitigate this, copies of the data will be stored locally on multiple machines as well as in the cloud, so there is no single point of failure.
* OpenStack Trove DBaaS
  + A database solution, which is free and open source and will be used to store all the data for the services
  + **Risk** (medium impact, medium likelihood): Setup of the database taking longer than anticipated, since previous work with the database was after it had been set up. Mitigate by working on this as soon as possible to ensure there is time to work through any issues.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Label | Activity | Description | Likelihood (low, medium, high) | Impact (low, medium, high) |
| R1 | Feedback from service providers (e.g. requirements elicitation) | They may be busy and do not wish to engage with giving feedback or may only engage in a limited way. To mitigate this, try to identify which people will be willing to provide feedback and be respectful of their time, to get as much out of any engagements as possible. | Medium | Medium |
| R2 | Feedback from service users (e.g. requirements elicitation | Feedback may be not useful or relevant. To mitigate this, care must be taken when designing questionnaires with a balance between closed and open questions. | High | Medium |
| R3 |  | They do not wish to engage with giving feedback or only engage in a limited way. To mitigate this, likely contributors will be engaged with early on. If necessary, a change to the project lifecycle could be considered. | Low | High |
| R4 |  | Attempting to code non-routine tasks may cause significant delay. To mitigate this, the schedule will be adjusted to include skills development as necessary, particularly for CSS. | High | Medium |
| R5 |  | Since this is the first time using this software, there will be some adjustment time to using it. No mitigation should be required | Medium | Low |
| R6 |  | Data loss in the cloud, this could be due to several reasons including accidental deletion and server failure. This is not very likely but could be catastrophic to the project if significant amounts of work were lost. To mitigate this, copies of the data will be stored locally on multiple machines as well as in the cloud, so there is no single point of failure. | Low | High |
| R7 |  | Setup of the database taking longer than anticipated, since previous work with the database was after it had been set up. Mitigate by working on this as soon as possible to ensure there is time to work through any issues. | Medium | Medium |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Impact | High | 3, 6 |  |  |
| Medium |  | 1, 7 | 2, 4 |
| Low |  | 5 |  |
|  | Low | Medium | High |
| Probability | | | |

|  |  |  |
| --- | --- | --- |
| Label | Mitigation | Result |
| R1 |  |  |
| R2 |  |  |
| R3 |  |  |
| R4 |  |  |
| R5 |  |  |
| R6 |  |  |
| R7 |  |  |

Risk: Service providers too busy to provide much feedback

Result: This occurred, and the result was that no providers were engaged with. The mitigation suggested was to identify the most willing and likely to engage, which did occur, but personal reasons meant they had to drop out of the study anyway. This mitigation was not sufficient, but analysis went ahead any way and further feedback was suggested as part of future work.

Risk: feedback from community members may not be useful or relevant

Result: The feedback was good quality and useful information was gained, so mitigation of carefully considering the questionnaire worked.

Risk: community members not willing to engage or only limited engagement:

Result: Partially occurred as less feedback was gathered than anticipated; so to mitigate, this changes to the project lifecycle were made to have a reduced focus on gathering feedback.

Risk: coding non-routine tasks may cause delay

Result: ongoing

Risk: data loss

Result: not occurred (ongoing)

Risk: Database setup delays

Result: This occurred due to the time scale involved of setting up Trove, so there was a switch to AWS. This was mitigated by starting the databases relatively early in the project, so disruption was minimised.

Separate risks out into separate table and include some that might not be necessarily linked to resources.

Add hardware to resources list

Effectiveness of risk assessment

Some of this in review?

### 1.1.4 Future plan

Discuss changes to plans, doing CSS 1st, changes to feedback

Skills development plan, CSS, AWS

Final part of plan TMA02->EMA?

Maybe appendix this? Or move to review?

## 1.2 Account of related literature

A previous literature review concluded that a NoSQL database would be a suitable for the project, and that OpenStack Trove would be a good choice due to previous familiarity gained from TM352, as well as it being a free open-source option. Another possible choice considered was AWS (Amazon Web Services) which has a NoSQL database DynamoDB, but concerns were around cost as AWS charges for some of its services and there is no budget for this project. The familiarity with OpenStack Trove was with the use of the database, not its installation and setup, so some skills development was required first, and the literature review will cover sources used for this purpose.

Skills development began with research into how to install and setup OpenStack Trove and in addition to official documentation for Openstack (2019), as well as a video guide from Tesora (2015) a DBaaS provider.

OpenInfra + freeCodeCamp

One thing that became immediately apparent is that OpenStack is not available for Windows and must be installed on Linux, so would require either an installation of a dual boot or virtual machine for Ubuntu 16.04. The installation would therefore require the following steps:

1. Create a VM (or duel boot install) for Ubuntu 16.04
2. Install OpenStack using the Linux CLI (command line interface)
3. Install relevant packages including Horizon, the OpenStack GUI
4. Install Trove

Each of these steps requires different guides to follow and while certainly achievable, may require further skills development. While I have installed an Ubuntu VM previously, I am aware that many other students quickly ran into issues during installation and struggled for a long time to get it to work. Further to this, while I have a little experience using the Linux CLI I may require some refreshing on this as I usually work with Windows. Therefore, given the time frame of this project alternatives were considered that may have a more speedy set up time.

The other option considered previously was AWS DynamoDB, which in comparison to OpenStack is very straightforward to begin using, being a matter of creating an account and going through some confirmation of credentials. DynamoDB can then be interacted with through the AWS GUI on a browser. The first challenge of using DynamoDB is to ensure that the ‘free tier’ is stuck to, so that inadvertent charges are not incurred. The AWS free tier provides 25GB of storage as well as 25 Write Capacity Units and Read Capacity Units (<https://aws.amazon.com/dynamodb/pricing/> ). Given the relatively small amount of data that will be required for this project, this will be sufficient. However, a full release must keep this limit in mind, and either consider monetisation to recoup the costs, or switch to a free alternative.

Learning how to use DynamoDB:

freeCodeCamp – DynamoD Tutorial: Basic Operatios

Be A Better Dev – AWS DynamoDB Tutorial For Beginners

Tables, partition key, sort key

Whilst using AWS does not require a lengthy and complicated setup process, it does present other challenges. The first of which, is setting up the APIs, as although AWS provides low level APIs these can be cumbersome to use and it is recommended that using the AWS SDK (Software Development Kit) is a better approach (AWS reference). The involves:

1. Create a table in DynamoDB (the database)
2. Create functions for CRUD operations in AWS Lambda (another AWS service – explain?)
3. Create the APIs using the AWS API Gateway service (explain?)

Amazon (reference) provides a step-by-step tutorial for this process, which was followed as part of skills development and provided a basis on how to set up the APIs for the project.

Check what is needed in this section – is it a new lit review or collecting previous lit?

1 – databases / API

Literature for openstack and subsequent decision to change to aws

Literature for aws and skills development

## 1.3 Account of Project Work

Setting up DynamoDB / APIs

Setting up map

Making pins work

# 2. Review

## 2.1 Review of project work

Reflection on process and what has been achieved

Not analysis of what is covered on TMA01/02

Discuss strengths e.g. lit review

Weaknesses so far include planning / skills dev plan

## 2.2 Review of project management

Short account of project lifecycle being used – perhaps cover changes to it here

Not a general discussion of lifecyles

## 2.3 Risks to project completion

Risks initially identified, strategies to mitigate them and how effective they were

Any risks that may still occur and how they may be mitigated

## 2.4 Review of personal development

What I have learnt so far, effectives ways to work and learn

What I need to extend current knowledge

Reflect on skills acquired or improved – project management and self management

Look back at TMA01/02 here

# 3. References

# 4. Appendix