Individual Project (CS3IP16)

Department of Computer Science
University of Reading

Project Initiation Document

PID Sign-Off

Student No.	**24026478**
Student Name	**Joseph Fazzino**
Email	**joseph@fazzino.net**
Degree programme (BSc CS/BSc IT)	**BSc CS**
Supervisor Name	**Hong Wei**
Supervisor Signature	
Date	**1/10/18**

SECTION 1 – General Information

Project Identification

1.1	**Project ID** (as in handbook)
	Own
1.2	**Project Title**
	OpenStudy
1.3	**Briefly describe the main purpose of the project in no more than 25 words**
	To create a platform that connects people wanting to share their knowledge with others using a recommendation algorithm

Student Identification

1.4	**Student Name(s), Course, Email address(s)** e.g. Anne Other, BSc CS, a.other@student.reading.ac.uk
	Joseph Fazzino, BSc CS, j.fazzino@student.reading.ac.uk, joseph@fazzino.net

Supervisor Identification

1.5	**Primary Supervisor Name, Email address** e.g. Prof Anne Other, a.other@reading.ac.uk
	Dr Hong Wei, h.wei@reading.ac.uk
1.6	**Secondary Supervisor Name, Email address** Only fill in this section if a secondary supervisor has been assigned to your project

Company Partner (only complete if there is a company involved)

1.7	**Company Name**
1.8	**Company Address**
1.9	**Name, email and phone number of Company Supervisor or Primary Contact**

SECTION 2 – Project Description

2.1 **Summarise the background research for the project in about 400 words. You must include references in this section but don't count them in the word count.**

In order to create a system that allows for this kind of sharing of information I researched the different types of already existing solutions. One of the most popular platforms is StackExchange.com which uses a very simple questions and answers format and tends to be a good resource to learn something very specific (for example StackOverflow, a subset of StackExchange is a popular resource for developers looking to fix issues that they believe other people may of encountered). I believe this approach to forums to be valuable however the platform I want to build is more structured and general.

In terms of building a sophisticated recommendation algorithm I have read the paper published by the Google developers who work on how YouTube figures out what videos to recommend to specific users [1]. This kind of material is very valuable to show how they A/B test against their whole user base to try and figure out if they are recommending the right videos to the right people and when the system gets it right it is very measurable meaning it gets significantly improved rapidly with the more information on a user it gains. This is relevant to my project as it shows that with just a few important data sets and a clear way to define success and failure you can create a machine learning program that works effectively.

A paper published by the IEEE organisation discusses the 3 most prominent types of recommendation systems that are in current use and also discusses, potential forward steps for the technology and how it can be extended [2]. This is important to my project as a base understanding of the technology will help me to create my own system that can be applied to this project.

As the type of platform I'm looking to create is going to be an online community for sharing information with others it made sense to look at some articles that discuss this newfound 'Sharing economy'. Famous examples of this include Airbnb and Uber. This paper discusses the actual psychology behind why people choose to participate in these kinds of businesses when you can easily argue it is much less of a consistent source of income than a standard job. This research will be valuable to me in order to help me create a platform that people really want to use and hopefully provide some element of stability to this kind of economy.

References:

[1] Deep Neural Networks for YouTube Recommendations by Paul Covington, Jay Adams, Emre Sargin

[2] Toward the next generation of recommender systems: a survey of the state-of-the-art and possible extensions by G. Adomavicius and A. Tuzhilin

[3] The Sharing Economy: Why people participate in collaborative consumption by Juho Hamari

2.2 **Summarise the project objectives and outputs in about 400 words.**
These objectives and outputs should appear as tasks, milestones and deliverables in your project plan. In general, an objective is something you can do and an output is something you produce – one leads to the other.

The overarching objective of the project is to create an easy to use platform that helps people who want to teach certain skills, make money and also helps people who want to learn those skills, learn them. The overall output will be a web application that performs this purpose.

Broken down into smaller objectives:

- The platform should be as user friendly as possible in order to make the process of signing up to a teacher's course as enjoyable and exciting as possible. In order to create a user-friendly application, the software should adhere to already existing design axioms and leverage common user behaviour psychology.
- The platform should be useable by any person no matter who they are. This means the software should be created to be as accessible as possible so people who navigate using screen readers are able to use the site effectively.
- The platform should provide an effective method of getting people who register as teachers paid. This may be implemented via a 3rd party solution such as Stripe but will result in users being attracted to the platform as a means of secondary income.
- The web app should be highly performant. There are numerous studies showing that non-performant web applications do not retain users and provide extremely frustrating user journeys. Google Chrome has an inbuilt lighthouse tool that checks performance of the website across different mobile network speed simulations and I aim to be in the top 10 percentile.
- Based on user data, the platform should intelligently suggest to the user the kinds of teachers that it believes they would learn best from, as well as the types of courses they would enjoy most. This is very similar to how something like YouTube recommends videos or Spotify recommends music.
- The backend of the application should serve data in an efficient and rapid way. This will be done by accessing data with effective SQL queries and using battle tested programming techniques.

2.3	**Initial project specification - list key features and functions of your finished project.** Remember that a specification should not usually propose the solution. For example, your project may require open source datasets so add that to the specification but don't state how that data-link will be achieved – that comes later.
	The OpenStudy platform will: - Provide a way for people with skills to get paid for sharing their knowledge - Provide a level of community engagement for a teacher with their students - Make it easy to find courses that users would be interested in - Make it simple to create a lesson/course - Make the payment process simple for teachers - Attempt to match students with teachers based on learning style/preference
2.4	**Describe the social, legal and ethical issues that apply to your project. Does your project require ethical approval? (If your project requires a questionnaire/interview for conducting research and/or collecting data, you will need to apply for an ethical approval)**
	In order for recommendation algorithm to work correctly it will need to analyse user's personal data (which they provide voluntarily). Social issues surrounding user generated content, can be combatted with report functionality
2.5	**Identify and lists the items you expect to need to purchase for your project. Specify the cost (include VAT and shipping if known) of each item as well as the supplier.** e.g. item 1 name, supplier, cost

	Not applicable
2.6	**State whether you need access to specific resources within the department or the University e.g. special devices and workshop**
	Not applicable

SECTION 3 – Project Plan

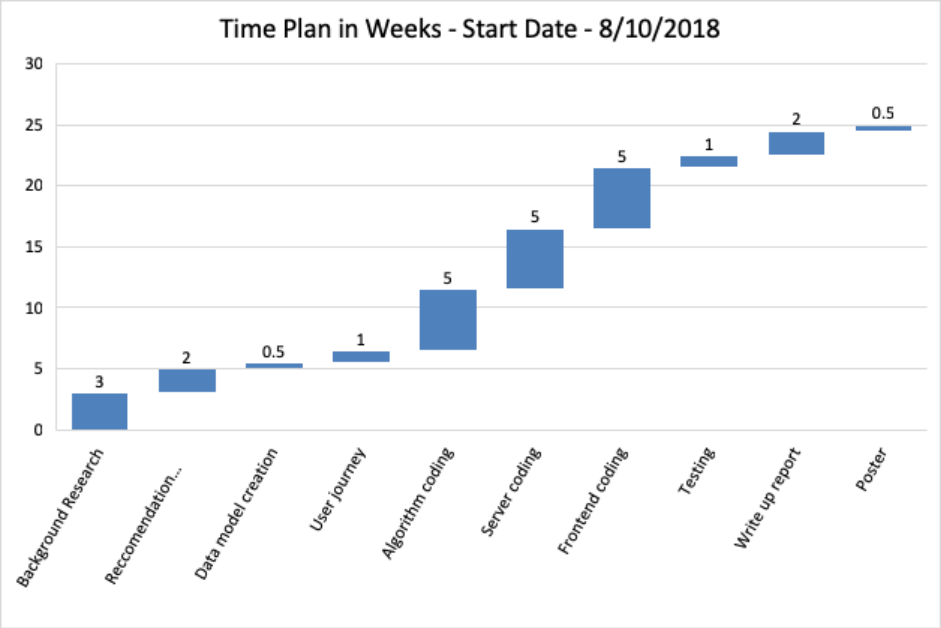
3.1	**Project Plan** Split your project work into sections/categories/phases and add tasks for each of these sections. It is likely that the high-level objectives you identified in section 2.2 become sections here. The outputs from section 2.2 should appear in the Outputs column here. Remember to include tasks for your project presentation, project demos, producing your poster, and writing up your report.

Task No.	Task description	Effort (weeks)	Outputs
1	**Background Research**		
1.1	Reading resources on similar problems regarding tutoring and payment	0.5	Understanding of the correct and incorrect approaches to take to the problem
1.2	Looking at examples of recommendation systems	0.5	Improve understanding of how recommendation systems work and how they're implemented
1.3	Looking at platforms that offer similar services and how they implement solutions	0.5	Understand the issues that similar platforms had when implementing their own solutions
2	**Analysis and design**		
2.1	Investigate different approaches to Recommendation systems	2	Decide which type of recommendation system to create and the language/tools to build it
2.2	Investigate different technologies to create the application platform	1.5	Decide what to use to create the full stack application in terms of DB technology, server toolchain and front-end framework
2.3	Create a data model which represents the different data structures and their relationships	0.5	A model for all the necessary data structures that will be created and the relationships they'll have
2.4	Plan user journey through application	1	A general idea of navigational structure in the website
3	**Develop prototype**		
3.1	Recommendation algorithm coding and implementation	5	A working recommendation algorithm that can be trained
3.2	Implement the server login and API endpoints	5	An API that can be used from any client in order to access information from the database
3.3	Initial development of the front end of the app	5	A working front end with all the required functionality for the platform
4	**Testing, evaluation/validation**		
4.1	Unit testing	0.5	Confidence that the system is functioning correctly

4.2	Recommendation algorithm testing	0.5	Confidence that the recommendation system works as intended
5	**Assessments**		
5.1	write-up project report	2	Project Report
5.2	produce poster	0.5	Poster
TOTAL	**Sum of total effort in weeks**	**24**	

SECTION 4 - Time Plan for the proposed Project work

For each task identified in 3.1, please *shade* the weeks when you'll be working on that task. You should also mark target milestones, outputs and key decision points. To shade a cell in MS Word, move the mouse to the top left of cell until the curser becomes an arrow pointing up, left click to select the cell and then right click and select 'borders and shading'. Under the shading tab pick an appropriate grey colour and click ok.



RISK ASSESSMENT FORM

Assessment Reference No.		**Area or activity assessed:**	
Assessment date			
Persons who may be affected by the activity (i.e. are at risk)	**Joseph Fazzino**		

SECTION 1: Identify Hazards - *Consider the activity or work area and identify if any of the hazards listed below are significant (tick the boxes that apply).*

1.	Fall of person (from work at height)		**6.**	Lighting levels		**11.**	Use of portable tools / equipment		**16.**	Vehicles / driving at work		**21.**	Hazardous fumes, chemicals, dust		**26.**	Occupational stress	✓
2.	Fall of objects		**7.**	Heating & ventilation		**12.**	Fixed machinery or lifting equipment		**17.**	Outdoor work / extreme weather		**22.**	Hazardous biological agent		**27.**	Violence to staff / verbal assault	
3.	Slips, Trips & Housekeeping		**8.**	Layout , storage, space, obstructions		**13.**	Pressure vessels		**18.**	Fieldtrips / field work		**23.**	Confined space / asphyxiation risk		**28.**	Work with animals	
4.	Manual handling operations		**9.**	Welfare facilities		**14.**	Noise or Vibration		**19.**	Radiation sources		**24.**	Condition of Buildings & glazing		**29.**	Lone working / work out of hours	
5.	Display screen equipment		**10.**	Electrical Equipment		**15.**	Fire hazards & flammable material		**20.**	Work with lasers		**25.**	Food preparation		**30.**	Other(s) - specify	

SECTION 2: Risk Controls - *For each hazard identified in Section 1, complete Section 2.*

Hazard No.	Hazard Description	Existing controls to reduce risk	**Risk Level** (tick one)			Further action needed to reduce risks *(provide timescales and initials of person responsible)*
			High	Med	Low	
26	Occupational stress	Get fresh air, exercise, regular breaks.			✓	None
Name of Assessor(s)			**SIGNED**			
Review date						

Health and Safety Risk Assessments – continuation sheet

Assessment Reference No	
Continuation sheet number:	

SECTION 2 continued: Risk Controls

Hazard No.	Hazard Description	Existing controls to reduce risk	**Risk Level** (tick one)			Further action needed to reduce risks *(provide timescales and initials of person responsible for action)*
			High	Med	Low	
Name of Assessor(s)			**SIGNED**			
Review date						

Comment Summary

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1. which kind? You need to explain it
2. which kind?

   You need to explain it.