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**School of Computing final year project**

**Matthew Anthony James Hawkins**

**INDIVIDUAL PROJECT (ENGINEERING) (PJE40)**

**Project Initiation Document**

**A flashcard web app to help efficiently learn languages**

Project Initiation Document

# Basic details

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| Student name: | Matthew Anthony James Hawkins |
| Draft project title: | Developing a really efficient language learning application |
| Course: | Software Engineering |
| Client organisation: | ------------ |
| Client contact name: | ------------- |
| Project supervisor: | Petronella Beukman |

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# Outline of the project environment and problem to be solved

**Who is the client? What do they do?**

*The client is my small side business, BritVSJapan.com which gets around 15,000 visits a month.*

*BritVSJapan.com is a website which originally started off as a blog for me to discuss my experience with learning Japanese. It now provides advice for new comers to the language and aims to provide advice on language learning based on my experience, and research into language acquisition, that will significantly make a difference to the time it takes for one to learn a language.*

**What is the problem? Why does it need to be solved?**

One of the main pieces of advice that you will find when looking up “how to learn Japanese” online is to use a flashcard software that implements “Spaced Repetition” as these systems are known to be very effective for keeping information one has learnt in long-term memory. However, after using one of these systems, Anki, for 3+ years I, and many others, have noticed a few issues with the software that make studying languages slightly harder than it should be.

Most of the popular flashcard applications on the market are not directly aimed at language learners (they tend to allow you to study for just about anything), meaning that they are not necessarily setup in the best way for an easy and efficient language learning experience.

If these applications fixed the issues mentioned and based development of their applications on research on language acquisition, then language learners would be able to produce better results in a quicker time period.

As a language learner myself I know just how long it takes to learn a 2nd language to a substantial degree of fluency (where one could work and live in the target country), so anything that can help to make the process easier or that allows one to progress faster is incredibly valuable.

*For engineering and business solution type projects: Who is the client? What do they do? What is their problem? Why does it need to be solved?"*

*For theoretical or social science type projects: Who is the intended readership/audience? What is the contextual significance of this topic? What are the research questions you are seeking to answer?*

# Project aim and objectives

**What is the overall aim of the project?**

The overall aim of the project is to allow language learners of Japanese to study more efficiently via simple flashcards. The application will provide some pre-made cards but will allow and encourage students to create their own cards too.

To be able to do this some research into language learning, spaced repetition and other learning techniques will be necessary. *This research will affect how certain functionality and features will be implemented. From here these features will need to be planned and designed and then an agile style development process will need to be used in order to get a prototype released and tested with an actual user base as soon as possible. After testing the first prototype with users, information such as how many flashcards, words, pieces of grammar etc., as well as how well they have retained this information will be recorded and compared with future versions of the application.*

*The application will be written in HTML, CSS, JavaScript, PHP and will connect with an SQL database in order to store user data, progress and flashcard data ready for scaling to mobile and desktop applications as well in the future.*

*What are the objectives in meeting that aim?*

# Project deliverables

As there is a high chance of the functions and features of the application changing throughout the process, an agile style development process will need to be implemented. Due to this the artifacts used throughout the process may have to been changed and updated during the process.

Prototype

Literature review

Report - Artifacts and documents to be produced

* Products roadmap
* Products backlog
* Release plan
* Requirements specification
* Design documentation
* Use case
* Class diagram
* Client-server architecture
* State diagram
* Sequence diagram
* System context diagram
* Project report
* Test reports
* User acceptance testing

*For an engineering project, what information system artefacts will be developed/adapted? What documents will be produced? This should include your project report, but could also include supporting documentation such as requirement and design specifications, test strategies.*

*For a study project, are there anticipated outcomes besides the report, for example recommendations to external bodies?*

# Project constraints

Time is a large constraint especially due to the nature of this type of application where in theory it could be constantly maintained and updated to increase “learning efficiency”. There is only so much that can be done in the timeframe available.

Lack of research in the domain of language acquisition may be a constraint.

Sometime will be spent learning about the technologies that are required to use to produce the application.

I am not familiar with JavaScript, so some research into popular frameworks for building web apps and how to use these frameworks will take time away from development.

*What constraints are there on your solution to the problem?*

# Project approach

Literature review

Background research will be on language acquisition, learning techniques, such as spaced repetition and mnemonics, and other existing software that is similar to this project.

An agile approach will be taken throughout the development process in order to produce multiple prototypes so that each version can be compared with each other in terms of whether or not they reach the overall aim.

Requirements

I require HTML, CSS, JavaScript, PHP and SQL knowledge to develop this web app. While I have knowledge of all of these, I am not particularly strong with JavaScript and haven’t yet used any of the commonly used frameworks that are out there for building web applications. I will have to work out first which framework will be best suited to this application and learn how to use the framework before and during the development process.

Agile

*What is going to be your approach? What background research do you need to do? What are the requirements / research questions or how are you going to find them out? What skills do you require and how are you going to acquire those that you do not already have? What methodologies are you going to use?*

# Facilities and resources

User testing maybe done online but it could also be done in person in which case some form of public space with some computers would be required. This can be done at the university at certain times when certain classrooms aren’t in use. Ideally testing will be completing over the internet.

Web hosting is required for hosting the finished site/software and database. This has already been acquired.

A computer and the relevant software is required.

*What computing/IT facilities will you use/require?*

*What other facilities/resources will you use/require?*

*Are there constraints on their availability? If funds are required to acquire them, have these been allocated? Will they be available in time?*

# Log of risks

*What risks will you encounter when doing your project? What backup plans do you have if identified things go wrong? What is your plan for reviewing risks? (review this section regularly)*

*Best approach is to create a table, with the following headings:*

* *Risk description and type*
* *Risk impact - description*
* *Risk probability (severity x likelihood)*
* *Mitigation / control*
* *First indicator – that the risk is turning into an issue*

*Remember that risk probabilities, and hence priorities, will change over the course of the project, so this log should be maintained.*

# Starting point for research.

**Books**

Explorations in Language Acquisition and Use by Stephen Krashen

**Papers**

Principles and Practice in Second Language Acquisition by Stephen D Krashen of University of Southern California

<http://www.sdkrashen.com/content/books/principles_and_practice.pdf>

Second Language Acquisition The Effect of Age and Motivation by Einar Garibaldi Stefánsson

<https://skemman.is/bitstream/1946/15018/1/BA%20EinarG.pdf>

**Existing Systems**

Anki

SuperMemo

SuperMemo2 Algorithm

Memrise

**Online resources**

Some issues with Anki - <https://vladsperspective.wordpress.com/2017/03/14/optimize-your-anki-youre-overtesting-yourself-on-too-few-cards-make-huge-gains/>

*What are the starting points for your research? (i.e. specific books or papers in journals, existing reports or documents, online resources, existing systems)*

# Breakdown of tasks

The approach will start with setting out the user requirements while beginning secondary research into the necessary topic areas. Based on the user requirements some designs will be mocked up and artifacts created to get a better understanding of the system and how everything will interconnect. During this process anything useful discovered from research will be noted. This is will be an ongoing process and will mean that the system could very well change numerous times throughout development.

The process will probably look something like this:

* Requirements
* Secondary research
* Design
* Secondary research
* Implement
* Secondary research
* Test
* Secondary research
* Repeat

**Paragraph at end of chapter in report on how I stuck to gant chart**

*What do you need to do to create the artefact / do the primary research and write the report? Walk through your proposed approach and list the tasks.*

# Project plan

*What are you going to do when? (This may be an attached output from MS Project etc.)*

*What risks to the success of the project have you identified? What steps can you take to minimise them? Note that plans can change over the course of the project, so this plan should be maintained.*

# Legal, ethical, professional, social issues

Multiple user tests are required to properly be able to tell whether the application has improved in terms of “efficiency”. In terms of legal issues, I will need to make sure that I handle these users personal data correctly as well as making sure that the system is secure in order to prevent any possible attacks to get users information from the system. This means preventing cross site scripting, SQL injections etc.

There shouldn’t be any ethical issues. Test users will be 18+ years of age. Consent form.

No professional issues.

Be culturally sensitive.

*What are the legal/ethical/professional/social issues that may impose constraints on the project? How will you ensure that they will be complied with, or what steps will you take to avoid/mitigate their effects?*

*Whatever project work you are doing, you must consider whether there are security implications, for the data you generate or use, or for the software artefact itself. Please describe how you are taking these into account. There is also a question about security on the ethics review form (ethicsreview.port.ac.uk).*

*What research ethics approval (if any) is needed for your work? Have you completed an ethical examination checklist and consent form if necessary?****Remember*** *– this is obligatory (see Moodle for link to the on-line form).*