

Curriculum Mapping Database



Initial Plan

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Table of Contents:

Project Description.....	2
Project Aims and Objectives	4
<i>Aims.....</i>	<i>4</i>
<i>Core Objectives.....</i>	<i>4</i>
<i>Desirable Objectives</i>	<i>4</i>
Work Plan.....	5
Scrum Lifecycle	8
References:.....	9

Project Description

Every year module leaders within the School of Computer Science and Informatics at Cardiff University carry out a module review and data collection for curriculum mapping processes. The outline description and subsequent learning outcomes for a particular module are recorded and these are used as evidence for accreditation by the degree professional governing body. In the case of the School of Computer Science and Informatics this is the BCS: The Chartered Institute for IT.

Accreditation for the school from the British Computer Society is only granted if the university meet the accreditation criteria as referenced in the Accreditation Guidelines². These are made to “establish and maintain standards of competence, conduct and ethical practice for information systems professionals”². Currently each module review is written in a word document to tie in with an excel spreadsheet for each degree level e.g. Postgraduate, Undergraduate etc and these are therefore inconsistent, varying between lecturers. The module outcomes are linked annually to the BCS accreditation specific requirements manually, which takes an unnecessary amount of time.

This project will therefore involve the creation of a database system to solve this inefficiency problem. Databases are the preferred solution as they are capable of organising data into fields and records and are designed for data management⁴. This curriculum mapping database I will make will map module/assessment learning outcomes with the British Computer Society accreditation criteria based on the use of a keyword spotting algorithm. This keyword mapping allows staff to search through any module or learning assessment to track a particular learning outcome. From this information, module leaders will be able to establish whether a certain learning outcome is being over assessed or under assessed within their module and overall across the degree. This database will have a web interface using AngularJS with a log in feature for security, allowing for efficiency and ease of use by module leaders.

The use of a curriculum mapping database is generally regarded “as an electronic repository of a curriculum”⁵. Curriculum mapping in one form or another is used world-wide by “indexing or diagramming a curriculum to identify and address academic gaps, redundancies and misalignments for purposes of improving the overall coherence of a course of study”³. This mapping is based on Dr Heide Hayes Jacobs’ work (Curriculum 21: Essential Education for a Changing World) and mainly occurs at intraorganizational levels within the health professions of various universities in America and Canada including University of Calgary and UCLA School of Medicine.

Through my background research I was able to establish how curriculum mapping databases are mainly used and gauge what products already exist. From this research it became clear that the main focus on mapping thus far had been specifically for the health professions in higher education - with CurrMIT being designed to accommodate data from medical schools throughout America and Canada and Liftupp, a platform developed by the University of Liverpool used to map their School of Dentistry to support quality assured assessment and

feedback alongside the curriculum design and mapping aspect - which is deemed to be a cutting edge approach to Artificial Intelligence in Education (AIED).

Applications such as Elentra Consortium ME, and Curriculum 21 offer the ability to “power delivery and management of undergraduate and graduate education” that fulfils curriculum mapping and reporting. With my project I plan to develop upon these pre-existing ideas to incorporate mapping with the professional governing body whilst also branching out from the health professions of medicine and dentistry that are normally mapped.

The idea of my project is also similar to the curriculum mapping website produced by BARTS School of Medicine and Dentistry in the UK who use a system called ‘COMPAS’¹ however this project will map module/assessment learning outcomes to the British Computer Society rather than the British Medical Association. The outcome of this project will unlike COMPAS, also not be available for public use.

Having consulted the university’s ethical approval guide, I feel there are no parts of the project that require ethical approval.

Project Aims and Objectives

The objective requirements listed in this section will be refined through research into the project. Throughout planning and implementation, careful consideration of factors such as framework, entity relationship diagrams (ERD) and integration will be necessary. When completed, the system should fulfil the core objectives listed below. I will also be aiming to include some desirable objective if time is permitting.

Aims

To design and develop a database that takes the input of module assessed outcomes in a text file and maps these to British Computer Society Accreditation guidelines using keyword recognition. The database will have a web interface to allow module leaders to easily analyse where module outcomes are over/under assessed.

Core Objectives

- Research different software and tools that are needed - mainly focus on how 'COMPAS' was made by BARTS School of Medicine and Dentistry
- Ensure consistent format of module review documents
- Create a vocabulary of keywords the database will search for
- Implementation of relational database that pulls in data from a text file containing module reviews for undergraduate modules
- Implementation of a relational database that links a table of module learning outcomes for undergraduate modules with matching values from a table of accreditation guidelines
- Using AngularJS create a web interface that allows module leaders to log in to secure database access

Desirable Objectives

- Database mapping based on key words - without the need to change the format of already existing module review documents
- Time permitting, I would like to extend this project to map postgraduate module e.g. Masters

Work Plan

The work plan I have created is to ensure I manage project stages efficiently. This is divided week by week and does not include the meetings with my project supervisor (the project owner) as these have been organised to occur weekly. Any meetings that are review meetings with extra importance however will be included in this plan.

In this work plan I will be using the agile development more specifically the sprint technique; this is due to the nature of the project being a prototype idea supporting change should an idea not work in practice. Therefore, this will iteratively account for the evolving requirements throughout this project. I will have sprints of length four days to allow for prioritisation of the most valuable features with one day weekly for the stakeholder review (with the project owner).

Week 1

27th January – 3rd February

- Background Research:
 - Curriculum mapping databases that currently exist
 - Word recognition software/algorithms
 - Relational databases
 - "COMPAS" – BARTS website
 - BCS Accreditation Guidelines
 - School of Computer Science and Informatics module outcomes
- Initial meeting with project supervisor to clarify general requirements, aims and objectives.
- Consider any ethical issues
- Write and submit initial plan
- Analyse and understand similar AngularJS web fronted databases

Deliverable: Initial Plan (due 3rd February)

Week 2

4th February – 11th February

- Further background research
- Practice to become familiar with AngularJS
- Solidify requirements with project supervisor
- Begin implementation of basic database structure
- Sprint review

Week 3**12th February – 19th February**

- Further implementation moving on to
- Have outline of text file layout for data input to database
- Sprint review
- Begin front end development
- Write up report introduction

Week 4**20th February – 27th February**

- Create summary of background research for final report
- Develop on initial report Background for final report
- Break down coding tasks further
- Sprint review

Week 5**28th February – 6th March**

- Document Approach so far
- Document language compilers, subroutine libraries etc
- Sprint review

Week 6**7th March – 14th March**

- Begin notes for Implementation
- Begin documenting results and Evaluation
- Populate exemplar data into text documents

Week 7**15th March – 22nd March**

- Begin documenting Future Work and Conclusions
- Populate database with test data
- Test how successfully database maps
- Demo meeting with project supervisor for back-end framework

Deliverable: Fully functional back-end framework with test data

Week 8**23rd March – 30th March**

- Testing of front-end application with data
- Begin documenting Reflection on Learning
- Demo meeting with project supervisor for front-end

Deliverable: Fully functional front-end development with test data

Week 9**31st March – 7th April**

- Update glossary, figures and acknowledgements
- Ensure all correct module information is in system

Deliverable: Initial draft of final report

Weeks 10 - 12**8th April – 1st May**

- Overflow time for development (only if needed)
- Write up – Results/Conclusions
– Future Work
- Update appendices and references

Deliverable: Second draft of final report

Week 13**2nd May – 5th May**

- Final proof-read of final report
- Ensure all relevant parts are included
- Final meeting with project supervisor

Deliverable: Final Report (due 5th May)

Scrum Lifecycle

Below I have included a diagram of the general layout of the Scrum Lifecycle I will be aiming to follow during this project.

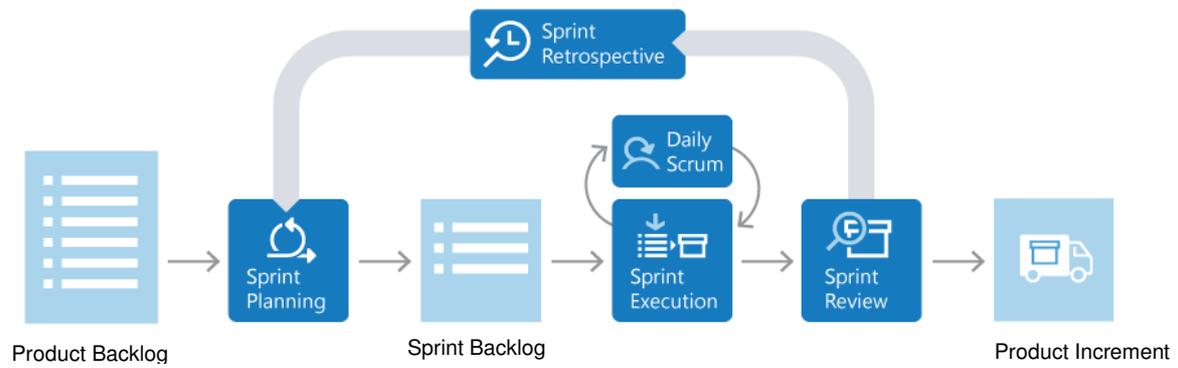


Figure 1: The Scrum Lifecycle by Boer, G. (2014)

References:

1. Barts and The London, School of Medicine and Dentistry, 2020, *Compas*, viewed 23rd January 2020, <<https://compas.smd.qmul.ac.uk>>

Figure 1. Boer, G. (2014), *What is Scrum [Online]*, Microsoft, viewed 29th January 2020,

<<https://docs.microsoft.com/en-us/azure/devops/learn/agile/what-is-scrum>>

2. British Computer Society, 2020, *Guidelines on course accreditation*, viewed 24th January 2020, <<https://www.bcs.org/deliver-and-teach-qualifications/university-accreditation/>>.
3. Great Schools Partnership, 2013, *Curriculum Mapping*, viewed 25th January 2020, <<https://www.edglossary.org/curriculum-mapping/>>
4. Masters T, 2018, *Spreadsheets Vs. Databases*, viewed 23rd January 2020, <<http://smallbusiness.chron.com/spreadsheets-vs-databases-53907.html>>
5. Mattern, W.D, Anderson, M.B, Aune K.C, Carter DE et al, 1992, *Academic Medicine*, viewed 25th January 2020, <<https://doi.org/10.1097/00001888-199201000-00003>>