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# Business Case

## Background

Yeovil College provides a Computing course, and on open days will often host a demonstration of the technologies used as part of the course. Previously there have been Human Computer Interaction (HCI) projects created by 3rd year students on display. In addition to the software demonstrations there were hardware demos, including the use of drones and non-conventional input peripherals such as eye and motion tracking.

Recently level 3 enrolment has been down when compared to previous years. It is hoped that having a more engaging open day demonstration suite will help increase enrolment numbers. A key focus of the Computing course is the development and integration of new technology into modern society, however the existing demonstrations could be seen to lack interactivity. Due to the nature of the course it can be hard to visually show software without having a practical exhibition to showcase capability.

## Purpose

The purpose of this business case is to recommend an approach which will help the Yeovil College Computing course, and the college in general to engage pupils and subsequently to drive an increase in enrolment, with the potential for future use by other students or members of faculty as a demonstration of what it is possible to achieve with computer interaction.

## Required Benefits

In summary the business benefit of the chosen approach will be to increase the engagement of potential students, and to provide a framework that future students and members of faculty can use as an educational aid.

## Proposed Solutions

As the customer has specified that a web application is desired, specifically one using a C# MVC implementation, this option will be considered favourably. In addition to this however, other options will also be explored in the case that they would better provide the business benefits.

### Options

Option 1 - Do Nothing

Option 2 – Standalone Java Application

Option 3 – Standalone C# Application

Option 4 – Java based web application

Option 5 – C# based web application

### Description of Options

#### Option 1 – Do Nothing

With option 1, the college would continue to operate as before, and student enrolment would be unaffected by our actions.

#### Option 2 – Standalone Java Application

It is possible to create a professional and feature-rich User Interface within Java. Although there are no official libraries designed for using the API’s with Java, it is still possible to use them using custom network interactions.

Java is also the language which the team members are most familiar with, this would expedite the development process.

Further to this, an early prototype has already been created to demonstrate and test the use of the API’s. This was created in Java, although if Java is the chosen implementation the prototype will be discarded in favour of a more comprehensive and cohesive design.

#### Option 3 – Standalone C# Application

As there are existing libraries developed for use with C#, it may be easier to implement the API’s with this language. On the other hand, none of the team are familiar with C#, so it would involve learning the language during implementation.

#### Option 4 – Java based web application

Whilst maintaining the benefits of the standalone Java application, a web based application would enable remote access without having to install anything on the college computers. This is of benefit as installation of applications requires permission from the system administrators. On the other hand this will require a server installation, as well as dedicated hardware.

#### Option 5 – C# web based application

The customer has expressed a desire for the project to be completed as a C# web based project using ASP.NET MVC as they already have a server capable of running a project of this type. This type of project had the same advantages as option 3. While the team has little experience with ASP.NET MVC they have previously used the same principle of design for other projects.

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# Project Product Description

The client has decided that they require a system with which to demonstrate the abilities of Computing students at Yeovil College, with the purpose of encouraging prospective students to enroll. The client would like for the demonstration to make use of various technologies, specifically including but not limited to the Microsoft Cognitive Services, as they will serve as an impressive example of what can be achieved through using publicly available resources.

# Project Plan

Time scales have been estimated assuming that most task have been completed one task at a time. This is because most requirements & design task are dependent on the information from the preceding task. In this regard our timescale project plan is heavily centered on our gantt chart that has been carefully laid out in regards to exactly what processes and tasks are to be done in precise order. Many tasks rely on previous sections to be completed or to be working on several sections simultaneously in order to have the various parallel tasks run smoothly. Inevitably there will be frequent meetings between the project team to oversee who is assigned to what task, and which particular task is to be focused on at that point in time according to our project plan.

Times for design, code and testing are estimates. Actual times will be finalised when requirements are agreed upon with customer.

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# Feasibility and Chosen Approach

As part of investigating the proposed solutions, we viewed the libraries provided by Microsoft for interacting with their API, we just looked for ones we can use in Java, C#, and Javascript as those are the languages we were considering. There are no available Java libraries, but there are for JavaScript.

Currently the only official Microsoft JavaScript library is for the Speech-to-text feature, but this combined with the fact that using the video API functions from Java is relatively easy means that using a Java back-end should not prove beyond the knowledge of the team. In addition to this there are several third-party Javascript and Java libraries that may be useful.

#### Option 2 – Standalone Java Application

Creating a Java application is the most feasible solution of the proposed solutions. It is the method that the team has the most familiarity with. There exist some Microsoft API libraries to help with development.

There are less issues that could arise when compared to the web based solutions and deployment would be easier as it could be run on any computer due to the lack of hosting requirements.

#### Option 3 – Standalone C# Application

Creating a c# application allows for use of more Microsoft provided libraries to make interaction with the Microsoft servers easier. The use of C# in development has the potential to inflate development times beyond those of Java. On the other hand C# is very similar to Java, and the potential API usage could offset this time deficit.

#### Option 4 – Java based web application

Creating a web based application does require more set-up, such as configuring apache tomcat. Conversely this means that there is less set-up for the end user. This will require a decent understanding of web hosting technology, as well as making sure that the solution would be able to be used with the available network infrastructure.

#### Option 5 – C# web based application

Creating a C#/ASP based web application not only requires the extra set-up of a web server. It also limits the computers that it can run on as it has to be hosted on a windows IIS server. In addition to this the ASP / MVC framework is unfamiliar to everyone on the team. This could cause issue as it would be comparatively harder to implement even simple functionality.

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# Risk

## Time overrun:

A serious risk to the project as a whole is the potential for time to overrun, with the deadline in April there is the potential due to other risks, unforeseen errors or problems outside of the project that the project may overstep its initial time boundaries and have to be completed late. Such a scenario will cause issues with the client, and will require a large work sprint to finish it as quickly as possible.

## Loss of Data:

Another large risk to the project is loss of data, whether this be in the form of documentation or source code. Either scenario would be devastating and would constitute a serious setback. In order to avoid this we are using Google Drive to keep a fully up to date and workable copy of the documentation and other pieces of work while simultaneously having an up to date copy stored on all of our PCs, and at least 1 external hard drive for redundancy which will be provided by Matt. This way the backup safety net is complete if one or two copies of the project components get lost.

## Illness or potential absence:

Due to the small team size a very large risk comes in the form of illness or absence of particular group project members. Without their input the workflow must be passed onto other project members which in turn can cause task overruns or a backlog of work to be done. While these situations are somewhat unavoidable steps will be taken through communication to help alleviate any heavy work loads on other project members, and with the use of Google Drive even if they are not able to attend meetings in person they can still attempt to carry out some of the tasks if they are able.

## Inaccurate Feasibility:

One of the largest problems that system designers face is an inaccurate feasibility checks that can snowball into an entire myriad of problems and potentially project breaking issues. In this regard feasibility must be reviewed by all the project members to form a set list of requirements and deliverables, including any risks, potential for scope creep and more. After this has been done it needs to be communicated and certified that the customer agrees with what has been stated so that the project can then be continued on with a strong foundation held up by a feasibility study that is comprehensive and robust.

## Customer Communication Issues:

Another common problem and big risk to the project over its course are communication issues with the customer. Constant feedback from the team to the customer needs to be undertaken, questions asked, amendments made, prototypes shown etc. If the customer cannot give feedback to the team or the team cannot contact the customer then the project will have problems. If amendments cannot be made, the customer may be unhappy with the end product after the team has to go on ahead without input etc. In this regard there needs to be multiple channels of contact. Email, social media, phone and more must be used to ensure that they can be contacted even if one such channel is unusable, cementing the ability for contact throughout the project.

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# Quality Management and Communication

In order to test this system, both manual and automatic testing will be used. The testing procedure can largely be split into the two most common testing strategies, black-box and white-box. Black-box testing is where the user creates data and knows the expected results for these data sets. This does not require knowledge of the inner working of the system and instead only compares actual results to the expected results. White-box testing uses the programmer’s knowledge of potential weaknesses of the system to devise tests that would cause an error in the system if the program was not coded in such a way to be robust. The idea of white-box testing is to enter data that will be entered to test every possible scenario that could an error.

As the system is intended to be used by members of the public we must test how well people outside of the project can use the web-site.

As part of UX-testing we will make use of several methods, arguably one the most important of these is Hallway Testing. This involves having other people outside of the project use the product without any guidance as to how to use it. The end goal is to identify areas of improvement.

**Automated unit testing**: We will aim for as much coverage by unit test as possible. Eclipse includes the the JUnit plug-in which allows for running automated tests created by the developer during the implementation stage. These tests can also be automated via the use of build scripts that can be run by third-party tools such as [travis-ci.org](http://travis-ci.org). This way developers can be notified of any changes to the code that makes tests fail as soon as those changes have been made, without anyone having to remember to manually run the tests.

**Customer feedback**: One method of quality management in relation to communication is constant customer feedback. In this regard we will set up a regular contact time in which we will email or otherwise contact the customer with the latest updates about the project. This could range from updates to requirements to documentation that must be approved.. Once they have done so they can communicate back any improvements or changes that need to be made. We will then list these changes on the daily log to then edit and make note of any changes made. Once this has been done we will do the next stages until the coming customer review where the process will be repeated to ensure our work is up to client standard.

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# Daily Log

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| --- | --- | --- |
| Date | Entry | Author |
| 13/01/17 | Added more info to feasibility study. | Jake Lewis |
| 20/01/17 | Added potential risk to risk register and also issue to the issue register | Myric Allen |
| 25/01/17 | Added project plan Gantt chart | Matt Rayner + Jake lewis |
| 27/01/17 | Resolved Project Plan write up, finished risk section. | Myric Allen |
| 27/01/17 | Added project product description bullet points | Jake Lewis + Matt Rayner |
| 28/01/17 | Added new product description, comment thoughts on old one | Jake Lewis |
| 05/02/17 | Updated project plan with more detail and upto date times as well as added to quality management and communication | Matt Rayner+Myric Allen |
| 08/02/17 | added description of quality management | Matt Rayner + Jake Lewis |
| 08/02/17 | started working on requirements | Matt Rayner + Jake Lewis |
| 10/02/17 | Proofreading | Jake Lewis + Matt Rayner |
| 10/02/17 | Fleshed out existing sections, added to quality management and communication | Jake Lewis + Matt Rayner |

# Risk Register

**Project Team Member being unavailable/unable to work:** A potential risk to this project and its time management will be a project team member or even members being unavailable due to out of project issues which may take up their time or cause them to be unable to work. Leading to backlogs and potential time management and work management issue.

# Quality & Issues Register

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Issue Id* | *Issue Name* | *Labels* | *Date opened* | *Date closed* | *Assignees* | *Milestone* |
|  |  |  |  |  |  |  |

Project Member being Ill on and off: One of the project members Myric Allen has and is ill on and off and so may impact the project, this will cause potential issues with workloads and timetables.

# Stage Plan

**Requirements stage**:

The two main sections of the requirements stage are making the requirements and then getting them approved by the customer. Writing the requirements should only take a few days but getting them approved by the user and/or amended could take upto a week depending on availability of the customer.

Get ordered list of features the customer want implemented and the order of importance they are in.

i.e. ccb / agile sprints

**Design Stage:**

**Implementation Stage:**

**Testing Stage:**