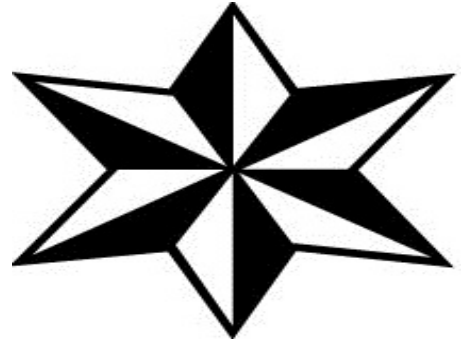


5/12/2017



Final Year Project 2017

Your Office Planner

A dissertation presented for the degree
of BSc. (Hons) Software Engineering.

13834408

School of Computing, Engineering and Mathematics

University of Brighton

Supervisor: Karl Cox

Second Reader: Mike Smith

Table of Contents

Project Scope	4
1.1 Aims and Objectives	4
1.2 Stakeholders	4
1.3 Methods of Communication	4
1.4 Research	4
1.4.1 Which language to use?	4
1.4.2 Which Database to use?	5
1.4.3 Which Encryption to use?	7
1.4.3 Current solution to the problem.	8
Specification.....	9
2.1 Deliverables	9
Figure 2.1.....	10
2.2 Analysis	11
2.2.1 Why Room booking system?	11
2.2.2 Programming Language	11
2.2.3 Why Postgres?	11
2.3 Quality Analysis	12
3.1 Methodology.....	13
Development	15
4.1 MVC Architecture.....	15
4.1.1 Client – Server	16
4.1.3 Authentication	17
4.3 Other Technologies	18
4.3.1 Git & Gitkraken	18
4.3.2 Window Builder	18
4.2.2 Data Dictionary	19
4.3.1 ERD Diagram.....	21
Testing.....	21
5.2 Automated Testing	21
5.1 Manual Testing.....	22
Review & Reflection.....	23
7.1 Background Research	23
7.2 Specification	23
7.3 Methodology	23
7.4 Limitations & Improvements of the application	24
7.4.1 Desktop application	24
7.4.2 Authentication Encryption	24
7.5 Conclusion	25
References	26



Appendix B	27
Iterations of Design	27
Appendix C.....	37
Ethics Form	37



Project Scope

1.1 Aims and Objectives

The ultimate objective of “Your Office Planner” project is to provide a Room Booking software for World of Books employees. The main aim for this project is to allow employees to create meetings at chosen time and selected room. Employee will be able to store the notes in the program and retrieve them.

1.2 Stakeholders

The Stakeholders involved in this project will be World of Books, myself and supervisor and the second reader. World of Books will be the main stake holder as they will be the main users using this software and testing. Stake holders will be giving the requirements for this project.

1.3 Methods of Communication

Communication with the main stakeholder was twice a week at the World of Books company. Where I’ve been showing the progress on the project to IT Manager and IT Infrastructure manager. Who gave their opinion about the software and changes that should be made to the project.

1.4 Research

I have made a research on three very important parts of my project which are Programming languages, databases and the encryption methods. The programming language maybe is not as important as the other two however still had to check which programming language to use for this project.

1.4.1 Which language to use?

When it comes to application development there are many programming languages which are relevant to writing such application. Each programming language will fill different role and will have advantages, disadvantages and is different in its own right.

Java

Java is one of the best programming languages created. Java is an Object Orientated Language which has a lot of Open Source libraries, great collection of powerful IDEs and has a rich API. Java offers swing for GUI creation which would allow me to create everything for the project. This is why Java is great for GUI creation which my software will use a lot. Following the research, I have found out that there is not a lot of desktop java jobs, there



are many more server side jobs however java can be enough to use for a desktop java application if it can meet all of the requirements. Java doesn't have a framework for Java desktop application which is definitely a disadvantage however it can still produce a good desktop application. Definitely Java is the easiest language to write desktop apps and it is great if you want the software to be compatible with all the platforms.

C++

I have chosen to research C++ as my second language as I have previous experience in using this language. C++ is a multipurpose language. C++ has a disadvantage which it's not good if you want your desktop application to be compatible with all of the platforms. This is why the C++ is not good for this project as "Your Office Planner" will be working on Windows, Mac and Linux.

1.4.2 Which Database to use?

SQL vs Postgres

When it comes to applications development where there is sensitive data and a lot of database usage it is very important to choose a right database. The database will hold mostly very confidential information which should not be lost or hacked. The database will continuously create, update and remove data, it will also have encrypted information which will be decrypted and encrypted. MySQL and Postgres are very similar DBMS however there are features and functions that are different and both have their pros and cons.

PostgreSQL has a lot of very useful feature as generate series, custom aggregate functions, arrays and many more which make life a lot easier. However, MySQL has a lot of features that Postgres doesn't have. The main difference but very significant is that MySQL has only one Server operating system which is windows where Postgres has Windows, OS X, Linux and many more it has much broader reach because of that. Postgres is an open source where MySQL is a commercial software. The disadvantage of Postgres definitely has to be that is behind MySQL on the popularity level, what comes with that (See figure 1.4.2)? It makes it a lot harder to get community support or google the results that you are looking for.

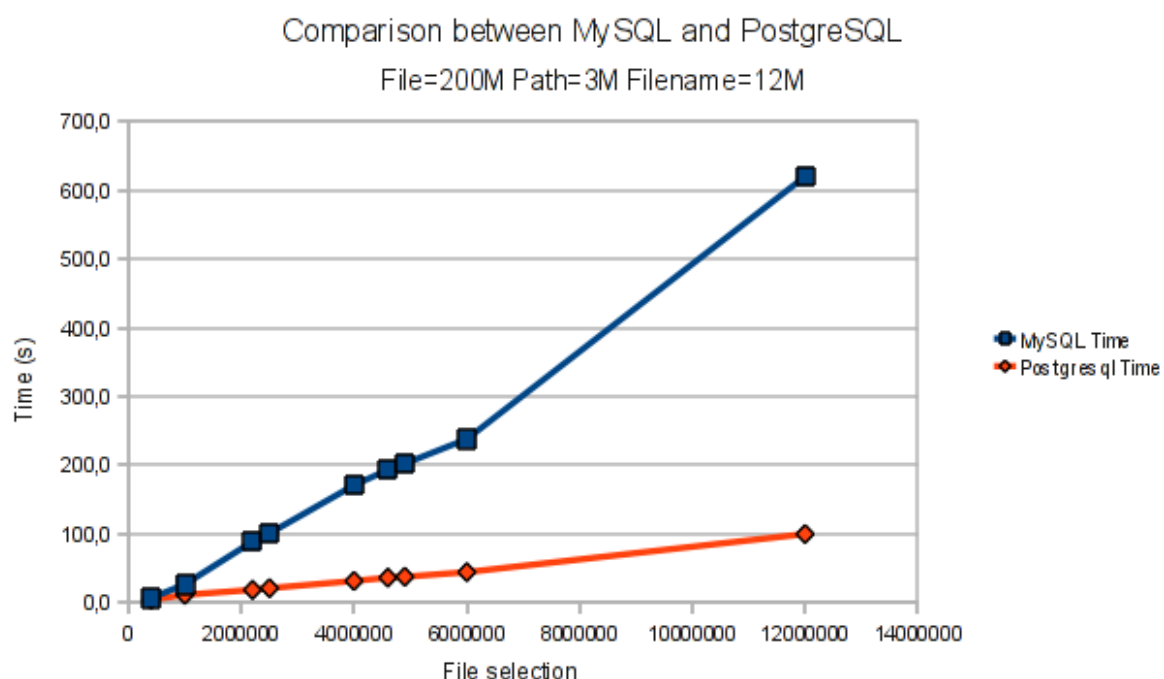
Figure 1.4.2:

Rank			DBMS	Database Model	Score		
Jun 2017	May 2017	Jun 2016			Jun 2017	May 2017	Jun 2016
1.	1.	1.	Oracle +	Relational DBMS	1351.76	-2.55	-97.49
2.	2.	2.	MySQL +	Relational DBMS	1345.31	+5.28	-24.83
3.	3.	3.	Microsoft SQL Server +	Relational DBMS	1198.97	-14.84	+33.16
4.	4.	↑ 5.	PostgreSQL +	Relational DBMS	368.54	+2.63	+61.94
5.	5.	↓ 4.	MongoDB +	Document store	335.00	+3.42	+20.38



Both of the databases have a very good tooling as (MySQL Workbench vs PostgreSQL pgAdmin 3), have been proven to be mature in production and have companies behind them if you need a professional support (Oracle and Percona vs Enterprise DB). In terms of performance between the two PostgreSQL is used mostly in large systems where read and write speed is very important and the data has to be validated. MySQL is mostly chosen for the web based applications that need a database for easy and simple data transactions. MySQL usually underperforms when there are heavy loads or running very complex queries. There is a comparison between MySQL and PostgreSQL which show the time difference in file selection between these two DBMS. (See figure 1.4.3)

Figure 1.4.3:



The graph clearly shows the difference between PostgreSQL and MySQL and that the first one is much faster at selecting files. However, this would have to be a very big database to see the real-time difference between the two. In a smaller query, it doesn't really make this much of a difference.

PostgreSQL has ROLES and inherited roles to set and maintain permissions. PostgreSQL has native SSL support for connections to encrypt client/server communications. It also has Row Level Security. MySQL implements security based on Access Control Lists (ACLs) for all connections, queries, and other operations that a user may attempt to perform. There is also some support for SSL-encrypted connections between MySQL clients and servers.



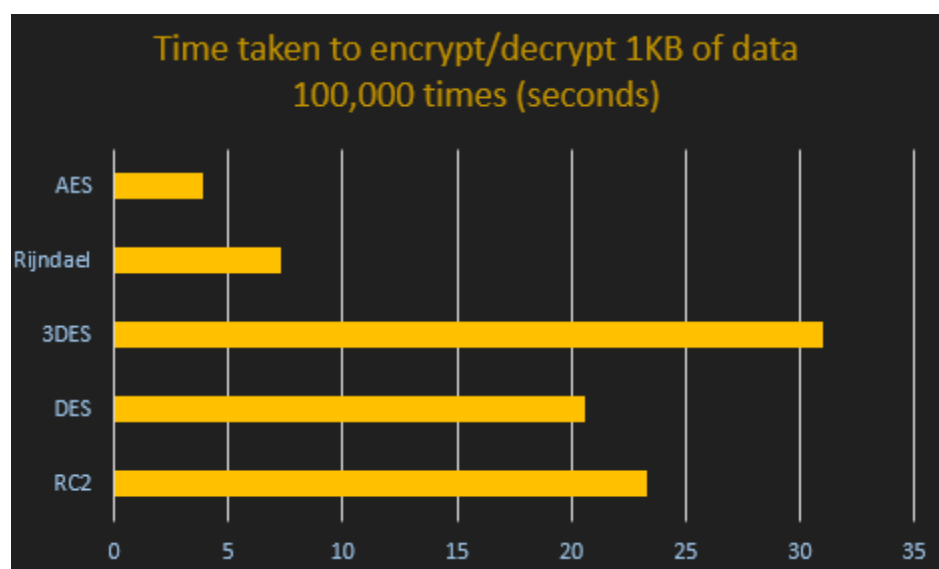
1.4.3 Which Encryption to use?

AES vs Triple DES

AES (Advanced Encryption Standard) and Triple DES(3DES) are two current standards in data encryption. AES is totally new encryption that uses the substitution permutation network. Triple DES is a newer version of DES encryption and it is just DES applied three time to the information that is being encrypted.

AES uses three encryption key lengths 128,192 and 256 bits where 3DES algorithm is limited only to 56 bits however it is applied three times that is why you can have 56,112 and 168 bits, this means that you can have 3 discrete keys, or two identical keys and one discrete also you could have three identical keys. The security is reduced when reapplying the same encryption three times. This means that in 3DES the encryption of 168 bits has a reduced security comparing to 112 bits and the 112 bits has reduced security of 68 bits. AES makes it a lot harder to make the to retrieve data from identical blocks. In terms of Security between this two the absolute winner is AES which is unbreakable in practical use.

When it comes to performance between two AES is around 8 times faster than Triple DES (See Figure 1.4.3). 3DES encryption takes longer than AES encryption and also has shorter and weaker encryption keys. In addition, the time required to check all possible keys at 50 billion keys per second in AES for a 128-bit key is 5×10^{21} years, whereas 3DES with a 56-bit key would take 400 days. [1]



1.4.3 Current solution to the problem.

The current solution for the problem right now is using google spread sheets where the room is booked for a certain time and can be accessed from any computer and changeable by anyone in the company who has access to the link. This problem still exists as not everyone is checking the link. The people are invited by writing a personal email to each person explaining the meeting agenda. The notes are being stored on the paper or personal laptop. The first is very unsecure as anyone can get hold of the notes as well as it is very easy to lose piece of paper with confidential information. The second option is more secure however still anyone can access the client's computer and get hold of the notes, also it is very easy to delete the document or very time consuming to find the exact notes inside the folder with many files. There are solutions as buying a software which would the company would have to pay for either annually or monthly. This is a good solution for a big company however much safer option is having a unique software with data kept on the internal server at the company premises.



Specification

2.1 Deliverables




















The first intermediate product will be creating Database using Postgres. This will contain all the users' information, created events, users' invitations and encrypted notes. The database will later be stored on the server inside the company premises. This development will be overlapped with the development of the admin side of application and the Gregorian Calendar in java. This will allow to add admin to the application who will be able to manage users' data. The first end deliverable will be the users side of the application. This will be broken down into several intermediate products, creating new events, editing events, creating notes/reading notes, inviting/removing users from event. After three of these deliverables will be finished, I will provide dummy data for the user testing. After the software has been user testes I will receive the feedback from the co-workers and managers from World of Books who will give their opinions about the product and the changes that have to be done before the final delivery of the software.

The second end deliverable will be the final report containing documentation and screenshots of the applications explaining how the application works and the chosen ways of delivering this software.

The initial estimated schedule of activities to produce these deliverables can be seen in figure 2.1.



Figure 2.1

At Risk	Task Name	Status	Start Date	End Date
	 System Requirements		15/09/16	30/10/16
	Gather all requirements	Complete	15/09/16	25/09/16
	Create UML	Complete	23/09/16	20/10/16
	Set up environment	Complete	20/10/16	30/09/16
	 Coding		30/10/16	01/02/17
	Write up the main Booking System	Not Started	30/10/16	30/11/16
	Write up personal Calendar	Not Started	01/12/16	24/12/16
	Merge Booking System & Calendar	Not Started	24/12/16	30/12/16
	Create Database / Add user groups	Not Started	01/01/17	30/01/17
	 Testing		01/02/17	01/04/17
	Create Test	Not Started	01/02/17	14/02/17
	Set up testing environment	Not Started	14/02/17	16/02/17
	Test	Not Started	16/02/17	28/02/17
	Apply Changes from test feedback	Not Started	01/03/17	10/03/17
	Test the program after final changes	Not Started	10/03/17	23/03/17
	Submit	Not Started	01/04/17	01/04/17



2.2 Analysis

2.2.1 Why Room booking system?

The first major point of analysis is why I have decided to create a Room Booking System & Personal Calendar rather than anything else, maybe more original. The main reason is I am working at the second biggest seller of used books in the world which doesn't have such software in place. This causes a lot of problems around the company. This made me think that I could do two things at once which are my final year project for university as well as creating a software which will resolve the issues in the company. My ambition is to get into a software development company where I could create more applications like this one and this application will be something that I can show to people and be proud of.

2.2.2 Programming Language

I have chosen Java for this project as I have been working with this language for the past three years. Java has all the features that are crucial for this software also I have had working experience with java at placement. I have used Java for many projects over the years and it makes me feel comfortable using it and visualise how the project would be written in this programming language. The other option was the C++ which is very similar to Java however I have had less experience using this language and it would make it much harder if approached problems.

The other dilemma I had to make a decision for was if to make a Java web application or desktop application this was the matter of experience, I've had much more experience in building desktop applications than web applications. Another impact on creating a desktop application was that I wanted to develop an offline version for the software where the user can access their calendar and notes when they are offline in case the server or internet goes down at the company.

2.2.3 Why Postgres?

I have chosen Postgres database for the same reason I have chosen Java, this is because I have had a lot of experience writing Postgres functions at the placement. The company is mainly using Postgres database and it is the software that is placed on the company server. The Infrastructure manager at the company has advised me to use this database for the project as the software is already in place on the server and it could cause problems as the two databases would be fighting for the same resources (I/O, CPU and Network), which could become a bigger problem for ecommerce company which is focuses on the performance.



2.3 Quality Analysis

The main measure of success will be when all their requirements will be met and all software functionalities will be working. I will have to make sure all of the functionalities are tested to the finest and assures the quality of the project.

2.4 Risk Analysis

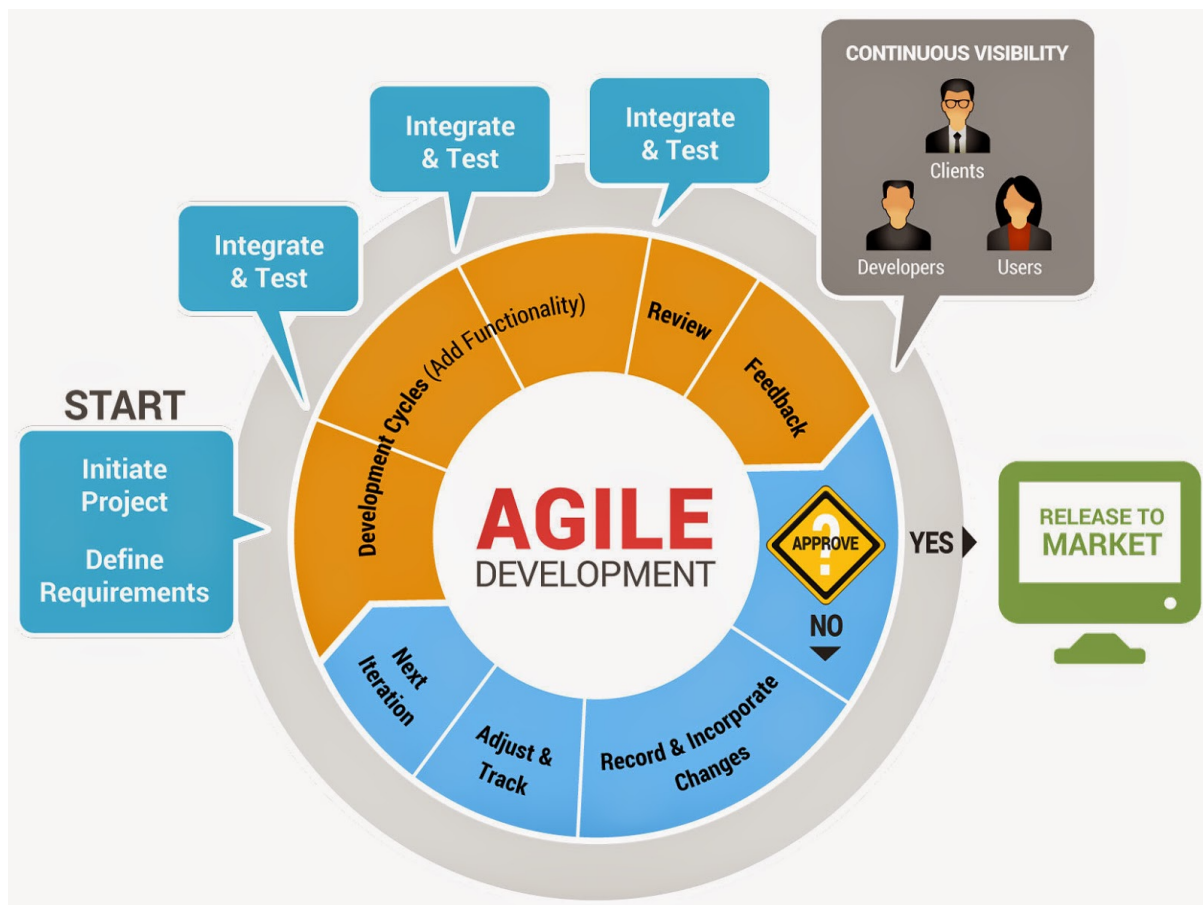
Risk	Probability (1-5)	Impact (1-5)	Mitigation	Contingency
Illness/Injury	4	3	-Reserve time for illness -Be hygienic -Eat healthy -Exercise	- Allow time for recovery - Take medicine to aid recovery
Inaccurate estimations	3	3	-Be liberal with estimations -Reserve time for deliverables behind schedule	-Adjust scope of project
Data loss	1	5	-Use a version control system -Keep local backups	- Recover data from git
Uncommunicative stakeholder	1	3	-Ensure regular meetings with stakeholder	
Stakeholder turnover	1	4		-Get new stakeholders
Project scope too large	3	4	-Research enough to be certain in project scope -Be liberal with estimations	-Adjust scope of project
Technologies too immature/insufficient for project	2	4	-Research technologies beforehand	-Find alternative technologies Adjust scope of project



3.1 Methodology

I have chosen the agile development methodology for this project as it has suited me and the clients, also I have had previous experience working with this methodology. Working with agile allows me to pick tasks from the backlog one at the time and progress through the cycle. At this project, it was very convenient as I would meet with the clients at World of Books twice a week where they would review the code and give me feedback for the completed tasks.

1. To Do
2. In Progress
3. Test
4. Review
5. Feedback
6. Done



In the “To do” step of workflow are all the things that have to be done. From this section I will choose tasks one by one or maximum of two at the time. In the “In Progress” stage the code will be written to meet the requirements defined at the beginning of the project. After the code is completed than the Test writing begins, the test will check if all the functionalities of the code are working. This part is very important as it saves a lot of time in development as the errors can be found at the early stages of implementation rather than testing large chunks of code further in development or at the end. When the code and tests



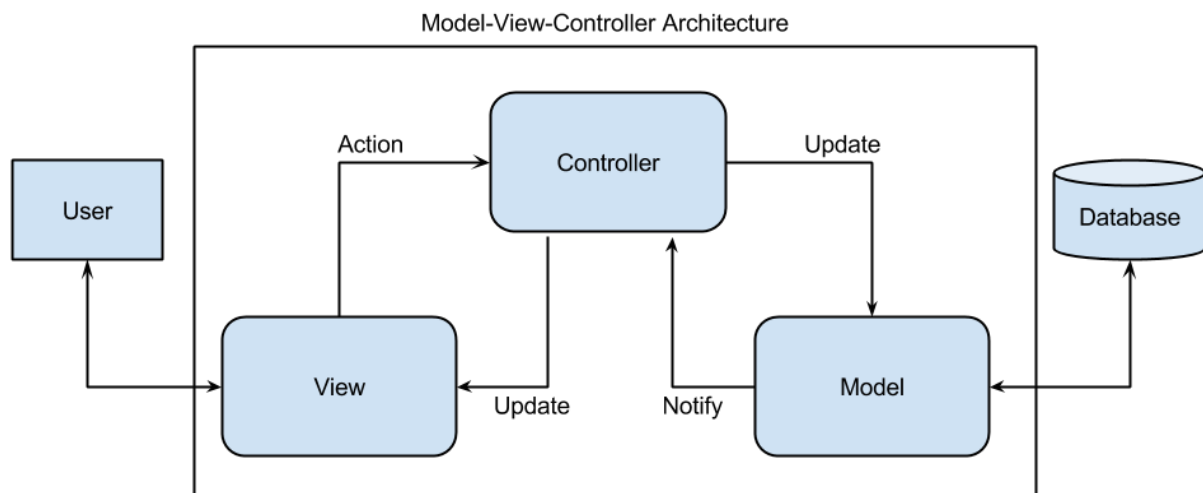
are completed I will allow other developers at World of Books(WOB) to check the code and review it. If the review is passed by the developers we follow to the next stage which is clients and users feedback otherwise the changes have to be implemented before passing to the next stage. At the feedback stage the management of WOB who are the clients and users give their opinion about the software if it meets their requirements and if this is what they want the software to achieve. That would be the end of the cycle if the functionality is approved otherwise the code has to be rewritten and changes have to be made.



Development

4.1 MVC Architecture

Figure 4.2 Application Architecture

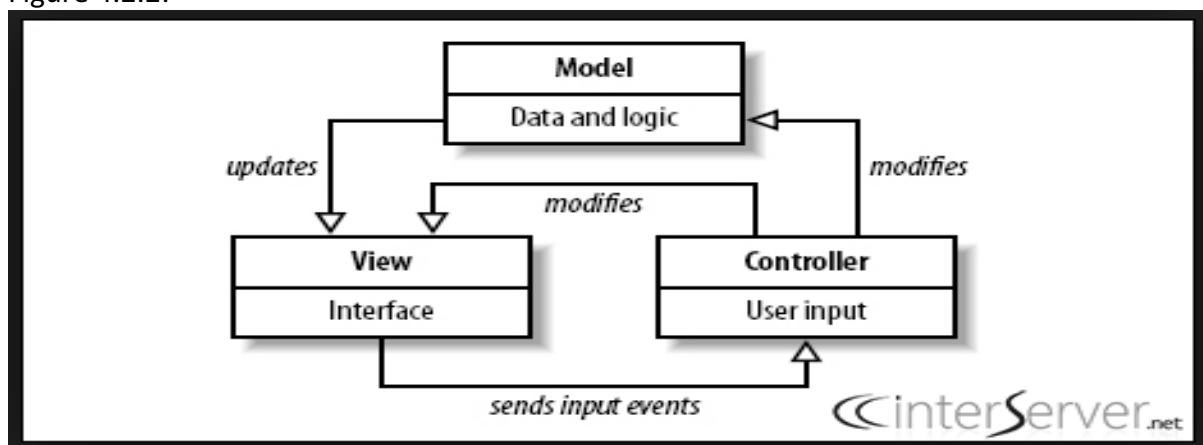


To organise the client-side application I have used the Model View Controller(MVC) Architecture. The model represents the state and business logic of the application. The view module is responsible to display data and the controller module acts as an interface between view and model. It intercepts all the requests. I chose this architecture because it is easy to maintain, easy to extend, easy to test and navigation control is centralized.

Both admin side of application as well as user side of application has been built with the MVC architecture. MVC Model returns the data without formatting: MVC pattern returns data without applying any formatting so the same components can be used and called for use with any interface.

All of the software was implemented using the MVC Architecture which connected to database on my laptop for testing.

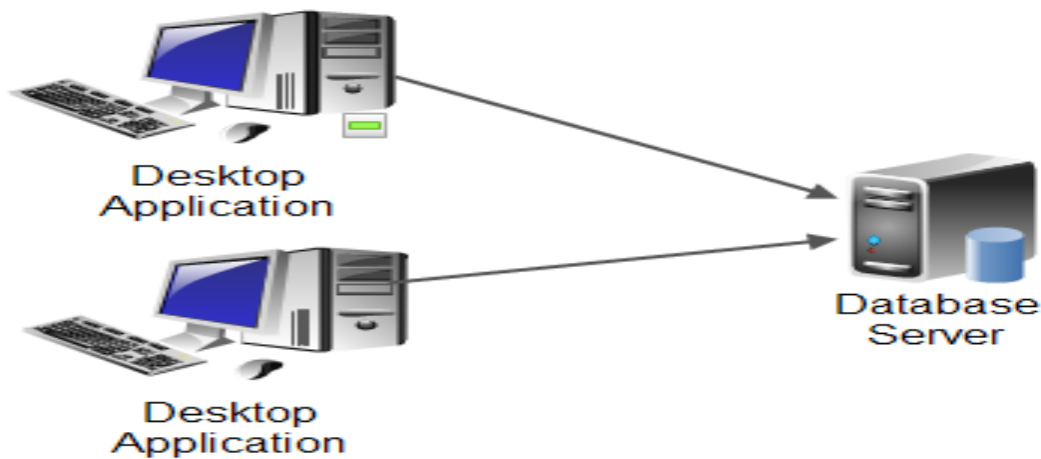
Figure 4.2.2:



4.1.1 Client – Server

I have used Client – Server (see Figure 4.1.1). The computers are connected to the database Server through the LAN network. Each computer establishes connection to server via LAN. In the case for this project user want to get all of the events he is invited to, the client sends the request to the server and once the server has fulfilled the clients request the connection is terminated. This configuration makes it very easy and efficiently to recover the data in case of the server break down as the data is kept on the server which is backed up instead of backing up every single machine. The LAN network in this situation is probably the best choice as of the amount of data that will be encrypted and decrypted the performance will be better.

Figure 4.1.1:



4.1.3 Authentication

To add basic authentication to the application, I have created a login panel which involve inputting their username and password. When the user is created by admin, the username and password are chosen by the admin. The password will then be encrypted and passed to the database. When the user Inputs his username and password the username is crosschecked with the username in database and the password is then decrypted and crosschecked with the one users input. If the username and password are checked and are correct the user is granted to the main user panel otherwise the error comes up. There is no forgotten password option, if the user forgets their password they have to contact the administrator. If the password was not hash encrypted anyone with some decent skills could grant entry to the database and retrieve all the passwords.



4.3 Other Technologies

4.3.1 Git & Gitkraken

Through the whole development process, I have been using GitHub repository where I have been committing my change regularly. I had previous experience of using git as I've been on the placement where everything had to be done through version control system. I've been using Gitkraken to push and pull files. Gitkraken provides the GUI for git and makes it a lot easier to see where the changes have been made and to select the files you would like to commit. Gitkraken also provides the option to see what lines of code have been changed in a file and allows you to discard or commit single line. Git is a great habit to learn as it allows you to track your log and prevent the data loss or overwriting your files which can be catastrophically. This can happen when you use USB stick, google drive, drop box or a hard drive. Git allows you to easily switch between platforms, it was very useful for me as I have been developing at work, home and at the university. After I've finished my placement I have kept using git for my university projects. Maybe someday I will have contributors to this project who will try to develop this software further.

4.3.2 Window Builder

I have been using Eclipse plug in which is a Java Window builder. This plug in allows you to create graphical interface for the project. This software was very helpful as each class had a view and it would be very difficult using just code to lay out every component. Window Builder saves a lot of time and provides a rich API for creating UI designers. This software lets you easily switch between code and design. I've been creating GUI by writing code for every single component and it has taken me a lot of time and made me frustrated. The plug in has a lot of features as:

- **Bi-directional Code Generation** – read and write almost any format and reverse-engineer most hand-written code
- **Internationalization (i18n) / Localization** – externalize component strings, create and manage resource bundles.
- **Custom Composites & Panels** – create custom, reusable components.
- **Factories** – create custom factory classes and methods.
- **Visual Inheritance** – create visual component hierarchies.
- **Event Handling** – add event handlers to your components.
- **Menu Editing** – visually create and edit menu bars, menu items and popup menus.
- **Morphing** – convert one component type into another. [2]



4.2.2 Data Dictionary

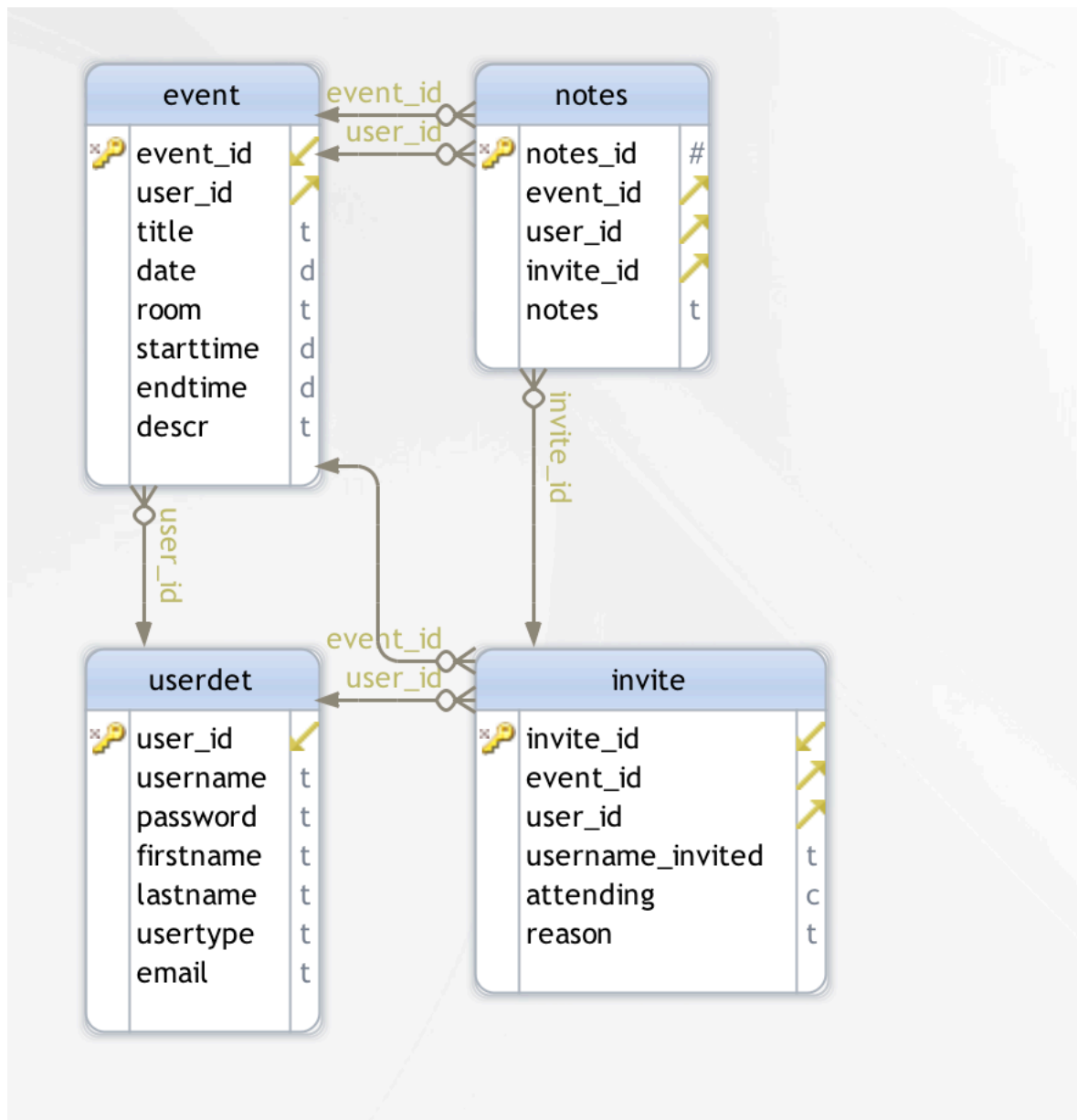
Entity	Attribute	Data Type	Allow Nulls	Description
Userdet	<u>User_ID</u>	PK INTEGER	N	Unique user id. Every user will have one once register.
	<u>Username</u>	Varchar (32)	N	This Is a username which will be used to log in . The users will are able to invite each other using the username.
	Password	Varchar (50)	N	This will include letters and numbers. This could be forced to 50 long or somewhere close to it.
	FirstName	Varchar (50)	Y	The user's first name.
	LastName	Varchar (50)	Y	The user's last name.
	Email	Varchar(30)	Y	The user's email. This is important as shares and invitations require emails to be sent to and from users. 17 characters for the username, 1 character for the "@" symbol and 9 characters for the domain name.
	Usertype	Varchar(20)	N	The user type which will determine if the user will be just a standard user of the software or the admin with special privileges.
Notes	Notes_ID	PK INTEGER	N	The Unique Notes Identifier which is created every time user creates notes for the new event.
	Event_ID	int	N	Event_ID is a foreign key which will assign notes to the correct event.
	Notes	Varchar(8000)	Y	This is where all the encrypted notes are held that's why the Varchar is very high.
	<u>Invite id</u>	Int	N	This is the foreign key from the Invite table which will allow invited users add their notes to the events they have been invited to.



	User_ID	Int	N	This is the foreign key from the User table to show who the notes belong to.
	Username_Invited	Varchar (8)	N	This is the username of the person that has been invited . This makes it very easy to assign notes to the right account.
Invite	Invite_id	PK INTEGER	N	This is the Unique identifier for each Invitation made.
	EVENT_ID	int	N	This is the foreign key from the events table which assigns event to the invitation.
	<u>Attending</u>	Char(3)	N	This is the field where the user can accept the invitation with “Yes” or “No”.
	User_id	Int	N	The user id of the user invited
	Reason	Varchar (300)	y	Optional field for the user to response why they can't attend the meeting they've been invited to.
Event	Event_ID	PK INTEGER	N	The unique identifier for the Event .
	Title	Varchar(50)	N	The title of the event.
	Date	Date	N	The date of the event.
	StartTime	Time	N	The start time for the event.
	EndTime	Time	N	The finish time for the event.
	Room	Varchar(50)	N	The location where the event will be held. All events must have room assigned before creating event.
	descr	Varchar(8000)	Y	The brief description of the event which users can see before accepting the invitation.
	User_id	int	N	Foreign key from the user details. This show the creator of the event.



4.3.1 ERD Diagram



Testing

5.2 Automated Testing

I have been unable to perform automated testing because of lack of frameworks for the Java desktop application. Sikuli is one of the frameworks available for Java desktop application testing. I have used Sikuli only for some of the functionalities as this involved a lot of work in setting up test by cutting out the buttons. However, it was very helpful when making changes to the database where all the data was removed and the test would



perform checks on the creating new user, changing the user password, changing user details and creating new events. Using automated test definitely saved a lot of time and made it easier to test all functionalities that had to be repeated over the course of development.

5.1 Manual Testing

I have been practicing manual testing through the whole project to ensure that the application is error free and it is working in conformance to the specified functional requirements. This testing checks the quality of the systems and delivers bug free product to the customers.

I had to perform Manual testing as 100% of automated testing cannot be performed. Due to lack of a unit testing framework for java desktop application GUI, I was unable to write unit or integration tests. To overcome this problem, I've been testing new functionality every time it was added. I was using manual black box testing with different possible cases to check if the specific functionality is working correctly and returns positive results. I've been testing the software on different platforms and also different users to check if the software is working properly. The users gave back their results and opinions about the functionality. If the everything was working as it should then I would move on to the next task however if there were changes to be made I would perform the changes and perform the test again.



Review & Reflection

7.1 Background Research

The background research that was investigated prior to the development of the project has definitely helped me understand many aspects of databases, programming languages and the most important encryption. I never had a chance looking into encryption and this project has definitely helped me achieve this. I feel as the database research made me understand the real difference between the MySQL and PostgreSQL. The research got me more involved into looking at C++. It has shown what the language is really useful and what features it has and which features it lacks compared to Java. The encryption detail made me realize that AES encryption is the most efficient algorithm out there and that it should be used when handling confidential data.

7.2 Specification

The deliverables that came out at the end of the project met all the requirements however some of the requirements have changed throughout the time. The chat that supposed to be added to the meetings was not implemented because company is already using “Slack” to communicate. Slack provides a lot of useful features and the stakeholders decided not to implement that. In the first Investigative report, I was going to implement “Twofish” algorithm to the database however by doing further research I have found better and safer ways to encrypt users notes. As a result of the medical issues I was not able to meet the estimated schedule of activities. This is why the schedule of activities shown in Figure 2.1 are inaccurate and also the risk analysis shown in Figure 4.1 were inaccurate as didn’t predict the medical issues to carry on throughout the year. The application would be considered a success as all of the requirements set by World of Books have been met and the software is successfully working

7.3 Methodology

Throughout the project’s timeline I was able to keep to Agile methodology approach. However, I have met some obstacles and difficulties across the development such as management or the developers couldn’t find time to review the code so I could progress further with implementing next functionalities. Another difficulty was writing test codes as it was my first time writing tests for my own code, however after doing some research I was slowly progressing through tasks.



7.4 Limitations & Improvements of the application

7.4.1 Desktop application

The software currently is a Java desktop application. The choice was made at beginning of the project to create a desktop application. Working through the project I've realized I would be better off creating a web application that would either be stored on the local server or be hosted outside the company so the users could use it at home as well. The graphic interface is one of the limitations when creating a desktop application, where in a web application there are many frameworks that can be used for e.g. Foundation, YAMML or the most popular which is Bootstrap.

Another disadvantage of using desktop applications is that the update to the applications must be installed by the admin directly on the user's computer and may require system updates in order to work. Updating web application means you have to update the web application once and the changes appear on the users' screen for e.g. changing the user interface. Creating web application would allow users to use the application on their mobile phones by including CSS styling for mobile phones where in the desktop application is not possible and would mean that there would have to be a separate mobile application to be developed.

I could have chosen the web application over the desktop application however the desktop application suits the company needs and has contains all functionalities that were collected in the requirements stage of the project.

7.4.2 Authentication Encryption

For this program, I have implemented a simple user and password verification. The password is hashed on the local server and password hashing occurs at the login panel to improve security. The registration is disabled for the users to disallow users creating multiple accounts for e.g. if they forget their password. The passwords are kept on the local database server inside the company which means it is fairly safe however if the hacker gained access to the server he would most probably have access to all the passwords. This are the risks of creating a desktop application. There are many more secure features as "keycloak" which are available for web based applications or also the google, Facebook login.



7.5 Conclusion

In my opinion, this project was successful for both me and the stake holders. Throughout the time of the project I have learnt a lot about Methodologies, databases, encryption techniques and mostly Java language. The project has met all of the requirements which allows World of Books to use this software on all of the platforms and make the most of the functionalities. However, the software could have been implemented better in many aspects starting from choosing different way of implementing it and finishing with using different language.

There has been few ideas which I have wrote down along the way but did not have time to investigate and implement. The areas I should definitely improve are the project management which was in my opinion poorly as to do with risk assessment which has delayed my project throughout the timeline.

I have kept a log of all of my work in the notepad which I will present at my viva also my project commits can be viewed at <https://github.com/bakogda/NewRoom> . All my commits can be viewed in the projects repository.



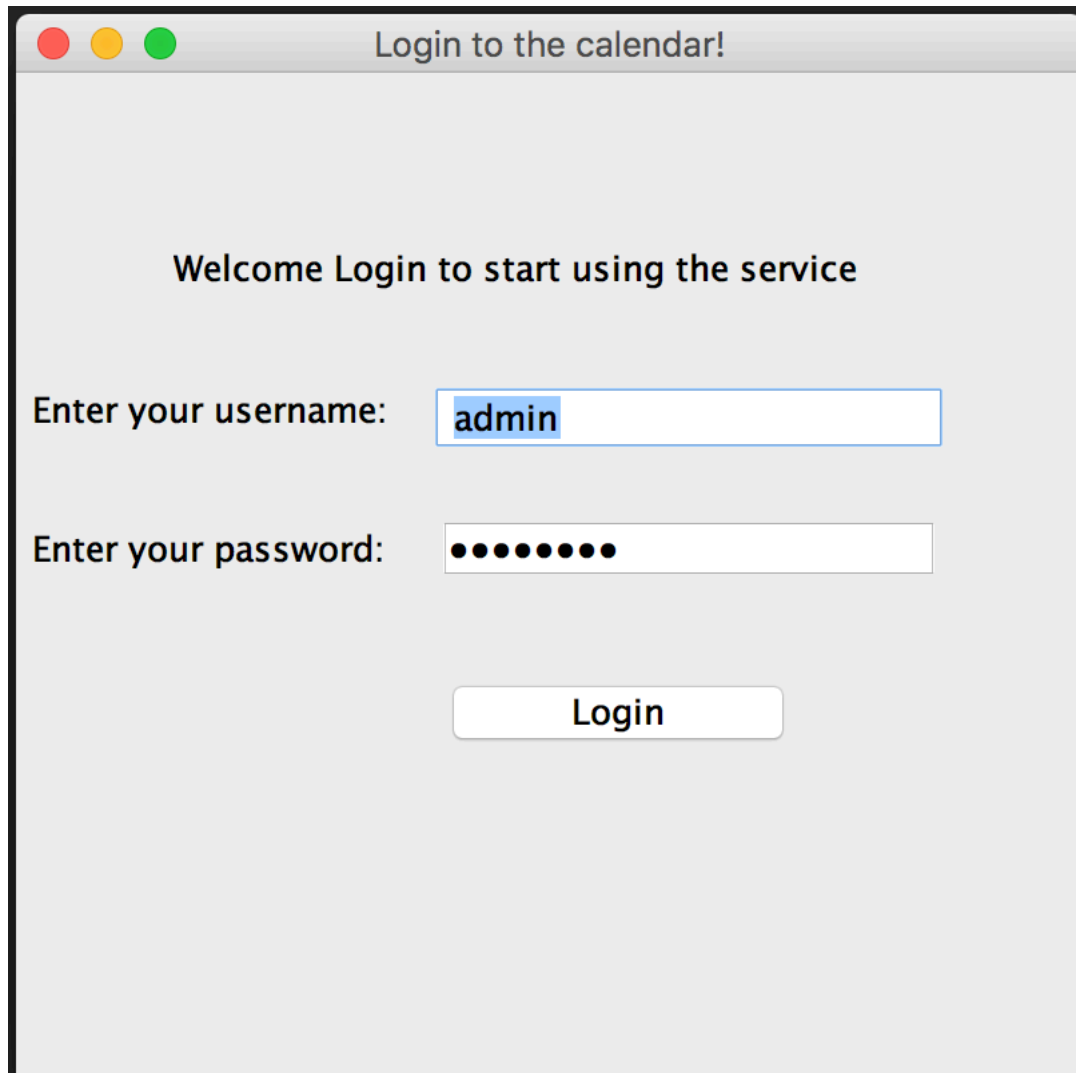
References

- [1] A Comparison of the 3DES and AES Encryption Standards - Noura Aleisa
- [2] <https://examples.javacodegeeks.com/desktop-java/ide/eclipse/eclipse-window-builder-tutorial-gui-creation/>



Appendix B

Iterations of Design



Login to the calendar!

Welcome Login to start using the service

Enter your username:

Enter your password:

Login



Remove Event

event_id	user_id	title	date	room	starttime	endtime	descr
3	3	sdasda	2017-08-13	Room 1	09:00:00	09:00:00	sadasdasd
2	2	TEST	2017-08-29	Room 1	09:00:00	09:00:00	TEST
4	3	TEST 2	2017-08-19	Room 1	09:00:00	13:00:00	DASDA

Remove

Cancel

Get Events

Choose Event to delete :

sdasda

Reset User Password

Username:

Password:

Retype Password:

Reset

Cancel



Remove User

Username:

Reason:

Edit User

Username:

Firstname:

Lastname:

User type:



Add User

Firstname:

Lastname:

User type:

Admin

Username:

Password:

Retype Password:

Email:

Cancel

Create

My Upcoming Events					
title	date	room	start_time	end_time	description
TEST	29-Aug-2017	Room 1	09:00	09:00	TEST



Edit Event

Event Title:

TEST

Date:

Room:

Room 1

From:

09:00

Until:

09:00

Description:

Cancel

Remove Event

Get Details

Save Changes



Notification of new Invitations							
first_name	last_name	title	date	room	to_char	to_char	attending
Martin	Jefford	TEST 2	19-Aug-2017	Room 1	09:00	13:00	Yes

Invite User(s)

Your Events:

TEST

Search

Enter User Name:

Check User

Enter User Name:

Check User

Enter User Name:

Check User

Enter User Name:

Check User

Enter User Name:

Check User

Enter User Name:

Check User

Remove User:

Remove

Invite

Cancel



Calendar

Calendar

<<Previous

August

Next>>

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Year: 20...

Main Panel

View Calendar

Open Calendar

Share Management:

Invite Users

Notification(s):

Manage

My Event(s):

Events

Past Event(s):

Event(s):

Edit Your Event

Edit Event

View Your Event Notes

View Notes

Logout



Event Notes

Invited Meeting:

TEST 2

Your Events:

Get/Create Notes

Meeting Notes:

TEST 2

Print Notes

Save Notes

Cancel



Add User

Firstname:

Lastname:

User type:

Admin

Username:

Password:

Retype Password:

Email:

Create

Cancel



Past Event(s)						
user_id	event_title	date	room	started_at	finished_at	description
3	sdasda	13-Aug-2017	Room 1	01-Jan-1970	01-Jan-1970	sadasdasd



Appendix C

Ethics Form

SCHOOL OF COMPUTING, ENGINEERING & MATHEMATICS ETHICS FORM

This ethics form is designed to help you quickly and easily identify how you should approach any ethical issues raised by your project or dissertation. It should be completed for ALL research projects and dissertations prior to the commencement of the project. Please do not approach any participants involved in the research until this have been completed and discussed with your supervisor or member of the CEM ethics committee (if appropriate).

This form must be completed by the project student or researcher responsible for the project. Once completed, you should discuss it with your supervisor to ensure that you take the right follow-up actions.

If you answer 'No' to all questions in this form and this is confirmed with your supervisor (if appropriate) then no further action is required. Please note that in signing this form you accept that it is still your responsibility for your project or dissertation module to follow the **University's Guidance on Good Practice in Research Ethics and Governance**, available on StudentCentral. Any significant change in the question, design or conduct of your project or dissertation that would alter your answers on this form must be notified to your supervisor who will advise you on whether you need further action.

If you have answered 'yes' to any of the questions in Section B of the Student Checklist your supervisor will need to make a judgment as to whether or not the research includes more than a minimum level of risk. If this is the case then your supervisor will need to email this form to the CEM ethics committee (CEMethics@brighton.ac.uk) for discussion prior to the commencement of research. This does not mean that you will not be able to do the research, but it will need to be considered by the School Research Ethics and Governance Committee.

Ethics forms, example consent forms/participant information sheets and supporting guidance are available on the **Research Ethics for Projects – CEM** area of StudentCentral.

Signed copies of this completed ethics form must be submitted with your project or dissertation. Note: the project or dissertation will not be marked if the completed checklist is not included.

PROJECT DETAILS

1. Name of researcher:

2. Name of supervisor:

3. Title of project:

...Blazej...Gdaniec.....
.....Karl...Cox.....
.....Your...Office...Planner.....



4. Outline of the research (up to 100 words):

The research was to find the most suitable programming language for me as well as the project. The other part of the research was to find out the best encryption method and most suitable database for the project.

5. Location of research: University

8. Email address: bakogda@gmail.com

9. Contact address: 18 Watersmead Drive, Littlehampton, West Sussex, BN17 6GH

10. Telephone number: 07478738552



<p>1. Does the study involve participants who might be considered vulnerable due to age or to a social, psychological or medical condition? (<i>e.g. children, people with learning disabilities or mental health problems, but participants who may be considered vulnerable are not confined to these groups</i>).</p> <p>If yes then provide details of any such participants. See the University's 'Guidance on Good Practice in Research Ethics and Governance' for more details.</p> <p>.....</p> <p>.....</p> <p>Note: proposals involving vulnerable participants are often likely to require ethical approval from the Faculty of Science & Engineering Research Ethics and Governance Committee (FREGC).</p>		✓
<p>2. Will photographic or video recordings of research participants be collected as part of the research?</p> <p>If yes then please outline consent and data protection procedures (<i>e.g. interviews cannot be overheard, details will not be accessible to others</i>), for the use of participants' images. Example consent and information forms can be found on StudentCentral and see guidance on data collection at the end of this document.</p> <p>.....</p> <p>.....</p> <p>If your data will not be confidential and anonymous then outline the justification for this decision here and procedures for mitigating against potential harm.</p> <p>.....</p> <p>.....</p>		✓
<p>3. Does the study require the co-operation of an individual to gain access to the participants? (<i>e.g. a teacher at a school or a manager of sheltered housing</i>)</p> <p>If yes then describe the procedures that will be put in place to ensure safe and ethical direct involvement of human participants. Where necessary and as appropriate, include comments on obtaining informed consent, reducing harm, providing feedback, and accessing participants through an individual providing information such as a teacher/lecturer, manager, employer etc. Example consent and information forms can be found on StudentCentral.</p> <p>.....</p> <p>.....</p>		✓
<p>4. Will the participants be asked to discuss what might be perceived as sensitive topics (<i>e.g. sexual behaviour, drug use, religious belief, detailed financial matters</i>) or could participants experience psychological stress, anxiety or other negative consequences (beyond what would be expected to be encountered in normal life)?</p> <p>If yes then describe the procedures that will be put in place to ensure safe and ethical direct involvement of human participants. Where necessary and as appropriate, include comments on obtaining informed consent, reducing harm, providing feedback. Example consent and information forms can be found on StudentCentral.</p> <p>.....</p> <p>.....</p>		✓
<p>5. Will individual participants be involved in repetitive/prolonged testing or vigorous physical activity, experience pain of any kind, or be exposed to dangerous situations, environments or materials as part of the research?</p> <p>If yes then describe the procedures that will be put in place to ensure safe and ethical direct involvement of human participants. Where necessary and as appropriate, include comments on obtaining informed consent, reducing harm, providing feedback. Example consent and information forms can be found on StudentCentral.</p>		✓



<p>.....</p> <p>.....</p>		
<p>6. Will members of the public be indirectly involved in the research without their knowledge at the time? (e.g. covert observation of people in non-public places, the use of methods that will affect privacy).</p> <p>If yes then provide brief details here (e.g. how they will be involved and, where known, the age, gender, ethnicity and location of those who will be indirectly involved).</p> <p>.....</p> <p>.....</p> <p>Provide details of any negative impacts members of the public will be likely to face and that would not be considered minimal impacts (e.g. invasion of privacy, harm to property, being subject to what an individual perceives to be inappropriate behaviour). Describe the risks and if appropriate explain why you believe they are only minimal.</p> <p>.....</p> <p>.....</p> <p>Describe any procedures that will be put in place to ensure safe and ethical indirect involvement of members of the public (e.g. providing information and feedback if requested by the public). Examples of participation information forms can be found on StudentCentral.</p> <p>.....</p> <p>Describe how you will ensure data collection is confidential and anonymous (e.g. people will not be able to be identified by photographs or notes taken by observers), how data will be stored and who will have access to the data. If the data will not be confidential or anonymous, outline the justification for this decision here and procedures for mitigating against potential harm.</p> <p>.....</p> <p>.....</p>		✓
<p>7. Does this research include secondary data that may carry personal or sensitive organisational information? (Secondary data refers to any data you plan to use that you did not collect yourself, e.g. datasets held by organisations, patient records, confidential minutes of meetings, personal diary entries).</p> <p>If yes then provide details regarding any secondary data to be used that may carry sensitive personal or organisational information.</p> <p>.....</p> <p>.....</p> <p>If secondary data CEMs containing sensitive personal or organisational information are to be used, outline how such use will be ethically managed (e.g. details such as anonymising data CEMs, ensuring protection of source agency, gaining consent of data owners, and how the data will be stored). See guidance on data collection at the end of this document.</p> <p>.....</p> <p>.....</p>		✓
<p>8. Is this research likely to have significant negative impacts on the environment? (For example, the release of dangerous substances or damaging intrusions into protected habitats.)</p> <p>If yes then provide details of these impacts here (for example the release of dangerous substances or damaging intrusions into protected habitats) and</p> <p>.....</p> <p>.....</p> <p>Describe how you will mitigate against significant environmental harm and manage risks.</p> <p>.....</p>		✓



.....		
<p>9. Will any participants receive financial reimbursement for their time? (<i>excluding reasonable expenses to cover travel and other costs</i>).</p> <p>If yes then provide details and a short justification (e.g. amounts and form of reimbursement).</p> <p>.....</p> <p>.....</p>		✓
<p>10. Are there any other ethical concerns associated with the research that are not covered in the questions above?</p> <p>If yes then give details here.</p> <p>.....</p> <p>.....</p>		✓

All Undergraduate and Masters level projects or dissertations in the School of CEM must adhere to the following procedures on data storage and confidentiality.

All data should be encrypted and stored securely. Documentation should be kept in a locked cabinet or desk, and electronic data should preferably be kept on a removable disk or data stick which can be locked away, or if this is not possible on a password protected computer. Confidential and sensitive data should not be emailed unless it is encrypted or password protected since emails are centrally archived.

For Undergraduate/Masters projects, normally only the student and supervisor will have access to the data (see the University's 'Guidance on Good Practice in Research Ethics and Governance for further details). Once a mark for the project or dissertation has been published, all data must be removed from personal computers, and original questionnaires and consent forms should be destroyed unless the research is likely to be published or data re-used. If this is the case a justification for this should be included where appropriate in this form and in the relevant consent and participant information forms.

Student: Please sign below to confirm that you have completed the Ethics form and will adhere to these procedures on data storage and confidentiality.

Signed (**Student**): ...Blazej Gdaniec.....
Date: ...12.05.2017.....

Supervisor: I confirm that the research **does/does not** (delete as applicable) include more than a **minimum level of risk**.

Signed (**Supervisor**):
Date:

Note: If the **supervisor judges** that there is more than the **minimum level of risk** then your supervisor will need to email this form to the CEM ethics committee (CEMethics@brighton.ac.uk) for discussion prior to the commencement of research.

