**Enterprise Framework Project 2012. Project Details.**

**Project : BookEasy.**

**Team :**

**Dermot Healy.**

**Remi Fatus.**

**Simon Rahilly.**

**Clem Roberts.**

The technical report fully document the following areas:

**1)Background research and investigations.**

Research was done on various holiday homes websites (eg naturalretreats, holidaycottages and holidayhomes websites etc) on how these websites are structured and display their data.

Also there was research on Visual Studio, design patterns, C# and other relevant things relating to the project.

**2) Project Plan.**

Due care was taken to accurately record details of which team member was assigned responsibility for each activity

Clement Roberts, Dermot Healy and Remi Fatus were assigned responsibility for coding of the project. Simon Rahilly was assigned writing the project report.

Each team members contributions were uploaded onto Github.

The team was named “DERESICL”

Introduction:

We designed and created an e-commerce website that serves as an online storefront. The website displays Holiday Homes in a virtual storefront. Users can create accounts, log in, browse the database of Holiday Homes and book Holiday Homes.

Goals:

The goal of the project is to have a functioning enterprise web application that can facilitate online bookings. The final developed application is a user friendly site, with clear instructions on the steps to make a booking while also requiring authentication and providing security.

Strategy:

The web application was developed using C# and ASP.net, the various stages of the project such as planning, design and development was shared out equally among the team members.

Functionality:

the key characteristics of the application are:

1. a) Holiday home owners will be able to create an account. Enter details about their Holiday home.
2. b) Authentication will be required for Owners when accessing their accounts on the site.
3. c) Allows the customers to browse through a various locations and holiday homes.
4. e) Provides functionality to add products to a shopping cart, and provide a summary of their selected goods in the form of a checkout.
5. f) The virtual storefront will be connected to a backend database, which can be updated also.

g) The customer will get a communication to confirm their booking.

Project Deliverables:

1. A working enterprise web application, as described above.
2. A written technical report to supplement the application.
3. A project log on gitHub detailing the development of all stages of the project.
4. Presentation.

Theteam developed a web application that handles holiday home bookings. The application attempts to

1. maintain a database of holiday homes.
2. record vacancy/booked periods.
3. record associated costs with renting the holiday home.
4. provide details of contract terms.
5. provide location of holiday homes.

The application will also allow holiday home owners to register as site-users which will then give them the capability to submit the details of their holiday home on the website etc.

**3) Software development methodology employed.**

The software development methodology used in software engineering is the framework that is used to structure, plan and control the process of developing a system or application. The system development lifecycle (S.D.L.C.) is a very deliberate, structured, methodical way to deliver the final system or application. There are a variety of frameworks for different situations eg Waterfall, Prototyping and Spiral.

The method used in this project was the Waterfall method. The stages in software development are

1. Requirements. b) Design.

c) Implementation. d) Verification. e) Maintenance.

Agile software development is a group of software development methods based on iterative and incremental development, where requirements and solutions evolve through collaboration between self organizing cross functional teams.

Agile software development was used as much as possible on this project.

**4) Requirements analysis.**

Requirements analysis in software engineering are those tasks that determine needs or conditions to meet for new or altered products, taking into account various users. Requirements analysis includes eliciting; analysing; documenting; validating and managing software or system requirements.

Requirements should be documented; actionable; measurable; testable and traceable and related to business needs and opportunities.

Requirements analysis includes three types of activity

1. Elicitation requirements.

b) Analysing requirements. c) Recording requirements.

Also the stakeholders are anyone operating or benefitting from the system should be identified.

The requirements of the holiday homes website were analysed using the techniques above. Users were found to want a website that has clear instructions on how to use the website, gives plenty of information and is easy to book a holiday homes from.

**5) Use cases.**

Use cases are a list of steps defining interactions between a role (known in UML as an “actor”) and a system to achieve a goal. When used at a higher level use cases may represent missions or stakeholders goals. Detailed requirements may be in contractual statements.

In real world situation, finding use cases would include many techniques such as, to mention a few, interviewing business users to elicit their requirements and/or studying documentation, and/or analysing problem/requirement statement.

In the above project description we deduced a set of use cases, which are:

A)     Welcome.

B)   Accessing the home

C)    Searching the homes

D)     Place a booking

Use case descriptions

1. Welcome

When a prospective customer visits the site, the systems takes the user to the welcome page where the user can search for different types of homes and place an order.  If the user entered the wrong password or username the application redirects the user back to the logon page until the right login details are entered.

1. Searching the Holiday Homes

A registered member can search for suitable products if the product is available. The application displays the names of the product by clicking or selecting the name of the product, the application displays the product information including the price.

1. Book a Home

When visitors/member has found a suitable home he/she can proceed by clicking the order button. The system calculates the number of days being booked and the user enters his/her credit card details. After the credit card details are entered the system asked the registered member to confirm order.  The application then generates a placed order details.

Application Overview:

The application is a Holiday Home, which will provide users with the ability to do the following:

·         Browse various holiday homes

·         Select a home to view more details

·         Add items to a shopping cart.

·         Proceed to the store checkout or placing an order

**6) Architecture/Design approach.**

An architectural Pattern defines the structural organisation or schema for software systems. Architectural patterns are standardized designs and cover broader areas than Design Patterns, like hardware performance etc.

A Design Pattern gives a schema defining the components of a software system or the relationships between them. In software engineering a design pattern is a general reusable solution to commonly occurring problem within a given context in software design. Different types of design patterns are algorithm; computational; executional and structural.

The diagram below is a conceptual framework for the project.

**7) Models (Class Models / Data Models etc.).**

Models notify their associated views and controllers when there has been a change in its state. This notification allows the view to produce updated output and the controllers to change the available set of commands.

Data models are abstract models that document and organize the business data for communication between team members and are used as plans to develop applications eg how data are stored and accessed.

There were three choices when developing the middle tier domain for this application. They were Domain model, Active record or Table model.

The Domain model was used in developing BookEasy application. Using this model the application started off totally ignorant of the database. The models used are based on the business requirements of the application and how the data flows. A table model was not used as the database is derived from the application models. Active record were not used as the database would be to the forefront of the application.

All the models in this project are class models there are no data models.

The views include owner, holiday homes etc and the models include owner, booking and holiday homes etc in this project.

**8) Implementation of particular OOP constructs.**

The whole project is done in OOP. In OOP a constructor in a class is a special type of subroutine called at the creation of an object. No OOP constructs were used in this project.

**9) Design patterns and architectural patterns implemented in the application.**

The Design Pattern implemented was a “Creational “ design pattern called a “Singleton”. A Singleton design pattern is used to ensure that there is a single instance of a class and a global access point to this instance. The class is instantiated once when needed and all requests use this single instance. Also the class itself is responsible for ensuring the single instance constraint.

The 5 layers (tiers) architecture was used in developing the BookEasy application.

Diagram of 5 layers (tiers)



**10) How cross-cutting concerns have been handled.**

In computer science cross-cutting concerns are aspects of a program which affect other concerns. These concerns cannot be removed from the design and implementation and can result in “Scattering” (code duplication) and “tangling” (significant dependencies between systems), Cross-cutting concerns are parts of a program which rely on or affect other parts of the system. Also cross-cutting concerns are things common to all the code that impact across all the layers. Cross-cutting concerns cause synchronization and Run-time constraints etc.

There were no major cross-cutting concern in this project.

In this project how logging in is done and how it is secured would be a cross-cutting concerns.

**11) Security of the application.**

The main aim of security is to protect information and property from theft, corruption or natural disaster.

Security in Windows can be provided by domain groups that organize different levels of authorization.

For security in Visual Studio, the following are ten security measures to defend code.

1. Do not thrust user input. Thrusting user input can lead to buffer overruns, cross-site scripting and SQL injection attacks.
2. Protect against buffer overruns.
3. A buffer overrun occours when data provided by the attacker is bigger than what the application expects and there is overflow into internal memory space.
4. Prevent cross-site scripting.
5. Prevent SQL injection.
6. Watch crypto code.
7. Reduce attack profile.
8. Employ principle of lest privilege.
9. Pay attention to failure modes.
10. Impersonation is fragile.
11. Write that non-administrator can actually use.

There should be no hackling problems as there is no Javascript used in the holiday home website. But it might be possible to hack into the database.

So the security for the holiday homes website are the security features built into Visual Studio and log in security.

The website customers will have to log into the holiday homes website using a username and password.

Authentication will be required for Owners when accessing their accounts on the site.

**12) Configuration of the application.**

In computer science configuration is the arrangement of functional units according to their nature, number and chief characteristics. Configuration often relates to the choice of hardware, software etc and affects system function and performance.

In Visual Studio, build configuration provides a way to select the components you will build with and on what platform. In build configuration two levels can be defined in Visual studio solution build configurations and project configurations.

The 5 layers (tiers) architecture was used in developing the BookEasy application.

Diagram of 5 layers (tiers).



**13) Scalability of the application.**

In software scalability is the ability of a system, network, process to handle a growing amount of work in a capable manner or its ability to be enlarged to accommodate the growth.

This project is divided into units which all can be scaled up. Also because this project has five layers or tiers it is very scalable. So if the holiday homes website gets a large number of customers the website can be scaled up or more websites can be created.

**14) Testing Approach (in terms of both functional and non-functional requirements).**

Testing is an investigation carried out to provide to provide stakeholders with information about the quality of the product or service under test.

The purpose of testing is to

1. Does the product or service meet the requirements that guided its design and development.
2. Does the product or service work as expected.
3. Can the product or service be implemented with the same characteristics.
4. Does the product or service satisfy the needs of stakeholders.

Functional testing refers to activities that verify a specific action or function of the code.

Non-functional testing refers to aspects of the software that may not be related to a specific function or user action such as scalability, performance, behavior under certain constraints or security.

Most of the testing in this project was “unit testing”, for example on the parser and the model. Also there was functional testing done on the website.

There was also some non-functional testing done, for example on security.

**15) Other relevant features of the application (if used) e.g.,**

None of the features below were used in this project.

use of client-side processing,

use of Ajax,

use of web services,

use of a workflow engine etc.

use of an ORM tool

use of dependency injection / IoC containers

etc.

If there is enough time web services might be used in this project because all the data is local. An API might be linked to hotel booking data to get a live source of data. But all this type of data is contractual and has to be bought.

Also an API or data could be fed out.

In this project, the developed application exhibits most of the traits and qualities associated with an enterprise application. How the qualities of an enterprise level application was achieved is documented. The rationale behind decisions made with regards to the various aspects of the project (eg choice of technology, choice of development methodology and choice of testing strategy) is also documented.