

# **Design Report on Software Maintainability**

**for**

## **Cafe Bunny**

**DR\_PRO\_005\_V1**

**Version 1.0 approved**

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## VERSION HISTORY

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# **1. Design Strategies**

## **1.1 Overview**

The design strategies that we have adopted are to reduce the cost of maintenance, comprehensive documentation of the code and have design patterns that will allow changes to be made to the app easily.

# **2. Nature of Maintenance**

## **2.1 Correction by nature**

Errors and mistakes are unavoidable during development. Properly documenting these mistakes, finding out what went wrong and then taking the appropriate steps to correct them will be our goal.

### **2.1.1 Corrective Maintainability**

The app will be thoroughly tested during the testing phase to identify any bugs. After release, players can submit bug reports, these bugs will then be fixed.

### **2.1.2 Preventive Maintainability**

The app will be designed with modularity in mind, any bugs can then be isolated to specific components and debugging can be done quickly.

## **2.2 Enhancement by nature**

### **2.2.1 Perfective Maintainability**

User feedback is important to us, and steps will be taken to modify the app based on their feedback.

## **3. Maintainability Practices**

### **3.1 Code Documentation**

All code must be properly documented. This allows for other software developers that are inexperienced with the app to understand the inner workings of Cafe Bunny.

### **3.2 Version Control System**

Github is the version control system that is used during development. VCS allows for tracking of the latest version of code as well as allowing for simultaneous development of code.

### **3.3 Modularity**

The app will be separated into modules to facilitate easy maintainability. The app will be separated into modules that have low coupling. These modules can then also be developed concurrently with each other and then integrated together.

## **4. Architecture and framework**

### **4.1 Flutter**

Cafe Bunny is developed on Flutter software development kit. It is a free and open source mobile UI framework created by Google.

#### **4.1.1 One Codebase, Two platforms**

Unlike other cross platform frameworks that convert components into their platform specific variants, which require a property mapping layer to synchronise platform widgets and framework widgets, Flutter provides a canvas for the application to draw onto which eliminates the need for platform specific UI components. This removes any UI inconsistencies on different platforms, allowing for both UI and business logic to be multi platform.

### **4.1.2 Reduced Code Development Time**

Flutter has a hot reload feature, which allows for reloading the app while keeping the application state to quickly view any changes in code. Flutter also comes with many ready to use widgets, so instead of creating our own widgets, one can simply use the widgets provided by Flutter.

### **4.1.3 Similar to Native App Performance**

Flutter does not use any intermediate code representations and is built directly into the machine code unlike other multi platform frameworks

## **4.2 Design Pattern**

Cafe Bunny uses the model view controller architectural design pattern due to the app's heavy emphasis on user interactivity. Flutter's reactive style is not entirely compatible with the Model View Controller pattern and as such we made use of the framework package, `mvc_application` to implement MVC in flutter. The controller is responsible for handling user input, it tells the model to update its state and tells the view that the model is changed. The view presents the data to the user and the model contains data and the business logic. The advantage of this design pattern is separation of concerns, each different section is specialised in a specific purpose. This separation also allows for faster development process since different sections can be developed simultaneously and then integrated.

### **4.2.1 Model**

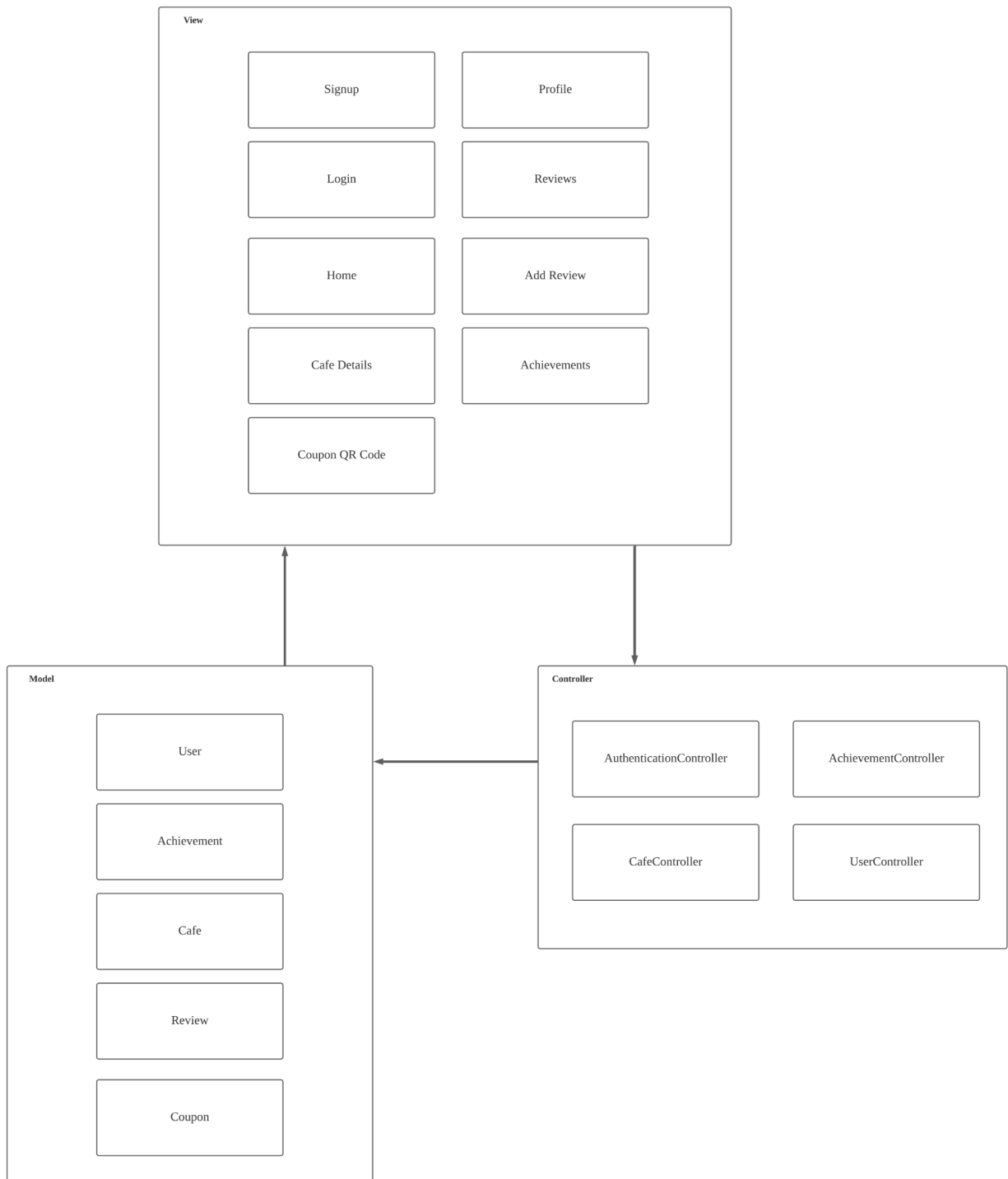
Contains the User, Review, Achievement, Cafe and Coupon Code classes as well their respective business logic.

### **4.2.2 View**

Creates and displays the widgets

### **4.2.3 Controller**

Receives inputs from the user and informs the view if the model has changed which will cause the view to refresh and retrieve the new data from the model.



## **5. Software Configuration Management Tools**

### **5.1 Github**

Github is an internet hosted version control system utilizing Git. Github offers version tracking, merging, bug tracking and branch creation. Github was chosen because of its high adoption rate among software developers. This means that a majority of developers will be familiar with Git and Github.

### **5.2 Google Drive**

Google Drive is the primary storage medium for documentations pertaining to the project. It was chosen due to the ease of setting up. The team will work on the baseline version of the documentation in Google Docs first. Google Docs allows for simultaneous editing of the same document, improving productivity.

### **5.3 Mediawiki**

Mediawiki is a free and open source wiki engine. Documents in Google Drive which have been approved will be migrated into Mediawiki. Mediawiki supports simultaneous editing of the same page by multiple users as well as has its own form of version control for easy tracking of changes.