Study of Mobile Application Development using MVC Framework

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Abstract

Mobile Application should be secure, portable, cost-effective and be of good quality. The architecture choice is very important to ensure the quality of the application over time and to reduce development time. Model-View-Controller (MVC) is a very useful for developing Application. It has become the most powerful and leading Programming Architecture for developing a large scale of Application. MVC Developers can trust on the framework that is widely accepted as solutions for recurring problems and used to develop flexible, reusable and modular Application. In this study we investigate the advantage of using MVC Framework when building Mobile Application available on difference devices. In this study compares and contrasts two platforms, iOS and Android Devices, and discusses how to apply the MVC Framework in order to minimize the inherent differences between the platforms.

Key Words: MVC, Programming Architecture, Framework, iOS, Android, Devices, Platform.

1. Introduction

The Mobile market has grown quickly in recent years. Many enterprises feel the need to be present on mobile markets and offer their services with Mobile Applications. Compared to Computer Programs, Mobile Applications often have limited functionalities, shorter shelf life and lower price. New applications should be developed fast to be cost-effective and updated often to keep users interested. The quality of the application should not be neglected, as mobile users are very fussy and competition is firm. Architecture choice remains important for Mobile Applications to ensure quality. Mobile Applications as well as other systems could be complex and evolve over time [1].

Fundamental MVC Design Pattern

MVC (Model-View-Controller) is a software design pattern built around the interconnection of three main component types: Model, View, and Controller, often with a strong focus on object-oriented programming (OOP) software paradigms. MVC is a framework for building applications using an MVC Architecture. It is the most important architecture of development the software now a day. This architecture automatically managed the code and help the programmer to develop the well-managed Applications.

How these Model-View-Controller acts in the Application development is given below:

- **Model** is an object representing data or a process such as database, and process of machines. For instance, the application logic is a model.
- **View** is some form of visualization of the state of the model. The user interface component is view.
- **Controller** offers facilities to change state of the model. The control functions as controller.
2. Literature Review

MVC Architecture and the Domain Model organization, the architecture defined can simplify the work of novice and experienced developer similar and enable creation of less complex and well-managed applications. The existing Android application was reimplemented using the Android Passive MVC, resulting in better maintainability, extensibility and performance. The complexity of the new implementation was lower [1]. MVC Design Pattern is an appropriate approach to break down or decom-pose a system or an application into sub systems. Then, it is more beneficial to distinguish between each layer. Then, each layer is responsible for a specific task within a system [3].

Mobile is very popular in these days. To facilitate more and more features, it is also getting more complex. Additional requirements are to be considered while developing Mobile Applications in relation to applications for desktop Computers. MVC pattern known for promoting orthogonality, reusability and usability in interactive desktop applications by implementing a graphical mobile devices application on the J2ME platform. The authors believe that the proposed idea will help mobile developers to write better re-usable code and also enhance the overall usability [4].

MVC design pattern helps us to implement the separation of application among the Model, View and Controller classes within applications. Separation of application makes it easy for us to test our application as relation among different components of application. MVC help us to implement a test-driven application development approach, in which we implement automated test phase before we write the code. These unit test phases help us pre-define and verify requirements of new code before writing it [5].

MVC (Model-View-Controller) design pattern to develop and implement a dynamic E-business system or an Internet application. The enterprise level application is developing quickly, and the E-commerce market is growing fast, more and more enterprise level projects presents the development trend that they take the Web technology as the central technology. At the same time, the dependence to the server end technology like the middleware is also increasing. So, the Information Technology department of the Enterprise needs a feasible way to develop the application, and make the application be related with that middleware which are flexible and can be transplanted [6].

![Figure 1: MVC Design Pattern](image)
3. MVC and Mobile Application

MVC Framework is a modern Architecture of developing Application. It is separate the application into three main Layers: Model, View and Controller. The Model contain the Business Logic Layer (BLL) that process the application data and also stores or retrieves data to or from the database. The View (Presentation Layer) displays information to the user and the Controller (Controlling Logic Layer) handles user interactions and input.

4. Apple’s MVC Architecture

In addition, the evolution of iOS applications with their new strains introduced and revealed weak spots in the traditional MVC Architecture. Therefore, to overcome all the limitations in the traditional MVC Architecture, Apple enhanced it. In Apple’s MVC, Controller objects know about View objects and Model objects Similarly, it is unnecessary for View objects to know about Model objects or Controller objects [3]. However, View objects respond to user interactions, then they send these interactions to Controller objects by delegation pattern or target-action pattern [7]. Thereby, View objects are totally decoupled from Model objects in Apple’s Model View Controller design pattern. As a result, application logic is separated from user interface that leads to more reusable objects and more extensible applications.

5. Android Passive MVC Architecture

Android application development we named Android Passive MVC. The second part of the section presents a simple example implementing the Android Passive MVC. The third part of the section recommends an architecture of the business logic of the application – the Model. Android applications have similar needs: internal database management and access, web service access and reusable components use. Clear main architecture of business logic could also simplify the development process [1].

![Apple's MVC Architecture](image)

*Figure 2: Apple's MVC Architecture*
6. Results and Discussion

This research paper was based on the Role of Model-View-Controller in Mobile Application Development. We have discussed how MVC is essential and how a developer can produce a working, and genuine application by using it. Also, we discussed the use of Model view controller makes software flexible, reliable, and scalable. And we had found that modification doesn’t affects the entire model so if anything is required to change such as screen layout, fonts, extra supports for mobile phones then it can be done easily.

MVC has played a vital role in Mobile Application Development. It has made greater influence in the web development and iOS and Android development. It has helped in reducing complexity of Mobile Application and separates the application in three major components i.e. Model, View and Controller. It gives a developer full control over the developed application. Three developers can work simultaneously. Also, testing of the Application would be easier and more effective.

7. Conclusion

To conclude, this research is done to study how MVC Architecture plays an important role in Mobile Application Development. An amazing architectural design pattern i.e. Model-View-Controller design pattern helps to maintain and define the good quality of software. By using MVC in Mobile Application can make application more flexible, clear, reliable and scalable. It has a plethora of advantages in comparison to its disadvantages. For the development of both iOS and dynamic web application it has been widely used.

8. References


