Abstract

The main focus of this thesis is that of devising an architectural model suitable for the development of cohesive and robust mobile applications. The way this is achieved is by exploring a number of existing solutions and architectural paradigms and incorporating them in such a way as to most efficiently capitalize on their inherent benefits with product scalability and maintainability as the primary driving factor.

This thesis is structured into three central chapters, the first of which being focused on presenting the theoretical aspects of the patterns and paradigms that make up the core constituents of the proposed model and justification for the necessity of their presence in software design and implementation. This part introduces in the context of this thesis the concepts of Clean Architecture and Architectural Patterns, with further emphasis being placed on Reactive Programming, the latter acting as the mechanism facilitating the flow of control and interaction of components across the boundaries of the model's layers and subsystems.

Following this, the practical part of this work has the purpose of evaluating the general applicability of the aforementioned design principles. For this analysis, the Android operating system has been chosen as its subject platform, with the second chapter providing technical details on its background and architectural components, as well as offering insight into some of its promising development approaches such as Single Activity applications and the adoption of the Kotlin programming language. During this process, the platform's comprising elements and behavior are to be studied in such a way as to identify their role in the model's structural topology.

As such, the final chapter depicts the main contribution of this thesis which is the implementation of a native Android application serving as a demonstration of the ways in which the described model may be incorporated in the context of the development of real-life mobile software. In this chapter, the conceptual purpose, encountered challenges, and the analysis, design, and implementation stages of the application's development are thoroughly presented along with the core tools and technologies employed during its realization.

This work is the result of my own activity. I have neither given nor received unauthorized assistance on this work.

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