

# Developing a Teaching Sequence to Introduce Google's Software Development Kit Flutter

Degree programme : BSc in Computer Science | Specialisation : Distributed Systems and IoT  
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Flutter is a software development kit which can create applications for multiple platforms from one single codebase. In this thesis, teaching material for Flutter was created.

## Introduction

Distributed Systems and IoT is a specialization at the Berner Fachhochschule (BFH). The first module is titled "Mobile Systems and Terminals", short MC1. Prof. Dr. U. Fiedler teaches this module, which focuses on an introduction to Android programming. The course also concentrates on new and hybrid technologies. Flutter is one of these innovative technologies. Flutter is a software development kit which can create applications for multiple platforms, such as Android, iOS, Linux, macOS, Windows and the web, from one single codebase. The creation of the same app for different mobile operating systems can be expensive. Depending on the platform, different teams using different programming languages are needed. Flutter tackles this challenge with its unified codebase. Developers can work on the same codebase, with the same language and create an app for multiple platforms. Changes or new features can be implemented simultaneously for both apps and therefore save a lot of time. Flutter also provides some helpful features for developers to accelerate the app development. In the future, Flutter aims to expand further to fully support web and desktop applications as well.

## Achievements

As the final scope of the material content was not fully defined, an agile approach was chosen to support this thesis. Some topics were predefined by the product owner, others were discovered during the creation of the material. The agile approach is a key factor in this thesis and for that reason extensively elaborated. In this thesis, teaching material for Flutter was created. The material contains slide presentations and exercises. The topics are aligned and build upon each other. First an introduction gives insight into Flutter and its concepts. A development environment is setup together. This enables the user to solve upcoming exercises. As Flutter apps are built with widgets, it is an important topic to begin with.

The corresponding exercise follows a guided manner to help the user work with widgets in the code. To teach the user on how to arrange widgets on the screen, layout widgets are introduced and used in the next exercise. A comparison between the different widget types introduces the state management topic. This is then again tested in an exercise. The navigation is necessary to work with multi-page apps and has to be taught. Finally, the teaching sequence is finished with the usage of the http package to create webservice requests.

To ensure the quality of the created material, a user trial was realized. This resulted in some minor changes and further clarifications in some topics.

## Impact

The created material can be used by a lecturer to create a teaching sequence about Flutter. The material aims to give the user detailed insight on how Flutter works and can be used for mobile development. The exercise tests the learned knowledge from the topics and gives the user a chance to work in the code. By the end they should be able to understand Flutter's concept, understand and work with the code to create apps.



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