

Master thesis : Development of a Flutter module for ATHLETin

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Development of a Flutter module for ATHLETin

*Thesis realized with the aim of obtaining the Master's degree of
Computer Science Engineering*

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Abstract

In the sphere of sports and athlete management, injuries often arise due to inadequate information and communication channels. *ATHLETin* presents itself as an innovative solution designed to tackle this challenge. The project originated from the mind of Julien Paulus, who believes that a better communication results in fewer injuries. In a nutshell, *ATHLETin* is a versatile mobile and web-based application that modernizes athlete management for trainers and health specialists.

ATHLETin is divided into several modules, each contributing a part of the solution : a calendar module for scheduling athlete-specific events, a training module for organizing training session, a medical module for handling athletes' health tracking, and an administration module for allowing authorized members to access and manage pertinent data (including athlete lists and their responses to questionnaires). Furthermore, a communication module is available to allow members to communicate with each other. This thesis focuses the development of a system for *Roles*, *Affiliations*, and *Groups* to complement the administration module.

The Role system, Affiliation system, and Group system are imperative to enable members to create and access only the data they are authorized to manage. Consequently, the implementation of the administration module must provide excellent performance while being easy to integrate into the current project. To achieve this goal, the implementation takes three key approaches. Firstly, the implementation minimizes requests through an efficient implementation design of the administration platform. Secondly, we reduce the backend workload by implementing efficient queries and minimizing the number of tables involved on the server and database sides. Lastly, the implementation leverages Flutter technologies efficiently by managing component states to target only essential rebuilds and thus avoid unnecessary reconstruction.

Regarding the components of the high-level architecture, the project is composed of a mobile application and a web application developed using the Dart language within the Flutter framework, which forms the frontend of this project. Additionally, it includes a REST server implemented in the Go language, along with a PostgreSQL database, which forms the backend of this project.

This work constitutes an integral component of the larger *ATHLETin* project initiated by Professor Laurent Mathy and his team. Consequently, these modules may see additional enhancements in the future. The principal objective was to offer an efficient solution that aligns perfectly with the ongoing project, facilitating future integration.