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Master thesis : ATHLETin: Web module for the management of athletes' training calendar and medical appointments

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ATHLETin: Web module for the management of athletes' training calendar and medical appointments

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As far as injuries are concerned, we commonly say that "prevention is better than cure". However, prevention usually requires a lot of information. This is where the *ATHLETin* solution wants to help. Its originator, Julien Paulus, is convinced that a better communication between athletes, trainers, and health specialists would reduce the risk of injuries. He notably believes that a better overview of the athletes' training program will prevent inadequate training load, and more interactions between doctors and managers will diminish the risk of injury recurrence.

The *ATHLETin* solution proposes a set of modules, each targeting a particular problem. A training module to focus on providing adapted training sessions to each athlete, a medical part to ease the communications with health specialists, and a shared calendar will allow both managers and athletes to organize themselves. This thesis consisted in the design, development, and deployment of solutions for the calendar and medical parts. The solution proposed is composed of a `REST` server interacting with a database, and two web modules. The `REST` server has been implemented in `Go` and communicates with a `PostgreSQL` database. For the web modules, it has been decided to implement them using the Dart language and the Flutter framework.

The main concern for this project was to provide great performances while keeping the modules ergonomic. To achieve this for the `backend`, we added indexes on the database's tables to speed up queries. This reduces the average queries duration and ensures constant performances when tables' sizes increase. For the `Flutter` modules, efficiency has been reached through a well-designed state management strategy. This strategy is based on the Flutter provider mechanism and allows fine-grained control on an application rebuild to avoid unnecessary operations. This thesis also provides several testing strategies, guidelines to improve them, and a `docker` solution for the deployment of the components. As a conclusion, it reviews the work realized and proposes some features to enhance the current system.

This thesis is part of a project started by the professor Laurent Mathy and his team. It had induced some technical restrictions, notably on the technologies to use. However, we still had the freedom of most design choices. The most important was to develop a solution that complies with its current work to smooth as much as possible the future integration.