

## 2.7 Selected architecture style and patterns

As previously mentioned above, a three-tier architecture has been chosen for TrackMe. This client-server architecture separates three layers, the presentation tier, the logic tier and the data storage tier. The application is basically users and third parties giving and requiring data, which justifies the client-server architecture. The main advantage of the three-tier system is that the separation into different modules allows developers to modify a specific layer without interfering with the others, for a change in requirements or in the operating system for instance.

The user of the application only deals with the presentation tier, the top layer of the mobile application. He never has access directly to the data tier, which is better, with regards to the privacy of it. Health data must always be secured, and thus not accessible to anyone using the application. The second layer is the logic layer, which is the core of the application. It links the two other layers, and is responsible for communicating with the external services, that is to say all devices used as wearables and map/ambulance services. Indeed, the logic layer contains all the logic needed to decide whether or not sending anonymous data required by third parties, or calling an ambulance in the case of the AutomatedSOS service. Plus, all the data collected from the users' wearables are sent to the second layer first, and then to the third layer. The third layer is basically the data layer. It only interacts with the second layer, and contains the complete database of the application.

Besides a strong flexibility, this architecture is up to a faster development because of the division of work. More, it leads to an enhanced security because the clients do not interact with the health data directly, it provides less risk and conflict with unauthorized data.

## 2.8 Other design decisions

- A router as a linchpin

A router has been selected to play the role of a linchpin, as seen in the components diagram. It makes the link between every component of the TrackMe application, except the registration component. Its role of linchpin between components is very important to forward data between the components and to simplify the architecture.

- The DataAccessService: a key service

One of the most important service is definitely the DataAccessService, as it is the one other services call when they need to get some data. It can be seen clearly in the services class diagram, where lays in central position. DataAccessService is called by the log in and session services, which need information about users and third parties to decide whether log in some user. It is then used by most of services of Data4Help, AutomatedSOS and Track4Run. DataAccessService works together with the DataTransmissionService, which is in charge of transferring data, and have a central role to simplify the application.