



# Design document

BudgetSimple

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**Version history**

Version	Date	Author(s)	Changes	State
1.0	08.10.2021	Stela Trencheva	Initial version of the 4 level diagrams	Draft

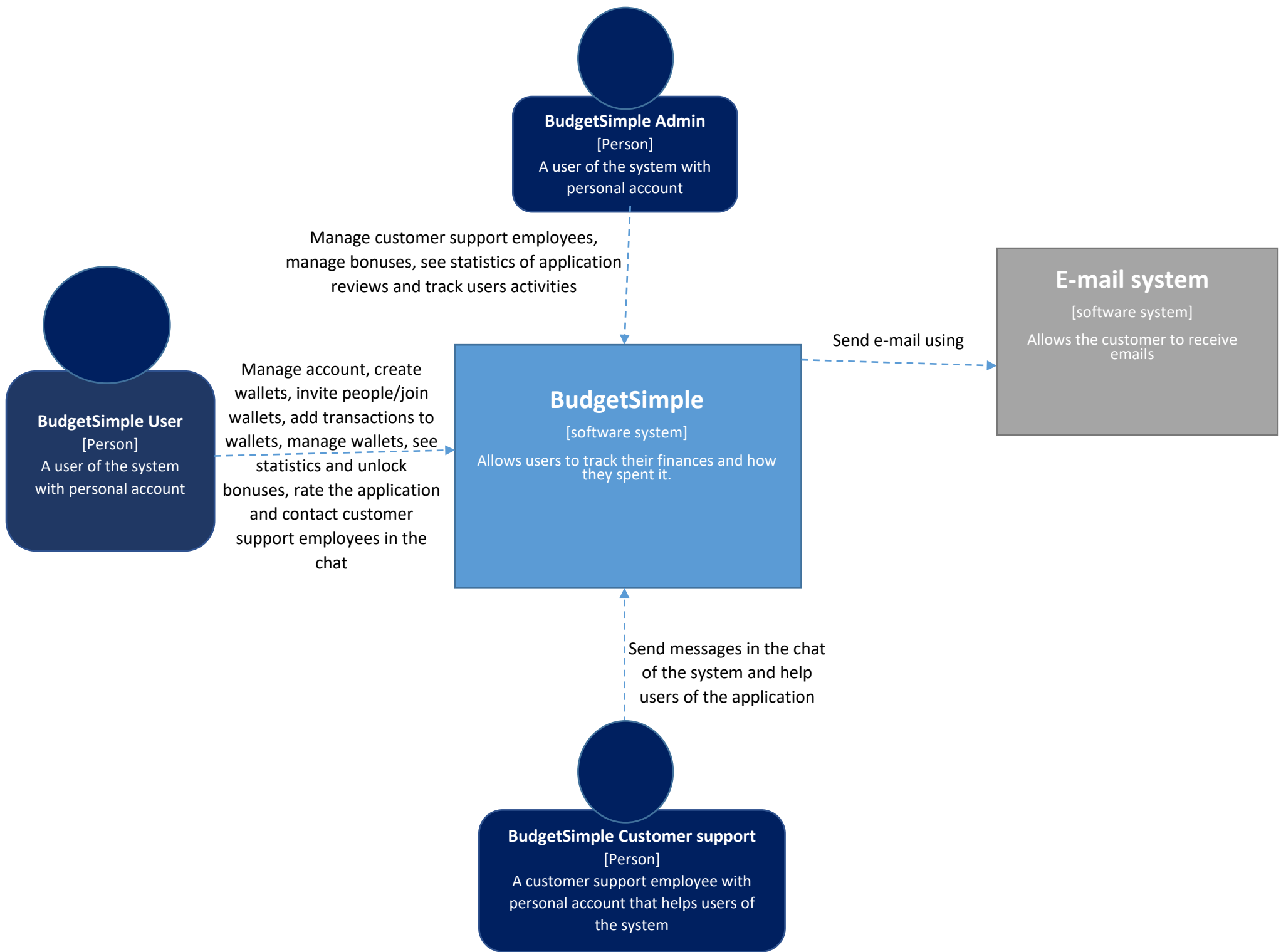
## 1. Level 1: System Context diagram

The first level of the C4 diagram is an overview of the big picture of the software application and its users. It is usually shown to non-technical people.

Three different types of users have access to the BudgetSimple application – users, admins and customer support employees. All of them have different roles and access to the application features.

- Admins – can manage(add/remove) customer support employees, manage bonuses, see statistics of application reviews and track user activities
- Customer support employees - can answer questions and help users of the application in the chat
- Users – can create accounts and login in the application, manage their info, create wallets, invite people to their wallets and join wallets of other people, can add transactions to wallets, manage wallets and wallets access of members, track their spending, see statistics and unlock bonuses. They can also rate the application and contact customer support employees in the chat.

The system uses an Email system to send emails with auto generated password to the newly added customer support employees, which they will need to change after their first login. Using the email system users can also reset their forgotten password.



## 2. Level 2: Container diagram

The second level of the C4 diagram shows the shape of the software architecture and the major technology choices. Also it describes how the containers communicate with one another. It is useful for software developers.

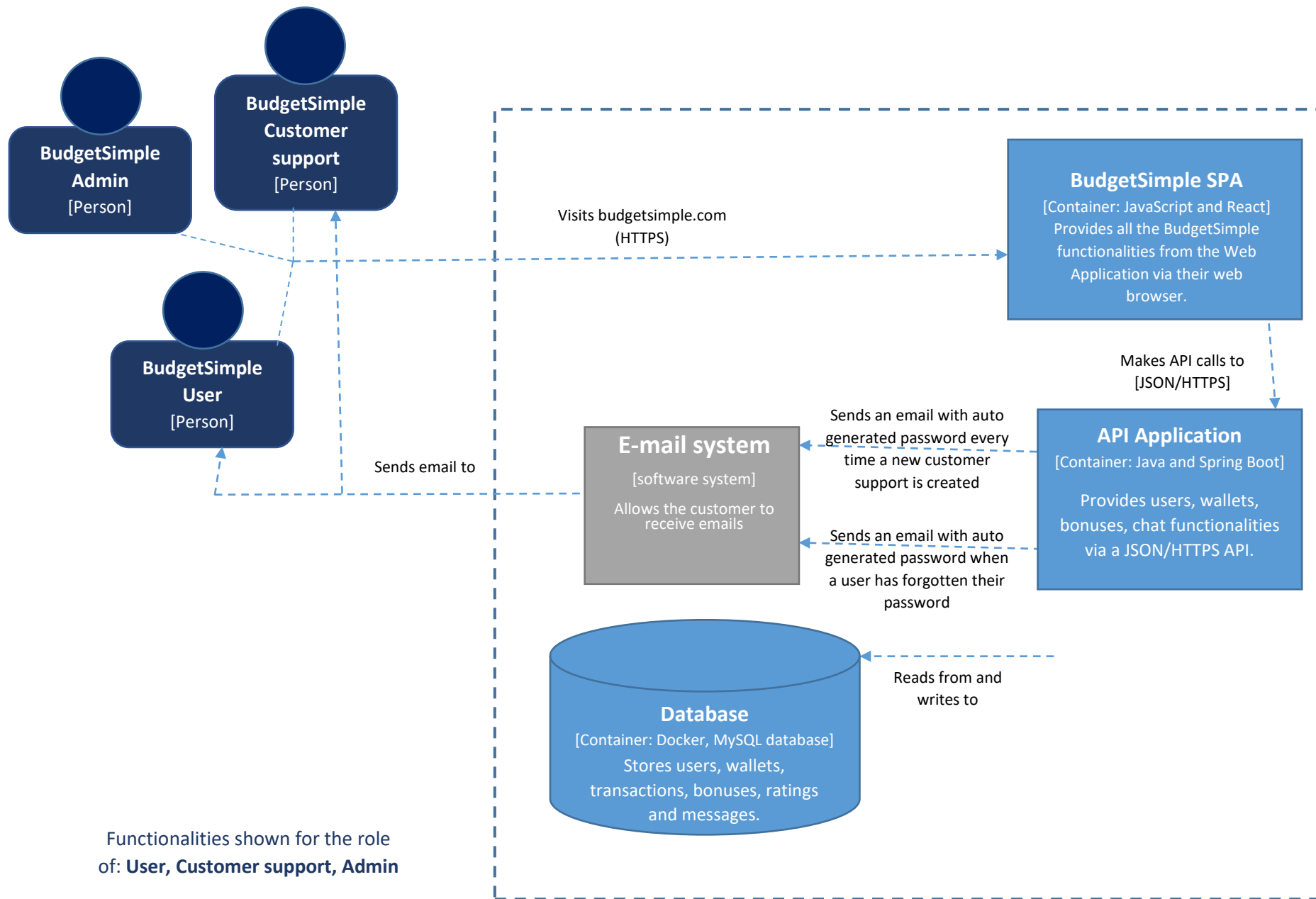
Backend and front end connection:

- REACT front end - it provides the UI and all of the website functionality within a browser environment. Users, admins and customer support employees use the interface to interact with the back-end of the application
- Back end - it provides all of the data and logical functionality of the website using Spring boot and Java. It makes the front-end functionality work
- Database - it stores all content information and directly interacts with the back-end when a request for specific information is created (retrieving/adding/updating/deleting information).

The backend of the application is connected with the front-end using HTTP requests to connect to REST endpoints, allowing the performance of CRUD operations. The backend of the application is interacting with the database through JPA implementation (Hibernate). JPA/Hibernate was chosen after a short research on Java/Spring Boot database interaction methods. The results from the research are that JPA with Hibernate is the most popular and suitable for beginners as there are a lot of publicly available resources and tutorials.

The user interface of the application is fully developed using React, JavaScript with HTML and CSS. It consists of custom built components that represent different functionalities. React was chosen for the project, not only because it is required from the course, but also because it has fast learning curve and is widely used so there are many available resources. It also provides a component based structure which allows to easily build a larger application using reusable components.

Spring Boot and Java are the technologies used for the implementation of the backend. Spring Boot's main purpose in the application is to reduce overall development time and increase efficiency by having a default setup for unit and integration tests and it also let beginners start with a Java application easier and quicker.

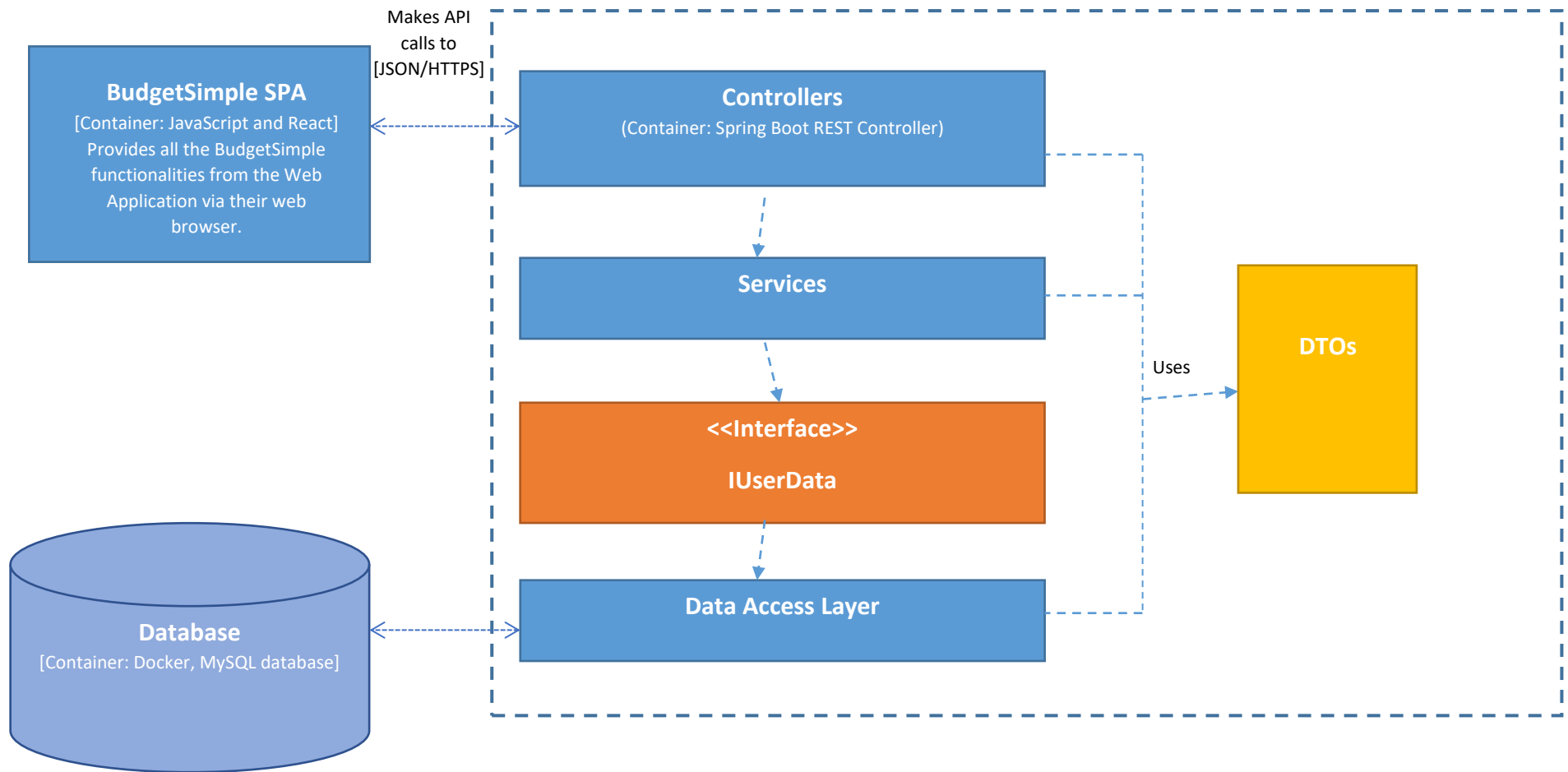


### 3. Level 3: Component diagram

Components in the BudgetSimple application are:

- Controllers – used to create endpoints of the application which can be used to connect to the frontend. The frontend of the application uses the endpoints in the controllers to get the needed information from the backend.
- Service classes – All the logic in the application is implemented in the service classes. There the information from the database is manipulated and ready to be used from the controllers.
- Data access layer – In this part of the application is implemented the connection with the database. Information is retrieved from or written to the database

The service components are connected with the database components using interfaces which allows flexibility in the change of the data type. All of the classes use Data Transfer Objects (DTO).





## 4. Level 4: Code

\*Link to the UML diagram



uml\_budgetSimple.pdf (Command Line)