Progress Report 1

On the Data Input Tool for the SURGEAhead Intervention Study

U. L. Rieger

Medical Systems Biology Group
Uni Ulm

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Outline

Introduction

The SURGEAhead Project

- Supporting SURgery with Geriatric Co-Managment and AI
- "A study protocol for a digital geriatrician" [1]
- Project aims to develop tools for *post operative delirium* prediction
- and a ***c****ontinuity* ***o****f* ***c****are* tool (*COC*).
- Where a first *Observations- und KI-Entwicklungsstudie* (OKIE) study was conducted recently.
- OKIE studies data-input tool was a little patchy and required intense maintenance.
- Novel data-input tool is now implemented for the intervention study.

Outline of the Data Input Tool

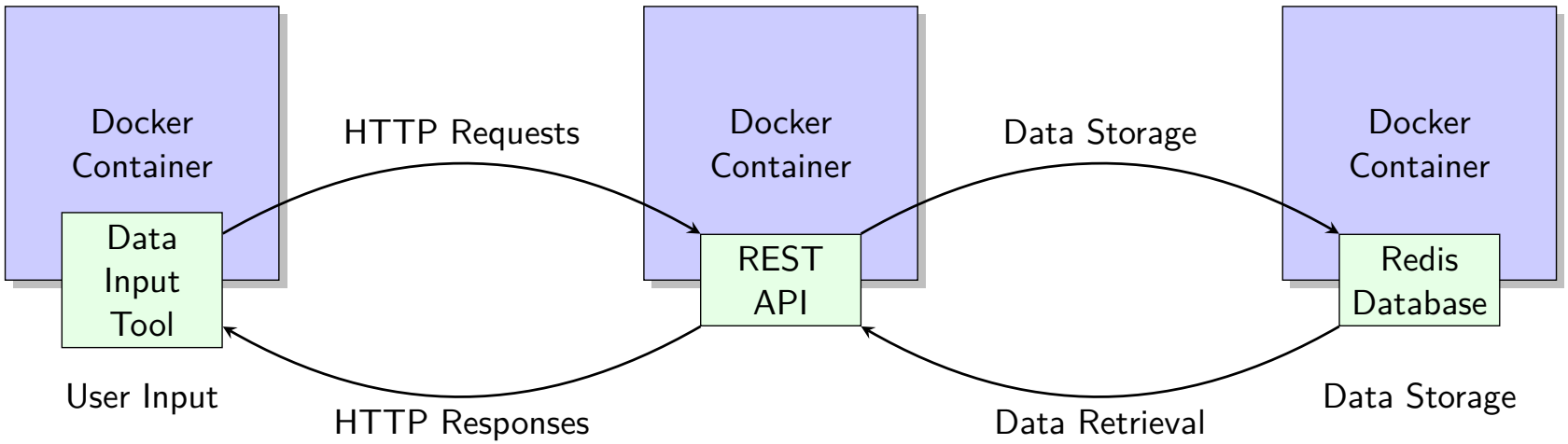

Figure: A schematic representation of the data input tool. All components are running in separate Docker containers.

Advantages of using docker Containers

- Isolation of components
- Security benefits

Data Input Tool

Data Input Tool

- Implemented in Googles Flutter framework
- Based on the *dart* programming language
- Supports different devices (mobile, web, and desktop) from a single codebase

On dart

Currently (2024-12-12) ranking place 33 ($0,47$ %) in the *TIOBE Index* [2], the language was developed by Google in 2011 as a modern option to javascript (JS ranks at place 6 with $4,61$ %) in the TIOBE Index).

Introduction to Dart

Dart

- Statically and strongly typed and ‘null‘ safe
- Object-oriented with classes and single inheritance
- Supports asynchronous programming

```
void main() {
 int n = 10; // Number of terms in the Fibonacci series
 List<int> fibonacciSeries = List.generate(n, fibonacci);
 print(fibonacciSeries);
}

int fibonacci(int n) {
    if (n <= 1) {
        return n;
    } else {
        return fibonacci(n - 1) + fibonacci(n - 2);
    }
}
```

Flutter

Flutter

Dart-based SDK for building applications.

Used by:

- Google
- BMW
- Alibaba
- ByteDance
- Tencent

Redis Database

Redis

- Fast in-memory data storage
- Key-value store
- Supports plenty data structures like:
  - strings
  - hashes
  - lists
  - and many more

REST API

REST API

- Representational State Transfer
- Stateless
- Uses HTTP methods to perform CRUD operations (Create, Read, Update, Delete)

Note

Mainly needed as there is no Flutter package for direct communication with Redis application is compiled for web.

In this project Pythons ‘flask‘ library is used to implement the REST API.

More on the input tool

Basic functionalities

- User authentication
- Assigning ID to new patients
- Write data associated with the patient to the database
- Read data from the database without the ability to modify it

Life demonstration

- Demonstration of the data input tool

Outlook

Next Steps

- A status bar showing completeness of data for a patient
- Some kind of sorting mechanism for the assessments
- Add a proper authentication mechanism (e.g. Firebase)
- Implementation of real world assessments

References

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Supporting surgery with geriatric co-management and ai (surge-ahead): A study protocol for the development of a digital geriatrician.

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TIOBE programming community index, july 2012, 2012. [Online; accessed 2024-11-28].