# Documentation

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December 25, 2019

## 0.1 Riscs

### 0.1.1 Riscs, regarding the health of the patient

| description | risc (low, middle, high) |
|---|---|
| Data could be leaked to third party people. | low |
| Data could be deleted e.g. through a bug in the system | middle |
| Data could be manipulated e.g. through a bug | low |

### 0.1.2 Riscs, regarding the data of the patient

| description | risc (low, middle, high) |
|---|---|
| Patient will be treated unnecessarily | middle |
| Patient will not be treated, but it is necessary | high |

## 0.2 Quality Management

The purpose of our product is to predict potential decubitus patients with aid of patient specific medical records. In order to achieve a system of this capability, many steps are required. We need to constantly convert data into the OMOP CDM, evaluate the data and illustrate the results on doctors or medical assistants, hence they are able to treat the patients correctly.

### 0.2.1 Development of an ETL Process

The first step of the product is to convert our standardized data into the OMOP CDM. In order to achieve that, we write a Python framework, reading the data of the input CSV files, connect to the required database and saves the converted data.

### 0.2.2 Evaluation of the data

To achieve the best possible results, we focus on a deep learning approach, hence our system learns from real data, how likely it is that a patient suffers on decubitus. Secondarily we work on a pure statistically approach as base line. If the second approach ends up more reliable, we discard the deep learning approach. As training data, we use a set of medical records from dummy patients. Unfortunately we don't have the opportunity to train on real patient data, as OHDSI don't offer real data of patients who actually suffered from decubitus.

### 0.2.3 Building the app

We build a simple web python application for the use of our medical device. This app is possible to schedule when the ETL process should restart, configure the database settings and illustrate the results of the patient evaluation.

## 0.3 Software Lifecycle Processes

### 0.3.1 Requirements

- For confidential reasons, a password for using the app is required
- The ETL process converts the standardized CSV files correctly into the OMOP CDM
- The ETL process can be scheduled through a cron job

  The cron job can be modified over the frontend of the app

  A ETL process can be triggered out of schedule over the frontend
- The evaluation of potential decubitus patients is aimed to be as accurate as possible for us
- The results of the evaluation can be illustrated inside the frontend of the app

  Selected additional data of the patient is illustrated

  Additional information can be showed, if desired

### 0.3.2 Tests

#### ETL-Process

| input | expected output |
|---|---|
| correct set of csv files as input | data is converted correctly |
| missing CSV file | error message appears |
| CSV file with wrong content | error message appears |

#### Evaluation of Patients

As we are using a deep learning approach, we split our data in two sets: the training data and the test data. As the names suggest, the training data is only for train our network, which will then be evaluated using the test set.

#### Frontend

Frontend tests are difficult, if not impossible. Therefore we can only test it by letting certain people evaluating it.

## 0.4 Usability