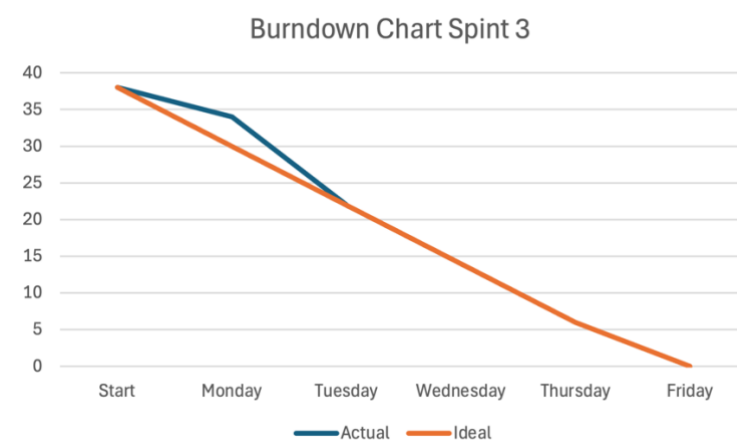
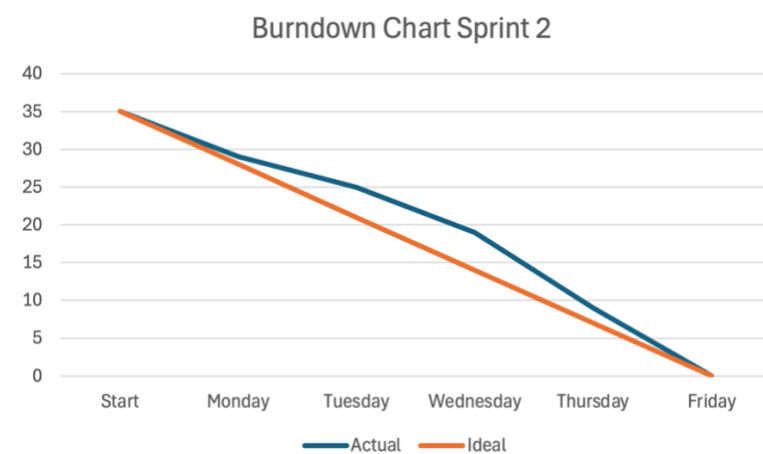
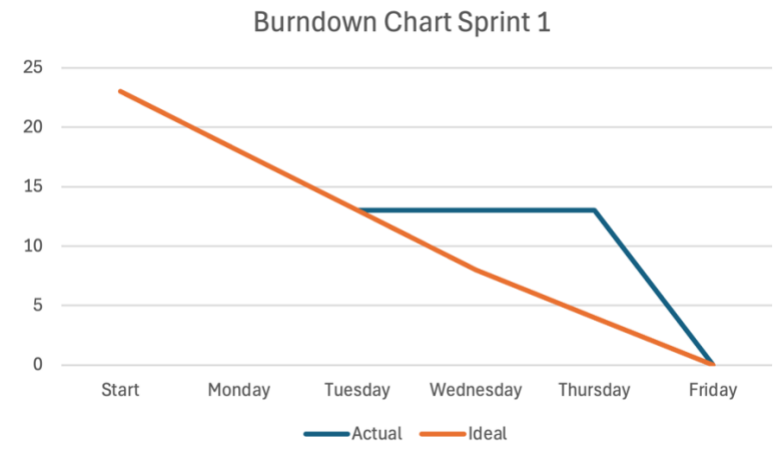


Project Management Summary

Below you can see the 3-sprint burndown charts as a representation of our planned work and actual work done compared to our schedule.

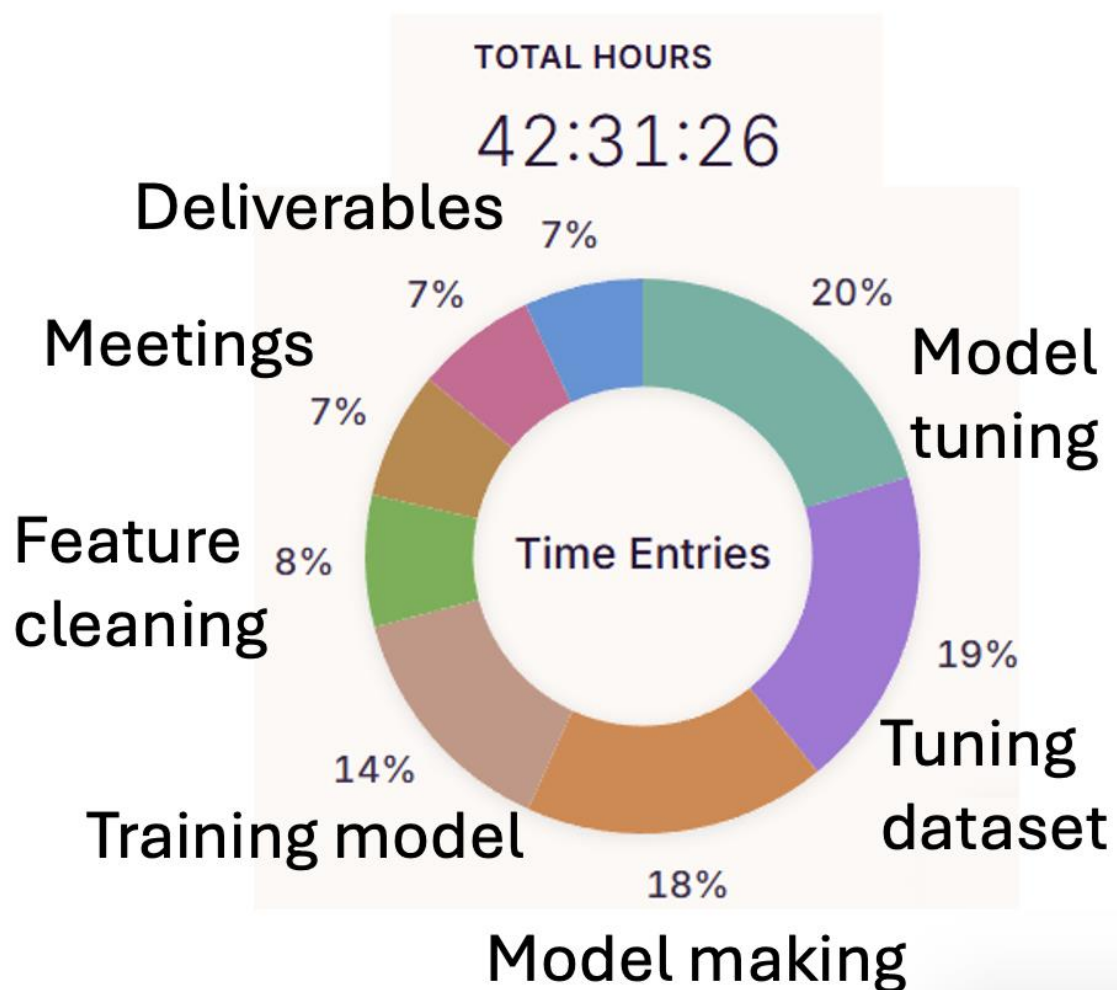


Each sprint we delivered and finished our tasks as planned by the end of the week

Below is our time tracking for the total time combined since the start of our project.



Wout



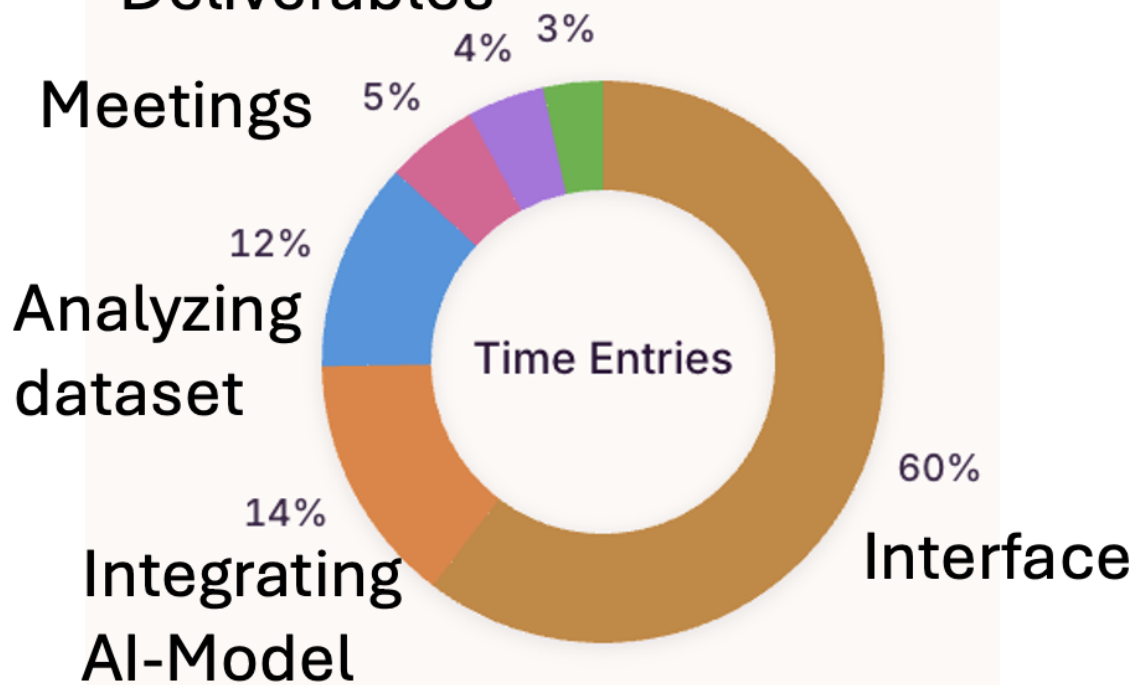


Tobias

TOTAL HOURS

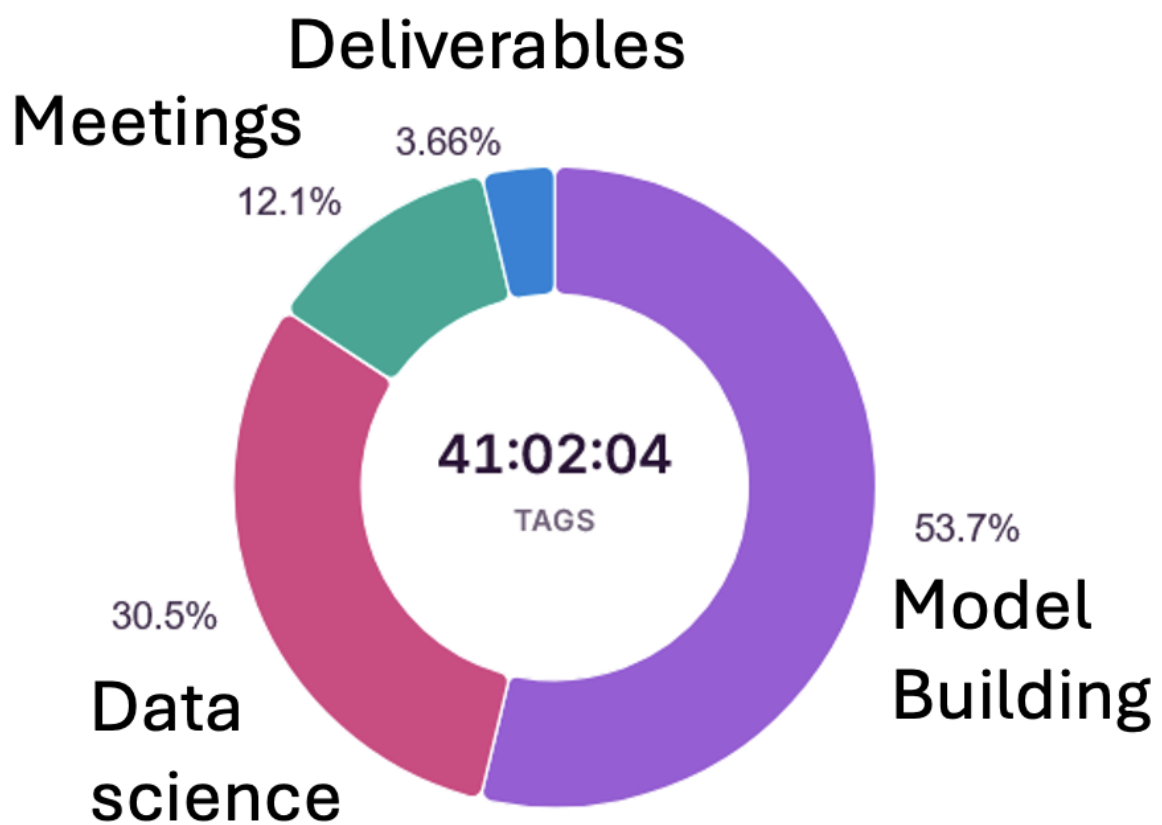
45:07:21

Deliverables





Robin



Sprint Backlog

We organized our work over three main focus areas across the current sprints:

1. **Understanding the data** – In the beginning, we focused on exploring the dataset, understanding the context from the client, and identifying which features were useful. We also cleaned the data, removed irrelevant or biased columns, and dealt with unrealistic values.
2. **Model building and tuning** – Then, we built baseline models for complication prediction using logistic regression, and later tried more advanced methods like XGBoost. We tested multiple variations, hyperparameter tuned, compared results, and documented performance. This is what Wout and Robin worked most on.
3. **Interface development** – Meanwhile, we focused on building a user-friendly interface where doctors can input patient data and receive risk predictions. The goal was to create something functional and easy to use, designed to fit naturally into a doctor's workflow. The system includes a well-integrated frontend, backend, and database, supporting data storage and full CRUD operations for patient files. This part of the project was mainly handled by Tobias.

Below are the 2 reports we made from the 2 meetings we had with our client, Dr. Breytenbach.

Meeting report 1: 19/05/2025

First meeting with Dr. Breytenbach discussing the project and what was expected from us.

Dr. Breytenbach opened by telling us we were to make risk prediction models for people undergoing bariatric surgery in South Africa. He told us this would serve as a sort of proof of concept for a part in the national standardised medical platform they've been developing for a few years in South Africa. He told us we would get historical data of past surgeries which happened in South Africa and gave us a quick look at the dataset.

Dr. Breytenbach instructed us to build separate models for predicting minor and major complications. He advised that we should start with traditional methods, such as regression models, as these are more widely accepted in the medical field. Once these models have been developed, we should compare their performance to more complex models, such as gradient boosting and neural networks, and assess whether the more advanced methods offer a significant improvement.

If the complex models perform better, Dr. Breytenbach asked that we clearly explain the reasons for the improvement and provide arguments to justify any changes in the modelling approach.

He also asked us to consider the process from a patient's perspective, where the patient would be asked to provide basic medical information such as blood pressure, smoking status, and basic medical information like age, size, weight and so forth.

Based on this, Dr. Breytenbach would like us to develop a web-based interface that allows doctors to input patient information and receive predictions on the patient's risk of complications. The system should also categorize patients into groups based on key health features and create a priority system to help determine which patients are most in need of surgery.

Meeting report 2: 28/05/2025

Meeting with Johan Breytenbach discussing different features in the dataset as well as looking what would be the best way forward.

We start by telling dr. Breytenbach what we were able to do so far in terms of trying to make some models. We then proceeded to have a closer look at the dataset with him.

Dr. Breytenbach informed us that a few columns like anaesthetist, hospital would better be left out for now as well as some totally irrelevant columns like ID numbers or columns where all values were the zero or NULL.

For now we should leave the doctor out as well, we already noticed doctor Smit had significantly more complications, but dr. Breytenbach explained that dr. Smit had a larger share of people who were at risk of complications in general, so that this could be a false correlation.

He pointed out that some columns were also containing unrealistically high values that we would need to correct and maybe replace by the average.

He wanted us to check if staying in the hospital longer reduced the risk of complication.

When we went on to the complications he explained that there was a grading system for the complications going from 1-5. With 1 and 2 being minor and 5 being morbid. We pointed out that the highest grade in the dataset was 3b and he replied that the worst cases were removed when anonymizing the data.

This was everything relevant for the pre-operative model. He said it might be interesting to develop another model that predicts the risk after the operation has been done, to look if this improves the predictions and maybe prepare the doctors for complications after surgery.

He said here it might be interesting to make a SurgeryTime column with the total time in Surgery and he also gave us some instruction to correct some mistakes in the blood loss columns. We agreed we could get started with this information and he said he would meet us again next Wednesday to discuss the first results.