**Project Plan**

***TRIP SPLITTER/MERGER AND ENRICHER***

*CROSSYN*

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# Project assignment

## Context

Crossyn is a company that has made a trip creator, that makes trips based on the ignition status of a vehicle, but different device types handle the ignition events differently, some are connected to the vehicle’s ignition switch with a wire and others look at the battery voltage level, but that can cause some issues. Sometimes the ignition event doesn’t show that its turned off or it shows that it turned on multiple times, we have to find out when a trip starts and ends and display the information to the user In a nice way.

## Goal of the project

The goal of our application is to create trips from provided datasets by the Crossyn company.

We have the goal of visualizing and enriching the datasets through a software solution.

Through linear interpolation we will be able to automatically remove data deviation without human input.

Using the location data, it would be possible to visualize the data on a graphical interface for a simple end-user-like experience.

The lightweight application we will develop will keep track and link trip data to the vehicle's driver account.

This will allow Crossyn to keep track of recorded information on a per account basis.

The main function of our application will be to ease up the workflow the recorded vehicle datasets.

## Scope and preconditions

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| --- | --- |
| **Inside scope:** | **Outside scope:** |
| 1. An application that will take the dataset and processes it into trips | 1. The ability to create trip grades from processed data |
| 1. Quality assurance and testing for the application | 1. The processing of data in the user case of an accident on the road |
| 1. User support through a manual | 1. Further usage of processed trip data for business or research purposes |
| 1. Documentation that justifies choices made during development (research docs, project plan) |  |

## Strategy

For this project we are using the agile and iterative Scrum methodology of development. The Scrum framework is usually used by smaller development teams (5-9 people) led by a Scrum master, whose main goal is to ensure that the team follows the correct practices involved with this methodology and is used a point of communication between the developers and the product owner. The product owner's main role is to communicate with the development team about the expectations for the project and to be a way of communication between the end-users and the developers.

In Scrum iterations are called sprints and usually last 2-4 weeks. At the beginning of each sprint, the development team does a sprint planning meeting, where every team member participates in setting the goals for the sprint. The product backlog is taken into consideration when planning the next sprint. This backlog is a to-do list, the priority of tasks in which is discussed with the client during the planning and usually, the ones that are with the highest priority are put onto the sprint backlog list, which represents the goals for the sprint.

After the goals are set and the sprint begins the development team organizes internal meetings every day until the end of the sprint, where the progress made in the last 24 hours is discussed, and the work for the next 24 hours is planned. At the end of each sprint, a sprint review meeting is held to review the progress made during the sprint. After the review meeting, the goals that have not been met are redirected to the product backlog again and a sprint retrospective meeting is held, where everyone reflects on the sprint and can express their opinion on what the team should start, stop, and continue doing. Then the process begins all over again until the completion of the project.

We choose the Scrum framework, because it allows us to make changes on the fly as not everything is predefined, therefore we can consider and implement the client's feedback immediately. Testing is done constantly as well and not left at the very end of the project, which allows the team to identify and prevent potential issues much earlier on. The daily meetings allow for the current progress to be easily tracked as well. Lastly, using this methodology allows the team to put out new releases very frequently, which keeps the end-users happy, as they see constant progress and give feedback as well.

## Research questions and methodology (IN PROGRESS)

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*Describe the research questions that are most relevant to your project. For each research question, describe the approach and/or methodology. Use the Dot Framework to specify strategies and methods - see* [*http://www.ictresearchmethods.nl*](http://www.ictresearchmethods.nl) *for details.*

*Note that research is not only part of the initial phases (like analysis) of the project but runs throughout the whole project. E.g., in the realization phases, you will probably do research in the Workshop and Lab context.*

*Realize that during the project your research questions may change, and that new ones will come up. That normal for any project and is not a problem as long as you involve the right stakeholders, and keep your deliverables updated.*

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For this project we will deliver:

- The project plan detailing our process.

- Research documents.

- Test reports proving our product is complete.

- Our application built so that it meets all the criteria that have been agreed upon.

# Project organisation

## Stakeholders and team members

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Abbreviation** | **Role and functions** | **Availability** |
| *Bram van Herwijnen* | *BvH* | *Product Owner: define goals and relay functional requirements for project. Evaluates progress after each iteration.* | *In person: during product demonstration*  *In correspondence: during workdays* |
| *Roopali Gupta* | *RG* | *Project Consultant/Teacher: Oversees project development and scrum. Gives instructive feedback during and after every iteration.* | *In person: On every Wednesday or through appointment.*  *In correspondence: Through appointment* |
| *Tobias Halomoan* | *TH* | *Developer/Scrum Master\*: Acts as liaison between product owner and other developers.* | *Available on every weekday through appointment / in class.* |
| *Dobri Trifonov* | *DT* | *Developer* |
| *Stanislav Petkov* | *SP* | *Developer* |
| *Robert Enuţă* | *RE* | *Developer* |
| *Joran van de Moosdijk* | *JvdM* | *Developer* |

## Communication

Communication between the product owner (BvH) and the development team are mainly done through email ([bram.van.herwijnen@crossyn.com](mailto:bram.van.herwijnen@crossyn.com)), with the scrum master as the main communicator for the group’s progress or if any inquiries are needed. Weekly meetings will also be held with the teacher (RG) as to show progress and receive feedback/ask questions regarding the scrum methodology and project. A Jira board is implemented for communicating project and sprint backlogs, as well as assigning specific tasks/issues/stories to each developer for every sprint. Stand-up meetings for the group are assigned three times during the week (Tuesday, Wednesday, Friday) as to stay updated on the development progress and discuss solutions when issues arise. A Discord group chat is also formed for the group for easy online communication.

# Activities and time plan

## Phases of the project

Using the Scrum methodology, we are going to split the project into 5 sprints, each lasting 3 weeks.

During the first sprint we are analysing the problem, planing the project, creating base documentation and implementing the chosen functionalities for this sprint. At the end of the sprint the first demo of the product is released and a review of the progress is made.

Then there are 4 more sprints, where the process of development is as follows: plan – implement – test – release – review.

After all of the sprints are completed, a final evaluation/reflection is made, a final release is scheduled, the project is wrapped up and the product is handed over to the client.

## Time plan and milestones

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| --- | --- |
| **Phasing** | **Effort** |
| 1. Sprint Planning | -Items, that should be achieved during this sprint are chosen from the backlog and put onto the sprint backlog as goals for the sprint  - The workload is properly devided among the developers |
| 1. Stand up meetings | -Each week three stand up meetings are held by the developers on Tuesday, Wednesday, and Friday, where the problems, progress made and the goals are discussed among the group members. |
| 1. Iteration | -Implementation of unfinished features from the previous sprint is continued.  -Implementation of the planned features for the sprint is made. |
| 1. Testing | -Unit testing is performed on the newly implemented features  -The whole system is tested after the new features have been integrated |
| 1. Demo Release | -A demo with the newest stable version of the application is provided to the client  -The client provides feedback based on the newest release |
| 1. Sprint Review | -The progress made during this sprint is inspected and the backlog is reviewed to check which tasks have been completed and which are still unfinished |
| 1. Sprint Retrospective | -A final meeting is held at the end of the sprint, where the team reflects on the sprint and discusses what everyone should start, stop and continue doing for the next one. |

# Testing strategy and configuration management

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## Testing strategy

For our Unit Testing we plan to make a per use case. We think that having a large amount

of single use case will simplify the testing process and improve the codes future debugging and

maintainability. Tests that validate several things may become too complex and hard to maintain in

the future. To be able to have maintainable code we will stick with having one (or if needed two) assertions per test.

Every test will be self-contained and not interact with other components to verify validity.

Taking the route of having many isolated, single case unit test will be very time consuming so our group

will only promise 60% code coverage with the potential to expand it to 80% in the future.

We plan to base our tests on user stories that will give us an idea of what to focus on.

## Test environment and required resources

For testing we have set up a CI/CD pipeline for automated testing and easier bug fixing. Later, we will make use of a docker container to further speed up testing and assure the quality of the project.

Classes and methods will be implemented alongside unit tests to assure as little errors are left in the code as possible.

User acceptance tests will also be a part of the testing process. The goal of the project is confirming that the system is comparable and upholds the initial requirements agreed upon. After the projects reaches a stated deemed acceptable for user testing, a small number of people, preferably with different backgrounds and interests, will be asked to use the product and give feedback on state of the application.

For conducting these tests, we will use a computer running Windows OS. No additional tools or resources are required at this time, but if any necessities arise, we will discuss about what tools are needed and the results will be talked about with the client.

## Configuration management

For our Git repository we plan to use the Branch Per Feature strategy.

Every basic feature will get its own branch. All these branches will merge into a

Development branch. After throughout testing and review on how the branches interact with

each other the development branch will be deemed stable. The Development branch will then be merged

into a separate, Stable branch on which we will have a stable version of our application.

On the Stable branch only bug fixes should be made.

When it is time for a client review and feedback, the stable version will be merged into main and

represent the current working release of our app.

# Finances and risk

## Project budget

*<< If specific budget is required for your project, indicate it here, and also what needs to be done to get budget approval. Think of hardware, applications, libraries, development environments, etc.*

*Regular costs that have already been covered, like an internship compensation, do not need to mentioned.*

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## Risk and mitigation

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| **Risk** | **Prevention activities** | **Mitigation activities** |
| 1. Scope | Make sure to plan and think ahead while keeping in mind our capabilities. | Roll back some features and trim down design for efficiency. |
| 1. Leaving member | Make sure to follow deadlines and share all valuable information regarding the group project. | In case of someone leaving the group will split his workload. |