Business Proposal

Damage Report Automation

Alpay Demirci & Alec Sola
Fontys University of Applied Sciences

April 13, 2025

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Abstract

This document is a business proposal for the individual project in semester 6. It outlines the project idea, the problem it aims to solve, the data required, a proposed plan, and a set of research questions.

1 Innovative Idea

We are developing a smart, AI-powered mobile/web application that helps users file a damage report after a car accident, just by explaining what happened in natural language.

The app uses a conversational AI assistant (LLM) that asks clarifying questions and automatically fills out a structured damage form. It also generates the required sketch diagram based on the user's explanation and can optionally extract personal data from a photo of the user's ID or driver's license.

2 Problem Statement

Filing a car accident report is often one of the most stressful parts of an already stressful situation. Right after a collision, emotions are running high, people might be injured or in shock, and yet they're expected to calmly fill out a detailed, legally relevant document on the spot. The process is time-consuming usually taking 15 to 20 minutes, and not always straightforward. Many people struggle with:

- Figuring out what information goes where
- Drawing the situation sketch accurately
- Avoiding mistakes that could later cause problems with insurance claims

To make things worse, the form is often confusing, especially for those unfamiliar with legal paperwork or not fully fluent in the language. And if someone is injured or shaken up, it's even harder to write clearly or think straight.

In short: at the very moment when drivers need clarity and simplicity, they're faced with a slow, complex, and frustrating process.

3 Solution / Goal

Instead of spending 15 to 20 minutes manually filling out a damage report after an accident, often under stress and emotional pressure. Our solution offers a much simpler and more intuitive experience. With our app, key credentials like name, license plate, and ID number can be automatically extracted from previously taken photos of official documents. Then, a conversational AI assistant guides the user through the process by asking targeted questions about the incident. Based on these responses, the app automatically generates a complete, structured damage report, including the legally required sketch — without the user having to draw or guess what to write.

Technically, the system relies on two key machine learning models: one for extracting personal data from images of IDs and vehicle documents, and another (LSTM-based

model) for interpreting the natural language description of the accident and generating the appropriate diagram.

This project stands out as an innovative, first-of-its-kind interface for damage reporting that replaces complex form-filling with a natural, conversational flow. By combining natural language processing, image generation, and document scanning, it not only simplifies the process, but also brings comfort and confidence to users in moments when they need it most.

3.1 Ethical Aspects

- Privacy & security of sensitive personal data (e.g., ID photos, accident details).
- Transparency of AI-generated content (user must always review and confirm the result).
- Avoiding bias or inaccurate interpretations of descriptions by AI.
- Ensuring users remain in control and can override or correct the AI.

4 Data

Although it is still early to know exactly what information to extract for the making of this project. These following points are believed to be important:

- Accident report form structure (publicly available formats used in EU or by insurance companies).
- Example user explanations of car accidents (real or synthetic).
- Simple training diagram examples for sketch generation (can be rule-based or prompt-engineered).
- Public data (weather, timestamp, location metadata if used later)
- Sample images of IDs (anonymized or synthetic) for testing document reading.

5 MVP (End Result and MVP components)

End Result: The user uploads photos of their documents and answers specific questions about the accident. Based on this input, the system automatically creates a complete and accurate damage report. This project will follow the AI project methodology students receive from canvas, these will be our MVP's:

- Domain Understanding: Technical document where all research which help decide on what analytical approach fits best to front this problem.
- Data Understanding: Document detailing what data will be collected and used for the project.
- Data Collection.

- Preprocessing: This project requires a huge amount of labelling, all details will be specified in the Jupyter Notebook submitted.
- Modelling & Evaluation: Technical process included in the Jupyter Notebook.

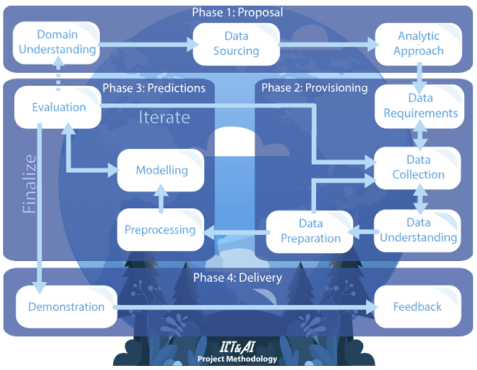

Figure 1: AI Project Methodology

5.1 MOSCOW

On a project of this scale, and analyzing the time left it is important to set some goals which are ambitious but realistic as well.

- Must Have (Core features):
  - LLM-powered conversational assistant to guide the user through the report.
  - Start a damage report by describing the accident in text.
  - AI asks additional context questions to complete the picture.
  - Automatically generate a filled-out version of the damage report (PDF or screen form).
- Should Have (Important but not strictly required for first release):
  - Auto-generate a sketch of the situation based on the user's description (Gen AI).
  - User can edit or add context to regenerate the sketch or update the report.
  - Preview and confirm generated information before export
- Could Have (Nice-to-haves if time allows):
  - Option to upload a photo of an ID or driver's license for auto-filling name/license fields.
  - Location/time detection from device (e.g. GPS & timestamp).
- Will not have (for now):
  - Integration with insurance companies or government platforms.
  - Advanced damage detection from car photos.
  - Multi-user collaboration (e.g. two drivers filling same report simultaneously).

5.2 Research Questions

- How realistic is it to build a model that can read key information from documents and fill in the damage report automatically?
- Is it possible to create a model that can draw an accurate sketch of the accident based on what the user says or answers?
- What happens if one person in the accident uses this system, but the other uses the old paper method from a different insurance company?
- Will reports created by this AI system be accepted by all insurance companies and hold up legally?
- How accurate do the document-reading and sketch-generating parts need to be for insurance companies to trust and use them?
- How can we make people feel confident using this app in a stressful moment right after an accident?

6 Individual Task

For this project, we have decided to collaborate on all parts together rather than dividing tasks strictly. By following the AI project methodology step by step, we'll ensure that both of us stay involved and understand the full process from start to finish. Once we reach the technical phase specifically, so the Jupyter Notebook, each piece of code will be attributed to the person who developed it. We believe this approach allows us to learn more effectively, as it avoids the situation where one person works on a specific task without understanding what the other is doing.