# Caterpillar – Supplier Quality Inspection

By
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## Introduction

- **Caterpillar** relies on consistent supplier quality inspections to ensure reliability
- Currently dependent on **multiple disconnected systems and limited history visibility**
- Developed **centralized inspection platform** for efficient inspections
- Allow for data to be stored accessible to **improve auditor learning curve**
- Built using **Django, SQLite, and Ollama**, targeting reduced inspection time and standardized audits

## Accomplished Goals

**Fall 2025**

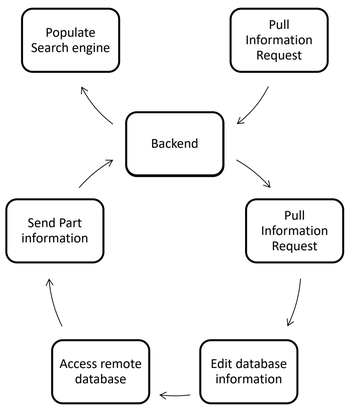
- Allow for admin to change part grouping
- View parts by specified criteria (i.e. grouping, design control)
- Inspection criteria entry for admin

**Spring 2026**

- Ability to enter inspections
- Get predetermined risk
- Time audits
- AI summary of past part history

## System Design

*Figure 1: System design cycle overview*




## Research Methodology

### Frontend

**Formulate Workflow Modules:**

- Map inspection processes to simplistic and clear app modules.

**Design and Integrate UI:**

- Designed mockups in **Figma** before implementation
- Built frontend using **HTML/CSS**
- Improve visual clarity while retaining original functionality
- Fetch and display backend data

### Backend

**Clean and Structure Database:**

- Convert CSV data to local **SQLite** for efficiency
- Add local changes to the remote database

**Search and Retrieve Information:**

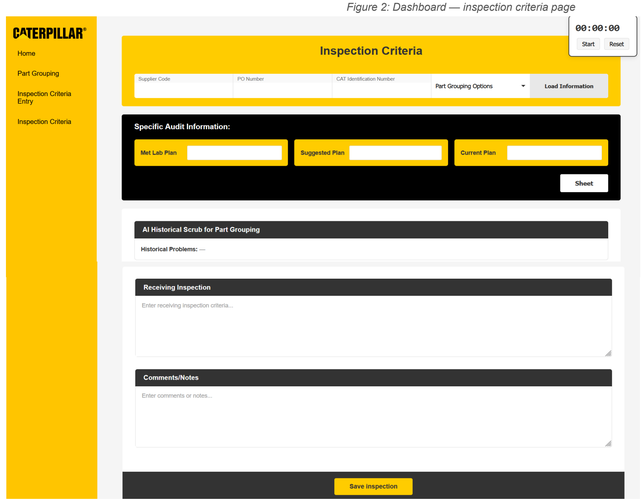
- Query database utilizing **Django API.**
- Search, retrieve, and update part groupings

**Develop and Refine LLM Summaries:**

- Generate summaries using **Ollama** (local LLM) from part groupings, past summaries, and current inspection findings.

## Inspection Criteria Page

*Figure 2: Dashboard — inspection criteria page*




## Conclusion

- **Centralized Inspection System:** Combines inspection guidance, criteria, and historical data into one streamlined workflow.
- **Updated Interface :** Captures inspection knowledge to reduce rework and ensure consistent inspection across sites.
- **Better Visibility:** Gives inspectors cleaner access to past inspections to support faster, more informed decisions.

## Future Goals

**Expand timer:**

- Record information about the audit and how long it took. Use start and stop time, the date, whether it passed or failed, and the nonconformance number if it failed to identify patterns and improve inspection accountability
- Store information from the timer in a data table.

**Login screen:**

- Create login screen and implement role-based authentication and permissions to ensure data security and controlled access across inspection sites

## Acknowledgements

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