



PSM Protech GmbH

PSM Protech GmbH manufactures high-performance hybrid components by injection-molding plastic directly onto metal substrates, combining both materials’ strengths for use in automotive, electronics and medical applications.



Motivation and Goals

Why this project?

- Reviewing complex mechanical drawings by hand takes up to 2 weeks per part.
- Mistakes can happen—important tolerance requirements might get missed.

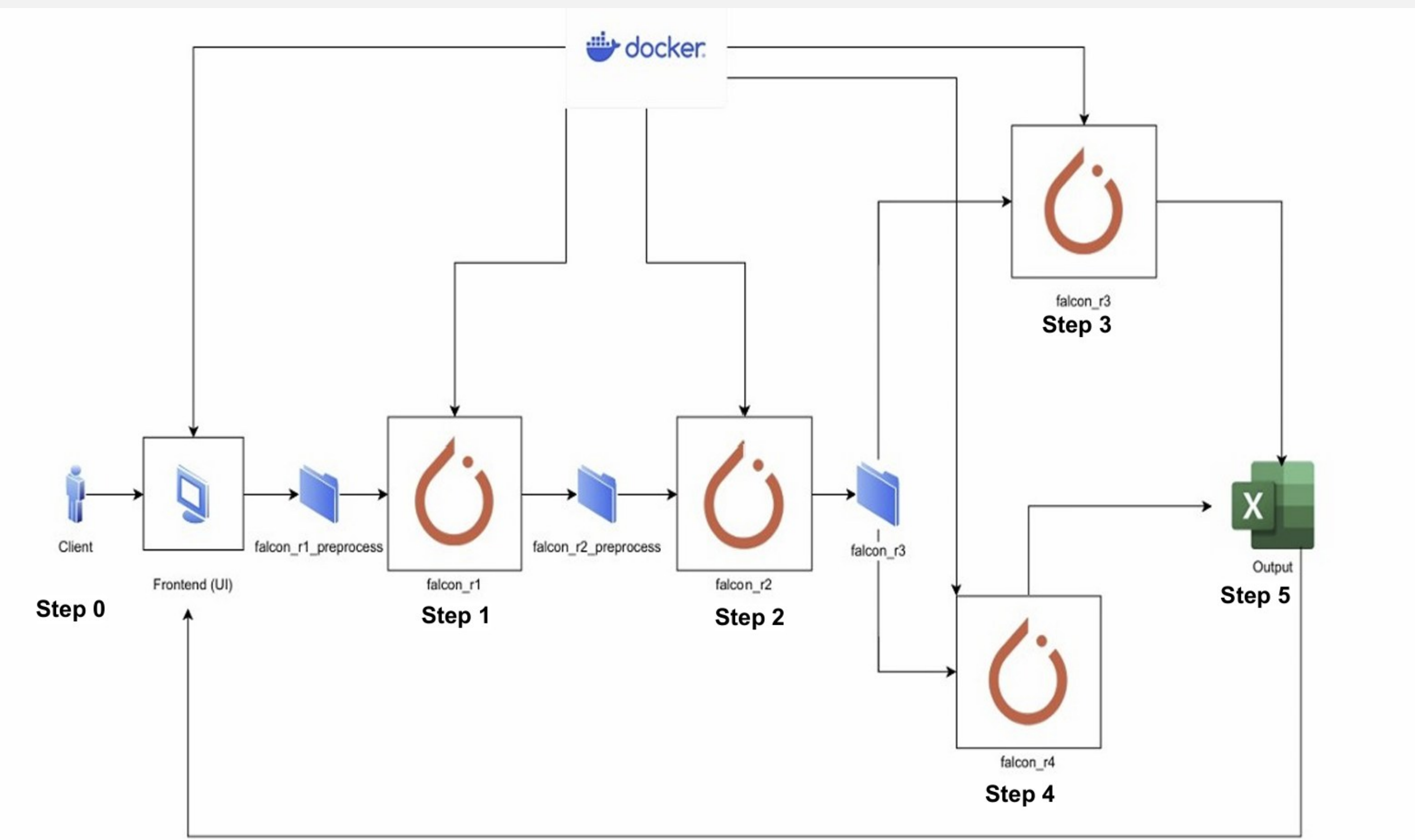
Our goal:

- Use Artificial Intelligence (AI) to automatically read tolerance information from engineering drawings.
- Save engineers’ time and reduce the chance of errors.
- Support PSM Protech’s move toward digital and automated design processes.

Challenges and Constraints

- **Complexity:** Interpreting engineering drawings with AI is a tough technical problem.
- **Time:** Few months are not enough to reach high reliability—more iterations and data are needed.
- **Resources:** Requires large datasets, powerful hardware, and deep expertise to achieve real-world accuracy.

Architecture



AI Tolerance Extraction System

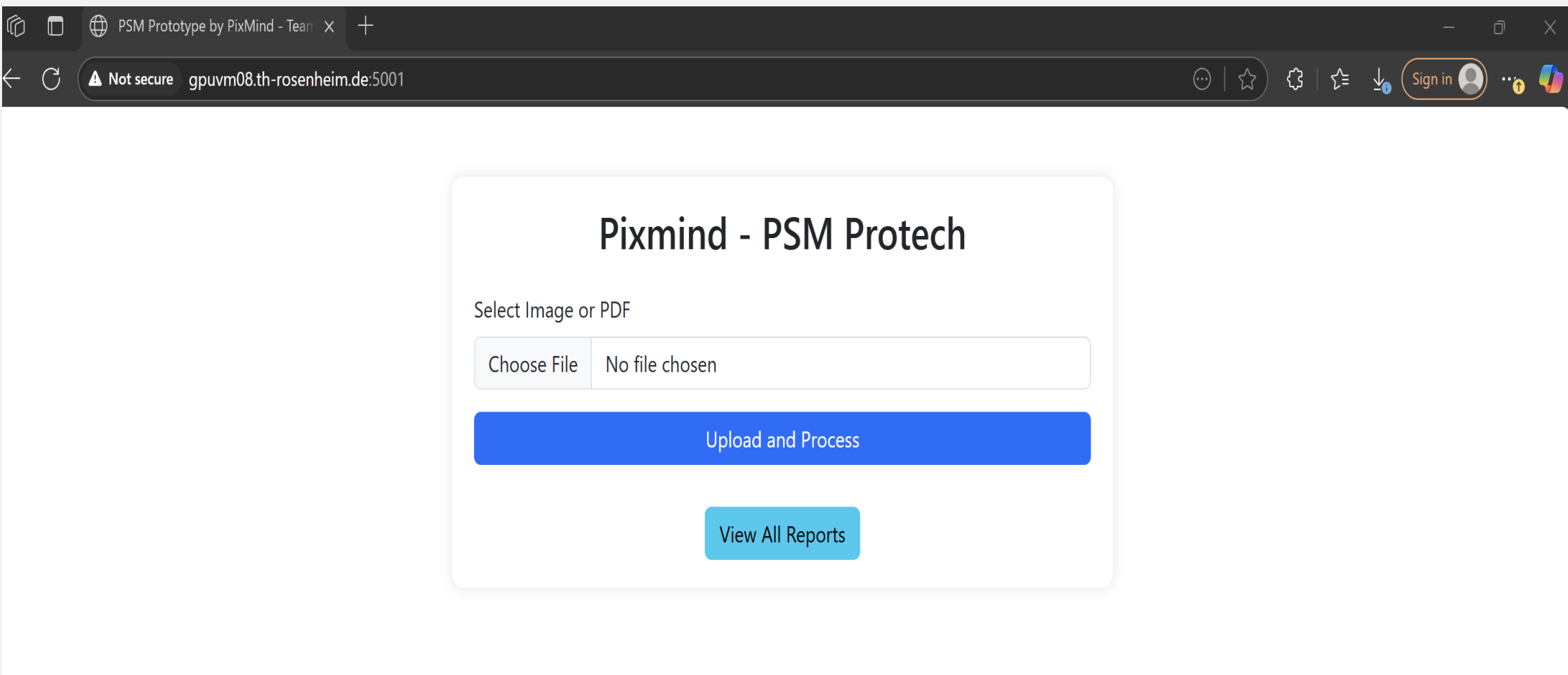
MVP

What we built:

- A system that scans engineering drawings and extracts important tolerance data—no manual data entry needed.

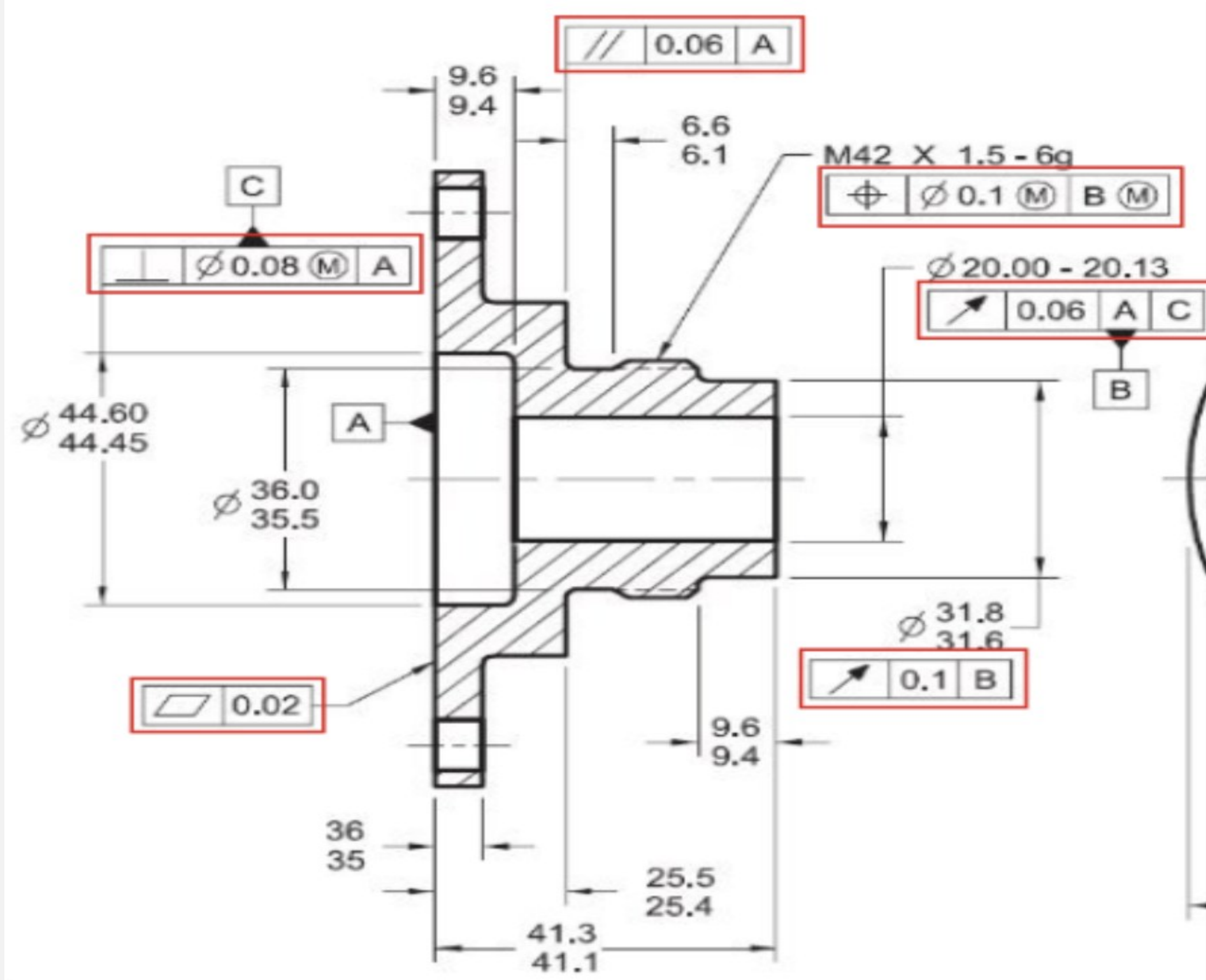
How it works:

- **Step 0:** Client uploads a Blueprint PDF.

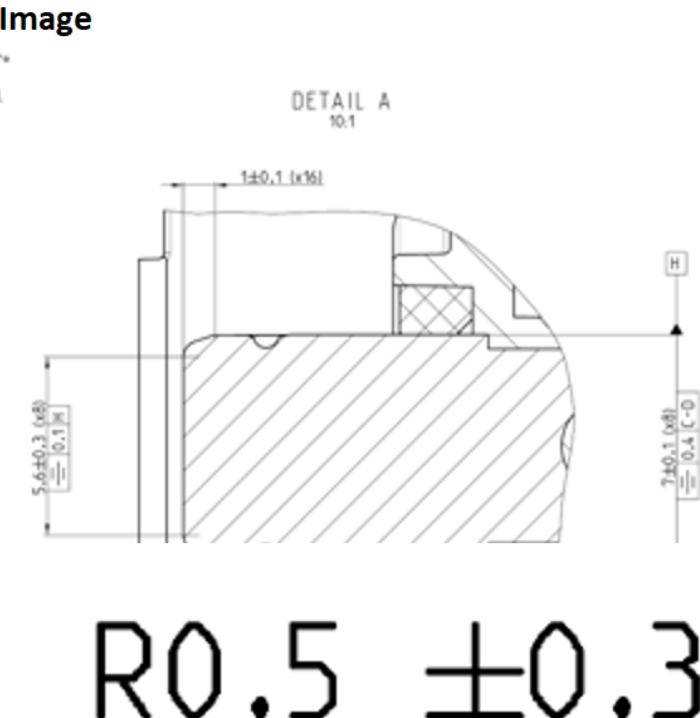


- **Step 1:** Big Crop (falcon_r1): Big Gears are detected and cropped.
- **Step 2:** Small Crop (falcon_r2): Crops out following from the Big Crop . 6.2 ± 0.1 $\begin{matrix} \text{---} \\ \text{---} \\ \text{---} \end{matrix} 0.2 D$

- **Step 3:** Classification (falcon_r3): Identifies what type of symbol it is (e.g., flatness, roundness).
- **Step 4:** OCR-Extraction (falcon_r4): Extract the Dimensions and the Tolerances.



- **Step 5:** Compiles everything into a clean Excel sheet for engineers to review.

Type	Image	Classification	Falcon 4 Extraction
1			
2	Parent Image		DETAIL A10:110,1 (x16)=_OOK. BSleonoSrt \X= 10.4 [C-D
3	Sub-crop	none	none: RQ,5 +0,3

Project Team

Mugesh
Shaheryaar
Ahmed Alyan

Areeb
Alina
Omar