



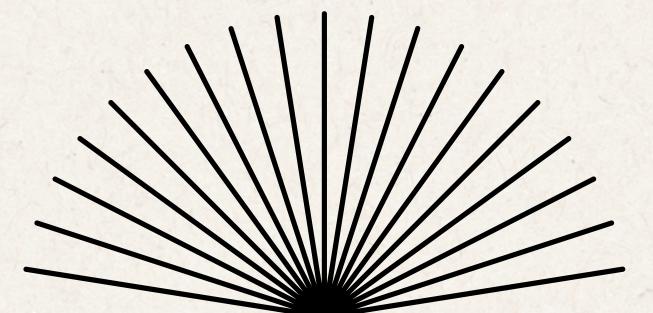
ByteMe tech inc.

P&ID ASSISTANT

View, remix, and save ideas in one vibrant web playground.

PRESENTED BY:

Apoorv Grover
Hitesh Singla
Khushal Hingorani



PROJECT OVERVIEW

Our P&ID Assistant revolutionizes classic piping-and-instrumentation workflows by turning static diagrams into interactive, JSON-driven flowcharts. Combining computer vision, LangChain-powered chat edits, and a realtime dashboard, it slashes manual grunt work—auto-detecting symbols, exporting structured data, and surfacing analytics at the click of a button. The result? Engineers iterate faster, collaborate seamlessly, and gain actionable insights from every P&ID.

01 Our industry still hand-edits P&ID diagrams in CAD tools super manual and error-prone

02 Build an end-to-end AI-powered P&ID Assistant that:

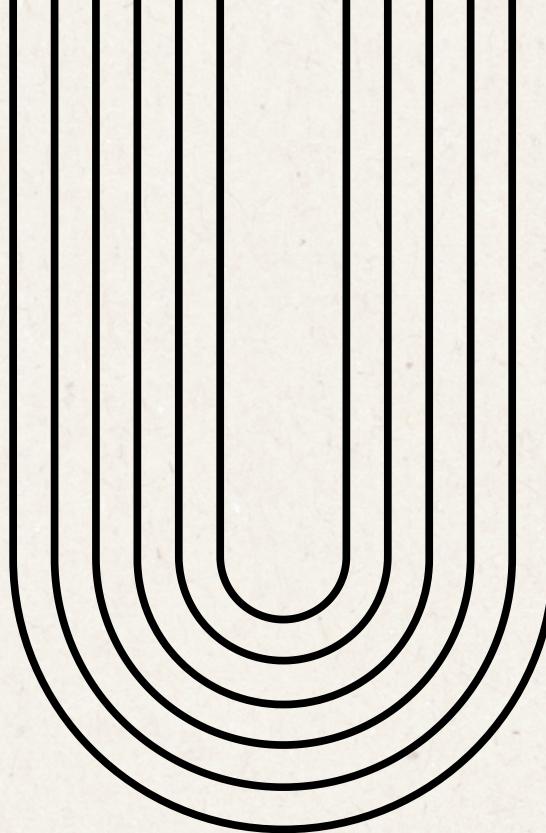
- Auto-detects & labels symbols and text
- Emits a live JSON tree for React-Flow-style flowcharts

03 >95 % detection accuracy on benchmark P&IDs

70 %+ reduction in manual drafting & revision time



Objectives and Goals



Goal # 1

Revolutionize P&ID Workflows



Goal # 2

Boost Engineer Productivity



Goal # 3

Deliver Data-First Insights



Resource Page

Symbol Detection & Counting

- Used the Automated-PnID-Symbol-Detection-and-Labelling model to spot & tally pumps, valves, sensors, etc.

Flowchart & JSON

- jsontree + JSON Schema to map symbols into nodes/edges.
- OpenAI (GPT-4) + Google Gemini 2 Flash handle natural-language flow edits & plan generation.

AI Orchestration

- LangChain Agents route user chats into JSON diffs or analytics calls.
- MCP Server hosts each micro-agent (detection, JSON builder, chat, analytics) as REST services.

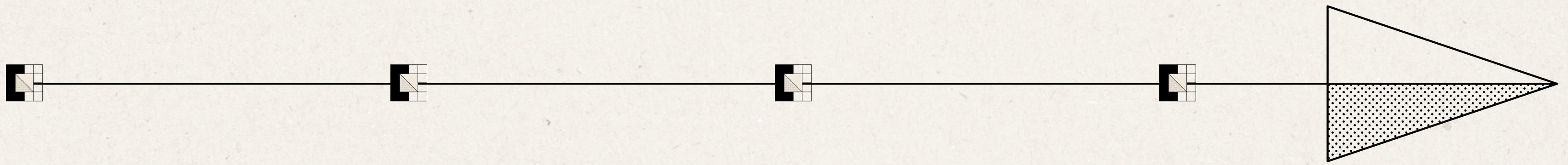
Frontend & Dashboards

- React-Flow for drag-n-drop diagrams.
- Google Gemini 2 Flash for the Info tab's counts, BOM exports, and KPI charts.

Infra & Data

- MongoDB Atlas for JSON/version history.
- Docker + Kubernetes (via MCP) & GitHub Actions for CI/CD.

Timeline



1st Quarter

Structure and methodology

2nd Quarter

frontend and model selection

3rd Quarter

ai agents and backend integration

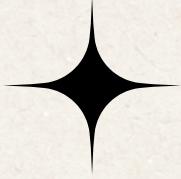
4th Quarter

polishing and final testing

Our team

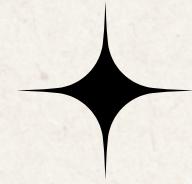
APOORV GROVER

AI dev and mcp server
integration



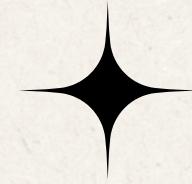
HITESH SINGLA

Frontend dev and
integration



KHUSHAL HINGORANI

Backend dev



thank you