



B.O.M.B.A.

PCBA BOM Parsing

Digitalisation & Part Replacement Optimisation

Bosch AI Agent Hackathon 25/6/2025

Imagine you want to build a chair...







Overwhelmed!

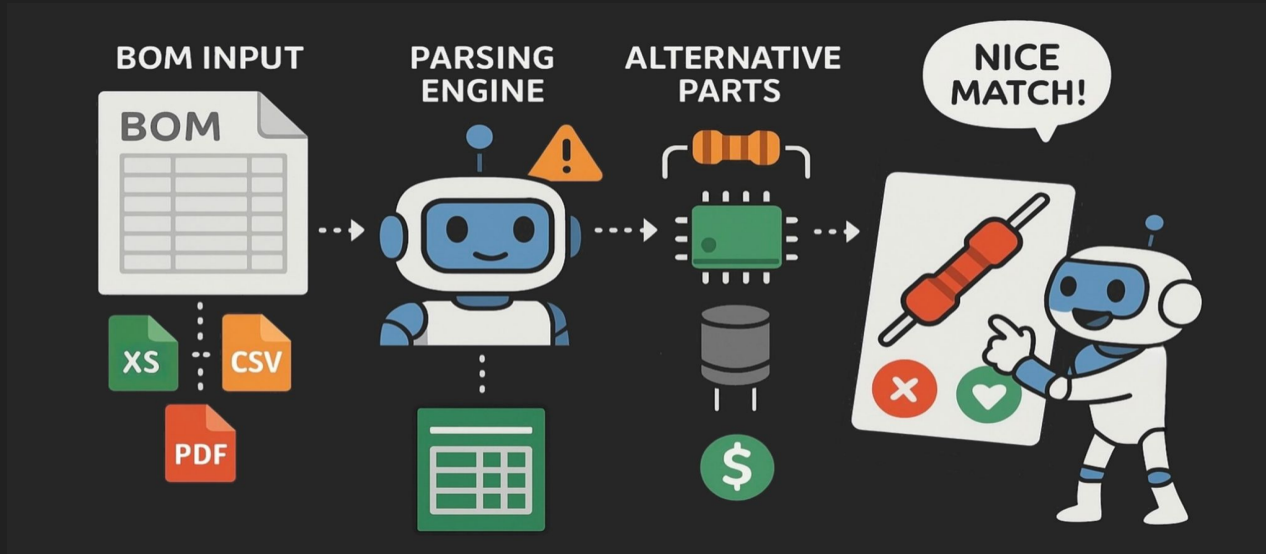
The image shows a perspective view down a hardware store aisle. On both sides are tall metal shelving units. The shelves are densely packed with various types of hardware, primarily screws and bolts. Many of these items are packaged in small, uniform blue and white cardboard boxes, which are arranged in neat rows. Some items are also displayed in open cardboard bins or loose on the shelves. The aisle is well-lit by overhead fluorescent lights, creating a bright but somewhat sterile atmosphere. The sheer volume and variety of the products create a sense of being overwhelmed, which is emphasized by the large white text 'Overwhelmed!' centered over the middle of the image.

Overwhelmed!



The challenge

Build an agentic AI system that can take Bill of Material (BOM) files as input, understand it, and recommend the best components available on the market



The agentic solution



Ask for user
input



Parse &
understand
BOM



Retrieve
component data &
alternatives



Analyze &
evaluate
alternatives

I found 6 potential alternative components.
I have selected **TDK CGA1E3X81E105M000AB** from manufacturer TDK for this project. The best offer for 1000 pieces which is a critical industry standard for automotive applications, ensuring high reliability and performance in harsh environments, lead-free, and operating within the required temperature range of -55 °C to +85 °C.

Rank	Component Name	Manufacturer	Manufacturer lead time	Best price (unit / total for 1000)	Name of seller and country	Expected supplier reliability	Time of set
1	TDK CGA1E3X81E105M000AB	TDK	168 days	\$0.02773 / \$27.73	Bettlink (HQ)	●	11
2	Yageo Group CCG503MR05R8BB105	Yageo Group	112 days	\$0.005 / \$5.0	YIC International (HQ)	●	25
3	KYOCERA AVX 06033D105MAT2A	KYOCERA AVX	56 days	\$0.014 / \$14.0	Amplify Systems (MY)	●	25

Generate
output

Gemini

Underlying main agent orchestrates conversation
and helper agents

Demo walkthrough



Start demo

Impact and next steps

B.O.M.B.A. **saves many hours** in component selection, **reduces errors** and **adapts instantly** to supply chain changes

Future versions will:

- ✓ Refine component selection with additional data & knowledge
- ✓ Improve robustness to handle a wider range of API data inputs
- ✓ Improve UX to guide user through all components step-by-step
- ✓ Automatically export a quotation based on the selected components

Thank you!



Andy



Daniel



Karolina



Kirsten



Leon