AI Quotation Scanner: Turning Engineering Drawings into Quotations

A PGDM student at Lexicon MILE's HyperBuild AI Lab built an AI tool for Mahekk Industries that reads engineering drawings and produces a costed quotation, cutting the average quotation time in testing by about 78%, from roughly 45 minutes to roughly 10.

About Mahekk Industries

Mahekk Industries manufactures and supplies standard and non-standard shims, with a core strength in precision manufacturing. Its customers work in engineering, automation, robotics and other industrial applications, where parts vary widely in shape, size and specification.

In this kind of business, customers rarely send a neat product code. They send an engineering drawing, as a PDF, a scan, a photograph or a Word document, and expect a quotation back quickly. How fast and how accurately Mahekk can turn that drawing into a price directly affects response time, customer experience, order conversion and margins. A student of the PGDM programme at Lexicon MILE's HyperBuild AI Lab worked with Mahekk's team on this problem as part of the Business Immersion Program (BIP).

Challenges Faced

Mahekk's quotation process began when a customer emailed a drawing. An employee then inspected it by eye, picked out the manufacturing dimensions, and typed them into a legacy Excel costing sheet to calculate the price. That works for a handful of inquiries, but it gets harder to sustain as volume grows, and a wrong dimension can change the final price: too low and Mahekk loses margin, too high and it loses the order.

Our analysis showed the deeper issue was not Excel itself. The information Excel needed sat in an unstructured visual format, so every quotation required the same manual step at the same point. This created five pain points:

- **Manual dimension extraction.** Drawings arrive as photos, scans, PDFs and documents, and need human interpretation. This was the main bottleneck between receiving a drawing and issuing a quote.
- **Manual re-entry into Excel.** Dimensions had to be typed into the costing sheet before any calculation, creating a direct risk of pricing errors.
- **Typing errors.** Dimensions copied from a drawing can be entered wrongly, leading to under-pricing, over-pricing or disputes.
- **A scalability constraint.** The process depended on an employee's time for each individual drawing, so turnaround stretched as inquiries grew.
- **No central visibility.** Management had no real-time view of processed parts and quotations, which limited monitoring, capacity planning and historical review.

The project's central question was how AI could extract dimensions and shape information from engineering drawings, feed them into Mahekk's existing costing rules, generate professional quotation reports, and give management real-time visibility of the pipeline.

Research Method: Our Problem-Solving Approach

We used an applied, mixed-method approach. The qualitative side focused on understanding the existing quotation workflow, its pain points, and the dimensions and costing rules the system would have to reproduce. The quantitative side tracked the drawings and application records used in development and testing, along with the change in quotation time and the behaviour of the extraction engine. The work moved through five stages: understanding the current process, collecting and reviewing data, defining business and technical requirements, building and testing the solution, and evaluating outcomes against the original problem.

- **Secondary research.** We reviewed how AI document processing, OCR and computer vision are used for quotations in industry. Traditional OCR struggles with technical drawings that have many dimensions, symbols and irregular layouts, while modern AI vision models can combine visual understanding with language-based extraction. The research also supported a hybrid design, in which AI interprets the drawing and a deterministic engine calculates the price.
- **Process observation.** We watched how drawings are received, how employees identify relevant dimensions, how data goes into the Excel costing system, and how quotations are produced.
- **Requirement discussions.** We agreed with Mahekk the fields the system must capture (length, width, diameter, thickness, holes and slots) and the shape categories it must recognise (rectangular, circular and slotted).
- **Testing and feedback.** We reviewed representative drawings and tested the extraction and quotation workflow. Feedback showed the need for a manual override where the AI is not confident or the geometry falls outside the supported categories.

The data behind the project, gathered between May and July 2026, included more than 500 sample engineering drawings in image, PDF and Word formats, Mahekk's master costing sheet, a list of 11 client organisations for context, and roughly 300 scan logs and test quotations from the application. We did not build a new pricing model. The goal was to automate how information flows into Mahekk's existing costing logic.

Solutions Delivered

We built two connected web applications: the **AI Quotation Scanner**, which turns a drawing into a quotation, and a password-protected **Admin Page**, which gives management a view of everything processed. Both run in a browser with nothing to install.

The design follows one principle: use AI where a human would otherwise have to interpret an unstructured drawing, and use fixed business rules wherever pricing must stay consistent and auditable. The AI reads the drawing, but the final price always comes from Mahekk's own costing rules. That separation also means Mahekk can improve the AI layer later without touching its commercial logic. Here is how a drawing becomes a quotation:

1. **Upload.** The user uploads a drawing as an image, PDF or Word file, or takes a photo.
2. **AI extraction.** The AI interprets the drawing and pulls out length, width, diameter, thickness, holes and slots.
3. **Shape categorisation.** The part is classified as rectangular, circular or slotted.
4. **Manual check.** The user can verify or override anything the AI is unsure about.

5. **Automated costing.** A rules-based engine applies Mahekk's established costing rules to calculate the price.
6. **Reports.** The system produces downloadable Excel and PDF quotation and specification reports.
7. **Records.** Every processed part and quotation is stored in a database and appears on the Admin Page.

The Admin Page gives authorised managers a real-time table of processed parts and quotations, with dimensions, shape, material and calculated cost. It also offers a quotation summary organised by company and date, search across historical records, weekly scan-activity charts, and one-click access to the generated Excel and PDF reports.

Business Impact

In testing on more than 500 sample drawings between May and July 2026, the AI Quotation Scanner cut the average time to produce a quotation from about 45 minutes to about 10. That saves roughly 35 minutes per quotation, a reduction of about 78%. For a business that depends on quick turnaround, that is the difference between answering a customer in the same session and leaving them waiting. The wider results were:

- **Accurate extraction.** The system extracted dimensions with 95%+ accuracy across the 500+ sample drawings tested so far, with a manual override for edge cases.
- **Fewer re-entry errors.** Removing manual retyping lowers the risk of transcription mistakes that lead to under-pricing or over-pricing.
- **Management visibility.** Mahekk now has a searchable record of processed parts and quotations, with activity analytics, that did not exist in one place before.
- **Capacity to scale.** The system was designed to handle peak workloads of up to 200 quotations a day.
- **Familiar outputs.** Mahekk keeps its Excel and PDF quotation formats while the upstream process is modernised.

These results, both the time saving and the accuracy, come from testing so far on 500+ sample drawings, not from a full company-wide rollout. The scanner works best on clear, high-resolution drawings and supports three shape categories for now. Commercial indicators such as quotation win rate and margin still need to be tracked over a longer period.

AI Tech Stack Used

Layer	Technology	Role
AI dimension extraction	Claude Opus API (vision)	Reads engineering drawings and extracts dimensions and shape information
Costing logic	Rules-based calculation engine	Applies Mahekk's established costing rules to the extracted data
Application	Node.js web app (Scanner and Admin Page)	Drawing upload, quotation generation, record management and analytics
Database	Neon (serverless Postgres)	Stores processed parts, dimensions and quotation records
Hosting	Netlify for the prototype, then Vercel (serverless)	Prototype validation, then the live deployment
Reporting	Excel and PDF generation libraries	Downloadable quotation and specification reports

AI is used only for interpreting the drawing. The price itself comes from a deterministic engine, so every quotation stays traceable to known business rules. The application moved from Netlify to Vercel once the prototype was validated, then was connected to the Neon database.

Students Involved

This project was researched, designed and built by **Nirmala Saha**, a student of the PGDM programme (Batch 2025–27) at Lexicon MILE, as part of the Business Immersion Program at HyperBuild AI Lab.

She worked under the guidance of Prof. Deepak Gupta, Head – AI & Analytics, and Mr. Manish Chaubey, Manager, IT & HyperBuild, with Dr. Raju Varghese, Director, Global Programs & International Campus. Mahekk Industries' management and team shared the quotation workflow, drawing requirements, costing practices and feedback that shaped the system.