

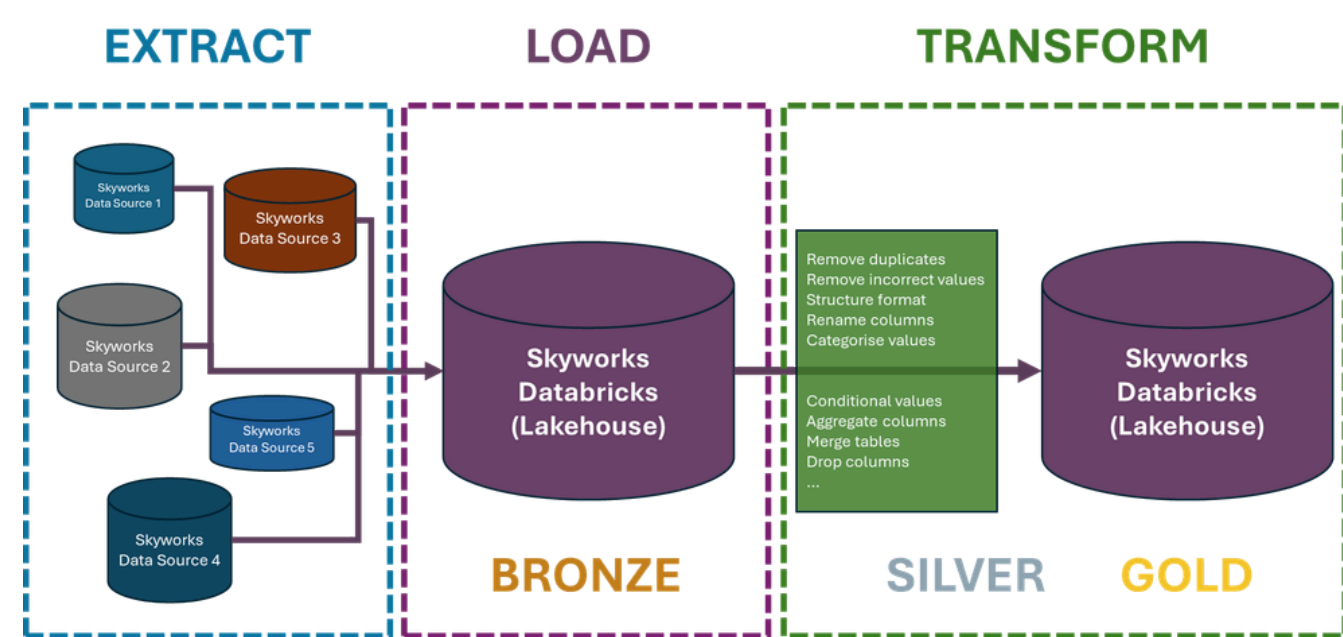
PROJECT OVERVIEW

COMPANY BACKGROUND

Skyworks Solutions, Inc. is a global semiconductor company operating across 17 countries, comprising numerous departments each managing their own data. The New Technology Introduction (NTI) team develops and tests new semiconductor technologies across the manufacturing process.

PROBLEM DESCRIPTION

Previously, data was siloed across departments, limiting cross-team visibility and hindering decision-making. Teams relied on significant manual effort to consolidate and analyse information. To address this, Skyworks introduced Databricks to centralise data via an ELT pipeline (shown below), organising it across 3 layers of increasing quality and structure known as the Medallion Architecture. The prevailing issue is that NTI datasets currently remain at the Silver layer. They are cleaned but insufficiently structured for effective business decision-making, and lack intuitive visualisations for non-technical stakeholders.



OBJECTIVES

This project therefore aims to design a scalable data integration framework that transforms Silver datasets into Gold-level, business-ready data via a transparent and maintainable pipeline, while delivering intuitive visualisations accessible to users across all levels of technical expertise.

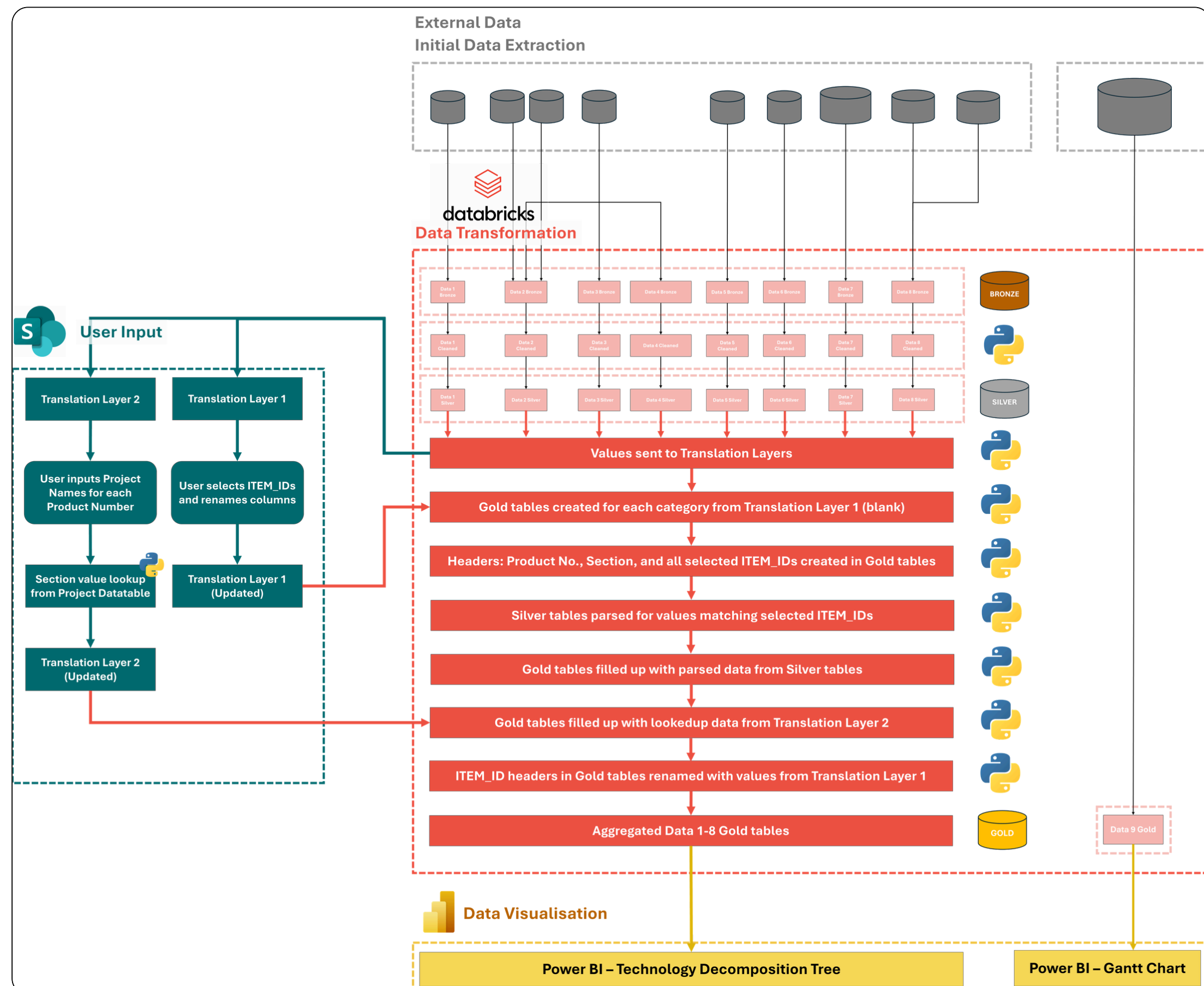
METHODOLOGY

PROPOSED APPROACH

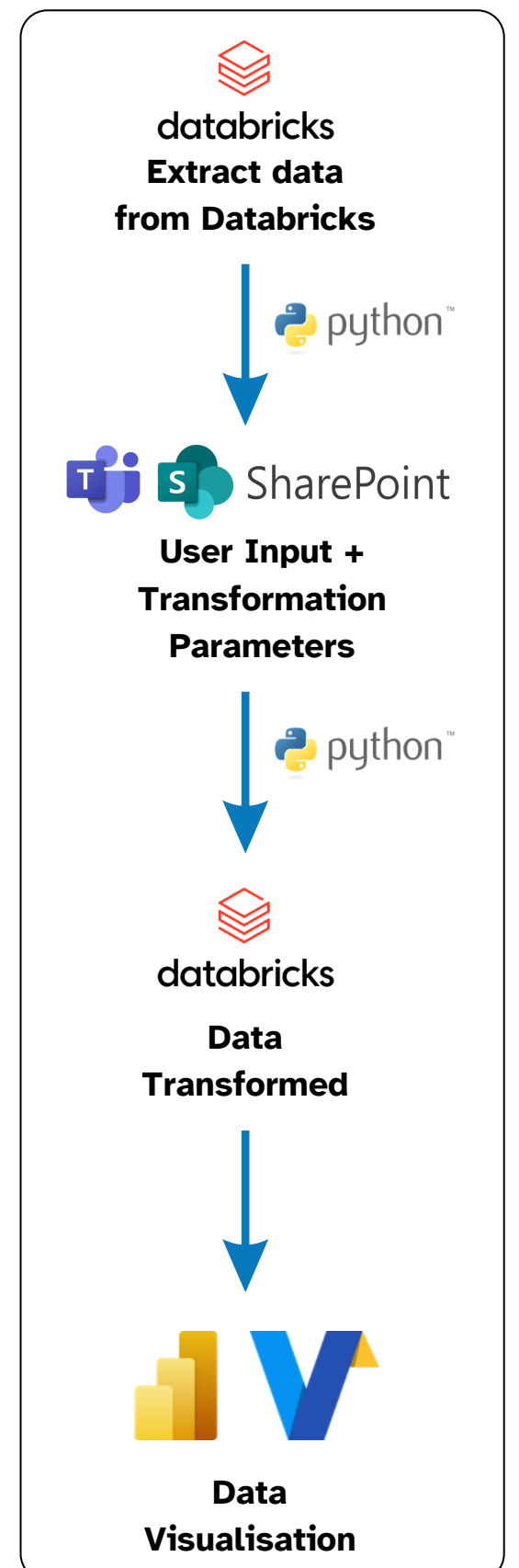
Our approach designs a structured 3-stage pipeline to convert NTI datasets into a usable format, using a translation layer where transformation rules are stored in mapping tables instead of being hardcoded. This improves transparency, maintainability, and adaptability.



SYSTEM ARCHITECTURE

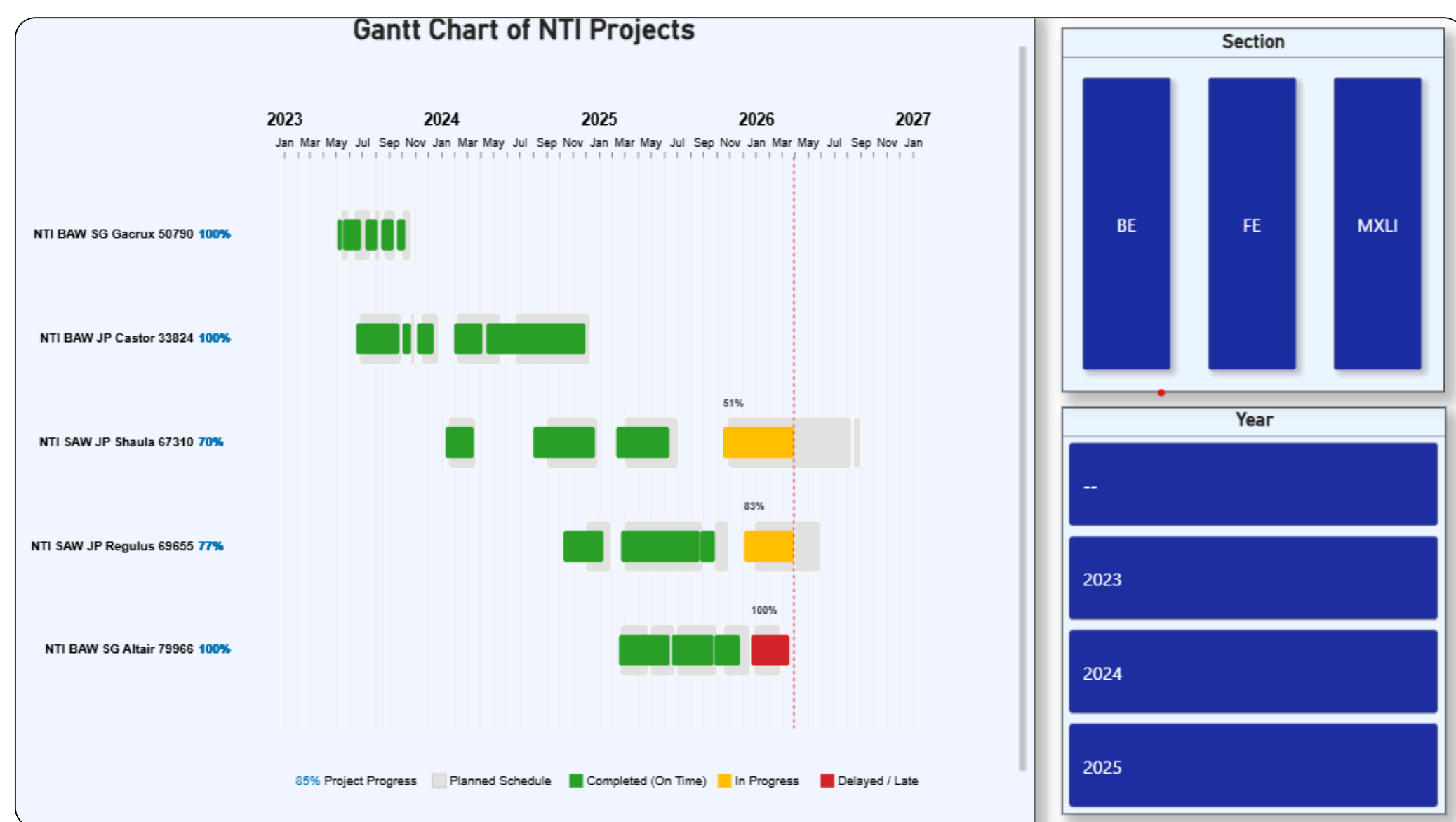


TECH STACK & PROCESS FLOW



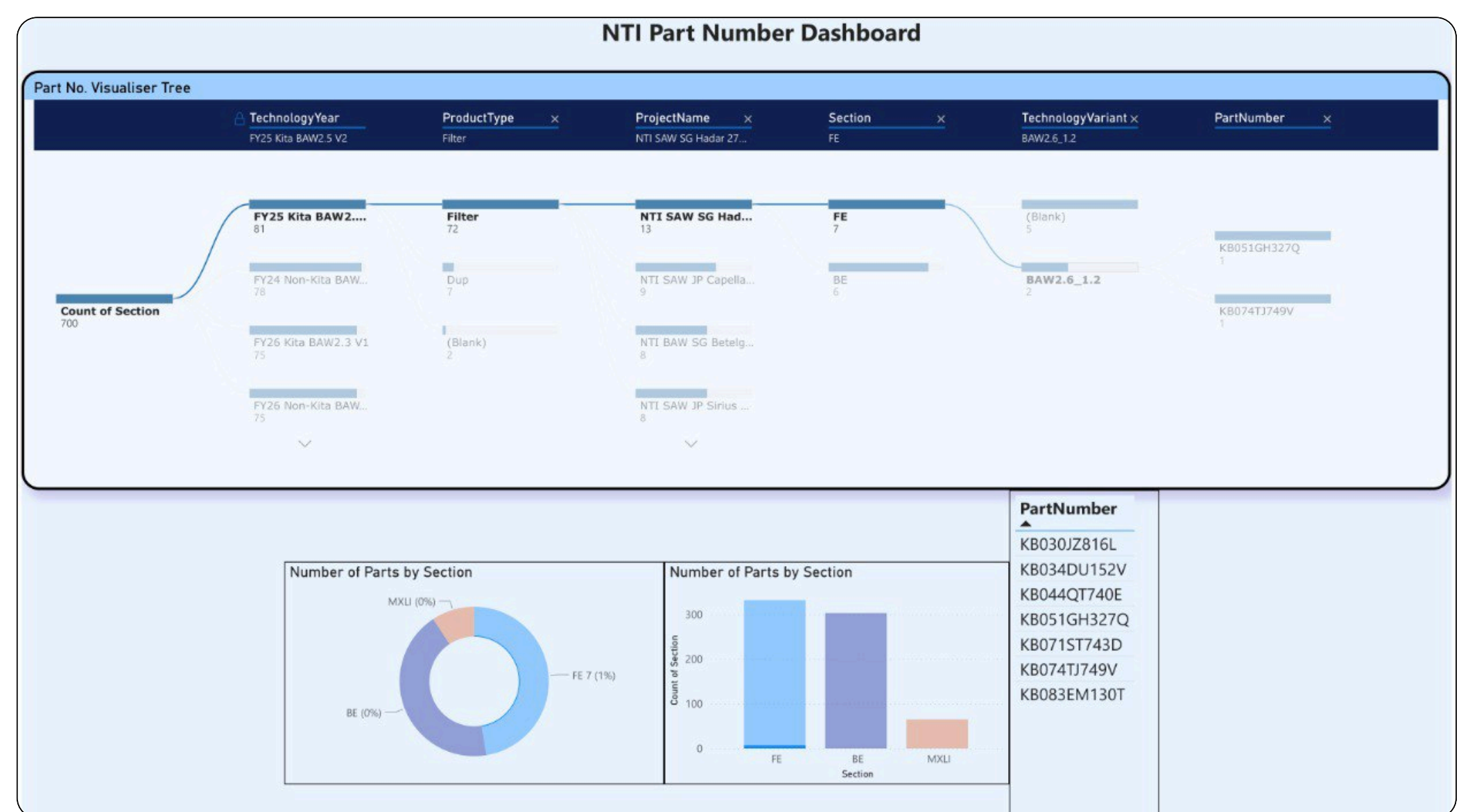
RESULTS

GANTT CHART OF NTI PROJECTS



Our Gantt chart enables multi-project timeline tracking across all active NTI projects. Unlike a traditional Gantt chart where each phase occupies a separate row, all phases are condensed into a single bar per project for readability across a large portfolio. The colour coding categorises project statuses into 'Completed', 'In Progress' and 'Delayed', with overall completion percentage displayed per project, and filters for Section and Year to quickly identify delays and bottlenecks.

DECOMPOSITION TREE FOR PART NUMBERS



The Decomposition Tree breaks down NTI's tracked parts into a 6-level navigable hierarchy from Technology Year through Product Type, Project Name, and Section, down to individual Part Numbers. Users can drill into any node to interactively filter visuals and instantly identify outliers, trends, and performance gaps at any level. The donut and bar charts provide both absolute and proportional overviews of part distribution across section types.

CONCLUSION

BUSINESS IMPACT

The framework empowers stakeholders at all levels to independently interpret and act on data without relying on technical teams. The translation layer allows NTI engineers to update transformation rules themselves without modifying any code, ensuring the solution remains functional and relevant beyond project handover. Together, these address the fragmented information, manual consolidation processes, and unequal access to insights across the organisation.

FUTURE IMPROVEMENTS

- Real-Time Dashboard Updates
- Data Validation on User Input
- Automated Alerts on Project Delays
- Mapping Table Version Control for Traceability

SKILLS ACQUIRED

- Sustainable Pipeline Architecture
- Dashboard Development
- Cloud Data Management
- Process Analysis and Improvement