GenAI integration in Industrial & Mobility Sector

>

ABC's Product Portfolio
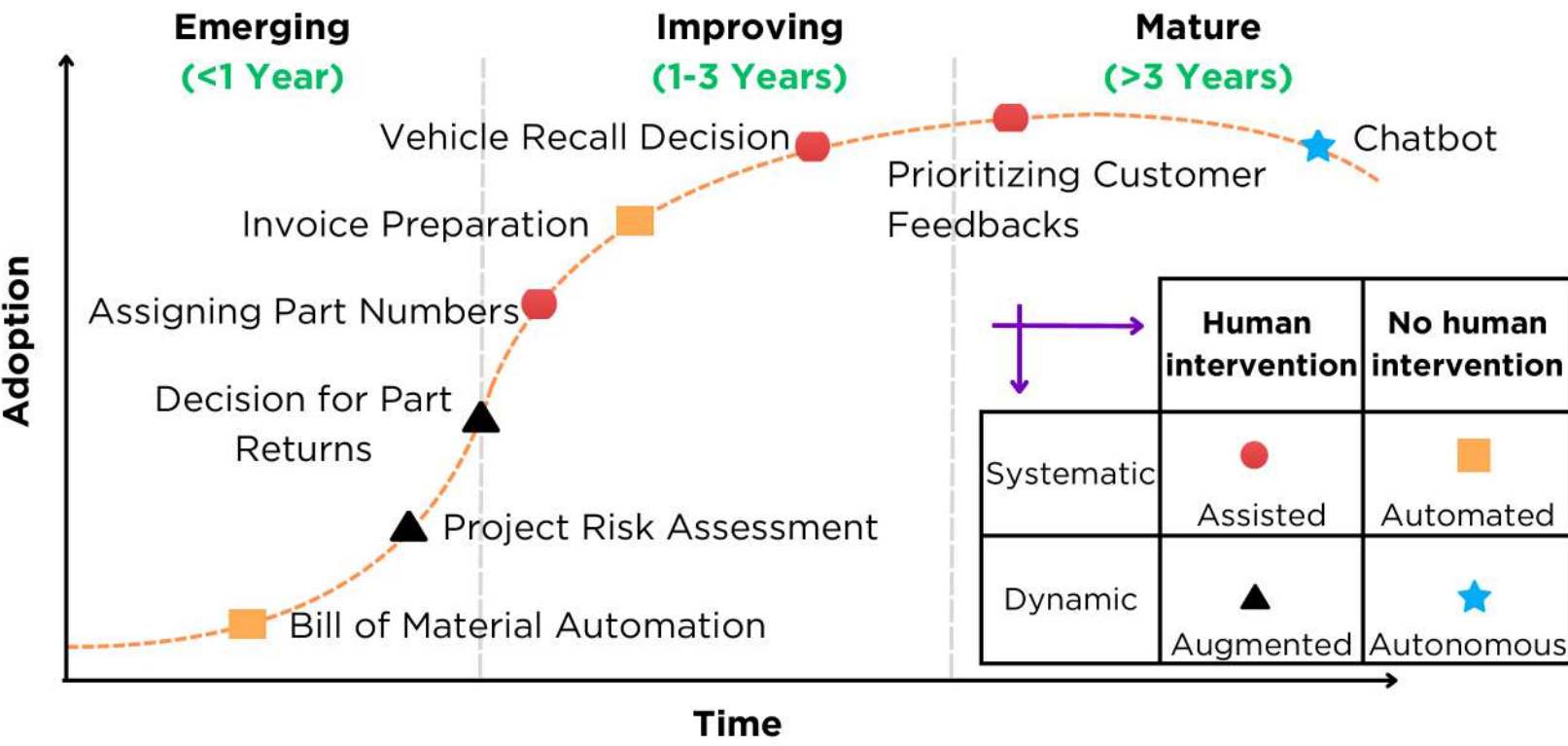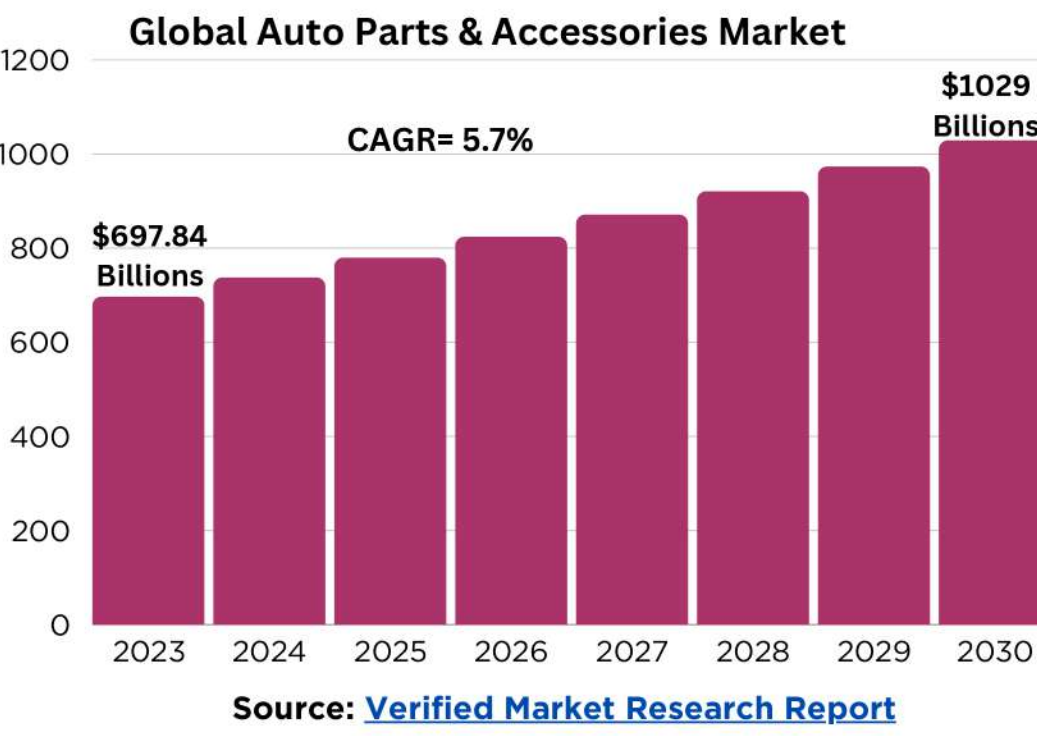
- Interior systems
- Emission Control Technologies
- Active Safety Features (ADAS)
- Lighting Solutions
- Advanced Electronics

Overview

ABC, a global automotive supplier, is behind its competitor in ISM department leading to **customer dissatisfaction**, **increased operational costs,** and **loss of market share**. Its significant portion of Project Management resources is allocated to risk assessments and handovers. ABC struggles with challenges in inventory management and manual BOM creation, delayed issue resolution, limited visibility into returns status, unavailability of on-field resources and missed opportunities to leverage feedback for customer-aligned product development. ABC is **exploring to integrating Gen AI** into the firm's ISM operations to stay competitive and gain an edge in the industry.

Global Auto Parts & Accessories Market

CAGR= 5.7%

$697.84 Billions (2023)
$1029 Billions (2030)

Years: 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030

Source: Verified Market Research Report

Use Cases

GE — Automating the analysis of **Claim Comments** by processing massive volumes of repair data that are traditionally reviewed manually by engineers leading to errors and latency. - **Automated Claim Processing** (Source: Industry report)

BOSCH — Achieved **15% reduction** in **cycle time** during production ramp-up at their **Hildesheim** plant in Germany by training their **Optical inspection algorithm** with synthetic images generated with Gen AI. (Source: World Economic Forum Report)

SAMSUNG — Samsung leverages Gen AI for **sentiment analysis** across various **customer feedback channels** like social media, surveys and service interactions to identify improvement areas and product development. (Source: Blog)

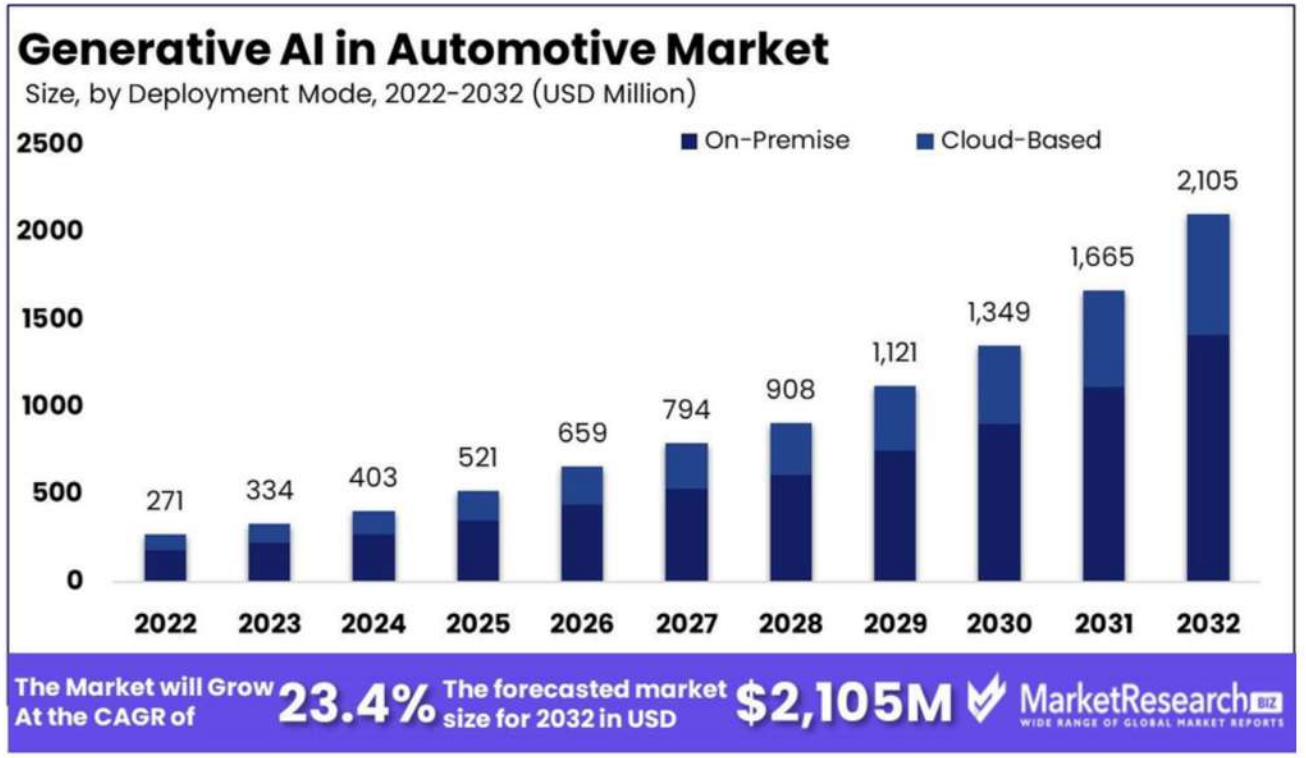**U. S. Steel / Google Cloud** — U.S. Steel's **MineMind™ application**, powered by Google Cloud's Gen AI, has reduced maintenance work order times by **20%**, by assisting maintenance crews by guiding them through truck repairs, ordering parts and providing verified references on-spot. (Source: News)

Adoption vs Time

- Emerging (<1 Year)
- Improving (1-3 Years)
- Mature (>3 Years)

- Chatbot
- Vehicle Recall Decision
- Prioritizing Customer Feedbacks
- Invoice Preparation
- Assigning Part Numbers
- Decision for Part Returns
- Project Risk Assessment
- Bill of Material Automation

	Human intervention	No human intervention
Systematic	● Assisted	■ Automated
Dynamic	▲ Augmented	★ Autonomous

North Star Metrics for GenAI revolution

- Build Business Adjacencies
- Expand Market Access
- Customer Satisfaction

Generative AI in Automotive Market

Size, by Deployment Mode, 2022-2032 (USD Million)

On-Premise / Cloud-Based

Year	Value
2022	271
2023	334
2024	403
2025	521
2026	659
2027	794
2028	908
2029	1,121
2030	1,349
2031	1,665
2032	2,105

The Market will Grow At the CAGR of **23.4%** The forecasted market size for 2032 in USD **$2,105M** MarketResearch.biz WIDE RANGE OF GLOBAL MARKET REPORTS

Installation and Project Management

3D/0D Data Collection → **2D/0D** Data Analysis → **2D/1D** Risk Identification → **2D/1D** Risk Mitigation → **3D/1D** Periodic Risk Review
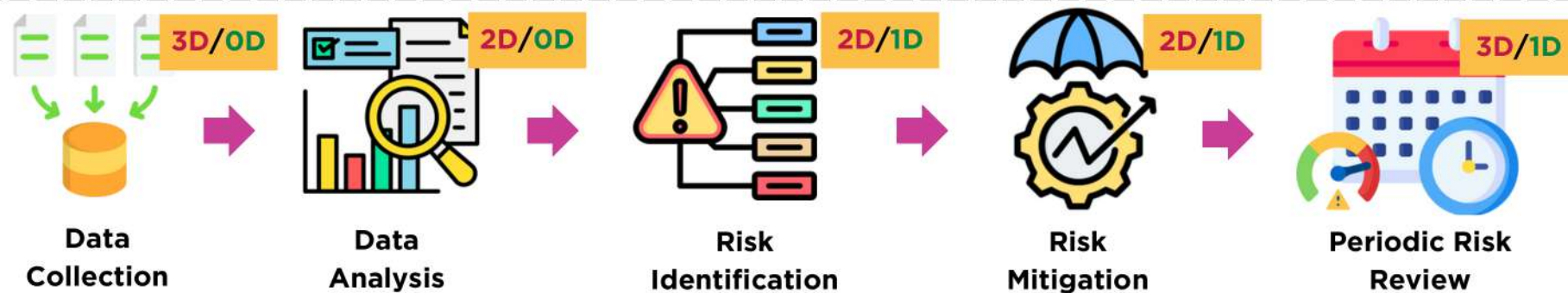
- Analyzes extensive internal (project risks, financial records, historical data) and external data (market trends, regulatory changes).
- Identifies patterns and makes data-driven predictions for continuous risk mitigation.
- Quantify the likelihood and impact of identified risks, enabling proactive risk management.

Benefits
- Manpower & Other Resource Reduction
- Immediate insights into emerging risks, allowing for quicker responses
- Risks monitored continuously to reduce potential surprises.
- Reduce subjectivity in risk assessment, leading to more consistent & reliable outcome.
- Analyzing comprehensive data sources leading to more accurate predictions

2D/0D Checklist Preparation → **5D/0D** Manual Preparation → **2D/1D** Handover Report → **3D/1D** SOP Preparation → Handover
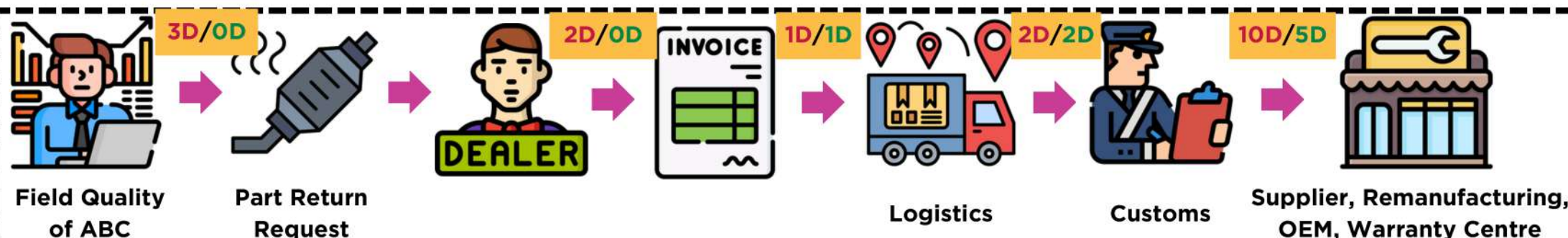
- GenAI can prepare checklist by analyzing project data, including tasks, milestones, and deliverables.
- Automatically compiled handover report as per project management tools, task completion statuses, quality check results, and any final reviews.
- GenAI can prepare manual using technical specifications, design documents, and historical manuals.
- GenAI can generate SOP using project-specific data, industry best practices, and existing SOP templates.

Benefits
- Reduces the time and resources required to create and update documents manually.
- Minimizes human errors by generating documents based on real-time & accurate data.
- Ensures that all documentation is consistent in format, content, and quality.

Customer Service Department

3D/0D Field Quality of ABC → Part Return Request → **2D/0D** DEALER → INVOICE → **1D/1D** → **2D/2D** Logistics → Customs → **10D/5D** Supplier, Remanufacturing, OEM, Warranty Centre

- GenAI instantaneously analyzes complaints and decides whether to place a part return request or not, reducing delays.
- Invoice will be automatically generated upon request reception by GenAI reducing manual intervention by dealer, which will be instantly shared with the logistics team.
- Logistics team receives immediate notification and starts parts pickup without delay
- GenAI reduces holding time at customs by checking past handling data and automatically creating checklists & drafting necessary documents.

Benefits
- Quick analysis and response to complaints, reducing delays in placing part return requests
- Eliminates manual invoice generation and communication lag, streamlining the workflow.
- Automated invoice generation and documentation reduce the risk of errors.
- By minimizing delays and manual work, operational costs are reduced, leading to increased profitability.
- Quicker response times and more efficient processes lead to higher customer satisfaction.

DEALER **11D/6D** → **8D/2D** Analysis → **4D/1D** Yard Secure and Recall + RECALL Lot Secure
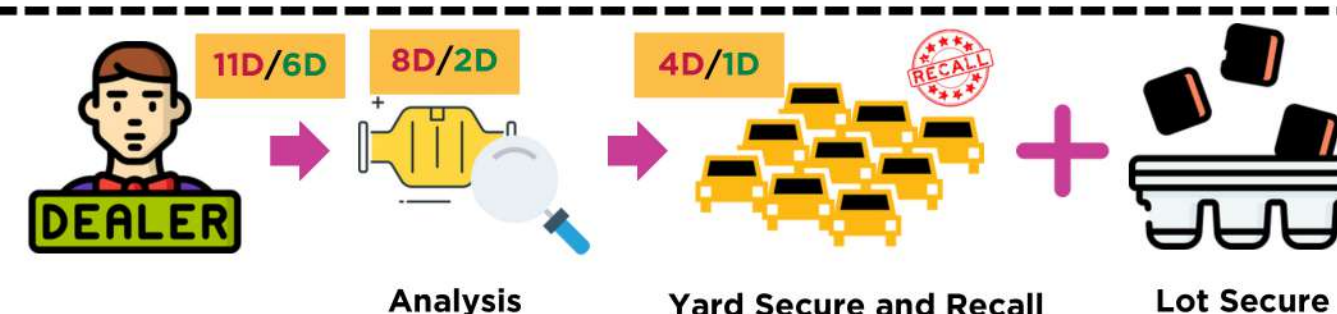
- GenAI analyzes the defective part based on past data and present issue to quickly identify if the failure is new or has occurred previously.
- Assesses the risk associated with the failure and recommends the appropriate action (yard secure, lot secure, or recall).

Benefits
- Speeds up the decision-making process and ensures that decisions are based on comprehensive data analysis.
- Reduces subjectivity in the analysis, leading to more reliable and consistent decision.
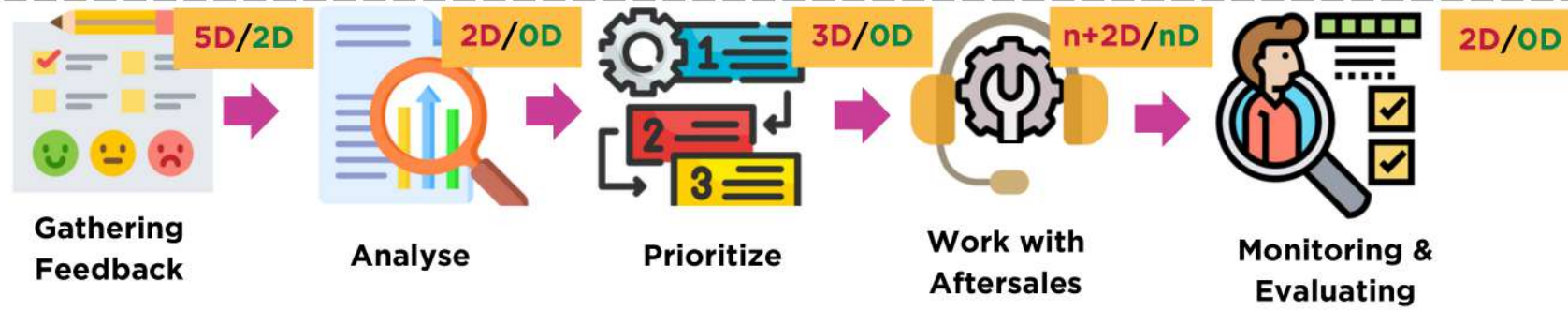- Cost Saving due to decrease in manual labour and likelihood of extensive recall.

Aftersales Support

5D/2D	2D/0D	3D/0D	n+2D/nD	2D/0D

Gathering Feedback → **Analyse** → **Prioritize** → **Work with Aftersales** → **Monitoring & Evaluating**
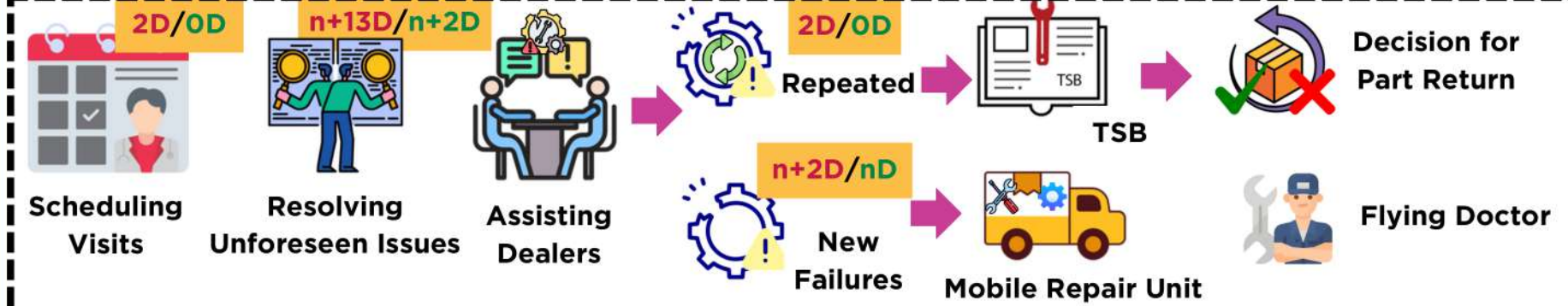
- GenAI quickly processes and analyzes customer feedback and social media data, identifying key issues with greater accuracy.
- Automatically prioritizes issues based on urgency impact, service duration, mileage and other relevant factors, ensuring that the most critical issues are addressed first.
- It enables ongoing monitoring and evaluation of resolved issues, providing real-time insights into the effectiveness of solutions.

Benefits

- Analyze large volumes of customer feedback and social media data with greater accuracy and speed.
- Better & early prioritization of issues based on impact and urgency.
- Provides real-time monitoring, detailed performance metrics, and automated reporting on support activities.

Maintenance & Repair Operations

2D/0D	n+13D/n+2D		2D/0D	

Scheduling Visits → **Resolving Unforeseen Issues** → **Assisting Dealers** → **Repeated** → **TSB** → **Decision for Part Return**

n+2D/nD

New Failures → **Mobile Repair Unit** / **Flying Doctor**

- Maintenance and repair teams visit dealers when assistance is needed for resolving issues, logistics support, or understanding failure rates
- GenAI optimizes and automates the scheduling, accelerates the resolution of unforeseen issues through rapid data analysis and benchmarking.
- It identifies whether a failure is new or repeated, and recommends the appropriate repair method by analyzing TSBs. Also make informed decisions on whether to send a mobile repair unit or a flying doctor on the gravity of failures

Benefits

- Optimized scheduling, ensuring timely dealer support.
- Accelerates the resolution of unforeseen issues through quick data analysis and benchmarking.
- Significantly reduce repair time by instantaneously navigating through TSBs
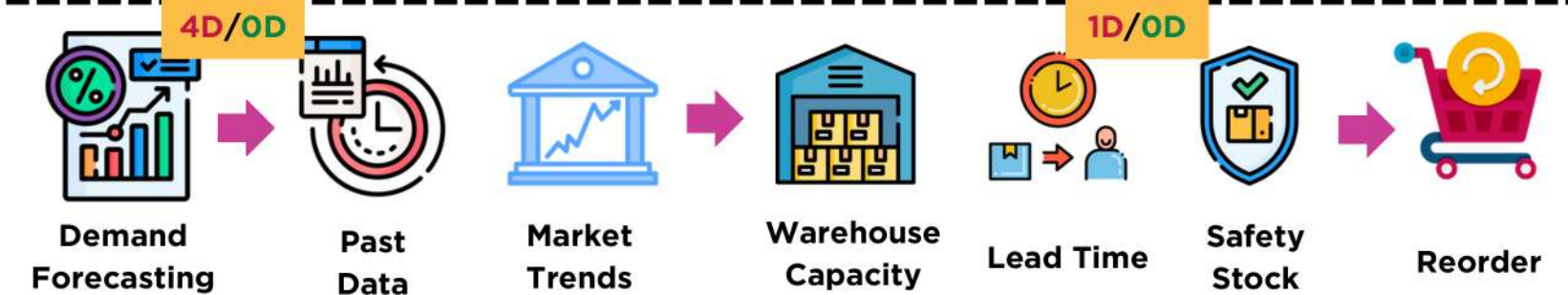- Reduces cost & resources required and increases customer satisfaction

Spare Parts Management

BOM BILL OF MATERIALS

20D/2D	5D/0D	10D/0D		5D/1D

Schematic & Specs Collection → **Assigning Part no.s** → **Recording Information** → **Specifying Quantities** → **Validation from Departments**

- GenAI can automatically identifies specifications and schematics from documentation and images, streamlining the data collection process.
- It can generates unique part numbers, ensuring they are not historically repeated and simplifying the decoding process.
- Part information and quantities can be automatically recorded based on the collected data, reducing manual input and potential errors.
- BOM will require less time for departmental validation, leveraging past performance history for quicker approvals.

Benefits

- Reducing manual data collection and human errors by automating the identification of specifications and schematics.
- Reduces the overall time and resources required for BOM creation.
- Speeds up the validation process with quicker approvals based on past performance history.
- Maintain consistency in the BOM creation process.

4D/0D				1D/0D		

Demand Forecasting → **Past Data** → **Market Trends** → **Warehouse Capacity** → **Lead Time** → **Safety Stock** → **Reorder**

- GenAI can provide more precise demand forecasts considering multiple variables and complex patterns.
- It can maintain real-time visibility into inventory levels and locations, offering early warnings and alerts on inventory discrepancies and trend changes.
- GenAI continuously adjusts safety stock levels based on current conditions and supply chain shocks, ensuring optimal inventory levels.
- GenAI automatically triggers reorders without delay, streamlining the replenishment process.

Benefits

- Reduces stockouts and carrying costs through better inventory optimization.
- Eliminate delays and improve efficiency by automating reordering process.
- Better risk management as more frequent safety stock adjustment.

9-Point Matrix for Cost vs Impact Analysis

Cost			
High	Assigning Part No.s	Assisting Dealers	Risk Mitigation Analysis of parts Lot Secure
Medium	Data Collection	Prioritizing feedbacks Decision for Part Return	Periodic Risk Review SOP preparation
Low	Scheduling Visits	Invoice Preparation Checklist Preparation	Part Return Request
	Low	**Medium**	**High**

Impact →

Business Risks of Generative AI

Ease of Resolution (Challenging → Simple) vs Level of Business Risk (Low → High)

- Unclear Investment Priorities
- Unskilled Employees
- Capability Overhang
- Biased Outputs
- Leak of proprietary data

Implementation Roadmap

Deliverables	Q4 2024	Q1 2025	Q2 2025	Q3 2025	Q4 2025	Q1 2026
Strategic Planning and Objective Setting	■	■				
Process Assessment and Budgeting		■	■			
Data Collection and AI model Development			■	■	■	
Gen AI Integration and Pilot Testing				■	■	■
Full-Scale Deployment					■	
Training and Change Management					■	■
Performance Monitoring and Optimization						■

Key Performance Indicators (KPIs)

Installation and Project Management:
- Accuracy of Risk Assessments

Spare Parts Management:
- Inventory Turnover Ratio
- Accuracy of Spare Parts Forecasting

Maintenance & Repair Operations:
- Average Resolution Time
- First-Time Fix Rate (FTFR)

Customer Service:
- Warranty Claim Resolution Time
- Return Status Visibility
- Customer Satisfaction Score

Aftersales Support:
- Number of Product Enhancements Based on Feedback

Total Cost Saved Vs Total Expense Incurred(in million $)

— Total Cost Saved — Total Expense Incurred

Breakeven

(y-axis: 0, 5, 10, 15, 20, 25; x-axis: Yr 1, Yr 2, Yr 3, Yr 4, Yr 5)

Payback Period = 2.34 years

ROI 56%

Validation : News Article

Gen AI can deliver 30% to 50% efficiency and effectiveness gains

GenAI to save cost in excess of 10%

Validation : Blogpost

Calculation Sheet

New vs Old Resource Allocation

OLD

AFS 12%
CS 14%
IPM 33%
MRO 18%
SPM 23%

NEW

AFS 16%
CS 19%
IPM 30%
MRO 13%
SPM 22%

Cost Structure of GenAI Implementation (in million $)

Heads	Year 1	Year 2	Year 3	Year 4	Year 5
Hardware Costs (GPU)	1				
Software Costs	1				
Labor	1	1.05	1.102	1.157	1.215
AI Training Cost	0.5				
Cloud Service	0.25	0.35	0.45	0.55	0.65
Maintenance Cost	0.25	0.25	0.25	0.25	0.25
Manpower Training Costs	0.123	0.05	0.05	0.05	0.05
Total	4.123	1.7	1.852	2.007	2.165

Cost Saving by GenAI (in million $)

Heads	Year 1	Year 2	Year 3	Year 4	Year 5
Cost of Poor Quality	1.24	2.37	3.42	4.4	5.25
Manpower Cost	0.46	0.83	1.13	1.38	1.58
Total Cost Saved	1.70	3.20	4.55	5.75	6.83

Assumptions:

- This increase in revenue due to customer satisfaction isn't incorporated in above estimate of cost saving.
- Resource Allocation is directly proportional to no. of FTE
- GenAI adoption rate is assumed to be constant for period of 5 years

New vs Old Resource Allocation

Sub-Department	Old %age Allocation	New %age Allocation
Installation and Project Management	33	30
Spare Parts Management	23	22
Maintenance & Repair Operations	18	13
Customer Service	14	19
Aftersales Support	12	16

Thank You