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# Generative Artificial Intelligence

## in Manufacturing and Robotics

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The market size of Generative AI in the automotive industry is projected to reach around USD **2,691.92 million** by 2032, with a CAGR of 24.03%.
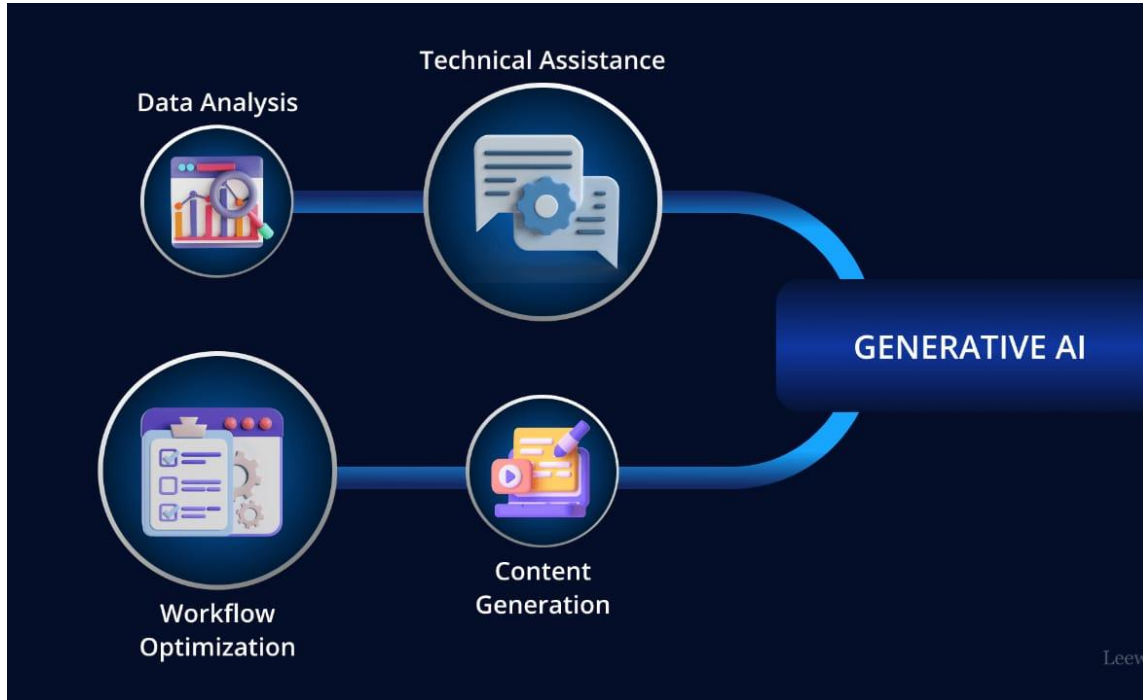
# AI in Manufacturing: Core Concept
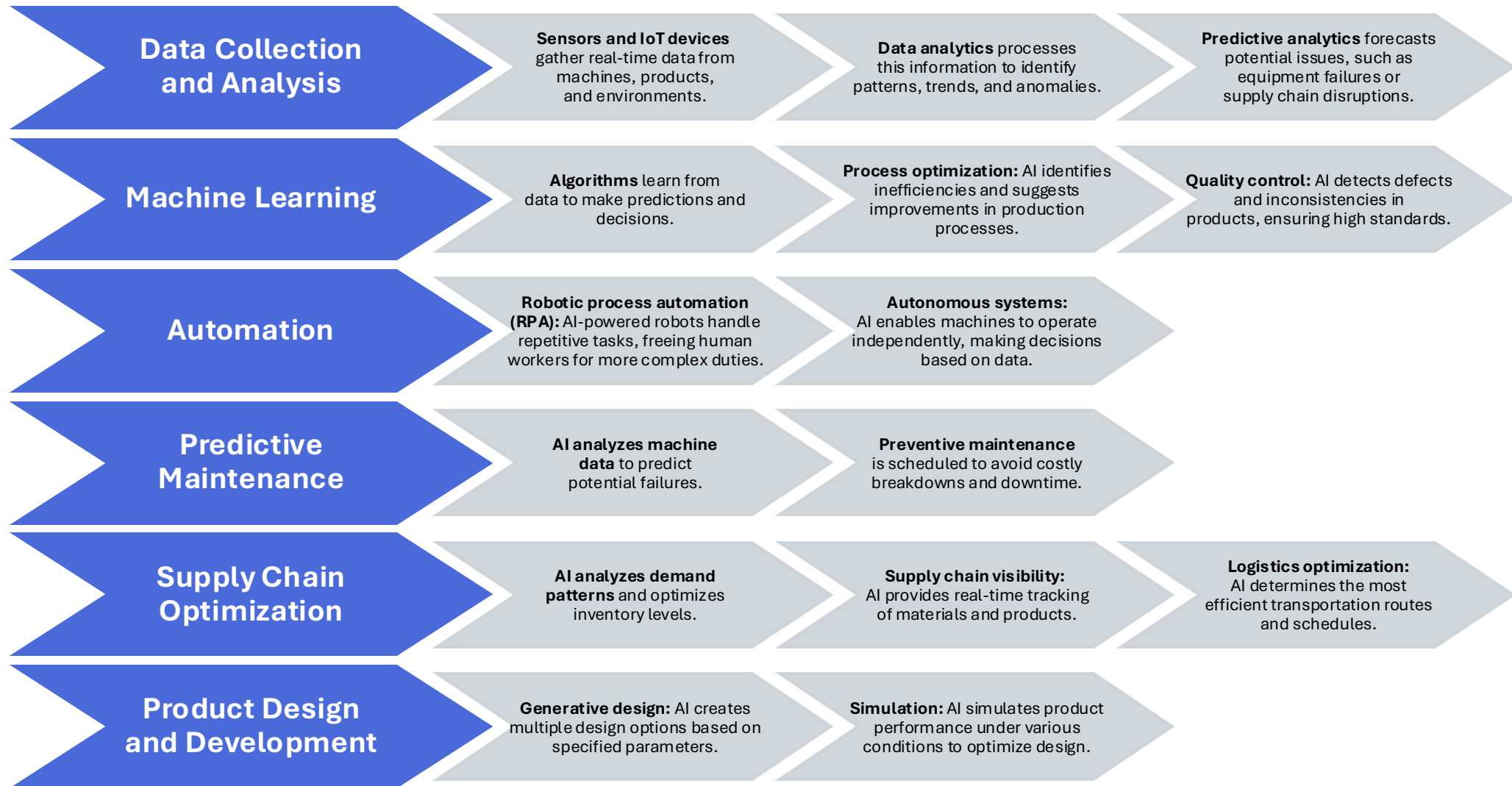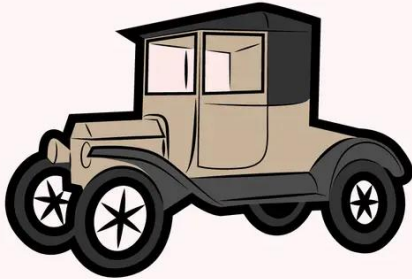
To optimize processes, improve efficiency, and enhance product quality through data analysis and intelligent automation.

# AI in Manufacturing: Key Areas

## Data Collection and Analysis

**Sensors and IoT devices** gather real-time data from machines, products, and environments.

**Data analytics** processes this information to identify patterns, trends, and anomalies.

**Predictive analytics** forecasts potential issues, such as equipment failures or supply chain disruptions.

## Machine Learning

**Algorithms** learn from data to make predictions and decisions.

**Process optimization:** AI identifies inefficiencies and suggests improvements in production processes.

**Quality control:** AI detects defects and inconsistencies in products, ensuring high standards.

## Automation

**Robotic process automation (RPA):** AI-powered robots handle repetitive tasks, freeing human workers for more complex duties.

**Autonomous systems:** AI enables machines to operate independently, making decisions based on data.

## Predictive Maintenance

**AI analyzes machine data** to predict potential failures.

**Preventive maintenance** is scheduled to avoid costly breakdowns and downtime.

## Supply Chain Optimization

**AI analyzes demand patterns** and optimizes inventory levels.

**Supply chain visibility:** AI provides real-time tracking of materials and products.

**Logistics optimization:** AI determines the most efficient transportation routes and schedules.

## Product Design and Development

**Generative design:** AI creates multiple design options based on specified parameters.

**Simulation:** AI simulates product performance under various conditions to optimize design.

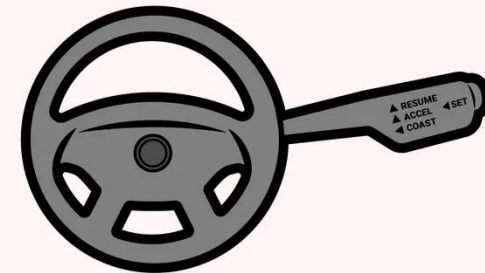# Automation Levels
# of Autonomous Cars



LEVEL 0     LEVEL 1     LEVEL 2

LEVEL 3     LEVEL 4     LEVEL 5

https://www.businessinsider.com/what-are-the-different-levels-of-driverless-cars-2016-10#-1

# 8 Impactful Generative AI Use Cases in the Automotive Industry

## Use Cases of Generative AI for Automotive

Generative AI-Powered Chatbot

Efficient Roadside Assistance

In-Car Virtual and Voice Assistants

Predictive Maintenance

Car Design and Prototyping

Manufacturing Process Enhancement

Supply Chain Optimization

Virtual Testing and Simulation

# Manfaat Generatif AI di Pasar Otomotif

**Bisnis**

- Efisiensi dalam produksi dan manajemen biaya

- Inventaris adaptif dan pengawasan rantai pasokan.

- Mendapatkan keunggulan kompetitif melalui kustomisasi.

- Mempercepat pengembangan produk dan meningkatkan penawaran.

**Konsumen**

- Pengaturan khusus.

- Keamanan superior dan navigasi yang dioptimalkan.

- Perawatan kendaraan proaktif.

- Belanja dan kustomisasi yang dipersonalisasi.
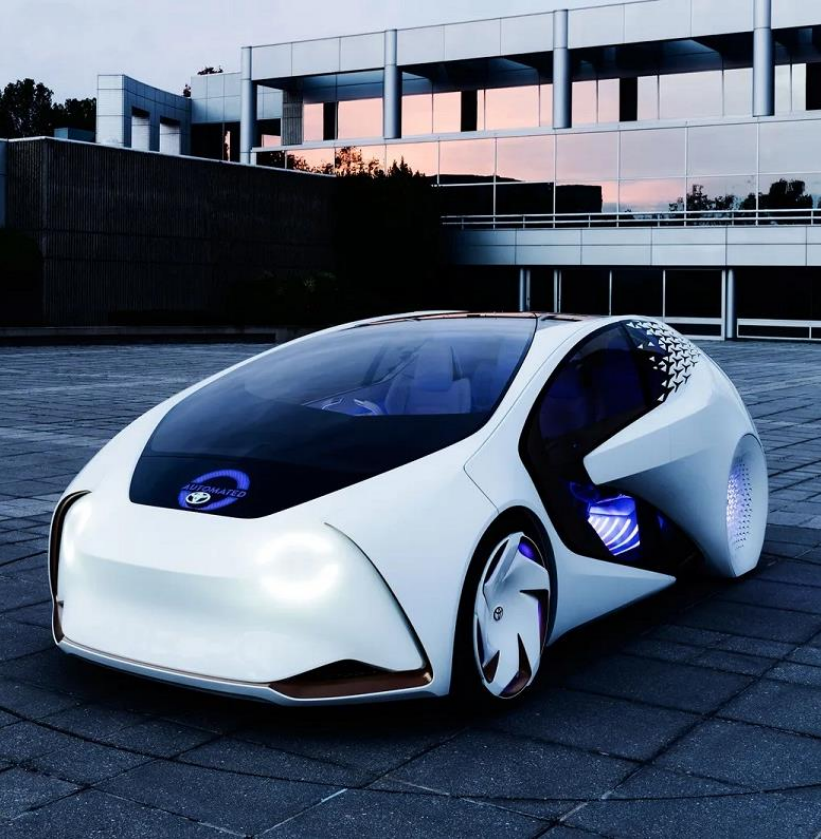
**Perusahaan Otomotif Pengguna AI Generatif**

- Toyota EV terbaru
- Mercedes-Benz
- BMW Neue Klasse 2025

# THANK YOU

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