

Scaling AI in Manufacturing **Operations:** A Practitioners' Perspective

### AI holds strong potential across the manufacturing value chain

### Demand planning

AI enables organization to optimize product availability by decreasing out of stocks and spoilage. AI can also help with getting a better understanding of sales patterns.

L'Oreal uses AI algorithms to predict demand based on a wide variety of data gathered from social media, weather, and financial markets.<sup>1</sup>



Product development/R&D

AI enables organizations to expediate product development and R&D by reducing the test times and driving more concrete insights from customer data and demands

Intel is using big data and AI platforms to create tests for hard to validate functionalities improving the targeted coverage by 230x compared to standard regression tests.<sup>2</sup>

Production

Inventory Management

**Quality control** 

and sensor-based processes.

traditional methods.⁵

Al can be used to get a better



Product quality inspections bring uniformity and

efficiency in quality control, using image-based

Bridgestone uses AI to promote high-level of

precision in tire manufacturing, resulting in an

improvement of more than 15% over



#### streamline manufacturing processes, improving throughput

TAKT can be reduced by using AI to

Mitsubishi Electric uses AI to automatically adjust rate, speed, acceleration, etc. of the industrial robots leading to the time reduction to 1/10th of conventional method.<sup>3</sup>

### **Process control**

AI can help organizations optimize processes to achieve production levels with enhanced consistency, economy and safety

**Unilever** uses AI to influence operations by predicting outcomes and improving efficiency levels to optimise output.4

### Maintenance

Using AI, organizations can predict and prepare for asset failure, reducing (or even avoiding) downtime.

General Motors uses computer vision to analyse images from robot mounted cameras to spot early signs of failing robotic part.6





Safety Al is used to get a better understanding of risk factors within the shop floor and can help safer operations

#### Energy management

AI allows organization to gain deeper insights in the energy use throughout the production process, resulting in reduced bills and more sustainable production

Sources: Capgemini Research Institute. Artificial Intelligence in Operations, Secondary research of top 75 companies by revenue from Industrial Manufacturing, Automotive Manufacturing, Consumer Products and Aerospace and Defense.

#### **Reference:**

- 1. Microsoft, "Technology, luxury brands, and retail a fashionable combination," January 2019."
- Intel White Paper, "Artificial Intelligence reduces costs and accelerates time to market", June 2018
- 3. Mitsubishi News Releases, "Mitsubishi Electric's Fast Stepwise-learning AI Shortens Motion Learning", February 2019
- 4. Cosmetics design-europe.com, "Unilever invests in digital factories to harness supply chains", July 2019
- 5. Harvard Business School, "Bridgestone: Production System Innovation Through Machine Learning," November 2018
- 6. Iflexion, "Industries to Be Transformed by Machine Learning for Image Classification," October 2018

# Manufacturers focus their AI implementations on maintenance and quality

### Share of use cases implemented by function



Sources: Capgemini Research Institute. Artificial Intelligence in Operations, Secondary research of top 75 companies by revenue from Industrial Manufacturing, Automotive Manufacturing, Consumer Products, and Aerospace and Defense. \*Supply Chain Management includes supply chain, logistics, inventory management, and warehousing Percentages depict the share of use cases implemented in a given function

# Product quality inspection features among the top three implemented use cases across sectors





New product development

Real time optimization of process parameters

Source: Capgemini Research Institute. Artificial Intelligence in Operations, Secondary research of top 75 companies by revenue from Industrial Manufacturing, Automotive Manufacturing, Consumer Products, and Aerospace and Defense.

# **Roadmap for scaling AI in Manufacturing Operations**



Sources: Capgemini Research Institute analysis.



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