# White Paper on Manufacturing Industries 2024 Summary

# May 2024

# The Ministry of Economy, Trade and Industry, the Ministry of Health, Labour and Welfare, and the Ministry of Education, Culture, Sports, Science and Technology



### White Paper on Manufacturing Industries 2024

- The White Paper on Manufacturing Industries is a statutory report based on the Basic Act on the Promotion of Core Manufacturing Technology. This is the 24th annual report.
- It consists of Part 1 covering basic data on manufacturing industries, challenges of the year, and government initiatives and Part 2 spelling out manufacturing industry promotion measures.

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### Part 1: Current Status and Challenges in Core Manufacturing Technology

Part 1 covers basic data on manufacturing industries, such as business conditions, challenges of the year, and government initiatives.

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### Part 2: Policy Measures Taken in FY2023 for Promoting Core Manufacturing Technology

Part 2 covers policy measures that Japan took for promoting core manufacturing technology.

## Messages from White Paper on Manufacturing Industries 2024

• • => ! <u>e</u>	The Japanese manufacturing industry has been facing the growing importance of domestic investment from the perspectives of ripple and multiplier effects on other domestic industries and the preparation for geopolitical risks. At the same time, the industry has rapidly been expanding global business development, resulting in having <u>a structure in which the majority of its earnings come from sales in overseas markets</u> . However, the manufacturing industry [i] <u>has failed to put in place a management structure suitable for global business, causing sluggish profit ratios relative to sales growth</u> . [ii] The industry's DX activities are also limited to <i>Kaizen</i> or improvements in individual processes and the industry has been advancing fewer efforts in the target areas for the expansion of business opportunities, which do <u>not contribute to improving earning power</u> . It is necessary for the industry to combine the effort for building a management and organizational system through CX and the effort for total optimization of manufacturing functions and change of business models through DX.				
Current status	<ul> <li>CX for building a management and organizational system</li> <li>The overseas sales ratio of major Japanese manufacturing companies has sharply been increasing over the past 20 years, revealing that these companies have a structure in which the majority of their earnings come from sales overseas. In addition, 60% of the employees in these companies are engaged in overseas subsidiaries on a consolidated basis.</li> <li>Although they achieved record profits on a consolidated basis, the profit ratios remain low.</li> <li>These companies have expanded global business through M&amp;A against the backdrop of the appreciation of the yen against the U.S. dollar. However, they failed to put in place a management structure suitable for global business, and this enables them not to manage their entire corporate group well, including the governance of their overseas subsidiaries. This may cause an impact on their earning power.</li> </ul>	<ul> <li>Total optimization of the manufacturing functions and expansion of business opportunities through DX</li> <li>The manufacturing industry should address labor shortages, horizontal specialization, product diversification, and GX. To this end, it is urgent for the industry to carry out DX at the level of an individual company as well as across the industry.</li> <li>In DX activities, many manufacturing companies remain working on efforts for <i>Kaizen</i> or improvements in individual processes as a target area, and a few companies have been making efforts for the total optimization of manufacturing functions and the expansion of business opportunities as target areas.</li> <li>Regarding industrial data sharing, manufacturing companies have been promoting efforts across the manufacturing industry to share such data as carbon dioxide emissions and efforts to enhance competitiveness, but these efforts have not been fully achieved yet.</li> </ul>			
Ideal state that the	<ul> <li>Competition for acquiring human resources between global companies has been intensifying. In order to make the most effective use of their management resources, including human resources engaging in overseas subsidiaries, companies should move away from the federal management style focusing on the combination of companies in Japan and overseas subsidiaries to build a system in which domestic and overseas organizations are seamlessly connected with no borders.</li> <li>Companies should organize the common infrastructures for human resources, goods, money, and data—which have been fragmented between domestic and overseas operations and optimized separately—into those that are unified globally.</li> </ul>	<ul> <li>In order to achieve the total optimization of manufacturing functions, manufacturing companies should <u>draw up a digital strategy coupled with their business strategy</u>, and they should <u>introduce digital technology based on a thorough understanding of the overall picture of the business processes on manufacturing functions</u>.</li> <li>In addition, in order to expand business opportunities, manufacturing companies need to <u>change their business models</u>, including embarking on the development of platform business.</li> <li>Accelerating the industrial data sharing among companies requires the manufacturing industry to show their companies the specific advantages</li> </ul>			

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expected to be brought about by data sharing, e.g., preparing use cases.

### CX (Corporate Transformation) for Building a Management and Organizational System: I. Current Status

- In recent years, the importance of domestic investment has been improving. Meanwhile, the overseas sales ratio of major Japanese
  manufacturing companies has sharply been increasing over the past 20 years, revealing that <u>these companies have a structure in</u>
  which the majority of their earnings come from sales in overseas. In addition, <u>60% of the employees in these companies are
  engaged in overseas subsidiaries</u> on a consolidated basis.
- As a result, these companies greatly expanded their global sales and <u>achieved record profits</u> on a consolidated basis. However, the profit ratios remain low. There is also a tendency for profitability to decline as the scale of business becomes larger and the business and regions become more diverse.
- => Many Japanese manufacturing companies send residential employees from Japan to their overseas subsidiaries. Meanwhile these subsidiaries have adopted <u>a federal management style</u> in which almost no governance is instructed from the main office in Japan. These companies do not manage their entire corporate group well, and this may affect their earning power.

#### Figure 1: Overseas sales ratios of major Japanese, U.S., and European manufacturing companies



Note: This figure shows the aggregated average value by country after dividing the domestic sales (sales in an EU member country) of the given company by the total sales of the company, based on the segment data by company obtained from Refinitiv. Concerning the year of data, the data is obtained on a relative year basis with the most recent fiscal year as the fiscal year ending in December 2022 and the fiscal year ending in March 2023, including the data on some companies with different fiscal year-ends. The figure targets the companies that disclose their overseas sales among the top 500 companies by country/region in terms of actual sales according to the EBITDA indicator (as of the end of the most recent fiscal year in 2023), which does not include the data on companies that do not disclose this information. As for companies on which data could not be obtained for 20 consecutive fiscal year-ends, the figure only targets the annual data that could be totaled for aggregation. The target European countries are 16 EU developed countries and 4 non-EU developed countries (Switzerland, Norway, Iceland, and the U.K.). As for the data on companies in European countries, the data by EU member country is given priority. As for companies that disclose data by country, the sum of sales in the respective EU member countries is aggregated as the sales in the given company's home country. As for companies in the U.K., data from 2020 onwards is aggregated as the data on a non-EU country, and the U.K. has been classified as a non-EU country from 2020 onwards. As for companies in the U.S. and Japan, only when the given company does not disclose the sales data on its home country, the data on the neighboring region (e.g. the Americas or Asia) is considered to be the data on its home country for the purpose of aggregation.

Source: Prepared by NTT DATA Japan Corporation based on Refinitiv (Material 3 submitted by the secretariat of METI Study Group on CX for Strengthening Global Competitiveness at its first meeting)

### Figure 2: Relationship between diversification and profitability



500 billion ven 1 trillion ven to 2 trillion ven or 0 ven to 500 billion ven to 1 trillion yen 2 trillion yen more Domestic companie ding non-disclosur 6% 8% 14% Regional diversificatio 냨 약 Low 1-28 12% 8% 23% Regional diversificatio Middle 16% 10% 14% 29-39 nal diversification High 40-16% 16% 13% 11%

0 yen to	500 billion yen	1 trillion yen to	2 trillion yen or
500 billion yen	to 1 trillion yen	2 trillion yen	more
24%	21%	21%	29%
22%	19%	26%	24%
18%	19%	17%	18%
21%	19%	22%	20%

U.S.

0 yen to	500 billion yen	1 trillion yen to	2 trillion yen or
500 billion yen	to 1 trillion yen	2 trillion yen	more
26%	19%	25%	33%
21%	20%	21%	23%
18%	18%	24%	22%
17%	18%	16%	19%

Note: This figure shows the results of aggregated data on top 500 manufacturing companies in terms of actual sales by country/region according to the EBITDA indicator (at the end of the most recent fiscal year as of 2023), based on the segment data by company obtained from Refinitiv. As for the definition of coloring, the profitability of target companies in three countries (regions) is compared cell-by-cell across the matrix. The level of profitability of the companies is indicated with a color gradient. For example, if the profitability is low, the cell is indicated in dark red, and if the profitability is high, the cell is indicated in dark bue. If N is less than 5 cases, the cell is indicated in gray. The target European countries are 16 EU developed countries and 4 non-EU developed countries (Switzerland, Norway, Iceland, and the U.K.).

Source: Prepared by NTT DATA Japan Corporation based on Refinitiv (Material 3 submitted by the secretariat of METI Study Group on CX for Strengthening Global Competitiveness at its second meeting)

## CX for Building a Management and Organizational System: II. Ideal State that the Industry should Aim for

- Competition for acquiring human resources between global companies has been intensifying. In order to make the most
  effective use of their management resources, including human resources working for overseas subsidiaries, companies should move
  away from the federal management style focusing on the combination of companies in Japan and overseas subsidiaries to
  build a system in which domestic and overseas organizations are seamlessly connected.
- => Companies should <u>organize the common infrastructures for human resources, goods, money, and data</u>—which have been fragmented between domestic and overseas operations and optimized separately—<u>into those that are unified globally</u>.

Organizing common infrastructures for human resources, goods, money, and data



# Total Optimization of the Manufacturing Functions and Expansion of Business Opportunities Through DX: I. Current Status

 Through DX, many manufacturing companies remain working on efforts for *Kaizen* or improvements in individual processes, and <u>a</u> few companies have been making efforts aiming at the total optimization of manufacturing functions.\* In addition, even fewer manufacturing companies have been aiming at the expansion of business opportunities by creating new products and services to succeed in new markets.

\*Note: The term "total optimization of manufacturing functions" refers to a process in which, in order to carry out its business strategy, a company not only focuses on the production department, but also encourages the production department to work together with other departments, including design, development, procurement, logistics, and sales, to integrally manage such matters as cost control, bills of materials, and process charts.

 Regarding industrial data sharing, manufacturing companies have been working to share data such as carbon dioxide emissions beyond the borders of individual companies and business sectors, and across the manufacturing industries. They have also been promoting efforts to <u>enhance sustainability and competitiveness across industries</u>, , as exemplified by the European automobile supply chain (Catena-X) as a main example. Japan has started initiatives such as the Ouranos Ecosystem, but willingness to participate in industrial data sharing remains quite limited.

#### Current status of companies advancing DX activities by field

Companies' intention to participate in industrial data collaboration





Source: Prepared by METI based on the results of the questionnaire survey conducted as part of the projects by the New Energy and Industrial Technology Development Organization titled "Research and Development Project to Strengthen the Dynamic Capabilities of the Manufacturing Industry by Using 5G/Survey Project on Measures to Strengthen Dynamic Capabilities on Manufacturing Floors and Future Dissemination of the Measures" Source: Report on the FY2023 Survey on the Current State of Core Manufacturing Technology (Survey on the Challenges in and Future Directions of the Manufacturing Industry in Japan), which was compiled by Mitsubishi UFJ Research and Consulting Co., Ltd. in March 2024

### Total Optimization of the Manufacturing Functions and Expansion of Business Opportunities Through DX : II. Ideal State that the Industry should Aim for

- In order to achieve the total optimization of manufacturing functions, manufacturing companies should draw up a digital strategy coupled with their business strategy, and they should introduce digital technology based on a thorough understanding of the overall picture of the business processes on manufacturing functions.
- In addition, in order to expand business opportunities, manufacturing companies need to change their business from just making and selling products to developing subscription services, including after-sales services, and platform business.
- Accelerating the companies' movement towards industrial data sharing requires the manufacturing industry to show individual companies the specific advantages expected to be brought about by the data sharing. To this end, the manufacturing industry should develop rules based on use cases, including efforts for making carbon dioxide visible and reducing emissions across its supply chain, placing related business worlds and highly motivated companies at the core. Concerning applications for data sharing, the industry should make use of marketplaces as an effective approach to encourage new players to enter services and compete with each other.

### **Case example 1: Bridgestone Corporation**

- This company has been taking on changes in manufacturing in which <u>efforts to please customers</u> <u>based on ultimate customization</u> are integrated with <u>cost reductions and reduced environmental burden</u> <u>by simplifying production and development</u>, thereby gaining a competitive advantage and fortifying value creation.
- The company leveraged digital technology to create value in the production-and-sales step and the use step. At the production-and-sales step, the company further enhanced a large volume of knowledge and skill that it had accumulated in its R&D center and production base. At the same time, by integrating the knowledge and skill and digital technology, the company developed high-performance, high-added-value products with simulation technology and automated equipment, thereby improving productivity and environmental friendliness.
- At the use step, the company developed its own algorithm that uses AI to analyze data on customers' tires and vehicles, and succeeded in the provision of solutions that help customers to use their tires more safely, longer, better, and more efficiently.

### Case example 2: Miura Co., Ltd.

- This company boasts the top share of factory boilers in Japan. Its <u>maintenance</u> <u>business accounts for half of the</u> <u>operating profits</u> backed by a maintenance subscription model and an online maintenance service.
- In recent years, the company has also been developing a service that makes operation information visible, including information on products made by other companies. It <u>aims to provide platform</u> <u>business</u> in which it proposes to customers labor and energy savings and offers solutions to challenges faced by <u>customers on production base through</u> <u>a one-stop consultation counter</u>.

### Case example 3: Catena-X

- Catena-X, an alliance of the automobile industries, was established in 2020 aiming to <u>share data among the industries</u>. It consists of 172 associations (as of February 2024) as participants, placing BMW, SAP, and Siemens as core members.
- <u>Through its marketplace</u>, Catena-X provides participating companies with services in which it <u>shows to the</u> <u>companies the specific advantages</u> of comprehensive <u>visualization of carbon</u> <u>dioxide and quality control</u> across the entire supply chain and then it helps these companies to achieve such advantages.
- Upholding the <u>involvement of SMEs</u>, which are providers of data, in its services as an important concept, Catena-X has a plan to develop a package service in which SMEs can smoothly participate.