Special Feature Article

DX Frontline for Automobile Parts Manufacturers

～Securing Digital Human Resources is also an Important Issue～

Automobile development and manufacturing sites are undergoing major changes through digital transformation (DX). Digital technology is not just a tool for saving labor and improving efficiency; it must be linked to development and production activities, technological innovation, and even corporate transformation in order to respond to the rapidly changing times. On the other hand, the realization of DX requires issues such as securing and training digital human resources, including data scientists. In addition, knowledge and experience in manufacturing are also essential, not simply personnel with advanced IT skills. This article looks at the frontlines of DX initiatives at the development and manufacturing sites of Automobile Parts Manufacturers.

What is the definition of DX by METI?

According to the Ministry of Economy, Trade, and Industry (METI), DX is "the process by which a company responds to drastic changes in the business environment and transforms its products, services, and business models based on the needs of customers and society by utilizing data and digital technology, as well as its operations themselves, organization, processes, corporate culture and climate to establish competitive advantage." Companies that engage in DX should not only introduce digital tools and technologies, but it is also important to establish a more competitive business model and transform the company by utilizing the introduced tools.

Achieving Corporate Transformation through DX

Led by the Digital Transformation Headquarters, NSK Ltd. is embarking on a DX initiative in which all divisions and businesses are working together. Their executive also commented, "In addition to the rise of China and emerging countries, the automobile industry is undergoing a major change with the spread of EVs. In these times, our company itself must change using digital technology, which can be used in a variety of ways. DX is one means of 'corporate transformation' (change from the very foundation of a company)."

In its medium-term management plan that ends in FY2026, they will invest approximately 100 billion yen in DX-related activities, including the development of core systems, promotion of initiatives in each business, human resource development, and human resource management, such as compiling a database of human resources on a global basis, and support for the invoice system, among others. In addition, production and development

divisions will use digital twin together to improve development efficiency and reduce costs.

Reduce development time through the use of AI

There is a move toward the active use of artificial intelligence (AI) in the development field. Nisshinbo Brake Inc. will revamp its R&D platform for brake friction materials and build a system that enables AI to analyze not only measured values but also various other data, such as sound and video, to determine the optimal combination of base materials and additive ingredients. The simulation software that has been used to analyze strength and abnormal noise will also be evolved to enable friction analysis.

Toyoda Gosei Co., Ltd. will use digital technology to shorten the development time of rubber parts, such as weather strips with improved sound insulation. In particular, they will use AI-based Materials Informatics (MI) in materials development to increase development efficiency. In addition, they will review its development methods by 2025, aiming to develop highly functional rubber parts in a short period of time by combining actual measurement evaluation on test courses with predictive evaluation using simulation technology.

Akebono Brake Industry Co., Ltd. has also strengthened its auditing system by introducing a quality control system that utilizes digital technology. The introduced systems are a "quality data collection system" that automatically inputs measurement data from inspection equipment and a "quality data report management system" that automatically generates reports based on the measurement data and also provides approval and storage management functions. The system automatically reflects the measured values of each piece of equipment in a dedicated format and automatically creates reports for customers and other parties. Two years ago, they announced that its domestic subsidiary had falsified the results of periodic inspections of brake products. They are using digital technology to prevent tampering and also to strengthen its auditing system.

Capital investment in the use of digital technology is strong, and among the results of a survey of attitudes toward capital investment in FY2023 compiled by TEIKOKU DATABANK, Ltd. (President Nobuo Goto, Minato-ku, Tokyo), 38.3% of companies selected either "information technology (IT)-related" or "DX" capital investment, up 4 points from the previous survey.

That way in securing and training digital talent.

At the same time, data scientists and other digital human resources are indispensable for the use of such digital technology. In a survey of 88 Automobile Parts Manufacturers conducted by Nikkan Jidosha Shimbun this spring, more than 70% of the companies responded that they are strengthening their hiring of digital personnel.

In recruitment activities, NGK INSULATORS, LTD., NIPPON SEIKI CO., LTD., Toyo Tire

Corporation, and other companies held internships and events specializing in software and digital human resources. These events are designed to convey the companies' appeal and approach more directly to job seekers. Bosch Corporation offers a "global internship" in which students have the opportunity to work on software development tasks based on actual development cases. The aim is to have students experience how the knowledge they have learned can be applied to their work and to get them interested in the company.

There were also moves to establish specialized units. Sumitomo Riko Company Limited, TOYODA IRON WORKS CO., LTD., and others have established recruiting teams that are solely in charge of hiring digital personnel. Digital human resources are competing with other industries in terms of recruitment, and require a different and more detailed approach to the selection process and to understanding the future image that students are seeking. Sumitomo Riko Company Limited decided that a team capable of accurately communicating post-employment roles and work styles was necessary in order to "give students an image of what a digital human resources job entails" .

The development of digital human resources is also being hastened. Primearth EV Energy Co., Ltd. (President: Masamichi Okada, Kosai City, Shizuoka Prefecture), an affiliate of TOYOTA MOTOR CORPORATION, has established an in-house school called "Digital College". They plan to increase the number of digital human resources from the current 20 or so to 600 by 2025, a 30-fold increase.

Bridgestone Corporation is also requiring all new employees to take training in the use of data, and will send engineers to universities to increase the number of "solution field engineers" and more advanced "AI experts" who can use digital technology to solve problems faced by customers to 40 within the next year.

Asahi Kasei Corp. will develop 2,500 employees into "digital professionals" by FY2024, ten times the number of employees in FY2021, and will also review its personnel system to retain talented digital personnel. They are waving the banner of reform, believing that "DX is the only way to upgrade and strengthen the management foundation and intangible assets.

According to the "DX White Paper 2023" (Information-technology Promotion Agency, Japan), 54.2% of respondents in FY2021 (297 companies responded) answered that there was a "slight shortage" and 30.6% answered that there was a "major shortage" in terms of "securing DX human resources," while in FY 2010, 33.9% answered "slight shortage" and 49.6% answered "major shortage. The percentages were reversed. The success or failure of securing human resources could have a significant impact on DX.

There are also notable moves to accelerate efforts to utilize human resources and collaborate with companies not only in Japan but also overseas. ALPS ALPINE CO., LTD. has signed a strategic long-term contract with Tata Elxsi Ltd, an Indian IT company, for the development of in-vehicle software. The Global Engineering Center (GEC), a development base, will be established within Tata Elxsi Ltd's development base in Thiruvananthapuram City in southern India, and approximately 50 engineers will initially be involved in the

development.

PIONEER CORPORATION also established its first new R&D center in India. They have established two locations: one within its existing sales base, "Pioneer India Electronics Private Ltd.,"and the other in Whitefield, a district of Bengaluru in the state of Karnataka that is home to a concentration of IT companies. Although the specific number of engineers has not been disclosed, they intend to gradually increase the number of personnel.

However, having an abundance of digital human resources is not the only way to advance DX. A DX manager at DENSO CORPORATION also states, "It is not just a matter of having good IT skills, but also the ability to use digital technology in combination with deep knowledge and experience in manufacturing". An executive at Topy Industries, Ltd. also commented, "DX may seem like it can do everything, but it is meaningless unless you know what the people who use it want".

Even with the development of sensors and digital technology, there is still a great deal of tacit knowledge that only veteran technicians possess on the manufacturing floor. It seems that the key to DX at manufacturing sites lies in the superiority of the "matching" of tacit knowledge, which is difficult to verbalize and cannot be taught, into digital technology.

Industry associations also position DX as a priority item and encourage companies to promote it. The Japan Automobile Manufacturers Association (JAMA, Chairman: Akio Toyoda) has made DX one of its priority policies in explaining its fiscal year 2023 management policy and other matters. Keiji Kojima, chairman of Japan Electronics and Information Technology Industries Association (JEITA), also stated that "it is necessary to accelerate DX in society," and that he plans to focus on the use of AI and the development of next-generation human resources who will be responsible for DX.

Lagging Behind China, Korea, and Taiwan in Japan's Digital Competitiveness

Japan's competitiveness in the utilization of digital technology is actually low compared to countries in Europe, the United States, and East Asia. According to the "Global Digital Competitiveness Ranking 2022," in which the International Institute for Management Development of Switzerland evaluated digital technology utilization capabilities in terms of "knowledge," "technology," and "future readiness," the top five countries in the overall ranking were Denmark, the United States, Sweden, Singapore, and Switzerland. South Korea, Taiwan, and China were also ranked 8th, 11th, and 17th, respectively, while Japan was ranked 29th, down one place from the previous year. In East Asia as a whole, Japan fell behind China, South Korea, and Taiwan. The speed of promotion at the global level and an early turnaround are required.