



Case Study

DENSO uses AI to automate and accelerate the use of data in its processing DX

Avanade Insight Discovery unlocks the possibility of automating data utilization processes with AI

Business situation

DENSO Corporation (DENSO) is Japan's largest global manufacturer of automotive components in the Toyota Group. The company, which is actively developing initiatives in digitalization and digital experience (DX), is also working to connect people and work, and to transform work by making full use of its strengths in human resources and workplace technology knowledge.

Mr. Junya Asaoka, General Manager of Digital Technology Research Section/Process DX Research Department/Advanced Production Technology Division, says, "The Advanced Process Research Department researches and develops new processing technologies for environmental safety and security and applies them to mass production processing to provide value to both internal and external customers. The mission of the Processing DX Laboratory within the Advanced Process Research Department is to accelerate the research and development of new processing solutions using digital technology, from research and development to mass production applications."

As for the challenges related to processing DX, Mr. Asaoka explains, "The information and data required to promote the research and development of processing technologies are scattered around and we had to rely on experience and manual work when collecting the data based on its location. In addition, to utilize the data, we had to manually structure it in a variety of media and formats, including paper and digital."

DENSO asked Avanade for support to help it realize the benefits of accumulating knowledge, focusing on the fact that this knowledge is not systematically accumulated in the data utilization process, which includes collecting, organizing and using it.

In March 2022, a workshop was held to explore the theme of "Future information utilization from a front-line perspective". Mr. Koichi Tanaka, Manager of Digital Technology Research Section/Process DX Research Department/Advanced Production Technology Division, recalls, "We examined the creation of an environment for collecting, analyzing and accumulating knowledge to identify actual on-site problems and issues. We found a path to solving these issues through the know-how held by Avanade and case studies from other companies."

"The Avanade workshop helped us clarify what we are lacking in terms of understanding the current situation," states Mr. Daichi Murakami, Digital Technology Research Section/Process DX Research Department/Advanced Production Technology Division.

Company Name: DENSO Corporation

Country: Japan

Company Size: 165,000

Industry: Automotive, Manufacturing

Solution: Generative AI, Microsoft Azure

Solution

In response to the challenge of structuring unstructured data in order to utilize it, Avanade presented the following question: "Can we verify the potential of AI?"

"We proposed a proof of concept (PoC) to address the challenges of data accumulation, collection and format conversion by automating tasks that were previously carried out manually and then using AI to verify the structuring of unstructured data, such as technical information from the field," explains Kosaburo Ichinose, Director at Avanade.

- Information in various formats – such as handwritten, PDF and Excel documents relating to processing prototypes, including technical details and Q&As for consultation work – are scattered throughout DENSO. The format of this data needed to be standardized; some was structured data, while some was unstructured data such as natural language.
- The next step was the verification of whether key items can be extracted and structured from natural language and unstructured data – a verification of whether AI-based structuring can reach the required quality. After that, we looked at GPT-3 and GPT-3.5 structured validation. This was to verify whether users can search for the information they want, when they want it, by adding tags to the data and cataloguing it.

The system combines [Avanade Insight Discovery](#) and [Microsoft Azure OpenAI](#), available from Microsoft for enterprise customers.

- Avanade Insight Discovery is a data analysis platform that runs on [Azure](#) and utilizes natural language processing technology. For this initiative, DENSO's knowledge is stored in Avanade Insight Discovery, catalogued as data.
- Azure OpenAI's GPT is used as an analysis resource and search tool to take advantage of the AI model's wealth of knowledge and information.

"We were concerned about the difficulty in meeting internal security standards with the services provided by OpenAI and the secondary use of input data through the non-API ChatGPT," says Mr. Murakami. "However, Avanade explained that data is only stored in Avanade Insight Discovery with the key items required for the search extracted. GPT is used as an analysis resource, so the system ensures security."

“It was confirmed that the PoC can automatically perform basic structuring of unstructured data in a variety of paper and digital formats within the department, and it was felt that this will lead to better utilization of knowledge.”

– Mr. Junya Asaoka

General Manager, Digital Technology Research Section/Process DX Research Department/Advanced Production Technology Division, DENSO Corporation

Results

Regarding the effects verified through the PoC, Mr. Asaoka says, “We have confirmed that we can automatically convert the department’s handwritten information and unstructured data in various digital formats into structured data.”

The benefits are that tasks that were previously carried out manually can be automated, which is expected to reduce hours of work for employees. It has also been confirmed that unstructured data, such as natural language and other technical information from the field, can be structured using AI.

Regarding the effects of using Avanade Insight Discovery, Mr. Murakami says, “A GPT-only system would not reflect the knowledge of the company. By combining Avanade Insight Discovery, it is possible to accumulate the knowledge of the company and promote search and information utilization that better meets the company’s needs. Through this PoC, we understand that it is possible to promote searches and information utilization. The aim is to create a system like an ‘in-house ChatGPT’, and the PoC has allowed us to verify the feasibility of such a system.”

Mr. Tanaka shares the following benefits of Avanade’s support:

- **Proposal capability:** Mr. Tanaka appreciates that we organized workshops and supported him, starting with identifying the problems and issues on the ground.
- **Technical competence:** He points to the high level of technical capabilities, including the use of the latest Azure technology, generative AI and, in particular, ChatGPT as an analysis resource.
- **Support capabilities:** This was reassuring regarding questions about cloud and AI. “We appreciated the fact that they gave us specific examples and initiatives, including solution proposals and support that used the strengths of Microsoft products, such as combining **Microsoft Teams** and search apps,” Mr. Tanaka says.

Regarding future development, Mr. Murakami explains, “We are planning to consider how to apply this to business operations. We are currently continuing to verify the demonstration effect using sample data to see how much

search accuracy changes between raw data and structured data to create an in-house chatbot.”

Mr. Asaoka says that it is important for companies that are feeling the challenges of internal DX to actually implement a simple PoC. “While drawing up a big goal is necessary, the key to gaining genuine acceptance is gradually increasing the number of internal supporters from the user’s perspective by repeating successful experiences through PoCs.”

Finally, regarding expectations for Avanade in future initiatives, Mr. Asaoka says, “AI use will be even more important in the future. We are looking forward to having Avanade as a partner to plan and study AI use while constantly sharing new information on the latest technologies and initiatives.”

“We are grateful for the latest information and the sharing of case studies to make full use of DX tools and expand use cases beyond departments,” says Mr. Tanaka. “As Microsoft solutions continue to be the mainstay of our systems, we look forward to Avanade’s proposals for the use of the latest technologies to utilize data.”

Mr. Murakami concludes by saying, “With no digital experts around, the dialogue with Avanade as a partner for DX promotion is a valuable opportunity. I look forward to continued support from Avanade’s technological capabilities amid the fast pace of change with the latest technologies.”

“Avanade has three strengths: proposal, technology and support. They explained our questions about cloud and AI with specific examples and initiatives. They were reassuring in their proposals and support for solutions that utilize their strengths in Microsoft products.”

– Mr. Koichi Tanaka

Manager, Digital Technology Research Section/Process DX Research Department/Advanced Production Technology Division, DENSO Corporation

“Through the PoC, we have validated several AI models, including GPT-3 and GPT-3.5, and have verified that Avanade Insight Discovery can automatically structure models that previously had to be done manually.”

– Mr. Daichi Murakami

Digital Technology Research Section/Process DX Research Department/Advanced Production Technology Division, DENSO Corporation

About DENSO Corporation

Globally headquartered in Kariya, Japan, DENSO is a \$47.9 billion leading mobility supplier that develops advanced technology and components for nearly every vehicle make and model on the road today. With manufacturing at its core, DENSO invests in around 200 facilities worldwide to provide opportunities for rewarding careers and to produce cutting-edge electrification, powertrain, thermal and mobility electronics products, among others, that change how the world moves. In developing such solutions, the company's 165,000 global employees are paving the way to a mobility future that improves lives, eliminates traffic accidents, and preserves the environment. DENSO spent around 9.0 percent of its global consolidated sales on research and development in the fiscal year ending March 31, 2023. For more information about DENSO's operations worldwide, visit <https://www.DENSO.com/global/en/>





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About Avanade

Avanade is the leading provider of innovative digital, cloud and advisory services, industry solutions and design-led experiences across the Microsoft ecosystem. Every day, our 60,000 professionals in 26 countries make a genuine human impact for our clients, their employees and their customers. Avanade was founded in 2000 by Accenture LLP and Microsoft Corporation. Learn more at www.avanade.com

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