

Combined Generative AI with IBM Watson, Mitsui Chemicals Starts Verifying Higher Agility and Accuracy for New Application Discovery Advancing DX for Increasing Top Line by Utilizing Big Data

Mitsui Chemicals, Inc. (Head Office: Chuo-ku, Tokyo, President & CEO: HASHIMOTO Osamu) and IBM Japan, Ltd. (Head Office: Chuo-ku, Tokyo, General Manager and President: YAMAGUCHI Akio) started verifying higher agility and accuracy for new application discovery by combining Generative Pre-trained Transformer (GPT)(*1), a generative AI, with IBM Watson(*2) Discovery. This initiative aims to expand top line (sales) and market share of Mitsui Chemicals products by advancing digital transformation (DX) in the business domain.

Since June 2022, Mitsui Chemicals has been implementing IBM Watson for new application discovery in the whole Mitsui Chemicals Group. More than 20 business units are utilizing IBM Watson, and more than 100 new applications have been discovered. In 2023, Mitsui Chemicals will further expand the departments implementing IBM Watson, including R&D and corporate. For one subject of new application discovery in a business unit, more than 5 million of external big data, such as patents, news and SNS are input into IBM Watson, and also one and only dictionary are made for Mitsui Chemicals products. Mitsui Chemicals' specialists in the sales and business domain are using IBM Watson to efficiently analyze the big data and discover new applications that exceed human preconceptions and current knowledge. For example, in SNS analysis, we found that there were many posts such as "musty smell in the local railway," which led to sales activities of Mitsui Chemicals' antifungal products for a railway.

While realizing many outcomes for new application discovery by utilizing IBM Watson Discovery, there is still a challenge that it takes a time to discover new applications. To address this challenge, we will implement GPT, one of the generative AI as advanced digital technology, to generate new applications from a huge number of text data such as patents, news, and SNS, and further clarifying the reason why we should focus on the new applications and the external environmental factors, thereby drastically increasing the discovery of new applications with agility and accuracy.

Mitsui Chemicals and IBM Japan have started verifying with Microsoft Azure OpenAI for the new application discovery. Mitsui Chemicals will identify and extract notable new application candidate data by optimizing the instruction prompt for GPT to meet the purpose of the new application discovery. By applying the data to IBM Watson, even users unfamiliar with using IBM Watson will be able to specify keywords for new application discovery in a short time. Furthermore, new application discovery will be automated by making it multimodal including SNS videos, and by inputting the information of new applications, discovered utilizing IBM Watson, into GPT.

By combining Generative AI and IBM Watson, Mitsui Chemicals will accelerate the process from market development to product development by integrating data between different departments, such as LOB (Line of Business) and R&D, through utilizing Sales Force Automation (SFA) / Marketing Automation (MA), Materials Informatics (MI) and Robotics.

< Masao SAMBE, CDO, Mitsui Chemicals, Inc. >

Conventional use of Artificial Intelligence has been mostly focused on productivity and efficiency. This time, we are engaging with IBM Watson to discover new material applications which will contribute to portfolio transformation by lifting the top line and increasing market share. For the sake of accelerating Corporate Transformation through DX, combined GPT/Generative AI with Watson will enable us to enhance agility, accuracy and usability in discovering new applications and to optimize stakeholders'

benefits between LOB and R&D.

*1 About GPT

GPT is a Large Language Model (LLM) that applies a deep learning model called Transformer, which has Attention mechanism to dynamically identify noteworthy data from big data, and with over 100 billion pre-trained parameters using a large data set of over 1 trillion sentences and words in the world. It supports a variety of natural language processing tasks such as sentence generation, document summarization, language translation, QA, and keyword extraction.

*2 About IBM Watson

Watson is IBM's AI technology for business, helping organizations to better predict and shape future outcomes, automate complex processes, and optimize employees' time. Watson has evolved from an IBM Research project, to experimentation, to a scaled, open set of products that run anywhere. With more than 40,000 client engagements, Watson is being applied by leading global brands across a variety of industries to transform how people work. To learn more, visit: <https://www.ibm.com/watson>.

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at Copyright and trademark information at www.ibm.com/legal/copytrade.shtml.

Microsoft and Azure are registered trademarks or trademarks of Microsoft Corporation in the US and other countries.