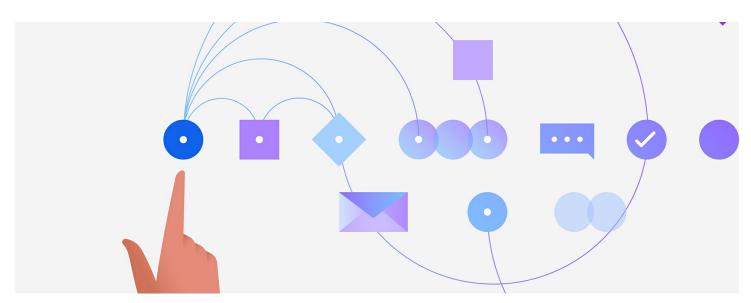# Combining Generative AI with IBM Watson, Mitsui Chemicals Starts Verifying New Application Discovery for Agility and Accuracy

This initiative aims to improve the top line by advancing digital transformation and utilizing big data

Mitsui Chemicals, Inc. (Head Office: Chuo-ku, Tokyo, President & CEO: HASHIMOTO Osamu) and IBM (NYSE: IBM) Japan, Ltd. (Head Office: Chuo-ku, Tokyo, General Manager and President: YAMAGUCHI Akio) started verifying to assess agility and accuracy in discovering new applications of Mitsui Chemicals products 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 revenue share of Mitsui Chemicals products by advancing digital transformation in the business domain.

Since June 2022, Mitsui Chemicals has been implementing IBM Watson for new application discovery in 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 points of external big data, such as patents, news and SNS, are input into IBM Watson, and also a dictionary specific to 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 for their products that exceed human preconceptions and current knowledge. For example, in SNS analysis, Mitsui Chemicals 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 there have been many outcomes for new application discovery utilizing IBM Watson Discovery, there is still a challenge that it takes time to discover new applications. To address this challenge, Mitsui Chemicals will implement GPT to generate new applications from a huge amount of text data such as patents, news, and SNS. With more information about why to focus on the new applications and external environmental factors, the team can drastically increase the agility and accuracy of discovering new applications.

Mitsui Chemicals and IBM Japan have started verifying with Microsoft Azure OpenAI for new application

discovery. Mitsui Chemicals will identify and extract notable new application candidates 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 information about new applications that were discovered utilizing IBM Watson into GPT.

By combining Generative AI and IBM Watson, Mitsui Chemicals aims to accelerate the process from market development to product development by integrating data between different departments, such as lines 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 OpenAI's 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.

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