MITSUBISHI ELECTRIC CORPORATION
PUBLIC RELATIONS DIVISION
7-3, Marunouchi 2-chome, Chiyoda-ku, Tokyo, 100-8310 Japan

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Customer Inquiries

Manufacturing Engineering Center
Mitsubishi Electric Corporation

wrc.cpe-kouhou@nd.MitsubishiElectric.co.jp
www.MitsubishiElectric.com/

Media Inquiries

Public Relations Division

Mitsubishi Electric Corporation

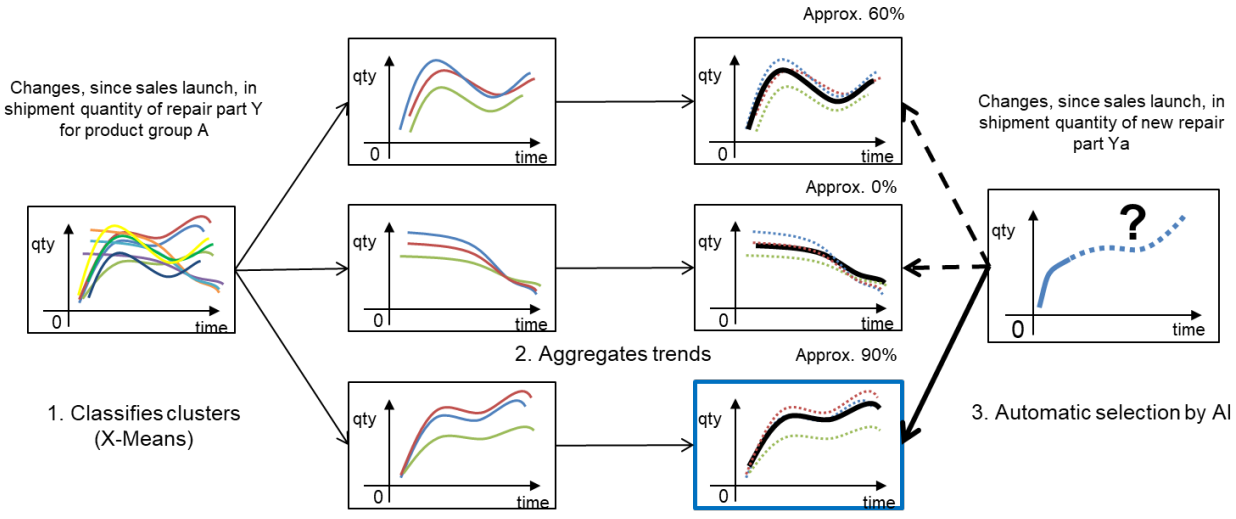
prd.gnews@nk.MitsubishiElectric.co.jp
www.MitsubishiElectric.com/news/

Mitsubishi Electric's New AI Forecasts Demand for Appliance Repair Parts

Company's first AI for accurate forecasting will help to strengthen maintenance services

TOKYO, March 16, 2022 – Mitsubishi Electric Corporation (TOKYO: 6503) announced today that it has developed an artificial intelligence (AI) technology that accurately forecasts demand for repair parts. Leveraging the company's Maisart®* AI, the technology is expected to help avoid over/under-supply of parts needed to service appliances and other equipment and thereby strengthen inventory management and parts availability as well as improve service quality.

* Mitsubishi Electric's AI creates the State-of-the- ART in technology



AI-based demand-forecasting method (with clarified rationale)

Product Features

1) More accurate demand forecasting

- By incorporating Maisart AI, demand forecasts for individual parts have been improved on average by 25.6% compared to the company's existing production–sales–inventory (PSI) planning and management solution, which is based on factors such as seasonally adjusted 12-month shipment-volume averages. Mitsubishi Electric's new method uses AI learning data on characteristic demand

trends for each type of part, such as air filters and controller boards. To forecast demands, the technology clusters trend components, then matches clustered trends to specific repair parts, and finally adjusts the results for seasonal factors.

2) AI optimizes number of clusters

- The AI optimizes the number of clusters and classifies characteristics into a maximum 20 patterns using the X-Means method and actual shipment volumes. Clustering normally is performed manually by an analyst, but the X-Means method automates the process with a machine-learning algorithm that classifies data by trends. The optimization process is a challenge since forecast accuracy varies depending on the number of clusters, so Mitsubishi Electric adopted the X-Means method, and incorporated existing know-how, to automate optimization.

3) Also assists wider decision making

- The AI also provides information that field forecasters can use to make decisions about shipments of other parts. Conventionally, results produced by AI have been difficult to translate into decisions because evidence used to produce the AI results tended to lack transparency (black box). Mitsubishi Electric's new method, however, indicates the rationale behind its results, allowing forecasters to use the information with confidence.

Future Development

The system will be introduced in the PSI management of repair parts for Mitsubishi Electric electrical appliances and other housing equipment from the new fiscal year beginning on April 1. Expanded use in other businesses will follow. Meanwhile, global weather data will be incorporated in the AI to assess weather-related trends and thereby further improve forecasting accuracy.

Development Background

In general, mass-produced products such as electrical appliances and other household equipment require that repair parts be stocked and supplied immediately to deal with normal wear and tear as well as malfunctions. So far, Mitsubishi Electric has forecasted parts demand based on parameters that take into account seasonally adjusted average shipments over the last 12 months. However, since this method is tied to past shipment quantities, forecasting accuracy is lowered if one of the trends differs from the past, possibly leading to inventory surpluses/shortages. To solve this issue, Mitsubishi Electric drew on the knowledge of experts in the field regarding the existence of characteristic demand trends for each kind of part. By training the AI on such data, the company developed a system that automatically selects trend clusters appropriate to each part in order to forecast shipment volumes with high accuracy. The new system is expected to upgrade parts supply and thereby improve of the quality of maintenance services.

About Maisart

Maisart encompasses Mitsubishi Electric's proprietary artificial intelligence (AI) technology, including its compact AI, automated-design deep-learning algorithm and extra-efficient smart-learning AI. Maisart is an abbreviation for "Mitsubishi Electric's AI creates the State-of-the-ART in technology." Under the corporate

axiom "Original AI technology makes everything smart," the company is leveraging original AI technology and edge computing to make devices smarter and life more secure, intuitive and convenient.

Maisart is a registered trademark of Mitsubishi Electric Corporation.

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About Mitsubishi Electric Corporation

With 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Mitsubishi Electric enriches society with technology in the spirit of its "Changes for the Better." The company recorded a revenue of 4,191.4 billion yen (U.S.$ 37.8 billion*) in the fiscal year ended March 31, 2021. For more information, please visit www.MitsubishiElectric.com

*U.S. dollar amounts are translated from yen at the rate of ¥111=U.S.$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2021