Renewal of Meiden Customer Center

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Abstract

Meiden Customer Center is undergoing a makeover for improved customer experience, evolving from an organization primarily focused on contact center of customer service to an organization that serves as an information hub for monitoring customer equipment.

With the expansion of its remote monitoring services, the Customer Center is developing new services, such as providing optimal operation and maintenance proposals for customer equipment. This was realized by integrating and utilizing data from its central maintenance information integration system collecting equipment remote monitoring data, the constituent equipment data, and periodical inspection data.

Furthermore, by digitizing the expertise of its experienced facility operators at the Service Center and by utilizing the history of past customer interactions, the center is streamlining its existing customer support contact center operations and expanding its services to offer new value to its customers.

1 Preface

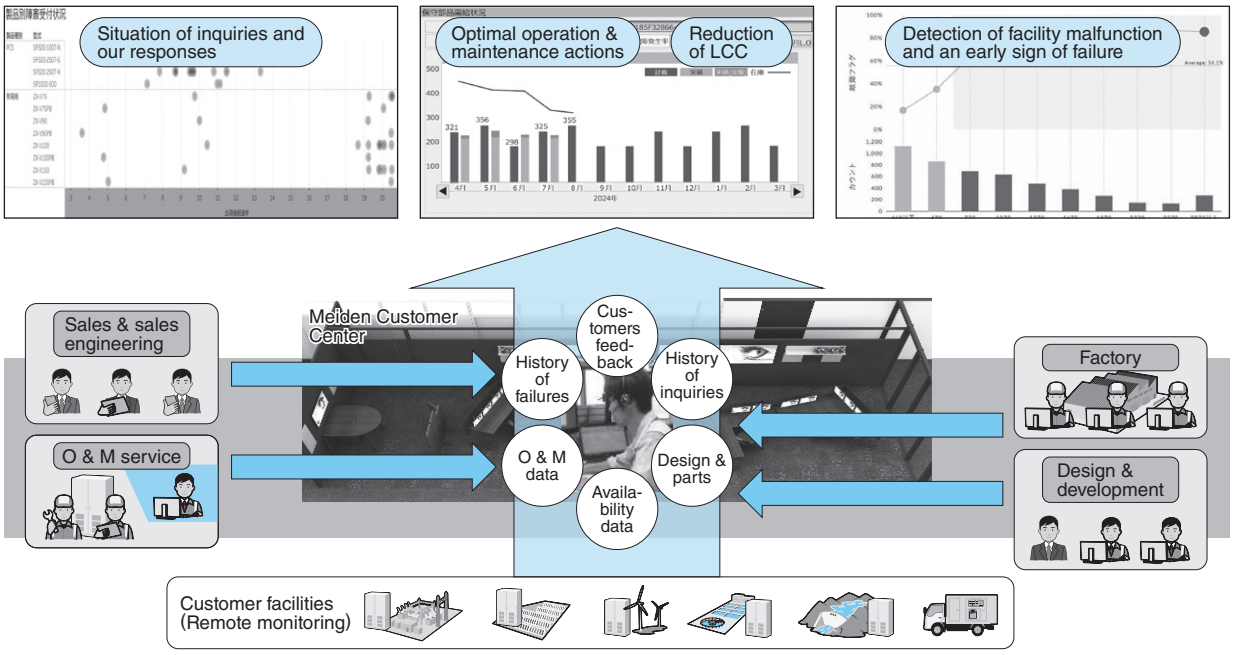
Meiden Customer Center (“Customer Center”) in Numazu City, Shizuoka Prefecture, Japan was established in 2003 with the aim of centralizing all error information and inquiry points from across the country. It has since provided 24/7/365 contact center services, remote monitoring service to customer equipment, and wind farm operation support services. Previously, the focus was on providing contact center services to address equipment malfunctions and responding to customer inquiries promptly. However, in June 2022, the center underwent a facility renewal to improve contact center operations and enhance its functionality. By integrating equipment monitoring data, customer information, and maintenance data, the center is developing services that support customers throughout their equipment lifecycle, including proposing optimal operation and maintenance solutions. Fig. 1 shows the service concept. This paper introduces the maintenance information integration system that contributes to optimal operation and maintenance proposals, and how to streamline the center operations through data integration and utilization.

2 Maintenance Information Integration System

2.1 Background of System Development

Our company has various customer information held by different departments (such as sales, manufacturing, service, and the Customer Center), but information sharing between these departments is not yet fully implemented. For example, when the service department investigates the timing for equipment inspection, it obtains and verifies information from the sales department regarding delivery and from the manufacturing department regarding design. On the other hand, when the sales department makes a replacement proposal, it asks the service department about the past inspection and repair history. Furthermore, to support the stable operation of customer equipment, information on equipment operating status, their past inquiries, and trouble reports is also necessary.

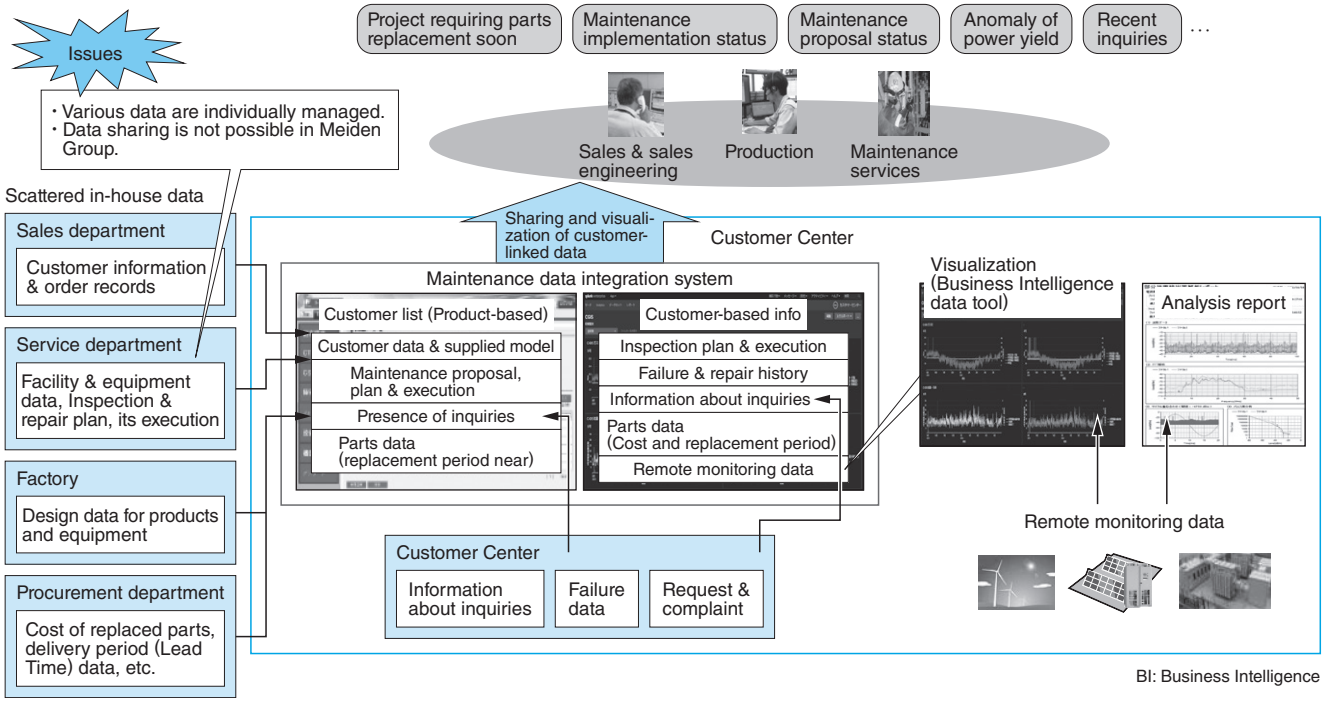
The Maintenance Information Integration System is a system that connects and shares customer information held within the Meiden Group, using the customer name as the key element of the database, and enables its effective utilization of related information. Fig. 2 shows the concept of the



LCC: Lifecycle cost

Fig. 1 **Concept of Our Services in Relation to Product Lifecycle Stage**

We provide appropriate and prompt service based on the condition of our customers' equipment.



BI: Business Intelligence

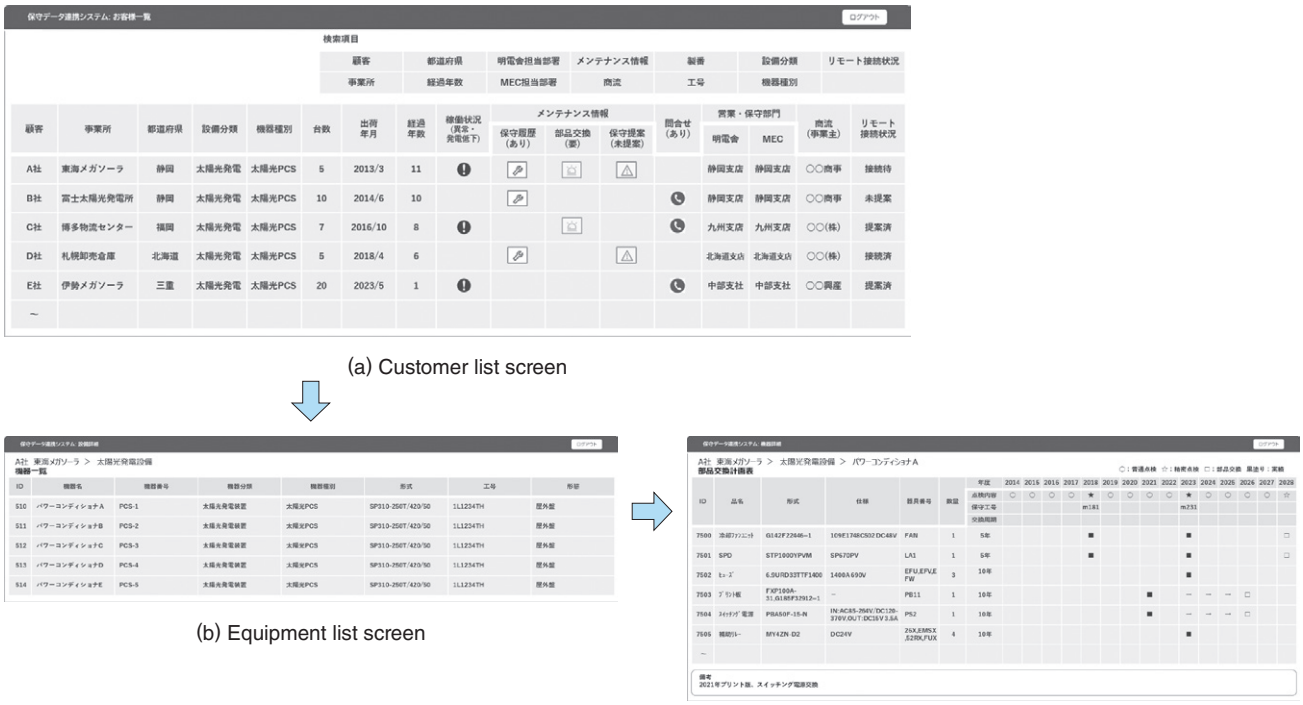
Fig. 2 **Concept of Maintenance Information Integration System**

By integrating maintenance data, monitor data, customer satisfaction level information, and design data, customer information is shared and visualized.

Maintenance Information Integration System.

2.2 System Overview

Because our product range is diverse, building an information integration system for all products will take time. To enable early system launching and operational evaluation, we started system development using solar power conditioning systems (PCSs) that have been in operation for more than 10 years and are approaching the time for frequent



(a) Customer list screen

(b) Equipment list screen

(c) Parts replacement plan table

Fig. 3 **Example of Maintenance Information Integration System Screen**

The customer list screen displays summarized information such as device details, maintenance records, and operational status. Detailed information is available on separate screens.

inspection and component replacement. These PCSs are used as a model. The main information integration functions are as follows:

(1) Integration of Supply Information: Integrate the end-user information and serial numbers of the solar PCS from the sales department's order sheet details.

(2) Integration of Design Information: Integrate information such as equipment type, quantity, delivery date, and replacement parts from the factory's design data.

(3) Operation and Maintenance (O & M) Information Registration: For each O & M project, the service department creates inspection and spare parts replacement plans and registers inspection and repair history on each customer.

(4) Availability Status Integration: Integrate information on equipment malfunctions and power generation performance deterioration based on the remote monitoring service data.

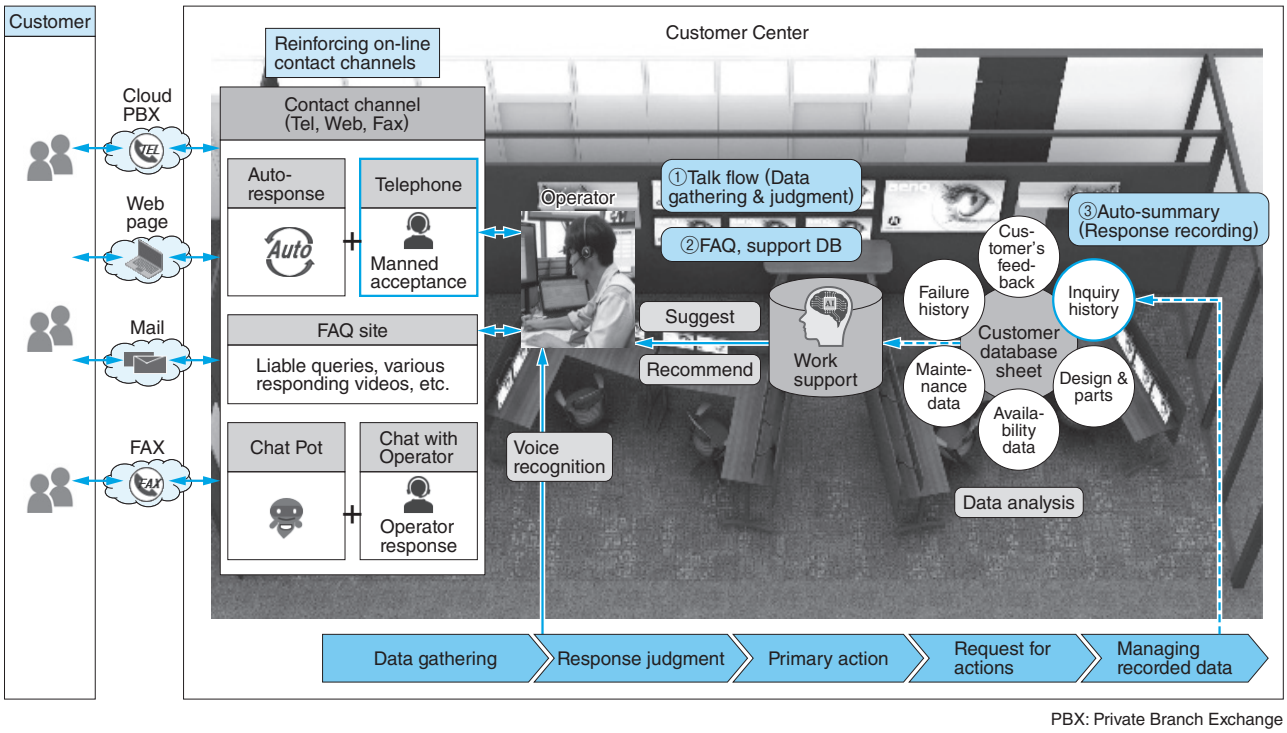
(5) Inquiry Information Integration: Integrate inquiries and error reports received at the Customer Center.

By integrating this information, the sales, manufacturing, and service departments can perform the suitable handling of customer inquiries while sharing the customer-specific inquiries with the related department. This can be done through the customer name as the key element of the database by accessing such matters as the need for inspections and part replacements, original maintenance plans and their execution status, facility availability status. Fig. 3 shows an example screen of the maintenance information integration system.

In the future, we will expand this information integration system to other product lines. We would like to build a system that allows sharing of various equipment-related information linked to the customer's name across various products.

3 Streamlining Operator Operations and Technical Knowledge Transfer

The Customer Center began operations by handling telephone inquiries. Over time, it has expanded its services and the types of equipment it supports, offering services such as remote monitoring of customer facilities and operational support for wind farm power plants, keeping pace with changing customer needs. These services now include remote monitoring service on customer equipment and operational support for wind farm



PBX: Private Branch Exchange

Fig. 4 Concept of Work Support System

Work support system structuring is shown based on the digitized expertise and judgment of veterans.
This shows how to make a business support system that digitizes the knowledge and expertise of experienced Customer Center operators.

power plants. The Customer Center handles a wide variety of inquiries, including not only those from customers regarding supplied products, but also requests for quotations (RFQs) from potential new customers, and opinions and requests from the residents living in the surrounding area of the Customer Center. It also provides remote monitoring and operational support. To handle this diverse range of tasks, a manual and communication system chart (emergency contact list) have been established. However, it currently takes a considerable amount of time to properly gather related project information while taking a customer call on a specific project and determining the appropriate course of action. Furthermore, the process of gathering project information and determining the appropriate response heavily depends on the operator's expertise, making technical knowledge transfer from experienced operators an urgent issue. To address these challenges, the Customer Center is developing a work support system.

3.1 Overview of the Work Support System

Fig. 4 shows the concept of the work support system. Its main functions include "Talk Flow" which streamlines the process of gathering project information from a customer call by flowcharting the steps for verifying call content; an "FAQ/Support Database" that displays hints for handling issues based on automatic analysis of call content and utilizes past response history and related information; and "Automatic Summary" which automatically analyzes and organizes call content, summarizing key points. Talk Flow flowcharts the process of determining the appropriate response based on various conditions, such as customer name, equipment location, product type, and inquiry type. While past response history has been manually recorded, there are gaps and inconsistencies in the data, making it unusable as learning data. Therefore, an automatic summary function is being implemented to ensure that all necessary information is reliably stored.

3.2 Future Initiatives

Currently, we are focusing on telephone as our primary contact channel and are developing an operator support system that leverages the digitization of our expertise and customer interaction history data. In the future, we aim to enhance the accuracy of our operator support functions and strengthen online customer contact channels, such

as an FAQ site and a chatbot, to enable customers to access information at their own convenience. This will allow us to build a system that provides faster and higher-quality service to address customer issues.

4 Postscript

This paper introduced how we provide various services to the customers from the Customer Center at every life cycle stage of the supplied products. We integrate and utilize maintenance service data, equipment remote monitoring information, and customer data. Thus, we stay in touch with the customers. The system described here is currently being implemented as a trial operation of this service to a certain product. We are also accumulating and analyzing equipment monitoring data to conduct ongoing trend analysis.

Looking ahead, we aim to provide a service that contributes to stable equipment operation and reduced lifecycle costs by detecting early signs of equipment malfunctions through analysis of subtle changes in the accumulated data. Through data collection, analysis, and the test run of the service by selecting a model equipment, we will continuously evaluate and improve the Customer Center-based services, accelerating our efforts to provide valuable services to our customers.