Case Study

Furukawa Electric Co., Ltd.

Building a platform for "TSUNAGERU MONOZUKURI"
Accelerating the challenge to the next stage through co-creation

Challenges

- Evolve into a Smart Factory for more sophisticated MONOZUKURI
- Start factory work innovation by introducing and utilizing various IoT equipment

Results

- All members shared their "Want To-Be State" and formulated a concrete activity roadmap
- Innovation activities started in each area and began to produce results

From left: Noboru Okada, General Manager, Optical Cable Production Dept.; Takashi Omori, Workstream Leader, RTF Global Fibercable Mie Workstream, Optical Fiber & Cable Div.; Yutaka Hoshino, Manager, Optical Cable Manufacturing Sec., Optical Cable Production Dept.; Shusaku Matsumoto, Manager, Production Engineering Sec., Optical Cable Production Dept.; Kazuyuki Iburi, Manager, MONOZUKURI Promotion team; Yoshiyuki Kanezaki, RP Team, Optical Cable Productions Dept., Optical Fiber & Cable Products Div., Communications Solutions Div.

Customer profile

Furukawa Electric Co., Ltd.

Head Office	Marunouchi Nakadori Bldg., 2-3, Marunouchi 2-chome, Chiyoda-ku, Tokyo
Mie Works	20-16, Nobono-cho, Kameyama-shi, Mie Pref.
Established	June 25, 1896
Paid-in Capital	¥69,395 million
URL	https://www.furukawa.co.jp/en/

Aiming to evolve into a Smart Factory

At Furukawa Electric Co., Ltd. (Furukawa Electric)'s Mie Works, which manufactures optical fibers and cables, MONOZUKURI Innovation has been a keen challenge. Noboru Okada of the company says, "We have been improving our MONOZUKURI capabilities based on the 'NF (New Furukawa) Production System' which has two pillars: 'Just in Time' and 'Automatization'. However, in recent years, not only conventional methods of improving production based on actual conditions in the field and product innovation, but also advanced MONOZUKURI methods utilizing data have been making progress. We also want to realize a Smart Factory and further improve our MONOZUKURI."

That is why Fujitsu's Field Innovation was introduced. Mr. Okada says, "Our use of data for MONOZUKURI has only just begun. So, I feel that Fujitsu's knowledge has great potential."

Considering the "Want To-Be State" of the plant by all members

Field Innovators (Flers) in charge of this project conducted their Factory Assessment using a unique tool developed by Fujitsu as the first step. The plant level

was assessed in 6 stages from 0 to 5 for 16 assessment items, and 5 challenge themes were presented. Based on the reults, the members held a workshop to tackle the challenge themes, and all members identified 7 important actual challenges.

In the following step, activity targets were set, and specific measures were considered. Based on the "Level-5 plant" proposals presented by FIers, the Want To-Be State of the optical cable plant was discussed repeatedly.

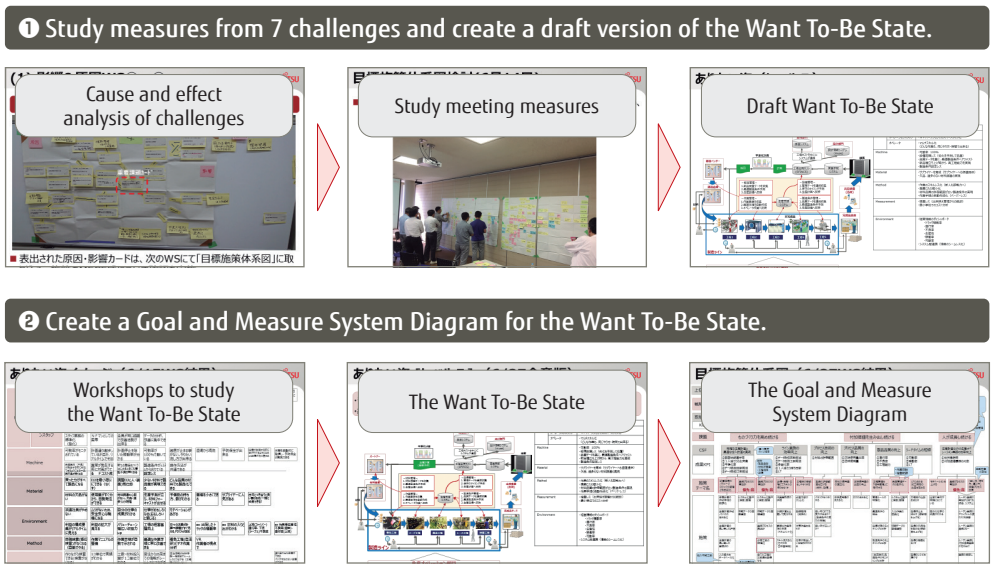
"What surprised me was that FIers asked me to think about the 'Want To-Be State' first. I was surprised because I thought they'd introduce their IoT solutions to us," Kazuyuki Iburi recalls.

In fact, this was an important point for later activities. "Because I was asked to think about the 'Want To-Be State', I was able to reconsider the mission of my section. In addition, we were able to understand each other's expectations through discussions that went beyond the boundaries of each section. This has deepened mutual understanding within the division," says Yutaka Hoshino.

At present, "The status of products in production is not immediately known" and "Operations information of equipment is managed on paper" were regarded as major problems. However, they defined "MONOZUKURI that automatically adjusts conditions by predicting the status of equipment, materials, and product quality" as the Want To-Be State of the plant. Then a Goal and Measure System Diagram with 4 challenges to "Realize clear production plans and optimal input plans", "Improve line operations efficiency", "Improve indirect works efficiency" and "Improve quality" were established.

"We discussed repeatedly creating the Goal and Measure System Diagram. Thanks to this process, we found a solid common understanding. Since MONOZUKURI is done by connecting all sections,

Create a Goal and Measure System Diagram based on the "Want To-Be State"



Through discussions at the workshop, everyone shared their "Want To-Be State". Challenges and measures for its realization were condensed in the Goal and Measure System Diagram which became the guideline of the activity.

having an image of everyone's common goal played a great role," says Shusaku Matsumoto.

Develop a road map for the Want To-Be State

In the third step, a four-stage road map consisting of "Create foundation", "Brush up", "Enhance" and "Master" was developed. Through working toward the Want To-Be State, the company aimed to realize its goal of "TSUNAGERU MONOZUKURI". Here, KPIs for verifying measures at each stage and their effectiveness, IoT/ICT measures, etc. were also specifically set.

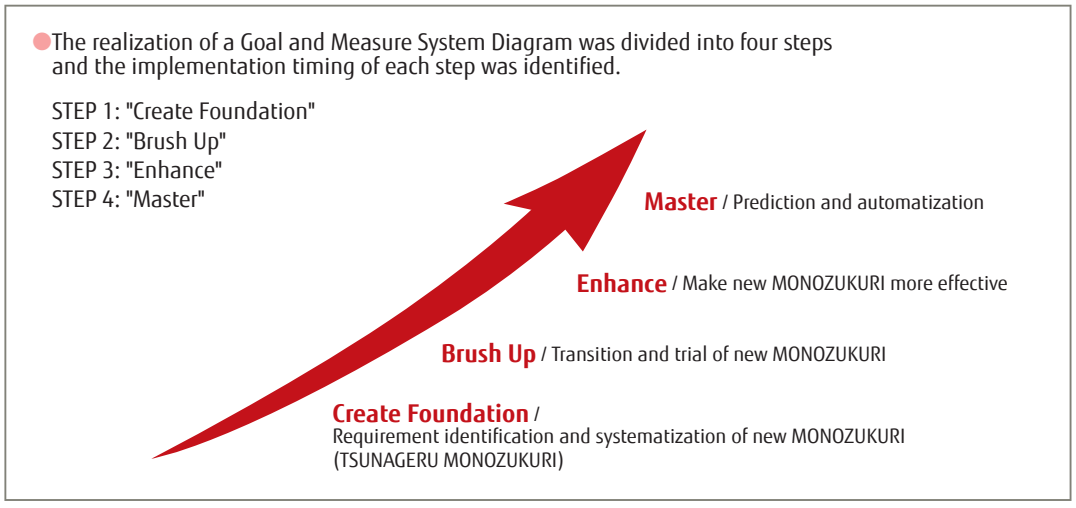
"There was a lot of hassle about how to set goals for this KPI and how to prepare data for it. FIers helped us a lot," Mr. Hoshino recalls. Yoshiyuki Kanazaki added, "We are currently rebuilding our document management system for technical works. We once tried to create a workflow of indirect works for that purpose by ourselves, but it was difficult because those works were highly personalized. We asked FIers for help, and were able to get a better understanding of the current situation by visualizing the links between the operation of each section."

Mr. Okada says it was good that they took enough time from the study of the Want To-Be State to the development of the road map. "If we proceed based on different perceptions, we would not be able to achieve the desired results. At present, we can clearly understand what we are aiming for just by looking at the Goal and Measure System Diagram. If we had bought a pre-made IoT solution from the beginning, it wouldn't have been so successful like this." (Mr. Okada).

Promoting smart manufacturing to realize TSUNAGERU MONOZUKURI

The actual use of IoT has already started in various ways. One of them is "Visualization of equipment operation time". Operation information for all manufacturing equipment is collected, and then this information is displayed on a monitor so that the operating status of the previous and current days can be seen at a glance. "When I first undertook the Factory Assessment, I didn't understand why data visualization would lead to improvement. However,

■TSUNAGERU MONOZUKURI Roadmap



A four-stage roadmap for realizing a Smart Factory was drawn up. Specific KPIs were also set.

when I tried it, I found that the equipment was not fully working, which I had thought was operating at full capacity. So, once we know this, we can get a perspective as to why it's not working and how to increase the operation rate. It's a start for improvement," says Takashi Omori. In addition, he says that by seeing the same facts through visualization, discussions can proceed constructively and creatively.

They also conducted a trial to visualize the movement of workers in the plant. "We encouraged our plant workers to be multifunctional. One person could engage with multiple pieces of equipment. Beacons were fitted to operators to visualize their movements to see if it worked well. As a result, we were able to confirm that the workers were handling the equipment equally," Mr. Iburi says.

Still, the realization of a Smart Factory has only just gotten started. Mr. Okada says, "We hope to progress with the road map sequentially and spread the results to other divisions and plants. We have production plants overseas as well, so we're hoping to play a leading role as the mother plant."

From left:
Makoto Abe,
Kiminori Sato

We got a request from the Production Technology Division of Furukawa Electric Co., Ltd., which is responsible for company-wide reform activities. Their request was, "In order to introduce IoT into the production line, we need process formulation support from FIers."
We suggested that the customer proceed with activities not from selecting IoT solutions but from considering what they wanted to achieve.
We first conducted a "Factory Assessment" to identify plant challenges and asked the customer to create a "Want To-Be State of the organization" and "Want To-Be State of the plant" through a workshop.
As a result, we were able to get the customer to share their objectives and desired results.

We are confident that activities at the optical cable factory will be further accelerated in the future.
We would like to express our gratitude to the team leaders for engaging with the activities until they formulated their Want To-Be State picture, even though they might have been a little unsure of the process at first.

Contact
FUJITSU
Address: Shiodome City Center, 1-5-2 Higashi-Shimbashi, Minato-ku, Tokyo, Japan
Phone: +81-3-6252-2220
From the US/Canada, dial 011 81-3-6252-2220
Website: www.fujitsu.com/jp/fieldinnovation/en/
2021-08-31