Tips for Implementing AI in Businesses Learned from the Case of Daikin's U.S. Subsidiary

Findability Sciences K.K.

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Overview

Daikin Comfort Technologies North America, Inc. , U.S. subsidiary of Daikin Industries, Ltd., which was renamed from Goodman Global Group, Inc. on April 1, 2022, is a leading manufacturer of residential air conditioning in the U.S.
The company has been promoting the digitization and digital transformation (DX) of management in recent years, and has been implementing AI with Findability Sciences as a partner since 2020. We asked the company about the benefits, challenges, human resources, and key points for AI implementation and utilization.

*This material is based on the webinar ”A Primer on AI Integration for Businesses” held on February 28 and April 28, 2022.
Webinar (Part 1) Video Link
Webinar (Part 2) Video Link

Interviewer & Interviewees

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VP of Transformation and Sales Planning
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Joshi Ashish

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1. Daikin Comfort Technologies' AI Implementation Project

- First of all, what is the background behind Daikin Comfort Technologies' decision to introduce AI?

Kawabata: The HVAC industry in North America is a relatively conservative industry, and I think AI and DX have not penetrated very far. Even now, two-step distribution is the norm, with products passing from the wholesaler to the dealer or contractor, and then to the owner. However, even in such a situation, companies that we call "platformers" have emerged, and there has been a significant change in the market. ServiceTitan, for example, has taken the market by storm by offering a platform for dealers. So I think there is more movement in the U.S. than in Japan, not only to adopt new technologies and processes, but also to create new business models and transformations, even in our traditional industry.

- Do you feel there are any other differences between Japan and the U.S. in terms of AI?

Kawabata: Yes, what I feel every day in the U.S. is a social consensus that everything that benefits the consumer is a good thing. For example, Amazon has been criticized for various things, such as its use of data and privacy, but I think they have been able to expand their business so much because they think about what kind of technology is necessary to benefit the consumer. Our industry also has the difficulty of moving products only through those who do the installation, but I think that our thinking will change more toward the idea that improving the consumer experience is the source of corporate value. However, I don't think this is the case in Japan. I think that Japan tends to be more process-oriented, or to seek causal relationships, in other words, what kind of results are expected from the introduction of new technologies. I think that is why the pace of corporate reform, DX and AI introduction is a bit slow.

> "There is a real sense that the threat is right in front of us.

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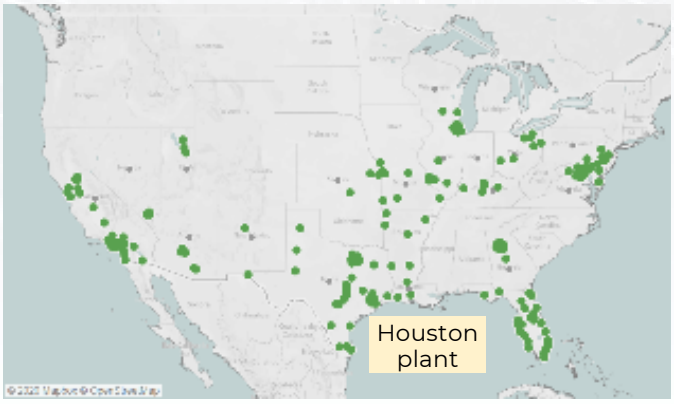
- Now let's talk about your company's efforts to introduce AI and what you are aiming for in the future.

Goodman's Approach: Optimizing the Supply Chain by Improving the Accuracy of Sales Forecasts

- Riding the tide of decarbonization and reduction of greenhouse gas emissions, the company is working to expand sales of differentiated products such as inverters and heat pump heaters. (Past performance alone is not enough to predict the future.)
- Further reinforcement of "Placing what you need, when you need it, and in the quantity you need at the location closest to you (the customer)."

1. Our own sales network



Number of self-supplied wholesale locations: **approx. 250 in 30 states**

Average of **70 truckloads** shipped daily from factory

Over 1,000 SKUs

Create monthly sales forecast by SKU for each location (approx. 700 - 800 SKUs x 250 locations = 170,000 - 200,000)

Goodman's Approach: Optimizing the Supply Chain by Improving the Accuracy of Sales Forecasts

2 . Sales forecast and shipment planning using AI

Current Process

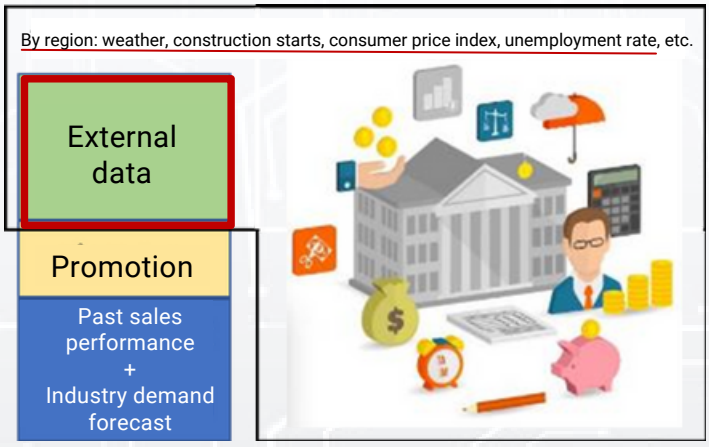
- Primarily based on past performance
- Depends on people's ability and experience

Promotion

Past sales performance + Industry demand forecast

Goal (under implementation)

- Consider factors that affect the future in addition to past performance
- Maximizes the use of computer processing power in addition to human ability and experience



Joshi: Yes. We at Daikin Comfort Technologies have about 250 wholesale locations in the U.S., and we have over 1,000 SKUs of products. So when we create a sales outlook, there are roughly 170,000 to 200,000 items in that combination. This makes it very difficult to create a forecast to ensure that we have what we need,

when we need it, and in the quantities we need. The U.S. market is large and varies greatly from region to region, and it changes daily depending on the weather and other factors. Until now, we had been creating forecasts based on past performance, and we felt limited in terms of what would happen in the future because we could only look at the U.S. as a whole, including GDP and weather. So we have introduced AI to create forecasts based on weather, construction starts, and consumer-related indices for each region. Our current goal is to use the time previously spent on forecasting to do more meaningful things, such as fine-tuning the forecast results by human hands.

- Could you then tell us about the ROI you expect from this project?

Kawabata: Yes. We consider the availability of products in the right quantity and in the right place at the right time to be the source of our competitiveness. This means reducing lost sales opportunities and increasing sales. We also have about 250 wholesale locations, and we have been exchanging inventory among neighboring locations, but this cost is very high, and we want to reduce it. We also want to reduce costs by improving the loading efficiency of truck transportation from Houston, where we are currently consolidating our plants to a single location, so that trucks are always fully loaded with products. Then, after the products are placed at the branch, we want to reduce costs by minimizing or maintaining the floor space of that branch, and reducing the rent by rapidly rotating products with a high turnover rate. We believe that we can expect numerical returns in these areas.

Goodman's Approach: Optimizing the Supply Chain by Improving the Accuracy of Sales Forecasts

3 . Concept of ROI

Quantitative ROI	• REDUCTION IN LOST SALES OPPORTUNITIES (SALES ↑) • Reduction in carrying from storage to other storage of inventory (cost ↓) • Maximize trucking efficiency from factories (cost ↓) • Maintain branch floor space and increase sales by increasing inventory turnover (cost ↓)
Qualitative ROI	• Increase customer satisfaction (CS) • Branch employees feel more comfortable serving customers. • Improve productivity of planning staff to reduce routine work hours and increase value-added work hours • Ensure transparency in the decision-making process

- Was this kind of ROI and goal setting requested by management at the beginning of the project?

Kawabata: Well, when we started this initiative, cost-effectiveness was not much sought after. Of course, there was talk of eventually pursuing that, but basically we were asked to adopt new technologies, change our processes, and eventually change our business model. I believe that they rather gave us an encouraging push, in that it would be difficult to survive without doing so. We were asked to come up with a big frame of reference, such as how the introduction of this technology would improve the overall supply chain and what KPIs we would use to measure its effectiveness. I think the idea was that if they decided everything at the beginning and we followed it, it would be difficult to move forward because of all the initial analysis, but I think they thought that would be more negative.

Joshi: When we proposed this project to the management for the sales forecast for each dealer and each product, the first question they asked was whether the objective was to increase sales, reduce costs, or increase customer satisfaction. I explained the concept that our goal is to have the products we (the customer) want in the stores we want, when we want them, and in the quantities we want. I was also asked from the larger perspective of how this AI implementation would fit into the overall story of the company's digital strategy, and whether there would be any overlap.

> " Cost-effectiveness of AI only comes into play at Level 4.

- I felt it was an excellent approach, and while there are so many cases where people immediately talk about the cost-effectiveness of AI implementation, in reality there are several steps that need to be taken before a numerical ROI can be achieved. Let me explain this point using the "Guidelines for AI-Ready Society" published by Keidanren (Japan Business Federation). The steps to becoming an AI-ready company range from Level 1 to Level 5, but it is at Level 4 that cost-effectiveness begins to emerge, where management understands the value of AI x data and can apply it to business, and employees have high AI literacy and can use AI as a driver to generate value in core business. Between Levels 1 and 3, it is important to solidify the foundation of understanding the technology of AI, having the ability to use data in-house, and being able to use that ability to develop AI-enabled strategies.

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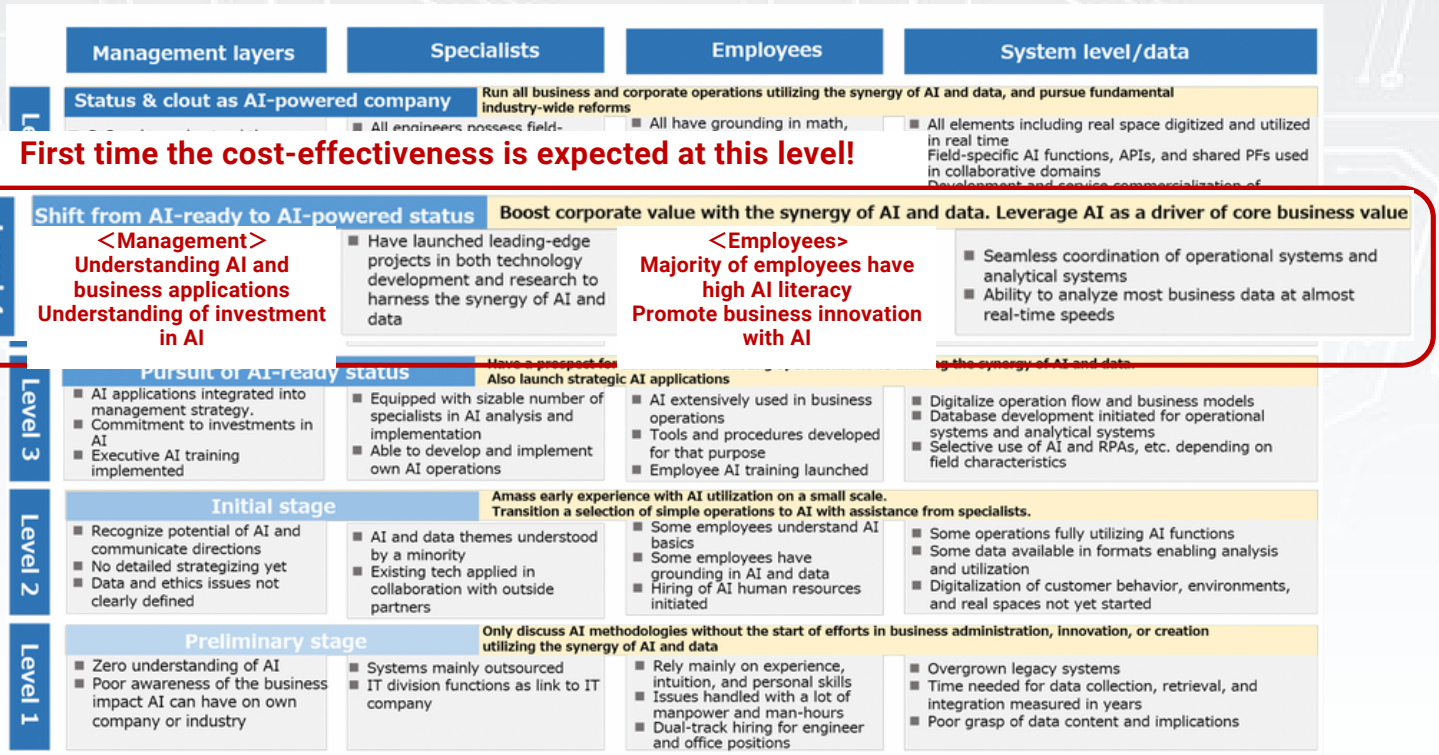
Challenges of Implementing Enterprise AI

Steps to bring about business transformation with AI



Reference:https://www.keidanren.or.jp/en/policy/2019/013_outline.pdf

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- By the way, it has been about a year and a half since you started the AI implementation project. What are some of the challenges you are facing?

Kawabata: Well, the accuracy of sales forecasting has been steadily improving since the introduction of AI. However, the local members have their own familiar ways of doing things, so I feel that the challenge is how and when to transition from these to the new ways.

Joshi: What I feel is the challenge is the scope and timeline. When we started the project, we discussed the scope with everyone in the company and people at Findability, and decided on the scope, but the more I understood about AI and machine learning, the more I wanted to do and wanted to do this and that. So the scope and timeline kept changing, and my boss, Mr. Kawabata, pointed this out to me (laughs).

- But Mr. Kawabata has such an agile way of thinking, so I think the project is turning out very well.

2. AI Talent Development at Daikin Comfort Technologies

– As companies utilize AI, the shortage of AI human resources will be an issue. What is your company's approach to AI human resources?

Kawabata: As for the recruitment and training of AI personnel, it is possible to hire young and motivated people by recruiting them, although they are of course very precious in the U.S. as well. However, in Japan, the absolute number is small and school education has yet to catch up. At Daikin's headquarters, the idea is to bring new graduates up in-house and then bring them back to the field, have them tackle their own issues at each site, and build on small successes to create a swell throughout the company. However, it is not the case that there are no human resource challenges in the U.S. Compensation levels are skyrocketing, and professionals such as data scientists and data analysts change jobs as soon as there is an opportunity. It is very common to hear stories of people quitting because of an opportunity, even though they were on the same team until yesterday. In particular, there are many cases where people move to a growing venture company because their role becomes bigger or they are closer to the management team. I feel that it is important for them to gain management experience and to feel that they

are in charge of the company's management strategy, not just to increase their remuneration, in order to motivate them. Reform takes time, but if people are constantly being replaced, we have to start all over again, and I feel the difficulty in this area on a daily basis.

- I see. Joshi, you are from India and joined Daikin Industries, a Japanese company. Can you tell us about the ease and difficulty of working in a Japanese company?

Joshi: I have been working for Daikin since I graduated, so I don't have much comparable experience, but from what I have heard from other Indian engineers and others, there is still a language barrier and communication problem. When communication with superiors becomes inadequate and they cannot see their future even a little,

> Feeling that you are in charge of the company's management strategy is important for motivation.

they often quit in search of rewards and satisfaction, as there are many other options out there.

Kawabata: This may sound a bit clichéd, but I think it is important to create a work environment and processes that can make people from various countries and cultures happy by combining the best of the U.S. and Japan (diversity in the workplace).

- Yes, I agree. Since the competition for talented people is on a global scale, I think companies are required to have true diversity in the true sense of the word. There are two types of AI human resources: those who utilize AI and those who create AI. Those who utilize AI are those who can identify their company's business processes and think about how AI can be applied to those processes to change the business. On the other hand, AI developers are those who build AI systems such as machine learning systems, such as AI engineers. Many companies are considering in-house production of AI, but I think it is a good idea to make it a point to consider to what extent it is best for the company to have its own human resources in place. Since AI is one of the ways to develop business, it is one of the ways to concentrate on your core business in terms of economic and time cost, to develop personnel in-house to utilize AI and leave the actual AI development and maintenance to the vendor.

3. Key Points of AI Implementation and Utilization

- Implementing AI involves the following steps: understanding business processes and internal data, collecting and integrating internal and external data, building, testing, and improving AI models, and building a UI to display analysis results. Were there any steps that you found difficult?

Kawabata: Well, I guess the last step, the reflection of analysis results. After all, it is meaningless if it doesn't lead to execution. We have changed the process and decision-making several times, and if we clarify the causal relationship at that time, it is easier to convince key people in the company. I think it is difficult to create a sense of conviction, especially among Japanese companies, by simply explaining that this is what happened after analyzing big data using AI.

- Yes, it is true that we are often asked by management why these results were obtained, and we would like to do all we can in terms of "explainable AI". How about you, Joshi?

Joshi: I found the data collection part the most difficult. We have an IT system in the company, so I thought we would have the right internal data. However, when I tried to use that data, I found that there was actually a lot of data in various systems, some of which had not been updated for two years, so it really took a lot of time. Even with machine learning, you have to give the machine a textbook to learn from, and I realized that if the textbook is wrong or inadequate, the results you are looking for will not be good either.

- I see. As you said, data collection is an important step, and it is necessary to assess what kind of data the company or the relevant department has and what kind of structure the data has before collecting it. In many cases, especially in companies that have undergone many mergers and acquisitions, data is scattered in various places, and it is often difficult to know what kind of data is available.

- Next, could you give us your opinion on the people and departments that should take the lead when a company is trying to promote DX?

Kawabata: I think that management should take the lead. If the objective is management reform or the creation of a new business model, it is a management issue, so I think it would be ideal for the management team to take the lead and lead the members by encouraging and cheering them on.

> "Management should lead the project.

Joshi: Yes, and since data must first be available for AI implementation, we are trying to have IT [team] take responsibility for data infrastructure, master data management, data governance, and security, all of which will be managed centrally.

On top of that, AI and machine learning will be done by each department, but if someone doesn't put it all together, the data, mechanisms, and processes will remain unintegrated, so we are trying to create a Business Transformation Team or Digital Transformation Team that will lead the entire company.

- Were there any difficulties in sharing the same goals with the various people involved in the project?

Kawabata: Well, in the past, in the supply chain, for example, the head office would create sales forecasts, production plans, inventory plans, etc., but at the field level, there were people in sales and logistics, and they would introduce their own software to create their own sales plans, and they were working in a silo-like manner. When introducing AI, we tried to involve key persons in each of these fields by carefully explaining our intention to introduce AI. This was a difficult and time-consuming process, but we were careful to make adjustments to ensure that they were all working in the same direction.

- So top-down approaches don't work?

Joshi: I think top-down approach is also necessary. For example, if Kawabata talks with people at the same level in related groups and doesn't give us instructions, or rather, a grip, it is difficult to make progress even if we, the people in charge, talk alone. The people onsite are more concerned with doing the job at hand, so they are not likely to take on new challenges even if I explain them. As for the benefits of introducing AI, it is important to explain not only the benefits to the company, but also the benefits related to the work the person in charge is doing, such as making the work easier to do or making it easier to explain to management. One thing to keep in mind, however, is that although we are working as a transformation team to promote the introduction of AI, unless the people in charge of each department take ownership of the project, it will be difficult to implement it. We need to make it clear that we will provide support and that you are ultimately responsible for the project. Also, if we create opportunities for front-line staff to report directly to management, they will be more motivated because they will be evaluated directly on what they are doing. This has been felt very often over the past two years.

Kawabata: Yes, especially in large American companies, it is very rare for field staff to have the opportunity to present their work to top management in a serious meeting, so it is a great motivation for them to report at management meetings and receive evaluations. I think that unless we include such human emotional aspects, it will be difficult to reach the final goal.

- Mr. Kawabata and Joshi, thank you very much for your very valuable talk. Findability Sciences will work as one team for the development and success of the project. Thank you very much for your time today.

THANK YOU

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