



Special Feature: A Roundtable Discussion between Our COO and Young Engineers

Development of Tire Technology that “Exploits” AI

— Responding to major transformations in the automotive industry



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AI Utilization Concept HAICoLab and Roles as Engineers

Seimiya Although a large amount of data has been accumulated by Yokohama Rubber during its history, it is impossible for engineers like you, namely, humans, to grasp it all. Our AI utilization concept HAICoLab was formulated to make effective use of this valuable



resource for innovation. This is a framework that merges human inspiration and creativity with the enormous knowledge processing capability of AI. Based on multifaceted experiences, knowledge, and judgment criteria unencumbered by stereotypical biases, AI

considers how humans would interpret the results produced by AI before making a final decision. HAICoLab builds upon two previous Yokohama Rubber AI-based materials development technologies, a highly precise multi-scale simulation technology and a material informatics technique to develop materials. In addition to merging these technologies, HAICoLab has become the Company's unique AI-based framework, aiming to achieve digital innovation through orchestrating a “human and AI collaboration” to bring about both

incremental and radical innovations. As Yokohama Rubber's Medium-term Management Plan YX2026 includes the keywords “exploitation” and “exploration,” it can be said that the approach of using this AI-based framework is in line with these concepts. HAICoLab is essential for us because the speed of various innovations in the automotive industry is accelerating, such that we are unable to keep up via conventional technologies alone. HAICoLab was introduced to promote the use of AI to accelerate the further development of technologies in fields we have been active in up to now. AI has already been used for rubber material development and new product structural development. In the future, we will continue to expand the scope of AI applications and promote the development of HAICoLab technologies to support the development of unique new products at Yokohama Rubber.

Kowatari I am in a position to promote the use of AI within the Company. For our Company to utilize AI in the first place, we must create AI that predicts excellent tire performance and compound performance. With AI, data cannot simply be entered, and if a human makes assumptions and enters data, it will not be accurate because of bias. This is a difficult issue regarding AI. The rewarding aspect of my position is that, in the name of AI utilization, I can work with many people in various departments within the Company, including material, design, and systems development, while also experiencing personal growth.

Sawa I am developing compounds for passenger vehicle tire tread caps—the parts of a tire that make contact with road surfaces. The development of a single rubber to serve as a material for tread caps is extremely complicated because it requires various performance characteristics, such as hardness and strength.

The challenge is that effective prototypes cannot be created at the factory level unless relevant data are enhanced.

Previously, we spent a significant amount of time repeatedly conducting lab-scale evaluations. It was a necessary use of time.

However, the AI-based application developed by Mr. Kowatari and his team to predict physical properties enabled me to skip much of the lab evaluation work, providing valid data instantly. I can feel just how great our technologies are and utilize them on a daily basis. I will continue to make effective use of them in the future and would like to see those around me using them as well.

Nakamura I am working on a technology that achieves both a high level of wet performance and rolling performance from tires. Unfortunately, however, I do not believe that I am making full use of AI technology. Although I have had the opportunity to use a lot of data in my work, my supervisor once pointed out that I had judged the superiority or inferiority of results based solely on the size of the numbers and that I had not seen the essence of the data. That’s why

when we use AI, we are careful to look at the essence of the data and not blindly trust it. I would like to continue my research without changing that approach.

Seimiya One of our strengths is our AI Research Laboratory, which provides us with clear direction. Having mainly worked in the field of tire design, in the past, I analyzed as much data as I could, but when the volume of data became too large, could not proceed further. I feel that we now have the foundation to successfully integrate the capabilities of AI and our engineers. Examples that have advanced to the point where we use them on a daily basis in tire development include our unique AI-based system for predicting the physical properties of rubber compounds and the values of key tire properties. Previously, the results of prototypes and evaluations were entered into a database in an unstructured way, and the data not fully utilized. We are integrating the latest AI technology into our daily design and development activities. These predictive systems enable many virtual experiments, which are expected not only to speed up development, reduce costs, and produce high-performance products, but also to make compound design easier for less experienced engineers. As a result, we created high value-added tires such as ADVAN and GEOLANDAR.

Roles as Engineers in Making the Most of AI

Seimiya Using AI tools during the development of advanced, new tires, we expect our engineers to create innovative solutions that go beyond conventional technology. I also want young, new employees to become independent as designers and engineers as soon as possible. As they do so, it would be a great advantage if they quickly learn basic skills utilizing AI technology. I want our employees to focus on two goals when using AI: innovative tire development and mastering basic skills.

Sawa Since I started working with AI, I have felt the need to use AI applications better. Evaluation data contains a certain amount of noise and abnormal data, which probably lowers the accuracy of AI-based analysis. It is important for those of us using AI applications to recognize this, and to analyze the data the Company has accumulated and will accumulate in the future more accurately. To do this, it is necessary for AI application users to verify the data produced by AI in their own way rather than taking the data at face value. Of course, if I verify everything myself, AI will lose its meaning. Therefore, I would like to integrate AI and my own thinking as necessary to move ahead in technological innovation.

Nakamura Recently, many new evaluation methods have appeared, some creating amounts of data at sizes that I had never seen before. As a result, I was unable to compile some of the data on my own. In such cases, I would like to utilize AI to efficiently organize large amounts of data. However, as Mr. Sawa mentioned, I would like

to utilize AI data while assessing its essence rather than taking the data at face value.

Kowatari I agree that AI data should not be taken at face value. However, along with such data, AI needs to be able to present information, such as results using conventional technology. I would like to focus on that point. After all, engineers always seek higher levels. Instead, I think it is necessary to have a process enabling users to understand what conventional technologies cannot do and are unlikely to do soon. I believe that this will lead to the “exploitation” and “exploration” of our YX2026 plan, the continued leveraging of existing technologies, and the discovery of new technologies.





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For “Exploiting” Skills at Yokohama Rubber

Nakamura I think one of the skills required as an engineer is to be able to look at acquired data from various perspectives. A lot of data is created, and I believe that a good engineer must be able to pursue the actual phenomenon, rather than assume that something is impossible because it is different from what they have seen before. Improving wet performance, which is one of the initiatives that I am working on, is directly linked to the safety of customers who purchase our tire products. In the future, I aim to accelerate the improvement of wet resistance, reliably elucidate the relevant phenomena, and deliver the needed technology.

Kowatari In using AI, it is necessary to have detailed knowledge of statistical analysis and programs. Even with AI, it is not enough to create a model once; it must be continuously refined. However, if you program AI to learn, it will learn, but people learn in different ways. I always feel that we need to gather and learn a variety of information from around the world. President Seimiya has stated that young



employees should actively use AI, as they are flexible and adaptable in this regard. Indeed, Yokohama Rubber needs human resources who can be flexible and adapt. Engineers should remember this and use new technologies as soon as these become

available. I believe Yokohama Rubber needs people who will do so.

Sawa I believe simply using AI in a routine manner defeats the purpose. When I joined Yokohama Rubber in 2015, there was already an Excel application with various types of macros built into it. Although you could use it with the touch of a button, I found it difficult to see what kind of operations were performed behind the scenes and which data were truly important for those operations. The same holds true for AI. Users need to understand which parts are important for AI to process. This way of thinking will be essential for people who join the Company in the future and take AI tools for granted. I intend to properly convey this to my junior colleagues and I myself also want to make full use of AI that ultimately leads to technological innovation, as our President has discussed. Of course, the Company’s development efforts involve everyone working together, but I aim to take the lead in using these tools to discover technologies we can all be proud of.

Seimiya I believe it is important for engineers to first discuss various matters using data. How we extract and utilize such data is key, and one of the tools to help with this is AI. As you three have mentioned, even though AI can process vast volumes of data with high computational power, it does not always provide 100% correct answers. We use AI while constantly questioning and thinking about what factors are influencing the results. It is crucial to incorporate the ideas of our engineers, make sound judgments, and further advance technological innovation. I feel that I can count on all three of you based on what you have said.

The Social Value We Want to Provide to the World

Sawa Sustainable development is one of the key demands the world places on all companies. Before working in tire compound development, I was involved in raw materials development. Some materials, even within the same groups like carbon or silica, can have different properties—some contain a higher proportion of naturally derived materials, while others generate lower CO₂ emissions during manufacturing. However, many of these materials lead to decreased tire performance. Figuring out how to utilize them effectively remains a challenge for our Company. Over the past several years, we have been conducting evaluations and accumulating data from lab-scale and factory tests. Technologies like AI are extremely useful for organizing and analyzing such data effectively. Looking ahead, we plan to make greater use of AI tools from a sustainability perspective, and based on the data accumulated so far, we aim to develop methods to manufacture tires using materials with lower CO₂ emissions, while increasing the proportion of naturally derived materials without compromising performance.

Nakamura One of the key technologies I am working on is wet performance, which is crucial for ensuring the safety of our customers, especially in rainy conditions. Additionally, improving rolling performance can help reduce fuel consumption—or electricity efficiency in the case of electric vehicles—benefiting both consumers and the environment. In the future, I intend to accelerate this process by developing technologies enabling a deeper understanding of the underlying phenomena. To achieve such a high level, I will focus on creating technologies faster and utilizing them in product development. For this, utilizing AI for data analysis can significantly speed up the process. With this in mind, I aim to explore uncharted territory by providing additional value beyond what has traditionally been achieved.

Kowatari Competition in the automotive industry has intensified. With the rise of various vehicle types, such as EVs and internal combustion engine cars, there’s a growing demand for tire development tailored to each type. For this reason, continuously reducing the lead

time for tire development is crucial. Despite the limited number of engineers, the development periods have shortened, and the variety of tires requiring development continues to expand. If this trend continues, I am concerned that developers may not be able to take the time to carefully and wholeheartedly engage in manufacturing. Indeed, it may be easiest to ask the President to increase the number of people involved, but it is precisely at times like this that we should ask AI to help in various development areas to shorten development lead times. I have seen firsthand how designers are working on a wide range of tire designs, all while adhering to strict safety standards, as safety and security are paramount for our products. From my point of view, I want to support them through AI-based data analysis to ensure these standards are upheld.

Seimiya As a manufacturer, Yokohama Rubber is fundamentally tasked to determine what kind of products and services it will deliver

to the world. We need to address key issues, such as safety, environmental concerns, and speed. AI is one of the tools that will tackle these challenges. Not only in product development, but also in competing with other companies, we must further refine our AI technology, improve it, and expand its applications. While the most important thing is to make high-quality products, I believe reducing costs and manufacturing products affordably are also critical. In today's tire industry, cheap tires from countries such as China and India are flooding the market, and in some areas we have no choice but to compete with them. Therefore, improving performance while controlling costs is essential. I would like us to pursue both of these goals simultaneously.

What Our Engineers Want to Convey to Our Stakeholders

Kowatari I hope to convey to our stakeholders that our design and development members have always developed our products with a keen awareness of safety and security. Additionally, we remain deeply committed to addressing quality and environmental issues.

Sawa First, I feel that the effective use of AI can only be a benefit for the Company. As has been mentioned in this discussion, even if we manufacture the same tires as before, AI can help eliminate certain production processes, speeding up the overall process and reducing costs. In other words, AI improves the balance between cost and performance. I am personally committed to promoting the effective use of AI and will share it with junior colleagues. I trust our stakeholders will come to understand the Company's stance on this matter.



Nakamura Although I am the only female member here today, we have more and more female engineers. When I need to carry heavy tires, I do receive assistance from male colleagues, but otherwise, I need not be conscious of gender at all, which makes Yokohama Rubber a comfortable place to work. Also, as Mr. Kowatari said, the Company conducts various types of tests and evaluations under all possible circumstances. With safety firmly assured, we strive every day to produce products with improved fuel consumption (or electricity efficiency in the case of electric vehicles) as well as wet performance.

Seimiya Over the past few years, I have realized that the tire industry and the overall automotive sector are changing faster than I had anticipated. These industries are changing in many respects, including environmental issues and legal regulations. For Yokohama Rubber to grow under these conditions, I believe it is important to stay ahead of the changes in the environment by using various tools, including the AI technology that we talked about today. This will allow us to produce high-quality products at low costs and speed up our processes. With a strong awareness of these points, I will continue working closely with the engineers here today, and I sincerely hope to receive guidance and support from all our stakeholders.