Innovation Management Tripartite Talk

Business Development and Technological Development to Create Value Chains

The IHI Group is making a complete over-haul of its approach to business and tech-nological developments in order to create businesses from a value chain perspective. The Group will reinforce the collaborations between business development and tech-nological development and will aim to create an organization that will enable the generation of a Development-focus Business, which will follow the fuel ammo-nia value chain businesses.

The officers of the Business Development Headquarters, which creates new growth businesses, Strategic Technologies Division, which acquires strategic technol-ogies for the future, and Corporate Research and Development Division, which is in charge of technologi-cal development, came together to discuss about the structure needed for the IHI Group to continue creating businesses from a value chain perspective and the trans-formation of corporate culture to achieve this.

What are the missions of your headquarters?

- **Kobayashi** The main mission of the Business Development Headquarters is to lead and supervise the development of businesses that will become the next growth business, based on the business concept. We identify issues to be solved among social issues in and outside of Japan and build new business models from a value chain perspective, as well as create businesses that are rooted in the local community. For this, it is important to combine regional strategies, business strat-egies, and core technologies to develop businesses with speed and scale.

- **Morioka** The main mission of the Strategic Technologies Division is to lead the acquisition of technologies that have a high potential of becoming core technologies in the future. Starting with technologies, we envision future possibilities and create scenarios to achieve them, deter-mining the technologies that need to be acquired. We are also responsible for acquiring the technologies needed for the business concepts created by the Business Development Headquarters. We continuously monitor both internal and external technology trends and swiftly acquire the necessary technologies. The strategic technologies we acquire will be the pillar that supports businesses with a value chain perspective.

Kubota The main mission of the Corporate Research and Development Division is to nurture the strategic core technology candidates identified by the Business Development Headquarters and Strategic Technologies Division, to the level required for commercialization. In the past, the IHI Group tried to maintain a competitive advantage in product specifications, but we often found ourselves caught up in price competition with our competitors. Through these experiences, we learned that even if we can become front-runners, it is not always possible to develop large businesses with new technologies alone. To secure a competitive advantage, we will continue developing technologies from a value chain perspective, leveraging these experiences. At the same time, it is our important mission to enable the technology developers themselves to draw up future visions and scenarios and to research and develop proprietary and advanced technologies. Unique research and development in a rapidly changing world can lead to the realization of future visions and scenarios that were not anticipated.

What kind of changes are taking place when you incorporate value chain perspective in business development as well as in research and development?

Kobayashi The way we collect information is changing. Information gathering in business development is the most important factor in determining the success or failure of an idea or strategy. In business development with a value chain perspective, regional strategies are more important than ever, so we have a structure to explore the trends in other countries. More specifically, we are establishing business bases such as Washington Office and Brussels Office from fiscal 2024 . Unlike the sales bases we have had in the past, these bases are established to explore the trends in the U.S. and Europe, which are necessary in the clean energy field. As we explore trends, we exchange opinions and information while offering input on what we think is the ideal state to the appropriate organizations in each country. This is a form of information gathering with a value chain perspective, an approach that was unthinkable with the conventional mindset of an equipment seller.

Kubota Changes are also occurring in the collection of technical information. Before, we gathered information mainly at academic conferences. However, we renewed our understanding that important information can only be obtained in world's top ecosystems.* Organizations and researchers that constitute top ecosystems are influential in the directions and trends of each country. Therefore, the technical information that can be obtained in the ecosystems is important for regional strategies and strategic technology acquisition. Currently, we are

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sending several people to study at universities and research institutes that make up the top ecosystem to participate in the development of cutting-edge technologies. We believe that making technical contributions in the top ecosystems will lead to the acquisition of critical technical information.

*A community of world-leading researchers and engineers in a certain field.

Morioka To obtain critical technical information, I believe that we also have to provide some important information or something equivalent. We can join the top ecosystem and have information shared because we are of some value. Information that can be obtained at top ecosystems cannot be acquired through internet search or by simple hearings. It is important that we have information that will be considered valuable prepared on a daily basis.

Kobayashi What Ms. Morioka mentioned is common to the three headquarters (one headquarter and two divisions) in terms of information gathering. If we talk about world trends or some matters that others have not been aware of, they will in turn provide us with information that will lead to new businesses, such as information and a sense of issues that we are not yet aware of. From there, we can connect to collaborative activities, realizing business development which is one step ahead of others.

Kubota Value chain perspective brings about changes not only in information collection, but also in the forefront of research and development. In the past, research and development was conducted independently in each area of the value chain and resources were dispersed, which sometimes caused us to lose out in business. Now with the establishment of the Business Development Headquarters and Strategic Technologies Division, the themes and directions to be focused on are shared

across fields, enabling us to allocate resources flexibly and conduct research and development speedily. We are expected to put priority on what needs to be done, rather than doing everything we can, and we are conducting the research and development to meet this expectation.

What kind of human capital are you seeking and how are you strengthening your organizations for business development and technological development based on a value chain perspective?

● **Kobayashi** The human capital that is required in business development, based on a value chain perspective, is people who can come up with ideas that are not confined to conventional ideas. For example, people who act with the awareness that demand is created are better suited for business development than people who start by looking to see if there is demand for the business they envision. We could say that they are start-up human capital with an entrepreneurial spirit. We are trying to obtain human capital that can envision what they want the world to be like and how they can create such a world, and take the necessary actions. When training internal human capital, we have found it effective to provide on-the-job training to those who have the desired aptitude for the project, as there are individual differences in suitability.
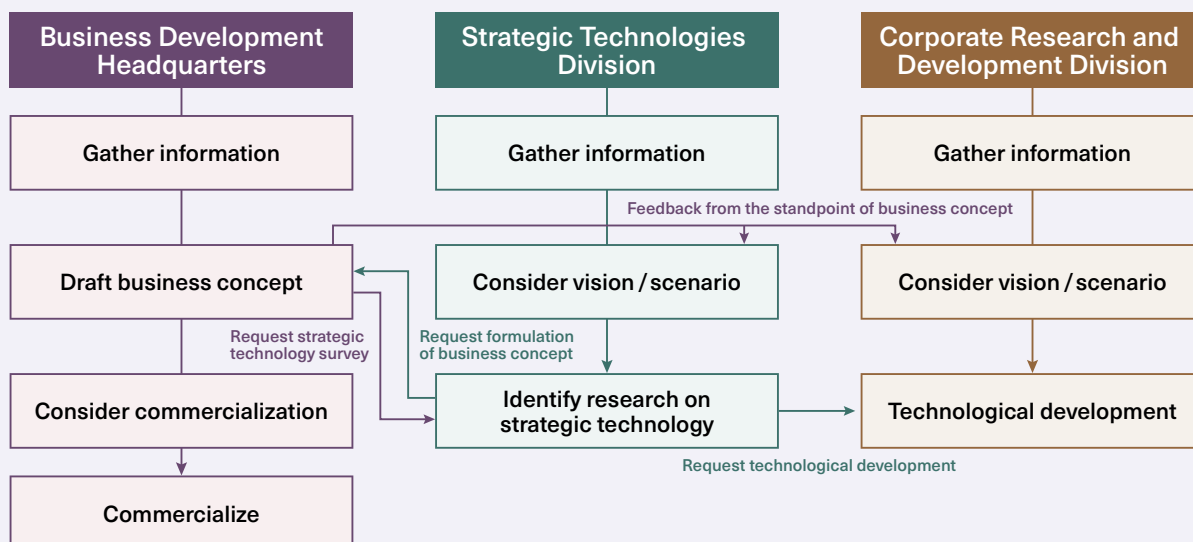

● **Morioka** In the past, we had an engineer who thought, "Can't ammonia be used for fuel?" This inspiration has led to the fuel ammonia value chain businesses we have now. The Strategic Technologies Division is considering training professionals who can develop technologies that can support the creation of value chains. But we are still in the process of exploring ways to nurture their "sense" and "desire" to create a new world. In any case, we believe that collaborations with external human capital and having external interactions have had a positive impact on reinforcing such senses and desires.

● **Kobayashi** As Ms. Morioka mentioned, acquiring external human capital while we establish organizational training methods is one solution that we can implement immediately. Commercialization of new businesses calls for a certain level of sensitivity and experiences in various fields. It is important to train internal human capital, but considering the speed of commercialization and expansion of scale, it is also necessary to hire diverse mid-career human capital.

● **Kubota** The three headquarters (one headquarter and two divisions) collaborate and strengthen organizational capabilities at the forefront of technological development. In the past, the engineers themselves were engaged in technological development with a certain amount of business concept. In this case, the technical level increased, but the level of business concept did not. When the business division confirmed a project, insufficient studies and critical problems were sometimes discovered, making it difficult to proceed with the project. Now, the process has been changed so that we collaborate with the Business Development Headquarters from an early stage as necessary, and raise the technical level and business concept level without being too reliant on the engineers' capability to come up with business concepts.

● **Kobayashi** Headquarters collaborate as appropriate. In addition, what is most important as organizations is that each headquarters achieving its mission. In technological development, we would like our staff to take on challenges toward the exciting future they aspire to, rather than strengthening their business perspectives. Even if they fail as a result of their challenges, what they have learned through the process and the facilities acquired will be an asset for future challenges. The Strategic Technologies Division focuses on identifying strategic technologies, while we are responsible for commercialization. Before the Business Development Headquarters was established, the boundaries of each organization's mission were blurred, and some projects did not go well. For example, since we developed the technologies for the fuel ammonia value chain businesses, we had two opportunities for considering major commercialization, but they did not bear fruit into a large-scale business concept.

Collaboration Structure of the Three Headquarters (one headquarter and two divisions)

Business Development Headquarters	Strategic Technologies Division	Corporate Research and Development Division
Gather information	Gather information	Gather information

Feedback from the standpoint of business concept

Draft business concept	Consider vision / scenario	Consider vision / scenario

Request strategic technology survey

Request formulation of business concept

Consider commercialization	Identify research on strategic technology	Technological development

Request technological development

| Commercialize | | |

This is the third time, and we are where we are now. To avoid missing opportunities, it is important, as an organization, to maximize results by concentrating on areas in which each of our human capital excels.

How do the three headquarters collaborate?

● **Morioka** The Business Development Headquarters leads business development from the value chain perspective. Commercialization originates from either a business concept or from strategic technologies. When it originates from a business concept, the Business Development Headquarters first draws up the business concept and requests the Strategic Technologies Division to do research and specify the core strategic technologies. On the other hand, when commercialization originates from technological strategies, the Strategic Technologies Division first identifies the vision, scenario, and the strategic technologies that make commercialization possible. The planning of the business concept is then requested to the Business Development Headquarters. In both cases, Corporate Research and Development Division takes the lead in executing the actual technology acquisition.

● **Kubota** Research and development at Corporate Research and Development Division must proceed by constantly checking if the direction, development level, and speed of the research and development meet the requirements of the business concept. For this, we make sure that not only the managers but also the technology developers themselves are aware of the collaboration with the Strategic Technologies Division and the Business Development Headquarters. The officers of the three headquarters (one headquarter and two divisions) hold regular meetings and are in constant communication.

What are the issues for the IHI Group in making a business transformation with a value chain perspective?

● **Morioka** The entire IHI Group needs human capital that is interested, curious, and capable of asking questions and changing themselves in all things. Taking decarbonization as one specific example, the last decade has seen an increase in global awareness and a significant social shift. It is vital that we have a bold ideal about how the world should be, how we want to change the world, and what we want to do to make it happen. It is also important to keep taking on challenges to go beyond boundaries. We support the growth of our employees by defining "Set a Goal", "Tackle Issues", "Cross Boundaries", and "Implementation" as the required behaviors in the Group Human Talent Strategy 2023.

● **Kobayashi** We think that organizational homogeneity is something to watch out for, and the Business Development Headquarters takes special care not to homogenize. We share the view with the Human Resources Division that avoiding homogenization is a key point when investing resources in the Growth Businesses and the Development-focus Businesses in the future.

- **Kubota** I also think that we need an organizational culture and human resources that encourage failures. A big inhibiting factor when we do something new is the mindset that does not tolerate failures. I believe it is important for employees to continuously take actions without being afraid to fail. The Corporate Research and Development Division encourages failures and implements a mechanism to systematically share our findings from failures.

What does a culture that tolerates necessary failures look like in the IHI Group?

- **Kobayashi** The top management and the managers both need to have a mindset that tolerates failures. I am in the position to receive many different proposals. I always ask the proposer to first implement the proposals even if I feel that they will not succeed. It is important that they think their way through, try it out to the end, and then fail. We all grow up by experiencing failures, so it is important for top management and managers to take risks and support the employees.
- **Morioka** It is also important to lead the way so that the employees will do everything that they need to do and then fail. Often, we see employees fail by doing only what they can and want to do. In the case of fuel ammonia value chain businesses, these businesses would not have developed into what they are now if engineers thought only about themselves and had made the utilization of boilers a strategy. The business concept was developed into the current large scale by considering what needs to be done from the value chain perspective, from upstream ammonia production to utilization of gas turbines. When the managers, including heads of divisions, clarify policies, decide what needs to be done, and exercise leadership, members can learn from their mistakes even if they fail, and this will lead to the next step.
- **Kubota** There are also cases in which it is necessary to stop the process before it fails. While it is essential to focus on day-to-day development, it is also important to create a scenario that leads to the final exit. In the past, we had engineers who devoted themselves to development with enthusiasm alone, but it is difficult to succeed in commercialization. Scenarios should not be created by the Corporate Research and Development Division alone. It is important that they are co-created with the Strategic Technologies Division and Business Development Headquarters. The managers are increasingly setting the direction, discussing it, and stopping projects with the individual's consent.

Do you have any tips on how to accelerate business creation from a value chain perspective?

- **Kubota** In the field of research and development, we have changed the mechanism so that the awareness of the technology developers will be changed. In the past, research and development was based on the assumption that a project would continue for one year, but now we are accelerating the speed of research and development by increasing the number of projects that will be considered for continuation every three months. Moreover, with the collaboration of the division in charge of public relations, we are trying to make external announcements of technological developments at an earlier stage than in the past. By doing so, we can attract people who agree with our technology and ideas and co-create with us. Once co-creation begins, the required level and timing of technology become clear, and research and development accelerates.
- **Kobayashi** In business development, making quick decisions at appropriate times accelerates business creation in the end. Until now, the IHI Group has often missed business opportunities because the Group missed the right timing and took too long to make decisions. Top management and managers need to delegate authority so that the frontline can make appropriate and quick decisions. It is also important to make an output of important matters at a timing which enables top management to make appropriate decisions.

- **Kobayashi** In May 2024, we have announced that we will become a company that creates value chains as the direction we will take beyond the "Group Management Policies 2023". We are already taking actions to realize this direction. To create new businesses, it is necessary to continue creating large-scale businesses that create demand by incorporating a perspective that balances both product-out and market-in approaches. To this end, we will strengthen the organic links among the three headquarters (one headquarter and two divisions) and continue to create innovation.