

02-2 Technology and People That Generate Profits

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“Technologies are Created by People” Co-creative talent thriving through their connections opens up a path to the future with their earning power

To continuously create new technologies and functional materials that society demands.

That is a vital task for Resonac, and at the heart of it lies fostering co-creative talent with borderless connections.

Resonac’s CHRO, CTO and Deputy General Manager of Electronics Business Unit discuss the prospects for raising the base level of earning power brought about by talent development efforts.

Generating the earning power of the future through simultaneous co-creation in the research, development, and manufacturing fields

Imai: As a company with the goal to become a world-class functional chemical company by 2030, its earning power is essential. The sources of our value are our broad-ranging material technology platform and our research and development strengths. That said, sophisticated technologies don’t lead to earning power unless we provide the functions that customers demand. It is vital that the people who talk directly to customers—those on the frontlines—can understand customers’ needs and that those in the field can respond to those needs. Each and every person on the frontlines and in the field must



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possess a passion to create and work going beyond boundaries of departments and companies to think, together, about how to produce solutions. We believe that personnel who can generate values by integrating diverse knowledge through such alignment is what we call co-creative talent.

One of the challenges of co-creation is dealing with the differing timelines of areas and departments. The speed of R&D varies tremendously from one business sector to another. For semiconductor materials, it is extremely fast. To keep up with such speed, research, development, and manufacturing must all keep in step.

Abe: The former Hitachi Chemical has passed on its DNA in the form of the processes used to customize materials in conjunction with customers in a speedy manner. On the other hand, it lacks research and development processes focused on raw materials or designs. Those are the strengths of the former Showa Denko. Through our business integration, we have connected upstream and downstream processes, so we are starting to see the synergistic results of co-creation. Taking into consideration cross-company collaborative creation such as co-creation with other equipment and material manufacturers, I think we still have a lot of room for growth.

Fukushima: Our frontline members need to be able to adapt to the dizzying speed at which customer demands change and to continuously improve our products. Prioritizing the issues at hand may improve final product quality without advancing core technologies. However, there is a limit to what can be achieved through this cycle, so researcher need to get ahead of these changes and work on core technologies. In this way, different talent are assigned to different tasks, but their efforts will come



to naught unless they are all working on the same timeline. Creating revenue-earning technologies requires making improvements to existing products, having frontline staff identify customer needs, and carrying out research to develop new core technologies, all at the same time. Of course, in this co-creation, it is absolutely vital that everyone is working on the same timeline, with a shared understanding of by when new core technologies are needed.

Co-creation through a new site that brings together professionals from inside and outside the company

Imai: We also focus on coordination with outside parties in our development of co-creative talent. We should be able to generate greater synergy by bringing in knowledge from other equipment manufacturers, material manufacturers, and universities.

Fukushima: Indeed. Resonac has been developing spaces for co-creation with a wide range of stakeholders. The first of these was the Innovation Center, which we opened in 2017 with the aim of promoting interdisciplinary dialogue and discussion. Then, in 2023, we opened the Stage for Co-creation. This is a core site for long-term R&D through collaboration with venture companies, universities, and other organizations, both inside and outside of Japan. In the process of expanding our network to create new future business, our own talents will also be able to learn open innovation methods and strategies, including what they can create with which partners. This establishment of co-creation spaces is also part of our efforts to build new connections, and I think it will secure us a sturdy foundation a decade or two from now.

The co-creative ability to deal with pressing issues is also essential. We put this into practice in our Packaging Solution Center, which we opened in 2019, and in our Power Module Integration Center (PMiC), which began full-fledged operations in 2023. These sites enable us to deeply understand and respond to our customers' needs. They have semiconductor production equipment equivalent to that of our manufacturing customers, which we use to pre-emptively perform evaluations and simulations. This makes it possible for us to speedily provide high quality products.

Abe: At the Packaging Solution Center, we have launched the JOINT2 consortium, joined by 12 manufacturers in the fields of semiconductor packaging materials, substrates,

and equipment. We have prepared an environment that fuses the diverse knowledge of the consortium's participants to tackle research themes. Normally, semiconductor manufacturers see material manufacturers as suppliers, but by sharing the same new technology development goals, our relationships are becoming more like partnerships. This represents tremendous progress.

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The capabilities essential for our frontline employee who connect customers with the field

Imai: Meeting all of our customers' needs is the very foundation of Resonac's business. Market competition is fierce, so developing products through co-creation with customers is vital to Resonac's survival. One could even say that our customers and their markets are nurturing us.

Abe: Electronics Business Unit has been rolling out products with a high global market share. At the heart of this strong market share is our motivation—we want to work hard for our customers and to contribute to the world. In that sense, earning power ultimately boils down to added value. Our customers pay for the value that we add, and that added value varies from project to project. It includes functionality, originality, development speed, and technical service, to name a few.

True co-creation doesn't consist of simply taking all customer requests at face value. Instead, for each project, we must understand our customers' true intentions and lead them to solutions. To achieve this, I believe our frontline personnel need to have attentive listening ability, predictive ability, and problem-solving ability.

Fukushima: If you focus on frontline communication alone, you won't be able to build relationships of trust with busy colleagues at Gemba, ultimately leading to precarious, day-to-day company operation. A person at the frontline is required to possess a sense of assurance that makes customers and internal engineers think, "If they say so, it must be true." A human touch that conveys the passion they feel for their projects is also vital. I believe that we are able to develop co-creative talent thanks to the number of communication sites we have that connect customers and the field.



Strengthening the Technical Management Department as a development and manufacturing hub

Abe: For our manufacturing customers, too, industry-wide needs are evolving at a dizzying speed. Even the products currently under mass production are subjected to frequent requests for quality improvement and specification changes. Speedily accommodating this requires teams that specialize in the product improvement phase. The Technical Management Section directly under the Manufacturing Department was responsible for this in the past, but to enhance these functions and to secure new technology development resources, in 2023 we promoted the Technical Management Section into the Technical Management Department. It brings together people with various backgrounds including development, manufacturing, and quality assurance, serving as a hub for different departments. Its coordination activities promote improvements to mass production products.

Imai: The process of transitioning from development to manufacturing, in particular, is prone to various errors. The Technical Management Department's role is to use co-creation to facilitate this transition and prevent mistakes. When transferring technology to overseas sites, as well, the Technical Management Department can make use of their storehouse of expertise and take charge of what was previously handled by the development division. This alleviates the resource demands placed on development.

Fukushima: The world's product specification demands have climbed far higher than they once were. Our development division listens to customer demands and

consistently raise to meet them, but the higher the level of the products we create, the greater the demands placed on the manufacturing department. To reduce this burden on the manufacturing department, we need to develop products with designs that make the manufacturing process as easy as possible. If, despite these efforts, manufacturing involves an unreasonable burden, errors will be inevitable. Strengthening our Technical Management Department enables communication in the form of consulting with manufacturing departments in the midst of development work and pro-actively promoting the preparation of production facilities and evaluation conditions. If we provide proper support in areas where problem-free manufacturing is taken as a given, we can set up smooth, safe production lines. This will ultimately increase our products' value and Resonac's earning power.

Striking the balance: assigning resources to highly profitable products and developing products that lead the way to the future

Fukushima: The further semiconductor technology advances, the greater our opportunities to compete will be. The harder development and manufacturing become, the less room there is for competition. Resonac has used the power of teamwork to tackle the issues before it, expanding market share worldwide.

Abe: Right. Our NCF non-conductive film is a great example of that. When we launched the program, people out in the field combined their efforts to achieve the world's highest levels of technologies such as coating and dispersion technologies. We increased sales of NCF as a material for use in AI semiconductors and other products, and we now have a 100% market share.

Imai: At the same time, one of my concerns is that there is less free time—less “play time”—that can be used to try out new things that aren't directly linked to operations. I think that new products are the product of technologies developed during that kind of “play time.” When we announced the results of our research on TIM thermal conductive sheets, roughly 15 years ago, many people were skeptical of their potential for commercialization. However, now we see that their properties are an excellent fit for the rapidly growing AI semiconductor segment, and they have become one of our core products. If we are to increase our corporate value over the long term, we also need to turn our attention to people who are

carrying out research based on new perspectives and creating environments based on innovative ideas. **Fukushima:** Those engineers who have come up with the concepts that underlie new products must have had some ideas in mind before they even announced the results of their research. If nobody had alighted on these concepts, we wouldn't have the exceptional products we do today. Of course, we need to devote resources to highly profitable businesses, as well, so balancing these two is always a challenge. One possible way forward is through our talent portfolio. For example, there are people who excel at creating a seed out of nothing, and there are people who is good at turning seeds into giant trees. I think they have fundamentally different attributes. Going forward, we will need to keep a close eye on that as we assign talent and shape our organization.

Experience, diversity, and management strengths will raise the baseline of our organization's co-creation capabilities

Imai: There are two things we are currently focusing on in our co-creative talent strategies.

The first is providing individuals with greater experience. There are a lot of types of experience available to employees in our company. They can refine their expertise, diversify their perspectives, and collaborate with others. Strategic job rotation will significantly boost the growth of individual employees.

The other thing we are focusing on is fostering management skills that enable co-creative workstyles. Diversity is essential to engaging in discussions with people from different backgrounds and advancing projects. We have defined five skills that are essential for diversity: the ability to provide psychological safety, the ability to eliminate unconscious bias, communication skills, active listening skills, and facilitation skills. We deliver training sessions for all management personnel up to Officer level to bolster their co-creative collaboration capabilities and their skills in these areas. At the same time, we also provide co-creative leadership training across the organization so that participants can gain the talent development skills they need as leaders.

Furthermore, in the R&D field, we are placing particular focus on improving our talent portfolio. Reflecting these individual attributes in our role assignments requires a system for visualizing skills and aptitudes by data and for

developing strategies based on quantitative judgments. We are currently in the stage of attempting data-driven team creation while leveraging FFS theory.

Fukushima: Managers at Gemba hold the key to all of these initiatives. Our organization can grow as a whole when managers have a deep understanding of the aptitudes of those they manage and give consideration to the most beneficial career paths. Managers need to refine their abilities through training, leveraging interviews and FFS theory while understanding Resonac's purpose and succession plans. From the perspective of the company's CTO, I would say that the key lies in building up experience looking at both technologies and business. If technologies aren't capable of generating profits, they can't be called innovation in a true sense.

Imai: Self-understanding of each employee is also important. In recent years, a certain expression has come into widespread use in Japan: career autonomy. This means consciously developing your own career and taking an active approach to learning in the midst of the ever-changing environment. We are holding events called “Purpose Exploration Café,” whose theme is to promote autonomy and to take another step forward. In these events, employees reflect on their own purposes.

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Resonac's Purpose, improving and contributing to the world through the power of chemistry, resonates with many of our employees. These employees also happen to be highly motivated. Employees each thinking autonomously and choosing Resonac as their ideal environment such a partnership may even be the foundation of co-creation.

In the past, “career advancement” consisted solely of being promoted to management positions. But we introduced a dual ladder career structure that also makes it possible for employees to strive to become exceptional research and development professionals. We are promoting career autonomy and creating systems that allow people to work toward diverse career plans. From here onwards we will be working on better establishing those systems.

The future vision Resonac seeks to achieve through its human resource strategies

Imai: My vision, through our human resource strategies, is to create an organization that provides everyone with a sense of excitement. Being able to experience growth while enjoying yourself directly contributes to productivity and corporate value. That is why it is important to keep on contributing to society, to customers, and to ones' teams. The heartfelt desire to make the world a better place is, I believe, our driving force as one of the world-class functional chemical company.

Abe: Furthermore, I want Resonac to be “the first company to turn to when people need help with semiconductor materials.” In the semiconductor industry, co-creating with customers from the very start provides us with a tremendous advantage. Our ideal is to generate and build up trust while expanding our technologies and network. Achieving this ideal is the mission of our co-creative talent.

Fukushima: Ultimately, we truly believe that technology will lead the way to a brighter future. To continue to be an organization where new technologies are constantly being created means that we are also being needed by society. And we need engineers and technologist, and the people who want to become them, to admire the environment we offer, making them want to work with us or join us as employees.

Imai: I want us to dedicate ourselves to creating talents who generate earning power so that Resonac remains a company needed and sought out by society and technical personnel in the years to come.

