

Advanced Business Management by Utilizing Digital Technologies

The Group-wide Effort to Promote Digital Transformation

A key focus in AP-G 2022 is promoting advancements in management through digital transformation (DX), which will strengthen competitiveness and transform business through the effective use of data and digital technologies. In order to facilitate reviews and discussions regarding group-wide efforts to promote DX, Toray established the Toray Digital Transformation (TDX) Promotion Committee, chaired by the President, and under that the Technology Center DX Promotion Committee and the Business Division DX Promotion Committee. The Company is advancing the group-wide TDX Promotion Project in addition to conventional departmental initiatives.

The Technology Center DX Promotion Committee streamlines R&D activities by leveraging material design prior to trials, relying on simulations to shed light on the true

nature of materials and informatics for predictive design. It also works to enhance quality and productivity through the utilization of AI-based automation, among other efforts.

The Business Division DX Promotion Committee is engaged in operations with themes that can be applied horizontally, serving as leading examples across the Group, such as improving the sophistication and efficiency of global supply chain management (SCM), introduction of a customer relationship management (CRM) system to visualize the information communicated with customers, and marketing automation (MA)-driven digital marketing.

In addition, the Information Systems Division is working to build out IT infrastructure and strengthen information security in support of global business expansion.

Toray Digital Transformation (TDX) Promotion Committee

Technology Center DX Promotion Committee

Drive advancement and streamlining by leveraging digital technology in research and technological development (R&D), and production

Business Division DX Promotion Committee

Visualize global management information in sales & marketing, finance & accounting, and purchasing & logistics, and advance business management

The Strengthening and Development of Digital Human Resources

Based on its policy of "improving the digital skills of personnel with a good grasp of *Genba* (workplace) operations," the Company's DX program will immediately train dozens of experts with digital expertise and at least 100 key personnel who can utilize digital technology to proactively promote business, as well as research and technological development.

These key people, being personnel engaged

in research and technological development, as well as being active in on-site production activities, will be educated in digital operations, by means including on-the-job training. To that end Toray has established in-house training programs to develop such digital personnel, and are also actively pursuing the recruitment of personnel who possess an exceptional affinity with digital initiatives.

Examples of DX Initiatives

Advancement and Streamlining by Leveraging Digital Technology

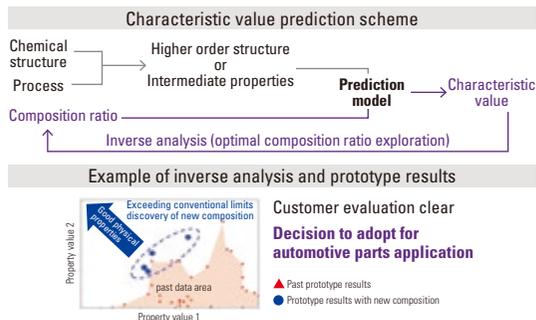
Example of Simulation

The Company has successfully accomplished the highly accurate calculation of contact angles, which are the macroscopic properties of polymer surfaces, by using microscopic molecular simulations. The results Toray achieved have been spotlighted as the cover story in a prestigious U.S. chemistry journal, and following that, received the 2020 CSJ Award for Technical Development from the Chemical Society of Japan. This has also been highly evaluated academically.



Example of Informatics

To design resin materials for automobiles, Toray built a model that uses machine learning to simultaneously predict two types of characteristic values, searched for the optimal composition ratio utilizing inverse analysis, and discovered a new composition that exceeds conventional limits. The product that resulted satisfies the characteristics required by automobile manufacturers and its adoption has been finalized.

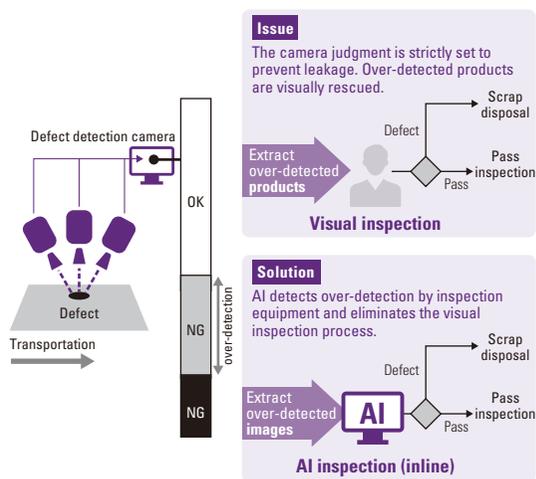


Improving Production Sites (Enhancing Quality and Productivity)

Example of AI Utilization

Defect detectors are used in a variety of applications, leveraging the ability to inspect products that are being transported. On the other hand, in line with the rising quality requirements of customers, it has become necessary to set stricter judgment criteria to prevent non-standard products from drifting outside of processes. As a result, there have been cases where defects that would normally pass the testing process were determined to not meet specifications (over-detection). In the past, this was remedied by having such over-detected products be visually re-inspected to determine whether they passed or failed.

As a solution to this problem, by having AI learn the details of qualified products, it became possible to determine a pass or fail grade for over-detection while the product was being conveyed, which greatly improved efficiency. In this way, by applying AI to various product inspections, Toray can realize improved productivity.



Application of AI to reduce the re-inspection process and achieve significant efficiency improvements