Research and Development

Basic Approach

Approach

In the more than 120 years since its foundation, the Toppan Group has evolved its original specialization of printing techniques into the art of printing. Technical advances in printing, coupled with the fusion of varied knowledge and expertise with processing technologies, have enabled Toppan to systemize “printing technologies” of its own. Five core technologies now drive the Group’s businesses: Information Processing, Microfabrication, Surface Treatment, Material Forming, and Marketing Solutions. These five technologies and the distinct benefits they offer are combined into the new solutions the Group offers.

By strengthening core technologies to maximize synergies within the Group, Toppan continues to generate new value for society through co-creation with clients, universities, and startups. Toppan will continue deepening and expanding its unique technologies to develop new businesses that provide solutions to global social challenges and transform the Group’s business portfolio.

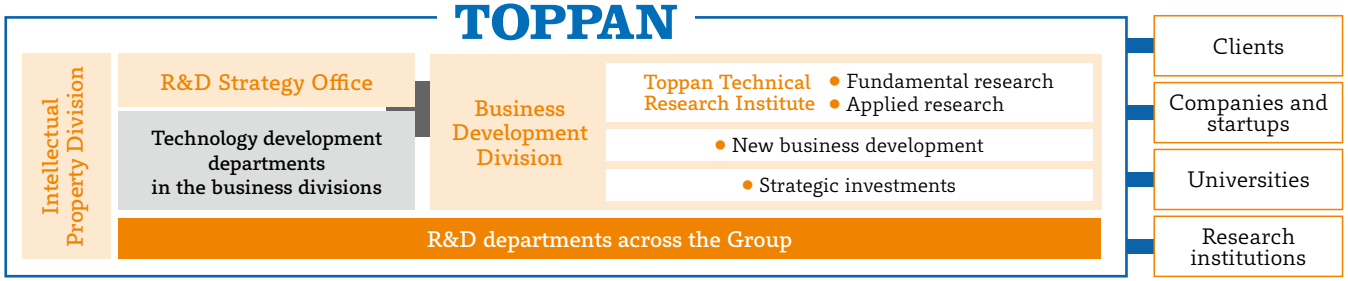
Research and Development Structure

Promotion framework

Toppan advances research and development activities centered on its core technologies from a market-oriented perspective. The R&D Strategy Office and Business Development Division work together with technology development departments at business divisions across the Group. The R&D Strategy Office seeks to build a cross-departmental technical administration infrastructure, while the Business Development Division engages in research, new business development, and strategic investment to create new businesses as a disruptive innovator.

Toppan also builds and uses intellectual property strategically, generates R&D synergies within the Group, and collaborates creatively with clients and external research institutions to advance the Group’s R&D activities. In these ways, Toppan delivers new value to address today’s shifting society and global environment.

Research and Development Structure



Toppan Technical Research Institute

Promotion framework

The Toppan Technical Research Institute was established in 1986 in Sugito, Saitama Prefecture, Japan. As the Toppan Group’s central research facility, the institute aims to promote research integration, research exchanges and technological development projects that engage researchers from different fields, and Groupwide collaboration involving worldwide departments. Its primary focus is fundamental research with the potential to usher in next-generation technologies. Another core target is the application of innovative technologies for the development of original and competitive products and services. The institute also provides technical support to business divisions working with highly specialized technologies across the Group.

As a move into frontier fields, the institute established a research course at the Graduate School of Engineering, Osaka University of Japan, in 2017. The Joint Research Laboratory (TOPPAN) for Advanced Cell Regulatory Chemistry carries out fundamental and applied research on a 3D cell culture technology. One project using this technology seeks to create artificial cellular tissues with high biomimetic properties for use in drug evaluation methods for the advancement of fundamental research on drug discovery in fields such as anti-cancer therapy. Another project seeks to develop a method to produce various types of cultured meat, including a type with nearly the same marbling attained naturally in Wagyu beef. Toppan expects the 3D cell culture technology to help the Group contribute further to the realization of a sustainable society.

New Business Creation Themes

Policy

The Toppan Group has been creating new businesses that address social and industrial issues by leveraging business models and technologies that give the Group a competitive edge. Healthcare and energy solutions are examples of the Group's frontier businesses pursued on a priority basis.

A specific venture Toppan carries out is the capital and business alliance with ICI Inc., a certified enterprise that can be trusted to handle anonymized medical data under the Next Generation Medical Infrastructure Act of Japan. Through this alliance, Toppan distributes health-related big data collected from hospitals, clinics, local governments, nursing care facilities, and other medical institutions across Japan for use in research and development in healthcare, medicine, and welfare fields and for the creation of new businesses that will help society achieve long healthy life spans and inclusive communities.

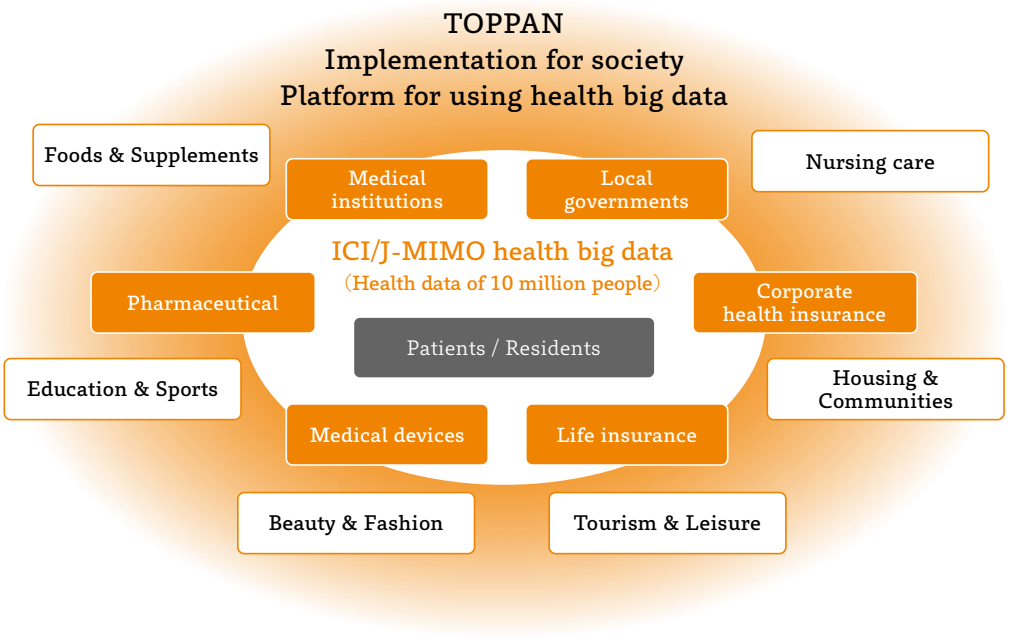
Strategic Investments

Policy | Activity results, performance data

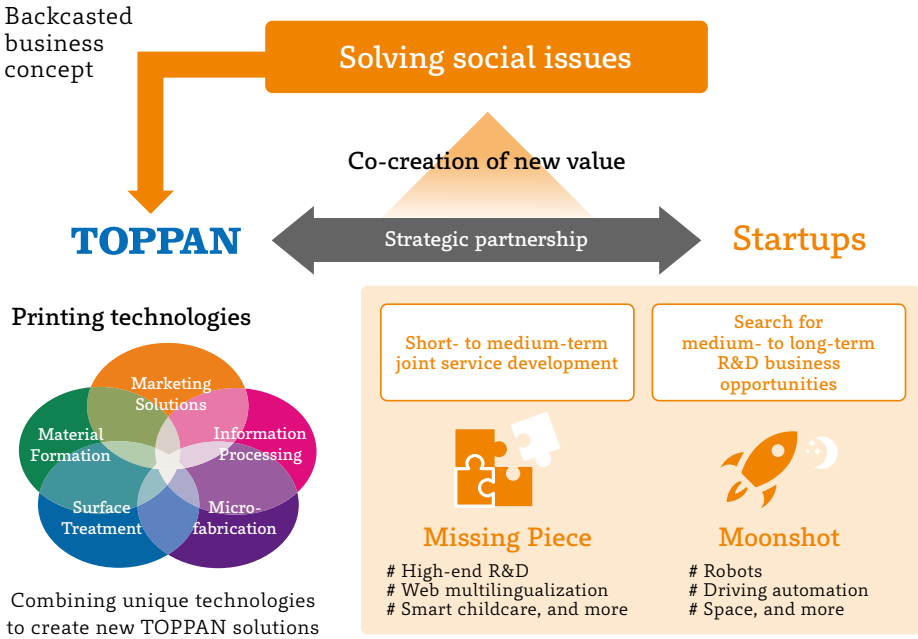
The creation of new businesses and markets has been identified as one of Toppan's main challenges for the medium term. Toppan has been developing new businesses for the dynamic growth of the Group by making small-scale investments in growth fields such as digital transformation (DX) business, cutting-edge technologies, and SDG-focused initiatives. The Group has invested in and formed capital and business alliances with more than 50 startups around the world since July of 2016.

Toppan is generating new value for society by combining the advanced technologies and business models of startups with the planning and technical capabilities throughout the Group, from both short-term and medium- to long-term perspectives. Toppan will continue to enhance collaborations with startups to accelerate DX initiatives and create novel businesses that the new normal society requires.

Users of Health Big Data Services



Collaboration with Startups



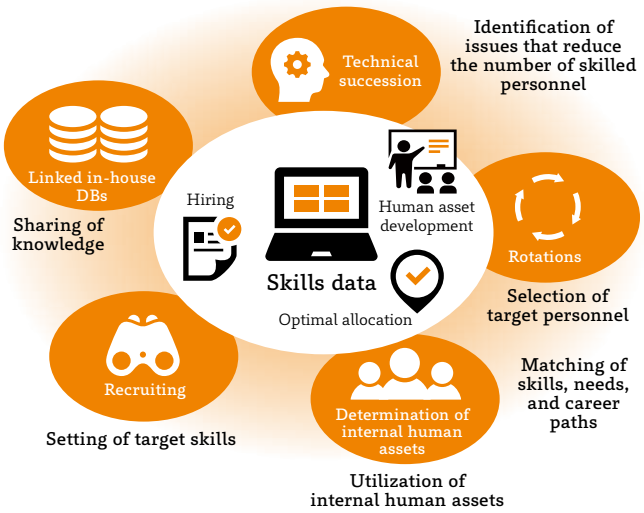
Visualizing Technical Skills

Policy

The Toppan Group strives for technological enhancements through the strategic utilization of its human capital. From fiscal 2020 onward, for example, Toppan has been surveying human assets in technology departments across the Group to rate their technical skills.

The surveys are structured by subdividing the Group's five core technologies into elemental technologies of several types, from currently trending technologies to practical technologies applied to products and services. The experience and skills of individual employees in each of these elemental technologies are consolidated into a skill map that can be used to formulate policies for strengthening technical capabilities through the training, hiring, and optimal allocation of human assets.

Overview of Skill Map Utilization



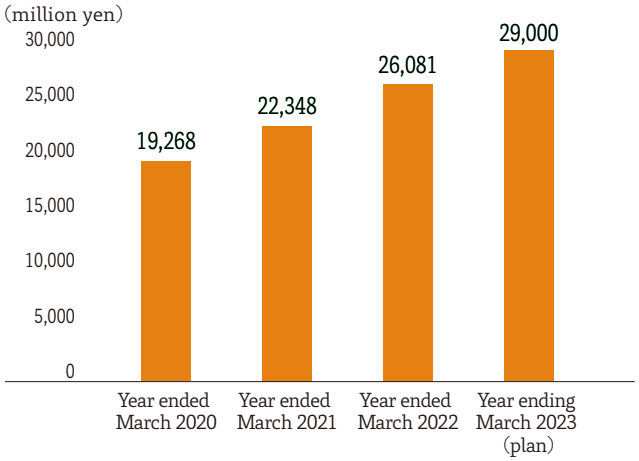
R&D Investments

Policy | Activity results, performance data

Toppan advances research and development to create new businesses with a view to transforming its business portfolio. The Group has defined key fields in which to invest R&D resources on a priority basis, starting from fiscal 2020. Fiscal 2020-2022 and fiscal 2023-2025 are positioned as the "foundation building phase" and "result delivery phase," respectively.

Toppan has been planting seeds to achieve results in fiscal 2023 and beyond by increasing the Group's R&D budgets to fund technological enhancements and the faster creation of new businesses. The bulk of the R&D funding is spent in key investment fields to address social issues and follow technological trends (shown on the table on the right), and the establishment of foundations such as technological platforms that support the Group's efforts in the key fields.

R&D Expenditure



Key Investment Fields	
Sustainability	Switch to paper materials, recycling/upcycling technology, mono-material compositions, etc.
5G	Next-generation FC-BGA substrates, 5G antennas, electromagnetic wave control/ absorption sheets, etc.
DX	Digital platform business, communication business, BPO, solutions for local government administration, etc.
Frontier	Healthcare business, energy business, genome editing, agribusiness, COVID-19-related business, etc.
Fundamental technologies	Converting technology, materials/analysis technology, microfabrication technology, AI/data analysis platforms, etc.

Breakdown of R&D Investment Fields

