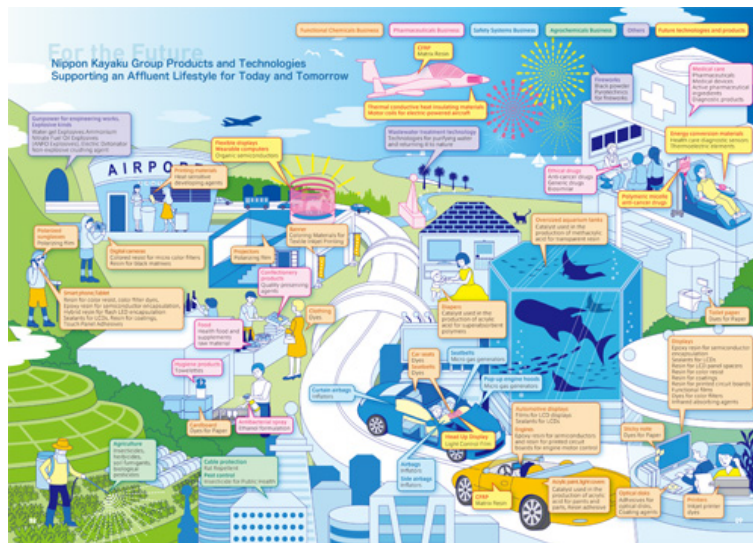




CSR Activities Fulfilling Economic Responsibilities

Current Nippon Kayaku Group Products and Future Technologies and Products Supporting an Affluent Lifestyle

The Nippon Kayaku Group has adopted a corporate slogan called Global "sukima" ideas and is striving to develop Nippon Kayaku into a company that the world truly needs, by developing high value added products with unique technologies that stand out in niche markets and elsewhere.



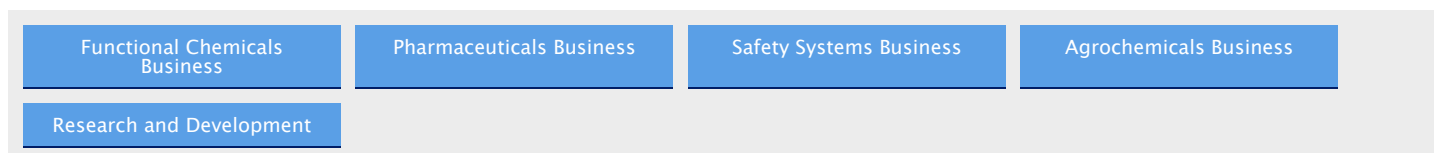
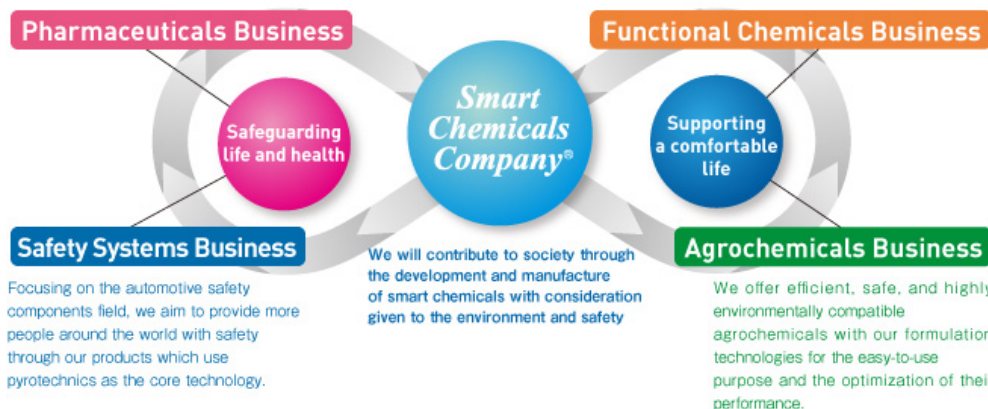
[View larger image](#)

The Nippon Kayaku Group's Businesses

This section will take a closer look at the 4 core businesses of the Nippon Kayaku Group as well as products that they developed with unique technologies that contribute to the betterment of society.

We are committed to promoting innovations by using our technological expertise. It is our goal to contribute to society by consistently supplying high-quality pharmaceuticals to improve patient outcomes, and to achieve more efficient medical spending.

Contribute to the creation of an "Super Smart Society" by providing functional chemical materials that offer special characteristics for the fields of information and communication, and energy and resource conservation.

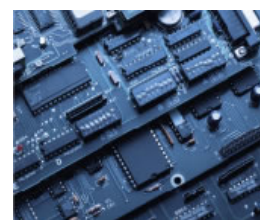


Functional Chemicals Business

We will contribute to society by supplying unique functional chemicals for the IT, ICT and resource conservation fields

Many believe that the world is set to become a super-smart society in the future. This is a society where various things are connected to the Internet, making people's lives truly comfortable.

In the field of ICT, the network connecting personal digital devices with home electronics and automobiles is growing, while rapid advancements are also being made in reducing the size and increasing the performance of semiconductor devices and improving the resolution of displays mounted on these digital devices. At the same time, there is growing demand for energy conservation and resource conservation. The Functional Chemicals Business is helping to realize this super smart society by supplying unique products to the fields of IT, ICT, energy conservation and resource conservation using its long-standing technologies in resins, pigments, and catalysts.



[Functional Chemicals Business](#)

Pharmaceuticals Business

We are committed to prompting innovations by using our technological expertise. It is our goal to contribute to society by consistently supplying high-quality pharmaceuticals to improve patient outcomes, and to achieve more efficient medical spending.

The Pharmaceuticals Business engages in research and development specializing in anti-cancer drugs and peripheral fields, focusing on polymeric micelle anti-cancer drugs that utilize nanotechnology as well as biosimilars and generic pharmaceuticals. Currently, we are participating in a Multi-national Phase3 Clinical Study of a monoclonal antibody biosimilar candidate for breast cancer as part of our efforts aimed at obtaining marketing approval for the next biosimilar following the success of FILGRASTIM BS and INFLIXIMAB BS.

We aim to contribute to society with innovations that are backed by our technological expertise and by consistently supplying high-quality pharmaceuticals to improve the level of treatments patients receive, and to achieve more efficient medical spending.

[Pharmaceuticals Business](#)



MINK Web - an informative site targeting medical professionals developed by Nippon Kayaku

Safety Systems Business

With explosives safety technologies as our core competencies, we will contribute to society by making people safer around the world through our automotive safety components

Automobile production is forecast to grow with the emerging countries of Southern Asia expected to follow China with a high level of growth. Also, the average safety device content per vehicle is expected to rise dramatically going forward. The Safety Systems Business manufactures and markets automotive safety components based on many years of research

using Nippon Kayaku's core competence of explosives technology. Furthermore, various departments are involved in the processes leading up to product launch starting with development. This allows us to simultaneously push forward with development, manufacturing and marketing, resulting in products being brought to market in a much quicker time frame. Looking forward, we will strengthen the collaboration with our overseas sites to enhance product value globally and contribute to society.



[Safety Systems Business](#)

Agrochemicals Business

We will contribute to society by supplying safe agrochemical preparations technology that are compatible with the environment and indispensable to stable food production

The environment surrounding agriculture is becoming more severe with each passing year, marked by food supply issues caused by the rising world population, issues with food self-sufficiency rate, and increasing crop damage from disease and pests. Such an environment requires that safe and secure agricultural crops be grown consistently and brought to market in a stable manner.

The Agrochemicals Division offers a variety of agrochemical products created with its innovations and proprietary technologies from unique perspectives.

For example, Fumon[®], ideal for Integrated Pest Management limiting the reliance on chemical pesticides, or Chlopic Flow[®], that use chloropicrin, improved formulation with low irritation keeping highly effectiveness for eliminating pathogens and pests in the soil.

We will continue to contribute to agriculture by researching, developing and supplying technologies and materials closely in tune with customer needs.



[Agrochemicals Business](#)

Research and Development

The Nippon Kayaku Group engages in proactive R&D activities, knowing that R&D is a driving force behind its business growth. Since marking its 100th anniversary, Nippon Kayaku continues to further deepen its long-standing elemental technologies and core technologies for new technological development. We will contribute to society, safeguard the life and health of the public, and support a comfortable life by executing R&D to consistently deliver the best products.

At each of the research laboratories directly run by the Functional Chemicals Group, the Pharmaceuticals Group, the Safety Systems Group, and the Agrochemicals Group, R&D activities are taking place aimed at the creation of new products only possible by Nippon Kayaku in each of these respective business domains. In addition, as part of the R&D aimed at the creation of new products and new businesses, we also actively pursue corporate research utilizing our strengths by allocating company-wide management resources strategically and combining technologies, products and intellectual properties from inside and outside the company.

R&D that takes the Nippon Kayaku Group's proprietary technologies to new heights – R&D of light control films

The Research and Development Group will contribute to society, safeguard the life and health of the public, and support a comfortable life by executing R&D investments to consistently deliver the best products.

Automobiles are set to undergo a major transformation with advancements in electric vehicles and autonomous driving technologies. A large number of sensors are now fitted to automobiles to support safe driving. One of these is the head-up display that displays various forms of information on the windshield. Head-up displays use special films that control light in order to display this information clearly. Light control technology is used in a very wide range of fields, including not only head-up displays, but also LCD and organic EL displays, projectors, transparent displays, heat shield windows, and sunglasses, to name a few.

Nippon Kayaku is examining the use of the group's light control technologies such as polarizing films and retardation films to develop highly advanced and specialized light control films as one of its corporate research themes. For example, we are examining together with group companies the possibility of using these films to develop automotive head-up displays using our unique technology that makes images clear in wide viewing angles and to develop eyewear such as sunglasses and goggles with a completely new metallic-like finish despite being made from organic materials.



Head-up displays



Eyewear

Researching the Needs of Tomorrow: R&D for Organic Semiconductor Materials

The Research and Development Group will contribute to society, safeguard the life and health of the public, and support a comfortable life by executing R&D investments to consistently deliver the best products.

Additionally, the Research and Development Group is implementing R&D strategy with a medium- to long-term perspective to create new products and new business through open innovation inside and outside the company and by combining the intellectual properties and technologies of the Nippon Kayaku Group. The Kita-ku, Tokyo is one of the

Nippon Kayaku Group's largest R&D hubs and considered a critical area for R&D and new business creation. We will concentrate resources here including researchers from each business field and facilities to achieve collaboration and integration of technologies and people.

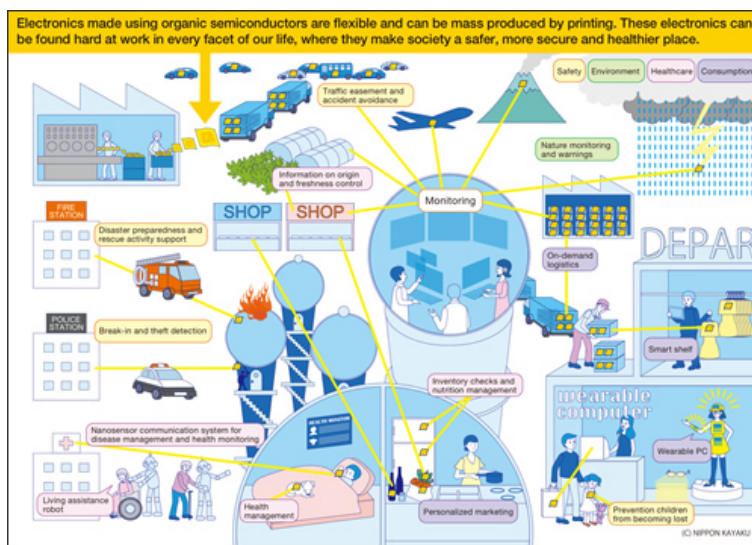
[Learn more about our research laboratories](#)



Inorganic semiconductor



Organic semiconductor



[View larger image](#)

The Meeting of the Movement for Tomorrow

The Meeting of the Movement for Tomorrow, which marked its 58 th time in 2017, is held annually as a company-wide venue for sharing achievements in terms of operational improvements, improving productivity, human resources development, and new product development.

It has become the largest annual event to participate not only from Nippon Kayaku but also from domestic and foreign group companies.

In the Meeting, each department makes a presentation, and among them we select excellence awards and special awards to recognize excellent themes.

Evaluation of daily activities increases employee motivation for work.

By attending presentations of various workplaces, we can obtain hints for new ideas and task solving.

In addition, at the social gathering after the presentation, we are deepening collaboration laterally by communicating with people beyond occupations, generations, and countries, and expanding our horizons of business.

(We will continue holding this meeting so that Nippon Kayaku Group employees can continue to raise their ambitions and take the next step in their careers.)

"KAYAKU spirit Dream and Drive"("Kaizen") Activities * The exchange meeting

The exchange meeting, which marked its 6 th time in 2017, is a field to talk about "KAYAKU spirit Dream and Drive" ("Kaizen") Activities frankly. It is a small-scale meeting mainly plant departments and every participant can speak frankly and actively.

In this exchange meeting for two days, the presentations were carried out on the first day and had open discussions on the second day. During the open discussion, participants talked freely about how to lead D&D activities, evaluation method of the result, and troubles and ingenuities of activities.

The small group size made it easier for participants to talk amongst themselves, resulting in active discussions. So it is popular among participants because it allows active exchange of opinions and information sharing. Through discussions with people in multiple workplaces, we receive stimulus from other workplaces, lead to improvement of problem awareness and promotion of D&D activities at our own workplace.



We will continue this exchange meeting and will do it for more active D&D activities in future



*"KAYAKU spirit Dream and Drive"("Kaizen") Activities: A form of improvement activities that focus on the ingenuity and innovations of all employees in order to resolve tasks in the workplace independently under the banner of CSR management)

Company-wide Research Presentation Conference

The annual Company-wide Research Presentation Conference brings together researchers from the Research and Development Group engaged in R&D at four laboratories in Japan as well as officials from the head office including the President for oral and poster presentations of research outcomes. The event also features oral presentations and awards for patented inventions that greatly contribute to the company's businesses or technological development.



In fiscal 2017, we organized oral presentations and postal displays on the theme of "A new world spun out of horizontal threads" so as to explain how our technologies are derived, what kind of future these technologies will bring to us, and which technologies are needed to realize this future.

Nippon Kayaku highly values opportunities for management and researchers to directly engage one another to share research outcomes in a multifaceted manner and to enable researchers to promote themselves. Researchers are also able to create company-wide networks among themselves, while being asked questions and given advice after their oral presentations and poster presentations. This allows for the linkage and fusion of the many excellent technologies developed by Nippon Kayaku over the years, and contributes to problem solving and the creation of innovation.



Globalization of Research Activities

Following the policy of Nippon Kayaku's global management, the Research and Development Group is in the process of building a global R&D structure inclusive of overseas Group companies. While promoting greater interaction among researchers working for overseas subsidiaries, the Research and Development Group is carrying out the following activities from the perspective of CSR.

Hosting International Internship Students

Nippon Kayaku hosts interns from both domestic and overseas universities. Interns engage in various activities at Nippon Kayaku's laboratories with a focus on research and development, while also learning about corporate activities and Japanese culture. At the same time our employees receive a boost in terms of motivation and stimulation by working together with these young interns. Going forward, through these internships, we will continue to globalize our corporate culture and contribute to international exchange as well as the education of overseas students.



Joint Collaboration with Overseas Research Institutes

Nippon Kayaku actively engages in joint research with research institutes located outside of Japan.

We utilize web conferencing during joint research with overseas group companies to share information in a timely manner and speed up the R&D process. Also, we are among the first to adopt cutting edge technologies and materials, while utilizing industry-academia collaboration programs with overseas universities, to ensure that we can help create a sustainable society.

The collaboration and integration of our long-standing excellent technologies help promote problem solving and the creation of innovation.

For the Future Nippon Kayaku Group Products and Technologies Supporting an Affluent Lifestyle for Today and Tomorrow

Gunpower for engineering works, Explosive kinds
Water gel Explosives Ammonium Nitrate Fuel Oil Explosives (ANFO Explosives), Electric Detonator Non-explosive crushing agent

Polarized sunglasses
Polarizing film

Smart phone, Tablet
Resin for color resist, color filter dyes, Epoxy resin for semiconductor encapsulation, Hybrid resin for flash LED encapsulation Sealants for LCDs, Resin for coatings, Touch Panel Adhesives

Digital cameras
Colored resist for micro color filters Resin for black matrixes

Printing materials
Heat-sensitive developing agents

Flexible displays
Wearable computers
Organic semiconductors

Food
Health food and supplements raw material

Hygiene products
Towelettes

Cardboard
Dyes for Paper

Confectionery products
Quality preserving agents

Clothing
Dyes

Agriculture
Insecticides, herbicides, soil fumigants, biological pesticides

Cable protection
Rat Repellent
Pest control
Insecticide for Public Health

CFRP Matrix Resin
Thermal conductive heat insulating materials
Motor coils for electric-powered aircraft

Wastewater treatment technology
Technologies for purifying water and returning it to nature

Banner
Coloring Materials for Textile Inkjet Printing

Projectors
Polarizing film

Diapers
Catalyst used in the production of acrylic acid for superabsorbent polymers

Car seats
Dyes
Seatbelts
Dyes

Seatbelts
Micro gas generators

Pop-up engine hoods
Micro gas generators

Head Up Display
Light Control Film

Airbags
Inflators
Side airbags
Inflators

Automotive displays
Films for LCD displays Sealants for LCDs
Engines
Epoxy resin for semiconductors and resin for printed circuit boards for engine motor control

CFRP Matrix Resin

Acrylic paint, light covers
Catalyst used in the production of acrylic acid for paints and parts, Resin adhesive

Optical disks
Adhesives for optical disks, Coating agents

Printers
Inkjet printer dyes

Oversized aquarium tanks
Catalyst used in the production of methacrylic acid for transparent resin

Polymeric micelle anti-cancer drugs

Ethical drugs
Anti-cancer drugs
Generic drugs
Biosimilar

Energy conversion materials
Health care diagnostic sensors
Thermoelectric elements

Fireworks
Black powder
Pyrotechnics for fireworks

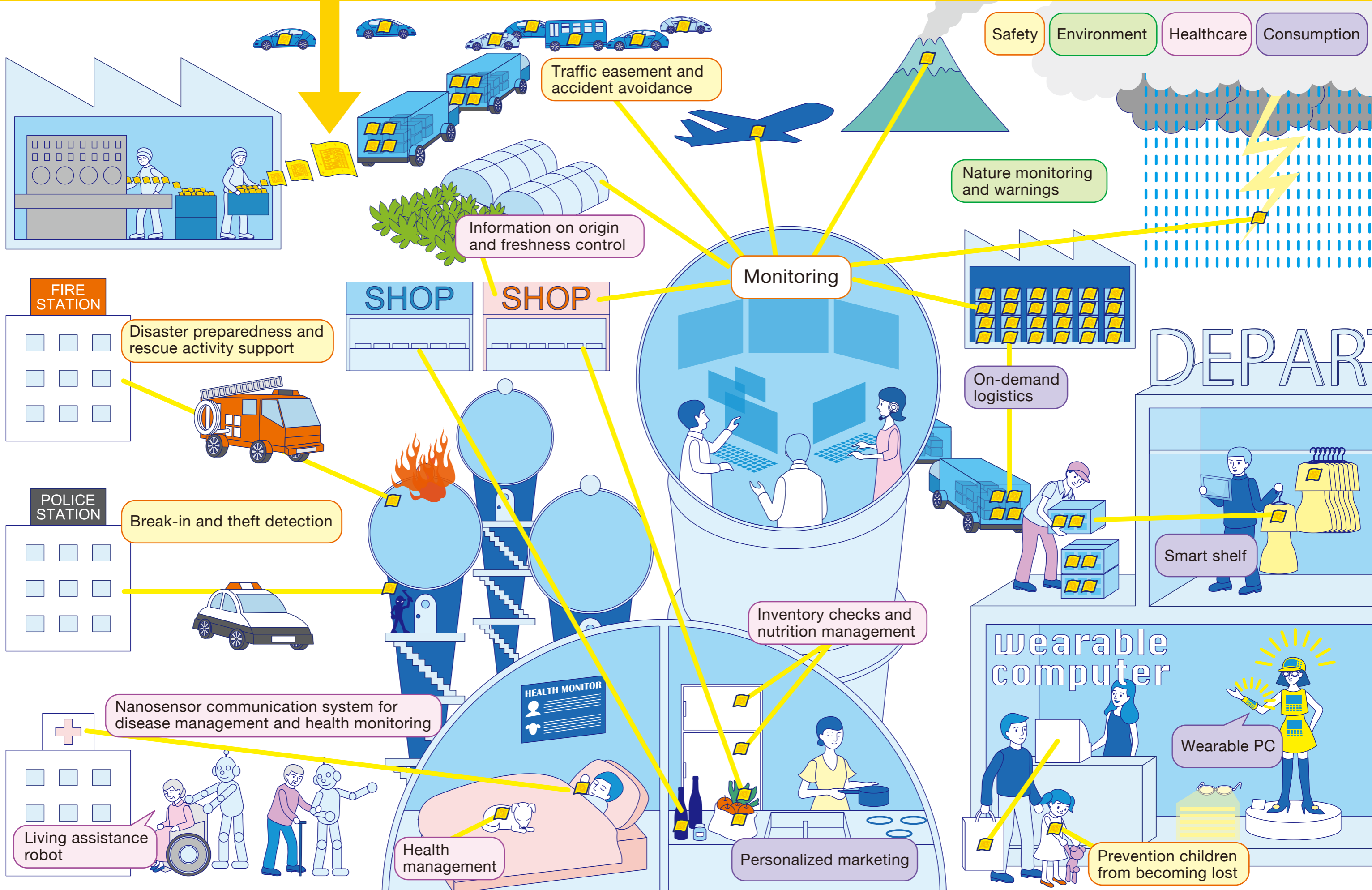
Medical care
Pharmaceuticals
Medical devices
Active pharmaceutical ingredients
Diagnostic products

Toilet paper
Dyes for Paper

Displays
Epoxy resin for semiconductor encapsulation Sealants for LCDs Resin for LCD panel spacers Resin for color resist Resin for coatings Resin for printed circuit boards Functional films Dyes for color filters Infrared absorbing agents

Sticky note
Dyes for Paper

Electronics made using organic semiconductors are flexible and can be mass produced by printing. These electronics can be found hard at work in every facet of our life, where they make society a safer, more secure and healthier place.



Safety Environment Healthcare Consumption

Monitoring

Traffic easement and accident avoidance

Nature monitoring and warnings

Information on origin and freshness control

On-demand logistics

Disaster preparedness and rescue activity support

SHOP SHOP

Break-in and theft detection

Inventory checks and nutrition management

Smart shelf

Nanosensor communication system for disease management and health monitoring

HEALTH MONITOR

Health management

Personalized marketing

wearable computer

Wearable PC

Prevention children from becoming lost

Living assistance robot