

HORIBA's "Analytical and Measurement" Technologies and Digital Transformation (DX)

The origin of "Digital Transformation (DX)" is said that Professor Erik Stolterman of Umea University in Sweden defined the concept as "The digital transformation can be understood as the changes that the digital technology causes or influences in all aspects of human life" in 2004. Although the definition of Digital Transformation commonly used is not fully consistent, it can be said that the improvement of operational efficiency and productivity, creating new value, and so on are realized by fundamentally transforming business models and business processes with utilizing digital technology as a tool. HORIBA provides not only generating essential data for Digital Transformation, but also creating various solutions for customer's Digital Transformation utilizing digital technologies such as IoT and AI. This article describes overview of these solutions.

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Introduction

HORIBA's measurement technology began with electrochemical pH meters. Since then, we have expanded the analysis targets to include liquids, gases, and solids, while accumulating various analysis and measurement technologies using infrared rays, X-rays, and the like. We now have core technologies such as "Infrared measurement", "Fluid control", "Particle measurement", "Spectroscopic analysis", and "Liquid analysis" and develops variety of analytical and measurement instruments by combination of core technologies. We also create and provide HORIBA's unique "HONMAMON" DX (Digital Transformation) solutions contributing to operational efficiency, productivity improvement, and the creation of new value through not only developing analytical and measurement instruments using core technologies but also utilizing "Sample handling", "Automation", "Data management", and "Data science" to flexibly respond to customer needs (Figure 1).

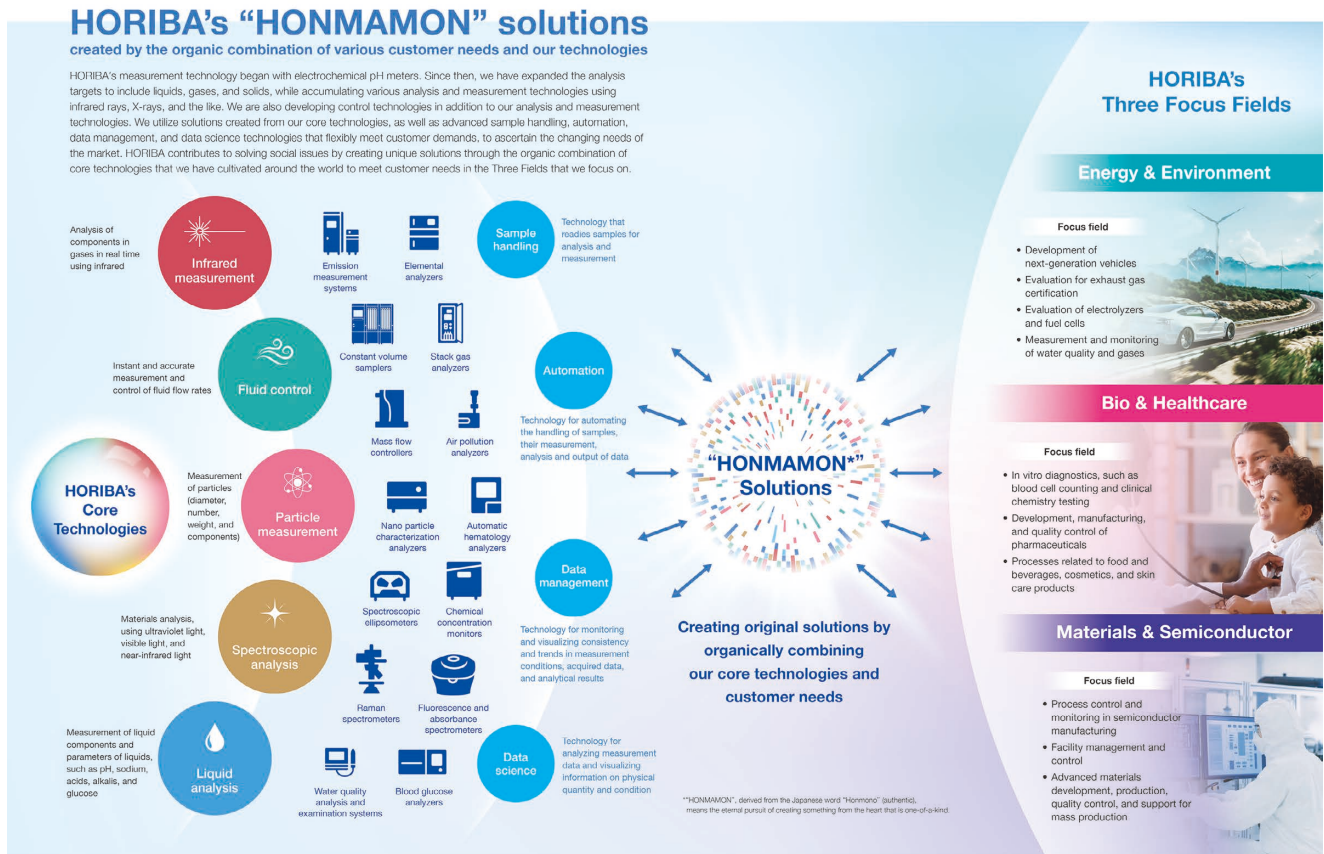


Figure 1 HORIBA's "HONMAMON"* solutions
https://static.horiba.com/fileadmin/Horiba/Company/Investor_Relations/IR_Library/HORIBA_Report/20250730_HR_en.pdf

* HORIBA Corporate Web site, What is "HONMAMON?"
<https://www.horiba.com/our-future/en/honmamon/>

HORIBA's DX Solutions Developed Together with Customers

The origins of HORIBA's DX solutions trace back to the 1970s, before the term "DX" was established. The first HORIBA Motor Exhaust Gas Analyzer, "MEXA" was sold in 1964. Subsequently, detailed workflows and testing procedures were specified in exhaust gas regulations and automation was required because of difficulty for humans to conduct measurements manually and correctly. To address such needs, in the 1970s, we began offering total solutions combining not only exhaust gas measurement equipment but also automation software for various business processes. This can say first generation of HORIBA's DX solutions (Figure 2).



Figure 2 Light-Duty Chassis Testing
<https://www.horiba.com/jpn/automotive/applications/emissions-performance-and-durability/exhaust-emissions/light-duty-chassis-testing/>



Figure 3 Total Automation of Elemental Analyzers for Carbon and Sulfur
<https://www.horiba.com/jpn/technology/automation/>

In addition, HORIBA also has over 40 years of experience about automation and labor-saving for analytical operations other than automotive emission gas measurement business. For example, in trace element analysis applications for steel, HORIBA has addressed the demands such as improving operational safety, reducing labor and man-hours, and eliminating the impact of human factors on accuracy through introducing the analytical automation including pre-processing and related tasks and online analysis to production lines. (Figure 3).

Thus, HORIBA has long worked together with customers to provide solutions, which could now be called DX, utilizing system integration and automation technologies.

The Evolution of Digital Technology and Diverse DX Solutions

Since 2000, HORIBA has developed a variety of remote solutions in response to evolution of digital technologies such as information technology, IoT, and AI. Through networking of instruments and utilization of IoT and cloud, HORIBA launched the comprehensive maintenance service support system “HORIBA MEDISIDE LINKAGE” for medical devices (Figure 4) and the cloud-based maintenance service “HORIBA AQUA LINKAGE” for water quality monitoring devices. These services have contributed not only to stable equipment operation

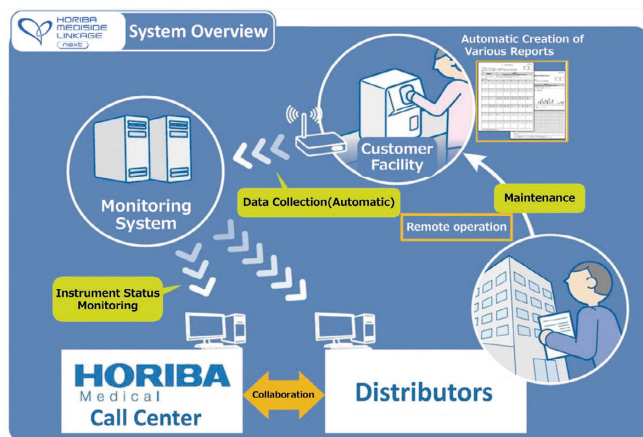


Figure 4 Total picture of [HORIBA MEDISIDE LINKAGE] system
<https://www.horiba.com/jpn/medical/news/news-press-release/detail/news/8/2023/horiba-mediside-linkage-next/>

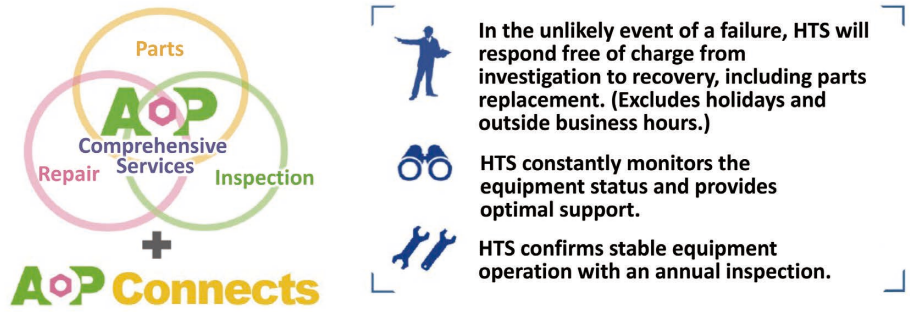


Figure 5 Remote support [AOP Connects]
<https://www.horiba.com/jpn/service/solution/service-product/remote-support/>

via remote monitoring but also to reducing the workload on-site, accelerating problem-solving, and promoting work style reforms.

In addition, we offer a variety of business efficiency improvement services through various plans tailored to customer needs such as "AOP Connects" (Figure 5), which adds remote equipment status monitoring by expert engineers to the "AOP (All in One Plan)," which is comprehensively maintenance and inspection services for HORIBA products, secure remote access to equipment that enables customers to work remotely, analysis consultations remotely with our specialized analytical engineers, and remote maintenance.

HORIBA's DX Solutions in MLMAP2028 R&D Strategy

HORIBA is currently implementing Mid-Long Term Management Plan, "MLMAP2028", aiming to solve social issues through "HONMAMON" solutions in three fields: "Energy and Environment" "Bio and Healthcare" and "Materials and Semiconductor". R&D strategy of MLMAP2028 is based on three pillars. The first one is to help expand new applications and businesses through product development by new combination

Cultivating HONMAMON technology by connecting technology and talents organically

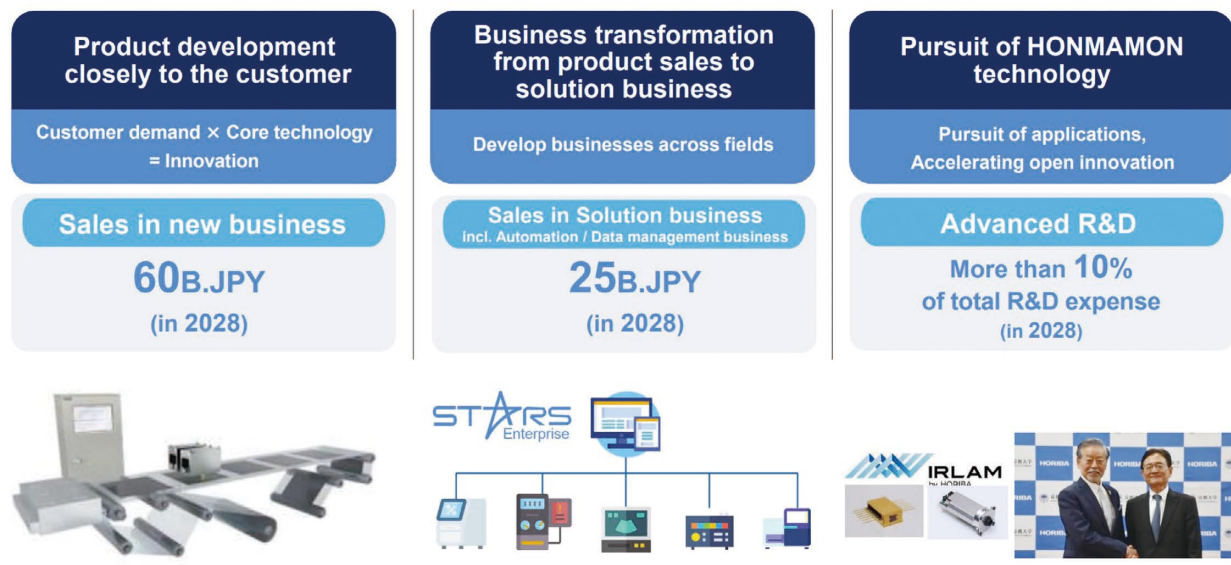


Figure 6 R&D strategy in Mid-Long Term Management Plan [MLMAP2028]
<https://www.horiba.com/int/company/investor-relations/mid-long-term-management-plan/>

of technology in all HORIBA Group. The second is to help expand our solutions business, including automation and data management, by promoting the transformation of our business from product sales to solution provider. And the third is to pursue “HONMAMON” technologies. (Figure 6).

In particular, regarding the second pillar which is the expansion of the solution business, HORIBA is focusing on applying the DX solutions such as laboratory data management expertise cultivated in the automotive business to new fields such as research and development in materials analysis.

Conclusion

To further expand and promote DX solutions, HORIBA is collaborating with academia such as Shiga University, The University of Tokyo, and Osaka Metropolitan University to develop DX talent through open innovation. HORIBA's dedicated data science team, as a company with analytical and measurement technologies at its core, values the mindset of a hands-on approach to developing algorithms in the laboratory based on the principles of physical phenomena, and strives to create solutions every day. The use of IoT and AI is now commonplace, and we believe that how we utilize them will have a major impact on business. HORIBA has many possibilities, such as Laboratory DX, which aims to improve the efficiency of experiments in research and development, and spectral analysis in spectroscopic analysis, which are seeing increasing demand these days. With a diverse range of analytical and measurement technologies, HORIBA will contribute to the expansion of our customers' DX, which can only be achieved by HORIBA.

* Editorial note: This content is based on HORIBA's investigation at the year of publication unless otherwise stated.



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