

Around the Globe

Connectivity and Innovation in AI and Digital Technology in Japan, and the Future Healthcare Industry

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Global connectivity and harmonization are critical pillars in the world of medical and healthcare information. One of their goals is to link to every data source and stakeholder group involved in and with this information.

With COVID-19 introducing new urgency to global connectivity, DIA Japan's first web-based symposium *Cutting Edge Series – Innovation in artificial intelligence (AI) and digital technology and the future of the healthcare industry* considered the social and economic benefits of these innovations from drug discovery to manufacturing and sales.

Key Takeaways

- “Patient-centric” research and care, no matter how heavily promoted, will remain little more than an official slogan (or excuse) if the R&D, healthcare, and patient communities lack connectivity across Japan.
- Social economic rationality is an important measure of “patient-centric” R&D and healthcare, which should deliver substantial changes in the social benefit of these services (and not only for one specific company or group).
- Emerging AI and digital platforms and tools make compelling arguments for decentralized and optimized R&D and healthcare. Many stakeholders wish to overcome the gridlock in the current labor-intensive R&D models.
- Many experts agree that humans seem inadequately prepared for the new digital era. Definitions of how to use a tool, of important things to do and not do, and ways to demonstrate social intelligence and creativity, drive harmonization among people and their processes but are not yet sufficiently refined at this time.

Each symposium presenter offered their concept of “connectivity” to complement a skill, knowledge, or technology gap in current business models. In the numerous industries that have already automated many processes, secure connectivity provides an empowering digital foundation for industrial automation and increases productivity and performance, bringing both strategic and tangible benefits to each organization and the individuals they employ.

In the healthcare industry, for example, healthcare databases combined with AI are expected to contribute to visualizing new aspects of R&D and healthcare, increasing efficiency and real world applicability as a complementary tool to the limitations of the traditional randomized clinical trial. The essential foundation for realizing medical care in the future is establishing interoperability across medical and other data, all connected to and acting upon each other to deliver outcomes and services that are meaningful to medical care and healthier human life.

The pharmaceutical industry has been increasingly utilizing artificial intelligence in a wide range of areas, from drug discovery to manufacturing and sales. At the same time, anxieties and theories such as “artificial intelligence takes away human jobs” have also become a big topic. But technology is essentially a tool that enhances human capabilities, and only when the purpose of using the tool is clear is it possible to demonstrate the true power of the tool.

When considering industrial growth and further technological advancement to achieve continuous innovation (and perhaps even a “revolution” of sorts), several key elements underpin the ultimate goal of connectivity and global harmonization.

1. Promote technological innovation as the core of innovation.
2. Seek out potential technology and its applications in collaboration (connection) with other participating stakeholders to drive advancement and improvement for processes and to nurture experts who can maximize its benefits.
3. When implementing new technology, carefully consider the paradox of its benefits and risks to connectivity at each stage of implementation for all stakeholders.

4. Continuously examine how emerging technology can identify and potentially resolve complex (and often inadvertent or unintended) business, social, or economic paradoxes.

Optimizing business models through fusion, combination, re-engineering or collaboration will be critical and will provide new ideas and sources for driving connectivity through these diverse approaches. Developments in 5G, AI, IoT and related technologies will be fundamental in those actions.

Public-Private Collaboration

Yoshiaki Uyama (PMDA) shared an impressive plan for a medical database based on a public-private collaboration model (between MID-NET and a private vendor's medical database). This basic concept of a common public-private database for medical care should be a cornerstone of global collaboration and may also be considered "patient-centric" since it is built on patient data. Motohiro Kanayama (Astellas) presented another somewhat surprising aspect of connectivity, healthcare and entertainment. Technology and human creativity are constantly evolving in the entertainment world, and although the world of pharmaceuticals is completely different, they share important concepts such as the value of convenience, efficient development and delivery, and generating consumer interest.

Decentralization

Many presentations explored new and different types of AI-empowered digital platforms and tools and their potential for optimizing healthcare through efficient decentralization. New medical devices, for example, are becoming increasingly more intelligent and connected, to more conveniently deliver optimized healthcare services, with their specific functions integrated with an IT platform and aggregated through the Internet of Medical Things (IoMT). Although major challenges remain to achieve total optimization, AI-powered document authoring systems covering end-to-end documentation needs in pharmaceutical R&D are also attracting great attention. It is critical to take every opportunity to promote connectivity is as the key component in addressing these and related challenges.

Human Factors

This Symposium also convened experts from medical economics, industry, academia, and government, for serious and ambitious discussion of the role people will play in the era of new technology. Results of a questionnaire showed that many Symposium participants want to overcome the gridlock of their current labor-intensive R&D models by moving into more "patient-centric" models enabled by technology. It was concluded that it is important to not only re-affirm the primary role of people connected by technology but also to define it (i.e., how to use a tool, important things to do and to NOT do, etc.) to further demonstrate and drive creativity and harmonization.

Rapid improvement in the culture of healthcare in Japan will be difficult to achieve and is work that will consume time and energy. Educational and other systems have promoted and firmly established many aspects of this culture. Japan presents unique cultural constraints and challenges to technology-enabled innovation, such as the "functional silo" workplace mentality, multiple layers of bureaucratic decisions, and educational and healthcare systems in which students and patients play more passive than active roles. Technology that increases connectivity between these persons can help overcome many of these constraints.

Finding the potential of innovation through technology and connectivity is not only for one great leader. This great work should be shared and leveraged by a great many people. We can all do better, and be better prepared, for this new era in technology.