



TRANSFORMING THE FUTURE OF DIAGNOSTICS: DIGITAL AND CONNECTED PATHOLOGY

As a highly data-rich industry, healthcare is ripe for the application of intelligent digital analytics and automation processes. The field of diagnostics, in particular, stands to benefit enormously from the latest in cutting-edge AI-driven analytics which can offer clinicians efficient, automated and error-proof decision-support to make, for instance, cancer diagnoses in a faster, more reliable and more timely fashion. Be it histopathology analysis or broader imaging analytics, the result is a safer, more reliable diagnosis for critical stages of cancer detection and management.

If you go by the data from World Health Organization, cancer remains one of the leading causes of death worldwide.¹ By 2040, the global number of new cancer cases is estimated to rise to 27.5 million with 16.3 million deaths as the result of the growing ageing population.² One of the most critical stages of cancer detection and management is diagnosis.

Infosys Healthcare organized a LinkedIn LIVE on *“Transforming the Future of Diagnostics: Digital and Connected Pathology”*, led by Roshan Shetty, Head of Life Sciences, Insurance, and Healthcare at Infosys with inveox Founder & Managing Partner, Maria Sievert. inveox is a Munich-based medtech founded in 2017 offering hardware and software solutions to digitize, automate and connect pathology laboratories. Building innovative systems for sample preparation and tracking in histopathology, inveox aims to increase efficiency and safety in pathology laboratories. It was listed on the 2018 Forbes list of “most promising startups”, and Maria was selected among the best innovators under 35 by Technology Review and “25 Women Whose Inventions Change Our Lives” by Edition F.

Maria and Roshan discussed the importance of digitization in diagnostic protocols, new innovations and technology trends currently transforming this sector, and the future of diagnostics.

Inefficiencies in the current processes

The pandemic has not only made everyone pay more attention to what is going on in the diagnostics sector but also the importance of diagnoses for faster treatment. Digital pathology is experiencing rapid growth worldwide. In 2019, the global industry value USD780 million with experts predicting growth at CAGR 11.8% by 2027, which means the global industry is almost going to double in size.³

However, even today, cancer diagnosis and analysis of the tissue sample in histopathology involves a lot of manual processes and data entry. Every sample undergoes a specific procedure, wherein it is dehydrated, embedded in paraffin, cut into thin slices and coloured so that it can be ready for an actual diagnosis under a microscope. The information at every stage is manually recorded. Owing to such a time-consuming and erroneous process, anywhere from 1-15% of tissue samples get mixed up, contaminated, or lost during this first step of diagnosis.⁴ Also, the one size fits all approach hinders better outcomes,

improved treatments, and a more targeted approach.

Time is extremely valuable for a cancer patient. With thousands of samples being sent to the lab, there is no way to track any slippages in the shipping. “We’ve seen innovation in other industries. For instance, an Amazon package can be tracked per 30 minutes precisely, so why we don’t use some of those innovations in the area of histopathology?” added Maria.

Thousands of samples arrive in a pathology each day that need to be registered and processed, which means more computing power to handle the gigantic, complex data sets. “In Germany alone, 100 million samples are processed per year across labs. Each sample has about 1 to 12 different images, which are very large in size. That’s already a voluminous amount of data, without adding information from hospitals, patient history and so on,” added Maria. Handling, streamlining and analyzing such a vast amount of data needs massive storage and computing power.

The role of technology

To address these inefficiencies, it is essential to digitize, automate and connect histopathology laboratories, physicians and improve outcomes for patients by leveraging next-gen technologies. There are a lot of routine jobs that can be automated, allowing clinical personnel to focus on adding value to diagnosis.

As we digitize the workflow, there is an opportunity to add other data points like what kind of medication the patient takes, how the sample looks, etc. A precise diagnosis also leads to more personalized treatment.

Roshan explains that the growing amount of data will call for new, more powerful ways of computing. “Quantum computing will replace the traditional way of handling massive amounts of data,” he added. Personalized and informed diagnostics will be further powered by AI, ML, big data and other emerging technologies.

“In diagnostics, a lot of research is being done. There is a lot of innovation towards using AI for screening the different images and cells using the additional data points. Analyzing such increasingly large datasets can support pathologists in the right decision-making,” Maria explained further.

Conclusion - interoperability and a connected ecosystem

The future holds a sort of interplay between lab operations, machinery and software that supports workflow efficiency and at the same time collects data points to enable digital pathology. Going digital will strengthen the diagnostics sector and pave way for collaboration across all stakeholders in the value chain. Moreover, the data-driven approach towards more informed diagnostics will increase speed, accuracy and efficiency.



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