

"IoT can be leveraged with the current COVID-19 outbreak situation"

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BioSpectrum interacted with Bob Harvey – President, QuEST Global



Singapore headquartered company QuEST Global caters to a number of industries including medical devices and diagnostics. The company's core competencies in the sector include – R&D and Product Development Services, Regulatory Compliance Support, Verification and Validation.

BioSpectrum interacted with Bob Harvey – President, QuEST Global, to find out more about the developments taking place in this sector.

Leveraging IoT across the continuum of care. How does it help in patient outcomes?

Medical Devices companies are in the process of developing a connected digital patient care ecosystem leveraging IoT with the following key objectives –

- Capture enhanced clinical evidence
- Improve patient outcomes by providing appropriate guidance
- Providing proactive patient support and care path management

The care continuum, including preoperative, perioperative and postoperative phases, would leverage multiple technologies - mobile apps, wearables, robotic surgery, imaging, sensors, and visualization. IoT based solutions would also help medical device manufacturers as well as healthcare providers to manage preventive maintenance of devices, remote monitoring/diagnostics, and software updates - enabling the increase of overall patient care efficiency.

Some of the use cases from the Internet of Medical Things (IoMT) are directly experienced by the patients, including medical adherence systems, activity tracker/sleep apnea detectors, etc. The holy grail of IoMT is when the entire ecosystem of patients, providers, payers, and doctors are connected and it would unleash significant benefits to all stakeholders in the ecosystem. A connected healthcare system can lead to increased timeliness in intervention, accuracy due to data-driven insights, and mobility through remote diagnostics and monitoring of patients, thus affecting patient outcomes with significantly improved results.

With the current COVID-19 outbreak situation, we can potentially leverage IoT solutions to identify the hot spots by monitoring the key symptoms of demography across different regions. Also, IoT enabled solutions can help healthcare providers to remotely monitor the patients with a lower risk of direct exposure.

What is the state of Industry 4.0 in the medical devices sector?

As more and more medical devices, diagnostic and pharma manufacturing companies are adopting Industry 4.0, they are focused on reaping the benefits through automation, remote monitoring and predictive maintenance at their manufacturing facilities. Some of the key business drivers for these companies include demand-driven supply, efficient operations, in-process quality control and feedback, integrated energy management, cybersecurity, etc.

We are currently witnessing that among most companies in the Life Sciences industry, manufacturing/process data traceability and reliability are major concerns. Customers are also grappling with multiple disjointed manufacturing systems across the business units and Industry 4.0 approach would greatly help in transforming and optimizing their operations resulting in better product quality as well as yield.

How are the medical imaging companies gearing for the future of digitalization?

Being a data-centric modality, medical imaging is well poised to embrace digitalization, compared to many other segments in the medical devices space. Two salient aspects of the medical imaging domain are its capital intensive business nature, and dependency on specially trained healthcare professionals to run it. Both are key drivers, encouraging newer business model pursuits & technical innovations.

There's an enhanced focus on moving the image processing and applications and image management capability from the equipment side to cloud-based platforms. This will potentially open up new options in licensing or ownership models in healthcare delivery.

Arguably, the way radiological images are interpreted will see the paradigm shift in the times to come. For example, digitization enables the corroboration of data from multiple clinical and non-clinical sources to interpret radiological images with better confidence. Leveraging AI in medical image interpretation is the single largest focus area in imaging R&D space today.

In the COVID-19 context, demand for Chest X-ray has grown exponentially as the X-ray is a modality to screen and diagnose Pneumonia. QuEST already has the technological capability to detect lung nodules in CT images with the help of AI. We're leveraging this experience to read Chest X-Ray in the COVID-19 screening context. The AI-based solution is in development

that will boost the patient screening efficiency in the current demanding situation.

How is automation affecting the medical devices industry at large?

Automation is not new to the medical device industry. Some segments of the medical devices industry, like In-Vitro diagnostics, is the early adaptor in the form of lab automation. The clinical lab space of this industry will pursue automation with greater vigor. Sample logistics & lab workflows will see 'factory like' operational models – driving towards better efficiency and lowering processing costs.

Many traditional healthcare functions, like health record-keeping, imaging data or clinical lab data are already automated through HIS, PACS or LIMS suits. We will see this automation envelop expanding in the healthcare space, with operational cost optimization as the key driver.

On the manufacturing side of the medical devices industry, the disposable and consumable segments are with the highest rate of automation adaption. The capital products, low volume segments are slow adaptors for obvious reasons.

How can reprocessing single-use devices help the medical industry?

Single-Use Devices (SUD) processing market is continuously growing and currently estimated to be approximately \$2 billion, out of which North America has a global market share of approximately 40%.

Some of the key business drivers for these companies include the demand-driven Cardiovascular and Laparoscopy segment. While medical device manufacturers (OEMs) are under cost pressure from SUD reprocessing industry, end customers in many cases are surely benefiting from this development with SUDs becoming up to 50% cheaper compared to original devices. FDA regulation supports reprocessing as long as the safety and efficacy of the reprocessed devices are not compromised.

Also, given the environmental impact by medical waste, reprocessing of SUD would provide some relief as a significant portion of the SUD will be recycled instead of going into landfills.