Barry Lam – Chairman, Quanta Computer, Taiwan

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Barry Lam, founder and chairman of Quanta Computer, shares the story of how he built the company into one of the world's leading electronics and IT manufacturers. Lam then sheds light on Quanta's expansion into healthcare and his strategy to position the firm as an AI tool provider, helping to usher in the age of smart hospitals.

As the founder of Quanta, what has been your journey in cultivating the world's major original design manufacturing company of IT and electronics products?

Since I was very young, my dream has been developing artificial intelligence. 60 years ago in Asia, everything was "atomic", and after seeing the movie Atomic Man as a child, I was fascinated by the computer intelligence that was able to control the character's mechanical suit. It was from this moment that I knew I wanted to study computer engineering. Later on, I would graduate with a computer science degree from National Taiwan University.

Quanta is a 30-year-old company which started as an electronics manufacturer and became the world's largest laptop ODM manufacturer. When I founded Quanta in 1988, everyone was making desktop computers, but nobody believed in my idea that computing needed to be portable. After years of making our own "luggable" PCs, it was not until 1995 when Apple come to us wanting be create their first notebook. Moving forward, in 2000 under the idea that computing should be accessible anytime anywhere, I filed a patent for the Application Store, the world's first cloud

computing platform. From here we worked to develop cloud computing and in 2006 Quanta became the world's leading cloud server manufacturer. In 2016, we created our first Cloud Tensor Processing Units (TPU server) for AI.

Today we have achieved USD 35 billion in revenues and have 75,000 employees globally. After a period of great success, we now find ourselves having to rethink who we are as a company – a creator of AI tools. Last year Quanta cooperated with the Ministry of Science and Technology (MOST) in the1 creation of "Taiwania 2", a supercomputer ranked among the world's top 20.

As a strongly positioned ICT manufacturer, what was the rationale for entering the healthcare space?

Quanta has been interested in the healthcare field for about ten years at this point. After seeing the collaborations between Massachusetts General Hospital and MIT, I realized that AI can, in fact, have an impact on the medical field. Within the last two years, we have become very active in the medical AI space.

From next-generation medical equipment to cloud-based information solutions, Quanta is seeking to revolutionize patient care. Our strategic partnerships with National Taiwan University Hospital, Chang Gung Memorial Hospital, and others, give Quanta a real-life window into how modern diagnostic equipment can solve medical problems.

How do you plan on establishing the Quanta name as an integral player in healthcare?

Quanta's artificial intelligence strategy will be based on a multi-faceted approach. Our first step was to create a not-for-profit research unit, the Quanta Medical Technology Foundation (QMTF), which is independent of the Quanta parent group. Currently, our primary business objective will be to create a smart hospital. Quanta itself will work in the areas of medical device, precision medicine, and telemedicine, smart hospital while the foundation will focus on cardiology and oncology.

Moving into solutions, we will create system-centric AI tools. Learning to create end-to-end solutions is a big challenge for not only Quanta but Taiwanese IT companies overall. However, this will be easier within the medical field thanks to Taiwan's large pool of first-class physicians with whom we can work with. During this entire process, it is important to remember that AI is a tool

and “smart” is a goal.

Quanta’s healthcare operations currently span three business units; consumer, cloud, and smart manufacturing. The consumer business includes wearable technologies for health and other smart devices. Next, our cloud operations are not only for the biggest players like Facebook and Twitter, but we also develop storage and suite software for the government and hospital use. For example, we have just recently signed an agreement with the National Taiwan University Hospital to jointly design a medical cloud. Finally, our smart manufacturing capabilities range from autonomous car servers for Google, Tesla but also medical IoT and AI tools to cover and end-to-end solution.

What are the primary issues being faced for the integration of AI and big data analytics into the existing health paradigm?

To reach the next level of smart healthcare, hospitals first need to integrate AI into their operations. However, now many challenges are facing this task. AI needs large amounts of data, but all the data in hospitals today are very fragmented in format – imaging, scans, health records, etc. Furthermore, each hospital has its own information system so we will need to provide a universal cloud which can service each partner.

Hospitals in both the US and Taiwan do not want to send their data outside of the hospital. Therefore, we establish unique AI models for each hospital we are working with. Afterwards, we can combine each trained program to drive forward precision medicine while keeping the hospital’s data internally stored. This will all be done through QMTF as a non-profit research initiative. For example, Taipei Veterans General Hospital is working with us in cardiovascular AI and ECG sensors. Additionally, we are working with Chang Gung Memorial Hospital for precision medicine. We have several university and hospital leaders on our QMTF board of directors to ensure the ethics and security of our program.

Healthcare has historically been seen as a conservative space resistant to disruption. How open are medical centers and health stakeholders to digital technologies like AI and what strategy does Quanta have to establish collaborations in the space?

In fact, many hospitals and medical centres come to Quanta to see what opportunities exist for collaboration. Many directors and health stakeholders understand that AI is coming, and they realize that they need to create partnerships with IT providers like Quanta to embrace this

innovation wave. The hardware is simple, but the learning process will be long and difficult.

In the cooperation of Taiwan Medical Center, we are actively cooperating with large medical institutions such as National Taiwan University, Chang Gung Memorial Hospital, and China Medical University, all of which have cooperative hospitals. Internationally, we have set up partnerships with institutions like MIT, INSERM from France, and several universities from Japan. Additionally, we are working on the industry side through partnerships. Quanta has the most advanced IT capabilities in the world, we so are a clear partner to institutions in both Taiwan and globally.

What is the future outlook for digitalization and eHealth within the Taiwanese paradigm?

In most countries, even Japan, hospitals do not understand AI and IT completely. Even in Taiwan, the challenges we face are in understanding to what extent these technologies can be fully applied. This is paired with a universal fragmentation of health data. Even with the National Health Insurance which covers 98 percent of patients, our full medical data is not centralized – only prescription data for the purpose of reimbursement.

Furthermore, despite the 5+2 policy and its goal of merging biotechnology with ICT, the government alone cannot be the primary driver of this movement. We are living in a free market, which means it is up to the private industry to work together and usher in the next stages of smart healthcare.

Precision medicine is still far away. We still need genetic data, electronic medical records, and other information. In precision medicine, there are so many aspects to consider and the outcomes are often not the same across patients. With more and more data we can better develop these therapies and have better prediction and prevention.

What vision do you have for Quanta as a leading solutions provider for the evolving smart health revolution?

The tools we have today for AI and precision medicine are still not good enough. There is still a large gap for improvement. In order to create a better computing solution, we have to get involved by working with doctors to understand their needs. We must learn to operate across the culture difference of the medical and IT sectors. My dream is for hospitals to become organic – that their IT

systems and medical capabilities can learn and grow through AI. This will allow each doctor to focus on their specialties and best serve patients.

Precision medicine for prediction and prevention will make a major difference in global health and fighting major disease trends. The AI market is very different from the cloud market – it is much more fragmented. For example, each country will have an opportunity to develop its AI and IT tools, but there can only be one Google in the world. This being said, I believe that Quanta’s core strength of merging the different technologies related to healthcare into one unified system can move the smart healthcare industry forward.

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