Douglas Huang – Founder & President, EPED, Taiwan

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EPED is a professional medical equipment company and a leader in navigation system technologies based in Taiwan. Here, Founder & President Douglas Huang discusses EPED's medical, dental and educational training systems, its internationalization strategies, and how both digitalization and regulations are impacting Taiwan's medical device sector. Huang also touches on how Taiwan could have a competitive advantage in medtech over other nations such as China and Korea.

Douglas, could you briefly introduce EPED?

I began my career as a practising dentist, however, after a few years I decided to change my path and study business. I saw a gap in the market, as Taiwan did not have a particularly well developed dental education system. To become a dentist a person merely needed to pass a written exam for enrolment into the university, no other prior experience was required. I truly believed there was a lack of technical and practical experience.

From there I started a business and subsequently acquired some optical precision technology. I then decided to hire engineering students (PhDs) from my university who could understand the intricacies of this technology. The school budget was not large enough to adequately train these students, furthermore, we felt there was a need to provide a training service for practising dentists with these products. It was after this that we changed to the clinical side and developed a navigation system with real-time imaging capabilities. However, at the time computers struggled to

produce these real-time images without some form of lag. These days the science is getting much better and technology truly is in real-time, which is fantastic!

In 2008, we started to focus on dentistry, implant solutions, and educational training provided to students, dentists, and researchers. Nowadays, and after many years of perfecting what we do, we concentrate our efforts on navigation systems guided through space location that can be witnessed in real-time on a screen by using imaging software crossing the barrier from dental into medical devices, which was an important milestone on the development of our brand.

The market for dental implant navigation systems is quite narrow, therefore, around five years ago we began to develop the technology for medical use in Neurosurgery. From a business perspective, we saw an opportunity to expand and have our optical system be utilized in different fields. Furthermore, we found that the system had far greater applications than simply Neurosurgery. We could be introducing it to E.N.T (ear, nose, and throat), orthopaedics, plastic surgery and so on. The opportunities are vast and moving from imaging to clinical development has been a very important step for us.

Our optical space location technology is starting to be used in motion capture systems, which are used not only in medicine but also in many other industries. Nowadays it can be implemented when converting motion into digital data for further analysis applications with the aid of virtual reality. To date, this technology has been intensively used in medical exercise analysis, athletes' movement analysis and rehabilitation programs, movies and video games. It is our hope that this will help us to give one more step into the next stage of growth in the path to obtain more development opportunities for our company.

Can you explain EPED's surgical and educational training systems?

EPED's first mission is to maximize the values of smart healthcare and to lead the future of the minimally invasive surgery industry. Our portfolio includes three main products: SimEx (augmented reality simulator), IRIS (implant real-time imaging system) and RETINA (real-time navigation system for brain and craniofacial surgeries).

At this point, SimEx is the most adaptive Augmented Reality Stimulator on the market. We were all students once, and that is why we have decided to develop a project focused on the virtual formation for future generations of dentists. Simex develops self-assessment skills early in training, resulting in more effective and independent students entering the clinical side.

IRIS is an extension of SimEx. It is the real application of what students have learned in school. If you had the opportunity to train with the first, working the second would be like taking off the training wheels to a bicycle, so to speak. The Implant Real-time Imaging System features the utilization of optical space location technology to instantly visualize the implant handpiece and drill together with a CBCT 3D image. IRIS can be applied in Implantology, Zygomatic implant surgery, Open orifice, and Apicoectomy. Both IRIS and SimEx are very intuitive and follow simple steps for calibration and operation. Furthermore, their accuracy not only allows users to move freely and with total certainty of the location of their instruments, but also helps them to avoid damaging nerves or tissue.

Last but not least is RETINA, the youngest member of the EPED Inc., family.

RETINA is a Stereotactic Surgery Navigation System that can be used for many kinds of minimally invasive surgeries including Neurosurgery, Craniofacial, E.N.T., Orthopaedics, Plastic Surgery, Oral and Maxillofacial Surgery among others.

The RETINA combines intelligent medical technologies and services which can integrate digital medical imaging for better surgical accuracy. RETINA also reduces unnecessary tissue injuries, to aid in minimally invasive surgeries, improve surgical quality, and reducing the risk of surgical complications which provide overall better medical service for patients.

Evolving from imaging to clinical development is a big move for the company and can be complicated. How are you managing this re-positioning?

We understand that to change and be successful in medical development we needed to consult with specialist doctors. I am in a fortunate position of knowing many people from my medical school days, furthermore, the majority of these people now occupy high powered positions. It was through this network that my peers introduced me to neurosurgeons which have helped immensely, as we can speak with them and ask for their opinion on what works and what may need to be changed.

It took us close to three and a half years to develop software, which is suitable for neurosurgeons. For dental, this is a lot different, but the basics are the same in terms of the software. We then applied for the IRB (institutional review board) license which is for us to conduct tests on real patients. This enabled us to gain valuable experience in modifying our software and systems. It is from this experience we were having been introduced to doctors and medical professionals in other

disciplines, as aforementioned, in E.N.T., Orthopaedics and so on. Doctors play a very important, but engineers are equally as important. However, engineers do not have the skillset to understand what is happening on the medical side. Therefore, I act as the bridge in combining these two groups, one from the clinical and the other is from the technology side. This has culminated in the establishment of two teams, one for the dental side and one for the medical.

Overall, how is the company positioned concerning revenue, growth and employee size?

We are still a small company, but we are growing fast and have great potential! Last year we had around USD 1.5 million in revenues. This year we are looking to double that figure and should hopefully reach close to the USD 3 million mark. This is quite impressive as we currently have less than 50 people within the company. When I go to conferences people often say you are a small company but are doing things that would typically take a much larger workforce. I always tell them this is due to our efficiency and capabilities.

How receptive are physicians to these new technologies?

Currently, for our new technologies, physicians have given us very positive feedback. When trying our devices with others in the field we have always come out on top.

Our core technology is optical positioning. We have other areas as well which is not only for medical. For example, we are cooperating with other companies on eyewear devices (VR systems) and developing a robot which will combine the VR system.

How do you see robotic guided surgery changing the traditional role of surgeons?

Regulation is still very important, and I believe there is a long way to go before these technologies are truly independent. It is still necessary to have the human element and doctors still control these devices, it certainly isn’t automatic like some of the automobiles you see on the roads. For surgery, I think this is very important because even AI (artificial intelligence) is very popular for doctors now. These technologies can be an extremely useful helping hand or system for the doctor but they cannot act as a substitute. I do not believe these technologies will take over, the surgeon will always be there. However, the surgeon should be open to learning more about digital devices to aid them in their work. These machines can help to save time and reduce the risk to patients,

but robots cannot replace the doctors in this decade at least.

As a Taiwanese company, what are the key trends impacting EPED and furthermore the sector regarding digitalization and regulations?

The Medical device ecosystem in Taiwan is flourishing. From a sales perspective, I have seen many colleagues in numerous exhibitions, developing high-quality solutions that are changing the lives of thousands of people all over the world.

Digitalization and regulations are more of a “must” than just a “trend”. Both of them are very different concepts. Digitalization has been in the market for many years and will be there for many more to come. Digitalization aids the medical industry in offering faster and more accurate services to the world’s population. Furthermore, digitalization opens a wide range of opportunities to bring healthcare to remote places in a blink of an eye, and that is why EPED Inc., just like many other companies would like to stay in business for the long term.

Regulation is another very broad topic, but I can say that not only have we succeeded in acquiring those certifications and legal permits required by law in Taiwan to distribute our equipment, but we can also push to achieve an international presence.

What is Taiwan’s competitive advantage against nations such as China and Korea?

For China, they are ticking every box. They have many experts in the hi-tech field. For Taiwan, I believe we need to pool our sciences industry together and encourage more of our taken to stay. Many people move to China and work for the higher salaries in my opinion China are just using these people for a while and then will let them go. This is because they tend to trust their people more. China is placing a lot of resources toward bringing in top talent and are succeeding in this respect. Subsequently, they are strong in many areas including astronomy, high-speed trains, nuclear and so on. In Taiwan, we need to be protecting our local medical products and IP (intellectual property). If Taiwanese hospitals are using local products, this will, in turn, grow the local industry which is what we need. China is a large market; however, we need to be stepping up and leading in an area ourselves. All of these countries, including Korea understand that they need to adapt to survive and I believe that the medical device sector is a great place for Taiwan to gain a foothold.

As you enter the international market, you will need to compete with many other companies. What are your strategies for partnerships and internationalization to further EPED's positioning as a leader in navigation system technologies?

We would like to play an important role in the world. Most importantly, we need to corporate with other countries such as Europe and the US. For the business side, it is not just about our technology, it has a lot to do with selling channels and promoting ourselves. We need to collaborate with companies that have an established sales force. In the future, we may be able to grow into a much larger organization but for now, the most important thing is for us to be very open-minded and link with international organizations.

Business strategies will be unveiled as they happened, and we are not aiming for quantity but quality. For example, at the moment we have been cautious while looking for investors and suitable business partners that allow our business to grow in a multidimensional way, instead of the traditional vertical way. In exchange, we would like to do the same for them, of course, but in a world full of discoveries, new implements, instruments, and further advancements in robotics being applied to surgery and navigation systems, these types of collaborations can be rare and hard to find. This is part of our internationalization process that is made up of different stages for the three systems we produce.

Regarding our leadership in navigation. I believe that by working together, we have accomplished a lot. Leadership is demonstrated in many ways and I think our way also shows it in every step we take. From the beginning, our company has focused on offering high cost-performance value, and improved surgical outcomes with better medical service for patients.

Over the next five years, what is your vision for EPED?

We want to have succeeded in playing a greater role within navigation technology. In the field of navigation for minimally invasive surgery, we are only known by a small number of countries. I believe we can position ourselves to be top five for navigation within the next five years.

What advice would you give to someone who is starting a company today?

Most of the younger generation just want to make something. When I entered dentistry, I knew from the start that it was only a temporary career. I had this goal and I planned for it. I believe this is essential for someone who wants to set up a business. From a young age, I was planning to have a globally successful company that was known all over the world. It takes time to get to the top and be very successful and I think young people need to understand that it doesn’t simply happen overnight.

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