Moving the dental world from analogue to digital - 3Shape’s success story continues
by Bernhard Moldenhauer & Matthias Diessner, DTI

3Shape headquarters in Copenhagen

O n occasion of Scandef, a major dental fair in Scandinavia, DTI recently visited the 3Shape headquarter in the heart of downtown Copenhagen, to learn about the company’s new products and future strategies. The historical building right next to Kongens Nytorv square and the Royal Danish Theatre features light and airy rooms, a perfect environment for a young, passionate and ambitious organisation driven by the quest to develop the best technological solutions in 3D Scanning and CAD/CAM.

Often called “The Google of the Dental Industry” 3Shape was launched 11 years ago in a one room apartment by two young and ambitious graduate students from the Technical University of Denmark and Copenhagen Business School - Tais Clausen and Nikolaj Deichmann. At that time Tais was finishing his master thesis on a groundbreaking 3D scanning technology and Nikolaj was finalising his Master of Finance and Economics. Knowing each other from common friends they joined forces to participate in the prestigious Venture Cup business plan competition, organized by McKinsey, in which they finished 2nd. Throughout the competition they were consistently discussing how the technology could be commercialised so the idea of launching 3Shape was born.

Initially they approached companies in the hearing aid industry with the idea to develop a quality control system for hearing aid shells and earmolds. Similar to a dental restoration, the devices need to be custom fit to the patient’s hearing canal and they’re traditionally made by taking an ear impression that is then manually sculpted, cut and used to make a mould - a time consuming, manual procedure.

“When we had these first meetings we realised that we could actually create a mass customisation production system. So instead of just checking the quality we decided to go directly for changing the workflow completely, from a manual process where you spend several hours of shaping the hearing aid shells to a completely digital workflow,” Deichmann said.

3Shape digitised the whole manufacturing process by introducing a 3D scanner for ear impression taking, a management software, a CAD software that is needed to simulate the position of all the electronic components, which need to fit along with the shell into the patient’s ear by taking minimal space and a CAM software for controlling the manufacturing equipment. They developed the system for one specific hearing aid manufacturer but retained all rights to sell the technology to others. There were only six companies controlling approximately 90 per cent of the global hearing aid market and within a period of three years all of them went from a completely manual to a completely digital production. Today about 90 per cent of all hearing aid devices are produced by using 3Shape’s technology.

Tais and Nikolaj were always aware of the 3D scanning technology’s enormous potential so they soon looked at other industries, such as the dental laboratories, where the manufacturing processes are similar to the hearing aid industry. In 2004 3Shape began to receive an increasing amount of requests from dental companies that were interested in the technology.

“We quickly decided that if we wanted to replicate our success in the hearing aid industry we needed to go for the full solution to have a very user-friendly system that the dental laboratories would adopt. So we went to a lot of labs, small ones and big ones, and tried to figure out how we could optimise the processes instead of just finding a better way to make zirconia copings. From the very beginning our vision was to achieve a complete switch from analog to digital,” Deichmann explained.

3Shape introduced its first 3D dental scanner and CAD/CAM software for virtual restoration design at IDS Cologne 2005 and the system became a raging success. In the following years the company extended and enhanced their dental lab product range by continuously listening to and involving their customers from the early stages of the product development process.

Perhaps the most important lesson we have learned is that successful innovation is only successful if it moves and is guided in directions that truly benefit professionals in their daily work,” pointed out Tais Clausen, CTO and spearhead of the 3Shape development team.

Today CAD/CAM has conquered the dental labs and clinics, ensuring high profitability by maintaining top level quality through standardised and controlled treatment and production processes that are also beneficial to the patient. In Germany, traditionally an early adopter of new technologies, nowadays approximately 82 per cent of all ceramic restorations are already produced by using CAD/CAM technology. The question today is no longer if CAD/CAM will endure in the industry, but rather when all dental professionals will be taking advantage of it,” Clausen said.

After having conquered the dental lab industry, 3Shape leveraged the proven technologies also to the dental clinics. “We did an analysis of all existing scanning systems on the market and defined what we like and what we don’t like about them. We wanted to do a system that incorporated all the advantages and eliminate all the drawbacks of the existing systems. Our solution really needed to be faster, easier, more accurate and more reliable,” Deichmann said.

At the opening day of the International Dental Show 2011 in Cologne, 3Shape launched its newest achievement, the TRIOS intraoral impression-taking solution, which aims at revolutionising the work in the dental practice. Their booth was literally flooded by dentists to try the TRIOS 3D scanner in sleek and elegant design, seldom seen in dental clinical equipment.

One of the TRIOS 3D scanner’s notable features is that it does not require dentists to apply spray or powder to coat the patient’s teeth, making scanning an easy, fast and patient-comfortable process that doesn’t ruin scan accuracy by adding material to teeth surfaces. In addition it can scan any materials, such as metals, semi-transparent materials and skin. It only requires minimal amount of training for use in clinical practice from day one. The scanner captures over 5000 2D images per second, which is 100 times faster than a conventional video camera. Dentists who witnessed the presentations at IDS stated that the “impression-free” dental practice seems to be just around the corner.

An open communication interface allows the dentists to send the scanning data by internet directly to the lab of their choice where the technician can start designing the restoration solutions immediately using 3Shape DentalSystem software or the appropriate interface to third party software. The TRIOS communication software also includes a tool to visualise the technician’s solutions for the patient, for example on an iPad, while the patient is still in the chair, which is especially important for anterior cases.

The system is designed to give dentists best quality restorations and treat more patients

From right to left: Nikolaj Deichmann (CTO), Tais Clausen (CFO) and one of the in-house developers at 3Shape
and solutions are born from the union of cutting edge technology with the latest trends in the industry and in the markets. 5Shape Product managers and key developers have regular meetings with distribution partners around the world to keep each product in a top-of-the-class position. During the whole life-cycle, the products are developed in close collaboration with partners who understand and gather the needs of their customer base and the market.

5Shape headquarters in Copenhagen
But even with 10 years of outstanding history behind it, 5Shape never stops looking ahead. The company believes that the age of fully digital dentistry is only a few years down the road, even if there will always be some smaller dental practices who will still go the traditional way.

About 5Shape
Branches of 5Shape’s customers support service are operative in Copenhagen (Denmark), New Jersey (USA) and Shanghai (China), virtually covering any time-zone. The very close collaboration between the customer support and the development team allows for unprecedented level of efficiency and responsibility to partners' call for help, typically available in 12 among the world’s major languages.

5Shape is a privately-held company headquartered in Copenhagen, with the market’s largest team dedicated to scanner and software development for the dental segment based in Denmark and Ukraine, production facilities in Poland, and Support Offices in New Jersey, USA and Shanghai, China. For further information regarding 5Shape products, please refer to www.5Shapedental.com.

Today 5Shape’s development team counts more than 100 developers of 22 different nationalities, with a least 50 PhDs among them. All products

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