

Case Study: TruScreen



Genesys improves ease of use, accuracy and speed for TruScreen cervical screening technology.

TruScreen offers the latest technology in cervical screening, providing real-time, accurate detection of pre-cancerous and cancerous cervical cells to help improve the health and wellbeing of women around the world.

TruScreen has been clinically tested 17 times by over 10,000 women around the world, and has been proven to perform equal to, or better than, alternative cervical screening tools.

The Challenge

TruScreen's development began in the late 1980s under the guidance of leading medical academics from Sydney University.

Backed by over 15 years of intensive R&D, the patent protected TruScreen 'Opto Electrical' Technology for the detection of cancerous cells was sought by medical professionals around the globe.

However, significant developments had been made in the electronics design arena since the TruScreen system had first been developed. Martin Dillon, CEO of TruScreen saw an opportunity to modernise the system, specifically to improve its portability, reliability, usability and reduce reliance on specialist parts.

"We sought a partner with the required electronics, software and firmware skills required to help us modernise TruScreen," stated Martin. "After looking at several options, we chose Genesys Electronics Design due to their expertise, responsiveness and exceptional internal quality assurance program."

Matt Sheedy, Senior Design Engineer at Genesys was assigned to head up the project. "This project was unique in that we needed to make substantial upgrades to the product housing and electronic components, with minimal alterations

to the diagnostic elements. This was necessary to ensure that the diagnostic capabilities were at least equivalent to the original system, in order to maintain medical compliance."

The Solution

Genesys were supplied with the original schematics and design for the existing TruScreen product. This enabled them to map out the sensory data acquisition and capture technology that feeds into the diagnostic algorithm, ensuring that changes could be made while maintaining the integrity of the original diagnostics capabilities.

“ We were highly impressed with Genesys Electronics Design. From our first engagement to delivery of the final product, their ability to understand the requirements and adapt everything to fit was brilliant. ”

Reliance on Specialist Parts

“Working off the TruScreen schematics, we went in search of equivalent manufacturers parts from the same processor family that would match the original componentry as closely as possible, thereby facilitating a quick design turn around and minimising risk” said Matt.

“This was important to maintain the diagnostic capabilities and thus the necessary medical compliance.”

Using current commercially available parts from the same manufacturer removes risks associated with reliance on a specialist provider and enables TruScreen to be more competitive in their operations.

Portability

Wireless technology and battery power were integrated to tackle the challenge of portability. However, with the system now relying on battery power, power consumption became a challenge.

“To manage this we re-engineered the circuitry to reduce power consumption and created two processors with custom firmware that deal solely with power management, including charging and distribution,” explained Matt.

“A separate module was added to enable wi-fi capabilities. This allows the clinician to upload results to any computer or device, and has the capability of connecting to the Internet in the future.”

“Using battery power introduced a new challenge,” added Matt. “When charging, the system could become hot which would be uncomfortable for patients and practitioners when they first went to use the unit. To solve this we designed circuitry to manage and ultimately stop charging if the system was over a defined temperature.”

Reliability and Usability

“It was important to produce a sleek tool that would be easy for medical practitioners to use and comfortable for patients,” explained Martin. “Genesys came back with a housing solution that delivered on both.”

Another important update was the addition of an LCD touch screen that would guide the practitioner through each step of the process and clearly present results in an easily digestible format.

“The software and user interface developed by Genesys provided a huge improvement over the previous system,” stated Martin. Previously TruScreen users relied on LED lights and a buzzer to indicate progress and results.

Maintaining Diagnostic Integrity

The system’s diagnostic algorithm was key to maintaining its diagnostic abilities.

Matt explained, “This also needed to be reverse engineered. The new generation device has a wider memory range than the original, so the code couldn’t simply be ported across. First we needed to reverse engineer the original code and mathematics, then map these matrices into the new memory structure.”

Results

“The new design has been on the market since April 2016 and so far customer feedback has been excellent,” said Martin.

“Medical practitioners have been very impressed with the new look, ease of use and ability to immediately and accurately provide patient results. From the patient’s perspective, the increased processing power means the procedure takes less time and they also benefit from immediate results.”

“In addition,” added Martin, “the remodelled TruScreen is clinically proven to be more accurate in identifying pre-cancerous change, or cervical intraepithelial neoplasia (CIN).”

“We were highly impressed with Genesys Electronics Design. From our first engagement to delivery of the final product, their ability to understand the requirements and adapt everything to fit was brilliant, as was their ability to quickly locate and rectify any minor flaws during the testing process.”

TruScreen has passed the medical requirements and is now for sale in many countries around the globe, including Latin America, South East Asia, central Asia, Russia, Europe and the Middle East, as well as Australia.



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