

LIFE SAVING INNOVATION THROUGH OUTSOURCING

How global sourcing company Patni helped RDT to develop the world's first telemedicine solution with video streaming technology, enabling non-medical attendants or ship crew to take and transmit medical data required for emergency diagnosis, under direct supervision of remote medical experts.

RDT Ltd. is a pioneering developer of telemedicine solutions. In 1997, the company launched Tempus 2000, the first device that enabled people with no medical experience to allow a remote doctor to diagnose medical complaints, such as high blood pressure or a heart condition. It has since been adopted by major airlines such as Virgin and Emirates, as well as throughout the private jet market and maritime industries, establishing RDT as a field leader in telemedicine products and services.

Developing and launching such a product is a challenging process, due largely to the requirement to meet stringent international health and safety standards. Tempus 2000 was built to meet quality standards such as EN ISO 9001:2000, EN ISO 13485:2000, and was cleared by the US Food and Drug Administration and independently certified and CE marked to meet the requirements of Annex II of the European Medical Devices Directive 93/42/EEC. In addition Tempus 2000 was awarded the Safety Acceptance Approval certificate issued to it by the UK Civil Aviation Authority.

Breakthrough product innovation

having designed, developed, manufactured and marketed Tempus 2000, RDT wanted to develop a next generation telemedicine solution: a new device, more portable, more robust, with greater medical functionality and the ability to provide ground- or land-based medical staff with better insight into a medical emergency.

Critical to the new product – Tempus ICT™ – was the ability to stream video and send pictures to a remote medical team. This would enable medical staff to make a better diagnosis, and improve outcome for the patient.

Graham Murphy, CEO of RDT, took the lead role in the development of the new product. “Central to the design of our new product was ensuring that it was user friendly. Flight attendants or ship crew aren’t medically trained and need to be able to use the product with confidence – often on an infrequent basis.”

“Our solution works on the principal of differential diagnosis – essentially enabling doctors to eliminate unknowns until one diagnosis remains. Being able to see the patient is critical to carrying this out effectively, especially in a high stress environment,” explains Murphy.

“We knew that adding video would add significantly to the user experience, but it came with a technical challenge. Video streaming is very thirsty work, from both a processor point of view, but also on the comms infrastructure. The problem is, at 30,000 feet or 200 miles from the nearest coastline, getting a wireless broadband connection is impossible.”

Outsourcing from the outset

Murphy and his team of design engineers decided that it would adopt an outsourcing strategy: keeping the core design in house, while outsourcing elements such as the look and feel of the casing and the video streaming software to outside consultancies.

“We decided that outsourcing to a combination of suppliers – incorporating the best of UK design and offshore technical and tooling capabilities – would make the most sense. This strategy is ideal for relatively small companies like ours, offering flexibility, scalability and access to skills we don’t have in-house” adds Murphy.

The video streaming element presented a particular challenge for RDT, due to the technical skills required and the man hours involved. Following a review of the offshoring marketplace, RDT settled on global sourcing IT consultancy, Patni, which had developed some innovative codecs, designed specifically for video streaming.

“Going for an offshore supplier meant that we could do much more with our budget, yet selecting Patni offered much more than cost savings. We were impressed with the team’s technical knowledge and responsiveness – overall Patni was the best fit for RDT,” says Murphy.

Moving images

Typically, video streaming works at around 25 frames per second and takes 500kbps bandwidth to stream effectively. The challenge for Patni was to stream moving images using a variety of wireless methods, including broadband over Wi-Fi, GPRS, GSM and satellite communications.

In addition, Tempus IC’s design required images to be streamed simultaneously while diagnosis functionality walks the user through procedures such as taking a temperature,

ECG reading or blood pressure. RDT stipulated to Patni that only 40 per cent of the unit's processor could be dedicated to streaming, so that other functions could run at the same time.

Patni developed Tempus' video conference software in conjunction with its H.264 encoder to enable the video to be streamed to RDT's data centre.

Running on the Tempus' processor, a PXA320 (offering processing up to 800 MHz, a 256 KB L2 cache and a 32-bit DDR memory interface). Raw video is captured and inputted to a H.264 encoder, which is then streamed directly to a server at RDT's data centre. Video is played at 5 frames per second, with the additional capability of zooming into a particular area (for example, to check a specific condition, such as an eye injury) or taking one-off pictures, which can be added to the case file.

Enabling telemedicine breakthrough

"We're delighted with the results of working with the Patni team," says Murphy. "Not only did they deliver on time, but they were proactive throughout the design and implementation phase.

"Technically, streaming video under these conditions is extremely challenging and the processing power dedicated to Patni wasn't much to play with – but they've delivered. Overall, the video streaming capabilities are a vital part of what is an extremely innovative product, enabling non-medical people to assist in emergency situations. For example, users can move the unit directly to take 'head to toe' image of the casualty or zoom into a particular condition all under direct instruction from a remote medical specialist.

"We're also delighted with the offshoring approach. We have a dedicated UK-based account manager and vast technical resources based in Mumbai, India. At its peak, we had 50 consultants working on the project, which we've been able to drop back in these final stages of product launch. This flexible capacity management capability is a key benefit to us," explains Murphy.

Looking ahead

Throughout the design process, Tempus IC™ has been built with the future proofing in mind – for example, having a docking station port in place in case this is developed further in the future. The software side is no different and the video streaming in particular will be

enhanced over time, incorporating new features such as having a record button, to enable video to be captured onto the automatically generated case file. Graham Murphy and the technical team at RDT look forward to furthering their relationship with Patni to ensure that Tempus IC™ continues to break new ground in telemedicine innovation.

Brian Stones, Patni's executive vice president for Europe, is delighted that Patni has played a crucial role in the development of Tempus IC™. "RDT have broken new ground with Tempus IC™ and it's a fantastic example of combining different skill sets across various parties to conceive, design, manufacture and distribute an innovative new product. It's also a good illustration of innovating through outsourcing and we're looking forward to working closely with RDT to develop the product further in the future."

RDT's Tempus IC is now being launched to the maritime and airline markets, with strong interest from commercial airlines as well as private and business owners. Typically, each device deployed on a commercial airline could be used every two weeks, which can contribute to saving hundreds of people's lives.

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About Tempus IC™

Tempus IC is a breakthrough in telemedicine, integrating years of R&D, innovation, real-world experience and unique communications technology. Tempus IC™ transmits the information that doctors need to identify up to 98 per cent of conditions remotely.

Key features include:

- iAssist screen guide users through every process
- Daylight readable, impact resistant touch screen
- Highly robust, sand-proof and water resistant
- Full set of medical parameters
- Lightweight and easy to carry (the size of a typical office telephone)
- Intelligent battery management keeps **Tempus IC™** ready for use
- Integrated wireless Bluetooth headset
- Integrated camera, with back light for low level light conditions

Tempus IC enables users to carry out a full range of diagnostic parameters, including glucometer, breath gas analysis and respiration, tympanic temperature, blood pressure, pulse oximetry and full diagnostic 12-lead ECG.

For more information about Tempus IC, please visit www.rdtltd.com