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# A Medical Device Manufacturer Enhances Groundbreaking Remote Patient Monitoring Device

With Mindteck's embedded software and testing expertise

Harnessing our niche knowledge to bring about positive outcomes and accelerate innovation remains a top priority of this long-standing client



## Market Reality

According to Global Market Insights, Inc., the patient monitoring application ecosystem is going to hit \$11 billion by 2025. Specifically, the remote patient monitoring device market is expected to grow exponentially, owing to various government regulations geared toward minimizing rising costs in the healthcare sector, as well as the development of effective, self-monitoring products, and technological innovations. However, the shortage of skilled professionals, concerns about medical data privacy and security, and low awareness of monitoring devices, are important factors hindering growth.



## Business Challenges

Our client designs and manufactures remote monitoring and resuscitation products for pre-hospital and critical care services. Specifically, remote patient monitoring devices and associated software applications which enable monitoring of patients outside of conventional clinical settings where immediate medical assistance may not be available. The devices relay medical, voice and video data from moving platforms, such as ambulances, airplanes and oil rigs, to ground-based medical experts who need to provide timely medical aid. Harnessing our niche knowledge to bring about positive outcomes and accelerate innovation remains a top priority of this long-standing client.

## Solution Components

VC++, MFC, WinCE, RDBMS (SQL Server, Arora DB, MYSQL), C#.Net, ASP.Net WPF, WCF, MVVM, MVC, JS, HTML5, SignalR, Android, JAVA  
Automated code review Tools e.g. Parasoft, Coverity, ReSharper, SonarQube, etc.

Automated Testing Technology used: TestQuest, Ranorex, Selenium Web Driver, JMeter, Medical Data Simulator, etc.



## Scope

Mindteck is continuing to develop the end-to-end software for multiple product lines, comprising a monitoring solution, data center, response center and cloud-based web solution. We have also undertaken a variety of verification and validation activities utilizing manual and automated test approaches for both functional and performance testing. Our strong, collaborative relationship also contributed toward success with FDA approval.



## The Mindteck Solution

Since 2007, Mindteck has actively contributed toward multiple successful product launches, primarily providing system software development and verification, as well as device integration. In addition to developing a WinCE-based device application, we have also provided robust, cloud-based web solutions. This includes real-time and history data sharing, and simultaneous monitoring of over 21 vital parameters. For example, real-time display of ECG, Plethysmogram, Capnogram, and IBP waveforms without any human intervention, thus enabling doctors to diagnose via web or a hand-held device. Additionally, we have implemented data security, including FDA-compliant data encryption for data transmission over the internet, AES-256 encryption for sensitive medical data, and 21 CFR Part 11 compliant design.



## Benefits

- ➔ Application software solution from end-to-end
- ➔ Software development on multiple technologies in 'one stop'
- ➔ Strong domain knowledge to provide a quick and accurate solution
- ➔ Stringent quality processes to ensure medical data security and accuracy, and medical standards compliance
- ➔ State-of-the-art UI design

For more information,  
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## About Mindteck

Mindteck provides product engineering and technology solutions to top-tier Fortune 1000 companies, start-ups, leading universities, and government entities around the globe. The company, established in 1991, is devoted to delivering knowledge that matters to help clients compete, innovate, and propel forward along the digital continuum. Its niche knowledge and deep expertise in embedded systems and enterprise applications is complemented by a strong track record in manual and automated test execution and validation. *Office Locations:* India, Singapore, Malaysia, Philippines, Netherlands, Germany, Bahrain, Turkey, UK, US, and Canada. *Development Centers:* Singapore and India (Kolkata and Bengaluru). *Publicly-traded:* Bombay Stock Exchange, and the National Stock Exchange. *Founding Member:* 'The Atlas of Economic Complexity' ([www.atlas.cid.harvard.edu](http://www.atlas.cid.harvard.edu)) for the Center for International Development (CID) at Harvard University. [www.mindteck.com](http://www.mindteck.com)

