Chill! SMS provides a **cool machine fix**

When hugely expensive patient imaging machines warm up unexpectedly, the downtime costs a small fortune. **John Romero, a National Support Specialist (MRI) at Philips Healthcare**, explains how the problem is solved with text...

Like anyone, engineers working for Philips Healthcare pay special attention when texts arrive from a small group of contacts. Spouse, boss, accountant maybe. But nothing will make them jump up faster than when an SMS arrives from one of their patient imaging machines. Yes, you read that right. A text from a machine.

Fix me
In 2014, Philips Healthcare began fitting these expensive devices with the ability to send alerts to specified numbers. The messages essentially say: there's something wrong, come and fix me. And the pilot has been hugely successful. The initial test with 30 machines saved Philips Healthcare $250,000.

Patient imaging machines are hugely complex, medically essential devices. They use superconductor magnets that must be kept chilled at all times, and use liquid helium as a coolant.

However, when the chiller fails, so do all the other parts. A rise in temperature will turn the liquid to gas, which expands rapidly and causes a cascade that shuts down the cryogenics system. When this happens, engineers need to restore the machine at room temperature. Such failures can cost up to $100,000 to resolve.

Finding fault
John Romero, a national support specialist (MRI) at Philips Healthcare, was thinking about this problem in 2014. He says: "In the past, customers would call when a machine went down. But you can't expect a customer to anticipate a fault. Their priority is getting the patient image done, not the functioning of the machine, so they would keep working till it broke down. We had to figure out a way for the machine's thermostat itself to tell the engineers when something was wrong."

Eventually, Romero rigged up a module using a Raspberry Pi, which triggered a text alert when there was any change in temperature. Later he called in messaging specialist OpenMarket to handle the routing of the texts to the engineers. He says: "We considered email, but the point about text is that everyone has a phone, everyone can read SMS and messages get through instantly. Meanwhile working with the OpenMarket API meant we didn't have to worry about network coverage or permissions."

Success helps
It took Romero six months to build the prototype, but the tests were a success and now 150 machines across the US, Germany and India have the ability to send 'help' messages. In two years, they've sent thousands resulting in that $250,000 saving.

Interestingly, though the project has kept machines running, it has actually required more man hours to maintain. However, Romero says this is delivering unexpected benefits. He says: "With all the extra data
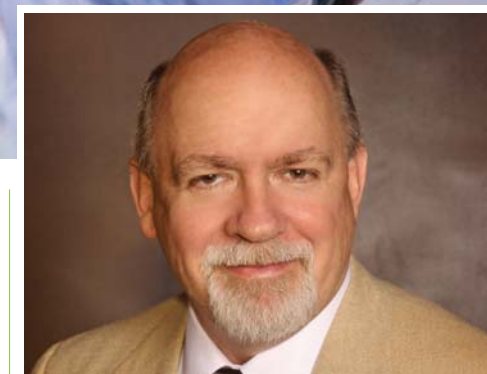
John Romero, national support specialist , Philips Healthcare

we have now on machine failures, we can build a more holistic view of what works. We can start thinking about replacing parts that we sense may be about to expire, for example, rather than waiting for an alert saying they are already failing."

Philips Healthcare is now looking to embed messaging functions into 3,000 machines worldwide, and is considering extending the concept to other departments for use in nuclear medicine, cat scan and cardio vascular systems.