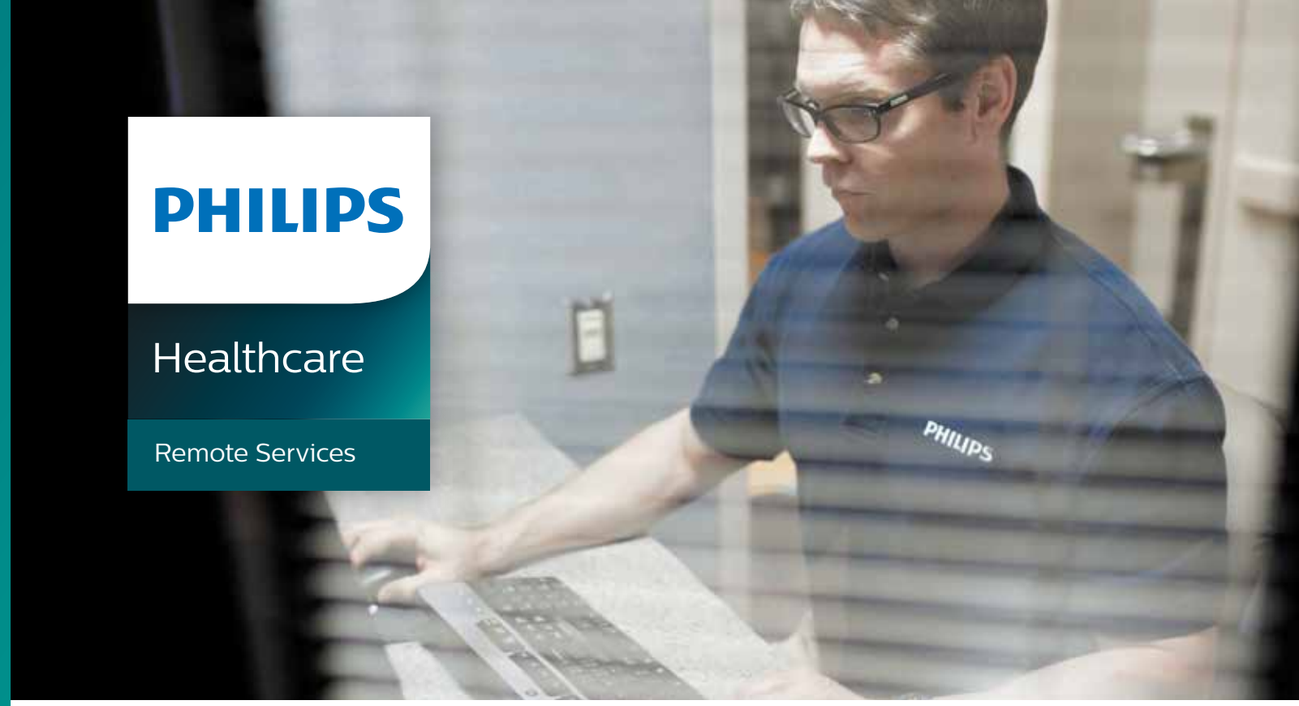

Big data: big benefits
for healthcare providers

The September 30, 2013 issue of Time magazine carried an article with the intriguing headline; ‘Can Google solve death?’ Of course the idea initially seems crazy. Yet the story explained that healthcare “is well on its way to becoming an information science,” with doctors and researchers able to harvest massive quantities of data from patients. And that Google is, “very, very good with large datasets.”

> Remote services, driven by the analysis of big data that allows equipment issues to be addressed before impacting workflow or availability, **could ultimately eliminate unplanned downtime completely.”**
>
> Francis Willems, Senior Marketing Communications Manager at Philips Customer Services.

www.philips.com/aimingforzero

So who knows, maybe number-crunching and identifying previously unrecognized patterns in hundreds of millions of patient dossiers, treatment plans, drug trials and other data could ultimately add years, decades or even centuries onto the average lifespan. It's a fascinating prospect, but more than anything the story confirms one thing; big data is increasingly at the heart of advances in medical science.

Targeted information to respond faster

At Philips we are exploring how to make best use of the vast amounts of non-clinical/non-patient information already being generated by our imaging equipment. For example, a typical MRI scanner produces an average of 300,000 log messages - every day. We are feeding such data into algorithms and models that can interpret it in a way that benefits caregivers and patients.

There's a glimpse of how this approach is already working at the Marienhospital in Stuttgart, Germany. There they have implemented our MR e-alert solution to continuously monitor a vital element in the system - the helium compressor - and to generate an automated alert whenever parameters like temperature and pressure fall outside acceptable levels. As Peter Heidi, Head of Hospital Technology at Marienhospital explains, "in the past, we were aware that something was wrong but didn't know exactly what and where until much later. Now, we have targeted information and can respond faster, which saves valuable time."

Philips Customer Services is currently looking to tap into the benefits of big data on a much wider scale. Operating under a mission we refer to as 'aiming for zero', Customer Services is striving to substantially reduce and ultimately eliminate unplanned downtime for medical equipment.

This essentially means that, rather than servicing a machine when issues arise or parts need replacing, it is serviced when data indicates that degradable parts are coming close to the end of their natural life, or that a problem could be just around the corner. The maintenance and/or replacement is then scheduled for a time when the equipment is not in use (e.g. at night) to further minimize disruption.

Ensured continuity of care

In some ways it's a strange concept. Imagine a garage calling to say that your car would need some fairly major repairs within the next couple of weeks, even although it was - as far as you could make out - running perfectly. This analogy demonstrates why effective use of the available data is so important. If you can prove to a customer that carrying out regular maintenance and timely replacement means ensured continuity of care and even cost savings - because problems are easier to identify and quicker to address - then they are more likely to embrace this new philosophy.

This idea of remote services has been technically possible for some time, yet the market didn't fully embrace the concept because it was somewhat limited in scope. The offering was hampered by a scarcity of actionable data. It's a familiar challenge; when you want to draw accurate conclusions you need as much high-quality information as possible to base those conclusions on.

This is one of the strengths of our approach. In 2015 we created an analytics infrastructure that integrates input from 24 different sources into one consolidated database. A portion of our equipment installed base is already contributing to it; we collect data from approximately 16,000 iXR, MR and CT systems, some of which are eight years old. It's a mind-boggling amount of information; 150 billion rows of data and growing all the time.

From reactive to proactive maintenance

Our remote services organization is using the output from this goldmine of information to drive a transformation; from reactive to proactive maintenance. We have already developed more than 40 proactive data analytics algorithms which analyze system log files on a daily basis in order to recognize patterns that analyze the need for future equipment maintenance.

This really marks a fundamental shift. Currently, equipment maintenance is often carried out when something goes wrong. The question is then; 'what happened?' We can now go beyond that, instead asking; 'why did it happen?' In fact, through constant monitoring and alert generation we are continually enquiring; 'what is happening now?'

That's what we are currently addressing with, for example, the MR e-alert solution in Germany. Building on this to reduce equipment downtime even further - driven by historical data and reporting - we then ask; 'what might happen?' And, ultimately, through algorithms that can analyze, simulate and enable well-informed decisions, we can solve the ultimate challenge; 'how can we make it not happen?'

Empowering radiologists to make data-driven decisions

Our Customer Services Portal is another proof point of how we are harnessing the potential of big data for the benefit of care providers. Customers of every imaging modality can now access our cloud-based Customer Services Portal 24/7 from a computer or mobile device, create a service request and track current and historic service data for their imaging inventory.

Once again, by bringing together the appropriate data and making it relevant and actionable, we can help you minimize disruption and streamline workflow. Similarly, we're empowering radiologists so they can make data-driven decisions to manage and manage dose to ensure patient and staff well-being. Another aspect of 'aiming for zero'.

Of course, there is one thing we can never forget; the use of data can be a sensitive issue. For example, during a seminar we organized in May 2016, a number of customers had pretty strong views about big data. They were – naturally - very curious to know what a company like Philips would do with information gleaned from their systems. As one medical physicist put it; "it's our data!"

Even though we were discussing system data rather than patient data - we operate a thorough and audited data scrubbing process to make sure no patient privacy information is used - such comments demonstrate that there are many different viewpoints and opinions to consider. So, ultimately, the onus is with healthcare solution providers like Philips to access and utilize big data in a way that has the blessing of medical professionals and which also contributes to improved patient care.

As big data continues to drive an increasing number of healthcare initiatives, including remote services, let your voice be heard. We value your opinion as a medical professional on sharing system data (just to emphasize once again; not patient data!).

Join the conversation at www.philips.com/aimingforzero or provide your feedback directly to aimingforzero@philips.com.