

A woman with blonde hair tied back, wearing glasses and a grey sweater over a white collared shirt, is looking down at a tablet computer. She is standing in a server room, with rows of server racks and a dense bundle of blue and orange cables visible on the left side of the frame. The background is dark with some green indicator lights.

PHILIPS

Services and solutions delivery

Operational
Intelligence

Envisioning the future of maintenance

Executive briefing



Leading the transformation from reactive to proactive and predictive maintenance, flexible service agreements and beyond.

“The new dawn of maintenance services is already here. The servicing of the future isn’t about reducing downtime, it’s about enabling healthcare systems to make full – and evolving – use of their sophisticated equipment and technology investments, when they want and how they want. With predictive maintenance, we are able to prevent issues from happening before they happen to continuously fine tune and optimize workflows and usage, enabling more patients to be treated. And our flexible maintenance agreements, have the evolving strategic priorities of our customers and their patient’s care at heart.

This is the age of Operational Intelligence, where we combine people, process and technology to reinvent operational efficiencies within healthcare facilities.”

Eugene Ivanov, Service Project Manager, Philips Remote Services

Medical equipment:

A sophisticated and vital asset that needs to be fully utilized and maintained

Every piece of medical equipment in a hospital is vitally important. Each solution allows healthcare providers to offer reliable and effective care, efficiently diagnosing and treating their patients as fast as possible; supporting the work of their clinicians and staff, while keeping their standards of care high and costs low. Keeping them working efficiently and effectively is a delicate balancing act. Large fleets of MRs and X-rays all require attention through careful monitoring and maintenance to ensure they are fit for purpose.

Dr. Mauro Barbieri, Lead Architect, Analytics, Philips Services & Solutions Delivery, explains, “These machines are not consumer products or goods of which millions and millions are made. These are made specifically for the healthcare provider and configured to their needs, to better serve their staff and patients. We are dealing often with healthcare professionals who are using devices in medical conditions that differ greatly all over the world.”

Critical medical equipment such as MRIs and CTs are incredibly complex, serve very specific health needs and are expensive to operate, with the cost of maintenance borne by both parties. Healthcare providers already face immense, and growing, financial pressures; wide spread digital transformation has been slow and equipment that risks their ability to deliver care and can significantly impact their operations. This translates into a need to get more from medical equipment and a culture of zero downtime, to avoid patient treatment delays and additional costs.

With less time to calibrate and fix important equipment, diagnosis of equipment failure needs to be proactive and predictive; no longer reactive. Which is why maintenance is now of increasing strategic importance: hospitals need fast, confident and proactive responses to equipment downtime to enable it to be always available and first time right fixes of any issues.

What do we mean by medical equipment?

The World Health Organization (WHO) uses the broader term ‘health technology’, which it defines as including: ‘devices, drugs, medical and surgical procedures – and the knowledge associated with these – used in the prevention, diagnosis and treatment of disease as well as in rehabilitation, and the organizational and supportive systems within which care is provided.’ (Source: Kwankam, Y, et al, 2001, ‘Health care technology policy framework’, WHO Regional Publications, Eastern Mediterranean Series 24: Health care technology management, No. 1)

However, the phrase ‘medical equipment used in this article only refers to the physical pieces of hardware in the WHO definition, that need to be maintained.

As the healthcare paper, *How to Organize the Maintenance of Your Healthcare Technology*, explains: “The healthcare provider’s most valuable assets which must be managed are its human resources, physical assets, and other resources such as supplies. Physical assets such as facilities and healthcare technology are the greatest capital expenditure in any health sector. Thus it makes financial sense to manage these valuable resources, and to ensure that healthcare technology 1) is selected appropriately is 2) used correctly and to maximum capacity and 3) lasts as long as possible. Such effective and appropriate management of healthcare technology will contribute to improved efficiency within the health sector. This will result in improved and increased health outcomes, and a more sustainable health service.”

What do we mean by proactive and predictive maintenance?

According to the FDA, proactive and predictive maintenance can be variously described as:
Proactive maintenance is a maintenance strategy that performs corrective action to the conditions that can lead to equipment failure. Predictive maintenance (PdM) is a type of condition-based maintenance in which assets are monitored with sensor devices that supply data (i.e. vibrational frequency) about the asset’s condition, which is used to predict when the asset will require maintenance.

Source: fda.gov, 2019





Proactive and predictive maintenance has never been more vital to enabling healthcare transformation

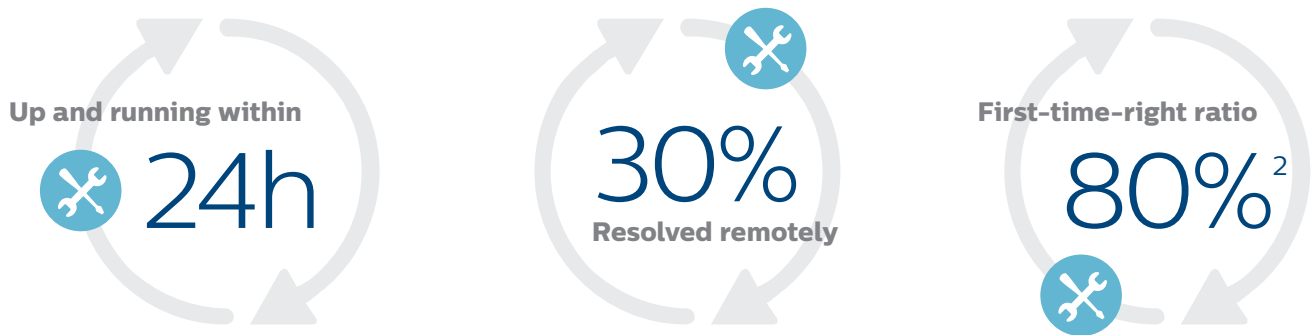
Through the advent of AI and data-driven technologies, the shift has begun from reactive to proactive maintenance, and, in time, to predictive maintenance.

Through remote monitoring, engineers can proactively assess equipment and respond before it degrades. Increasingly, more predictive capabilities will enable engineers to know when a system is going to degrade and automatically order the necessary parts for repair. Making the future of maintenance more predictable and proactive and keeping unplanned downtime to zero.

As Burcu Sen, Sr. Product Manager, Philips Services, Service Portfolio Management ventures, “At Philips, we offer much more than simple up-keep for your technology. We’re committed to helping you drive performance, usability and interoperability by keeping your technology sustainable and reliable.

Turn to us for technical phone support, on-site support and remote problem resolution directly from experts with deep clinical insights. Whether you are looking for short or long-term services for Philips or multi-vendor equipment and software, we can work with you to choose the most appropriate options that complements your in-house capabilities and budget for first time right maintenance.”

How Philips is unlocking remote resolution for first time right maintenance



The Philips Maintenance Services Remote Service solution provides reactive and proactive support and can be set up and running within 24 hours, ensuring that remote service engineers can perform essential maintenance remotely. This makes it possible to prevent issues before they occur and resolve 30% of customers' cases remotely, supporting an overall first-time-right ratio of 80%.

To deliver this, Philips Remote Service constantly monitors system health remotely and its smart algorithms generate an alert if a potential future system issue is detected. The service engineer can then register the case in the system and forward it to the remote support team. The remote service engineer assigned to the case immediately begins to work on identifying and proactively fixing the issue, if possible, advising on future actions and proposed part changes.

Ashishkumar Sinha, Manager, Philips Imaging Remote Services explains, "With remote monitoring and proactive service delivery, engineers are not only able to diagnose problems with customer devices early on, but can also open a whole new world of service delivery. When the remote and field service engineers are equipped with detailed remote (or onsite service plans), they can detect equipment degradation much sooner than the customer and act before the equipment fails, preventing any downtime."

2 Philips internal data, Case Resolution Dashboard in Qlikview. (Direct operations countries only)





Fast-tracking the transformation through a global pandemic: How Covid-19 boosted remote monitoring

The shift towards more remote monitoring of medical equipment was fast-tracked early in 2020, when hospitals were forced to minimize access to personnel during the Covid-19 outbreak. One of the pandemic's side effects was the instant boost it gave to connectivity. With critical equipment needed to diagnose patients with Covid-19, hospitals that had delayed digital transformation were suddenly forced to adapt.

Dr. Mauro Barbieri, explains, "Before Covid-19 happened, connectivity was considered a 'must-have' and was high in some parts of the world, but far from all. Many countries hadn't advanced the connection of their equipment, but with the pandemic rendering it impossible for field service engineers to go onto healthcare premises and the high usage of CT modalities for COVID-19 diagnoses, the need for remote monitoring quickly became very apparent all over the world. It was vital to keep life-saving equipment up and running more than ever.

For example, in the Latin America region, the remote resolution of equipment problems stood at 19.6% at the end of February 2020.³ Field services engineers weren't able to visit hospitals due to the Covid-19 outbreak and were instead trained to deliver remote services and tools to customers and began providing remote support. The current rate of remote resolution in Latin America is now 42%.³

We doubled the remote resolution rate in a few months, and bear in mind that we have been driving remote resolution in that region for many years with an average increase of 0.5% and 1% per year.³ The same was true of North America which also, due to the fragmentation of healthcare delivery and the complexity of the market, had not embraced remote monitoring as widely as other countries, such as France, Germany and Japan."

An MRI communicates an exhaustive amount of data about its condition: there are at least 1,500 sensor readings³ and different measurements that are monitored. When an

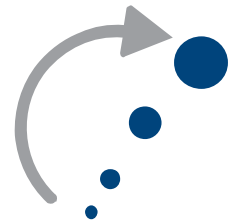
incident occurs, a remote monitoring engineer receives alerts from the system which reports the customer site; the details of the service contract; and, the specifics of the incident. This data that is then used to make a service decision.

Dr. Mauro Barbieri reflects, "Before the pandemic some hospitals were reluctant to have remote connectivity or any remote operation, due to the perceived privacy and security risks. Now it is a must. It is demanded and they understand that, by partnering with Philips Services, we can deliver industry leading cybersecurity and privacy, leading compliance and standardization. One of the immediate – and we predict, lasting – effects of Covid-19 was a boost to the digital transformation of hospitals, enabling them to become more digital and connected. We are now doing much more work remotely — equipment resolution, fixing, troubleshooting — rescheduling maintenance as required while also having the ability to control systems at a distance. And we are not sending engineers to a site if it is not needed. For Covid-19, it is much better to do it remotely."

Not everything can be resolved remotely, and yet it is key to know what you need to do before you arrive at the customer site. A field service engineer can figure out the root cause of a system fault or failure, and have the right parts ready because an assessment and corrective maintenance has been scheduled in advance.

"That is better than going onsite with nothing but the customer's account of what happened, and having to troubleshoot there and then. It makes sense to prepare remotely," says Mauro Barbieri. "An X-ray tube weighs 60-80kilos³, you can't fix that alone. You need two people, so you need a certain number of hours to complete the work, which is time the hospital needs to reschedule patients. The better you know what the problem is, the more you can prepare and the more predictable you are towards the customer, in providing an end time for the system to be online again."

Evolving beyond the reactive 'break-fix' model



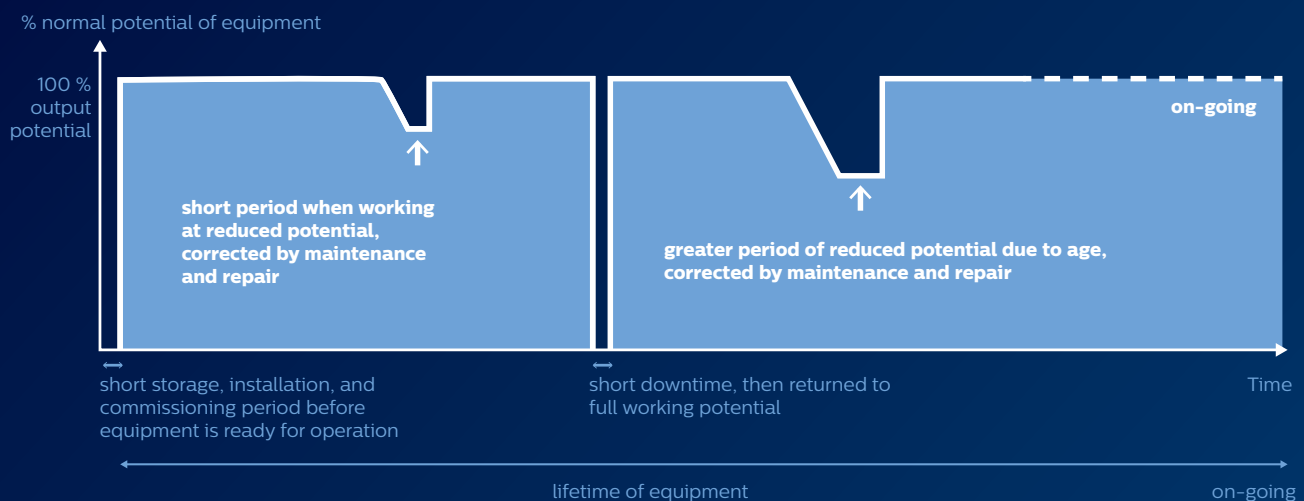
All equipment has a life expectancy and this will be dependent on the type of equipment and the type of technology it contains. For example, five years might be the typical life for an ECG monitor, ten years for a MR or CT, 15 years for an operating table, and 20 years for an electricity generator.⁴

All equipment is made up of various parts – moving and non-moving, active and passive. At any time during the life of the equipment, these parts can degrade (this even applies to software). Thus, it is very important to give regular attention to the equipment through planned preventive maintenance (PPM) and corrective maintenance (repair). Depending on how well equipment is looked after, the expected life can be achieved or cut short, and therefore maintenance is crucial to the 'life' of the equipment. If maintenance is not carried out regularly and on time, equipment will deteriorate to a state where it is beyond economical repair; in other words it costs more to repair it than to replace it. If maintenance does not occur at all, the equipment will grind to a halt.

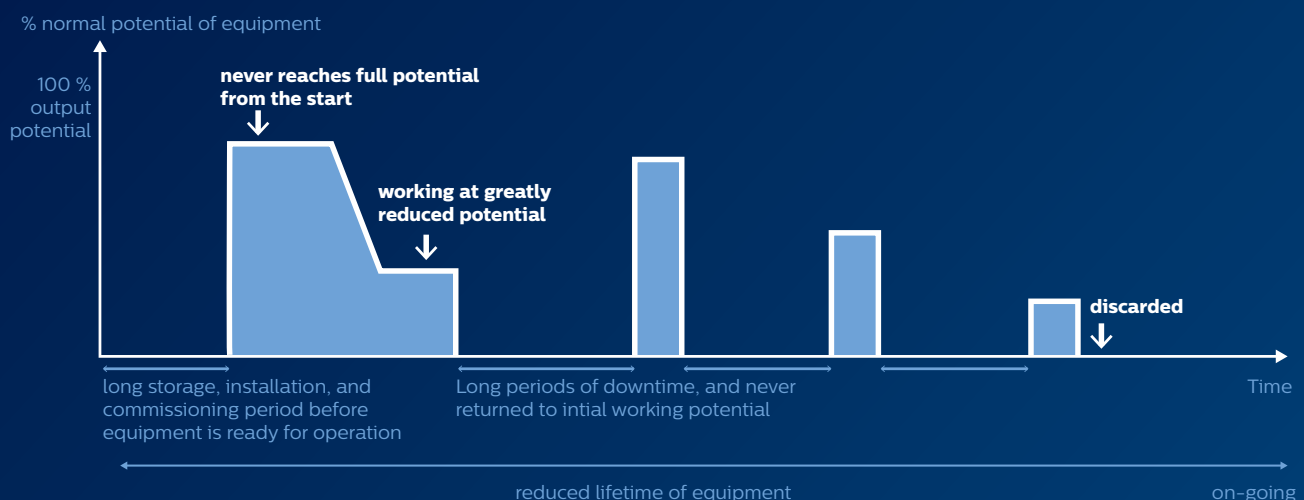
4 Philips internal data, Case Resolution Dashboard in Qlikview. (Direct operations countries only)

Potential and life of equipment with and without maintenance

With efficient technical support



Without efficient technical support



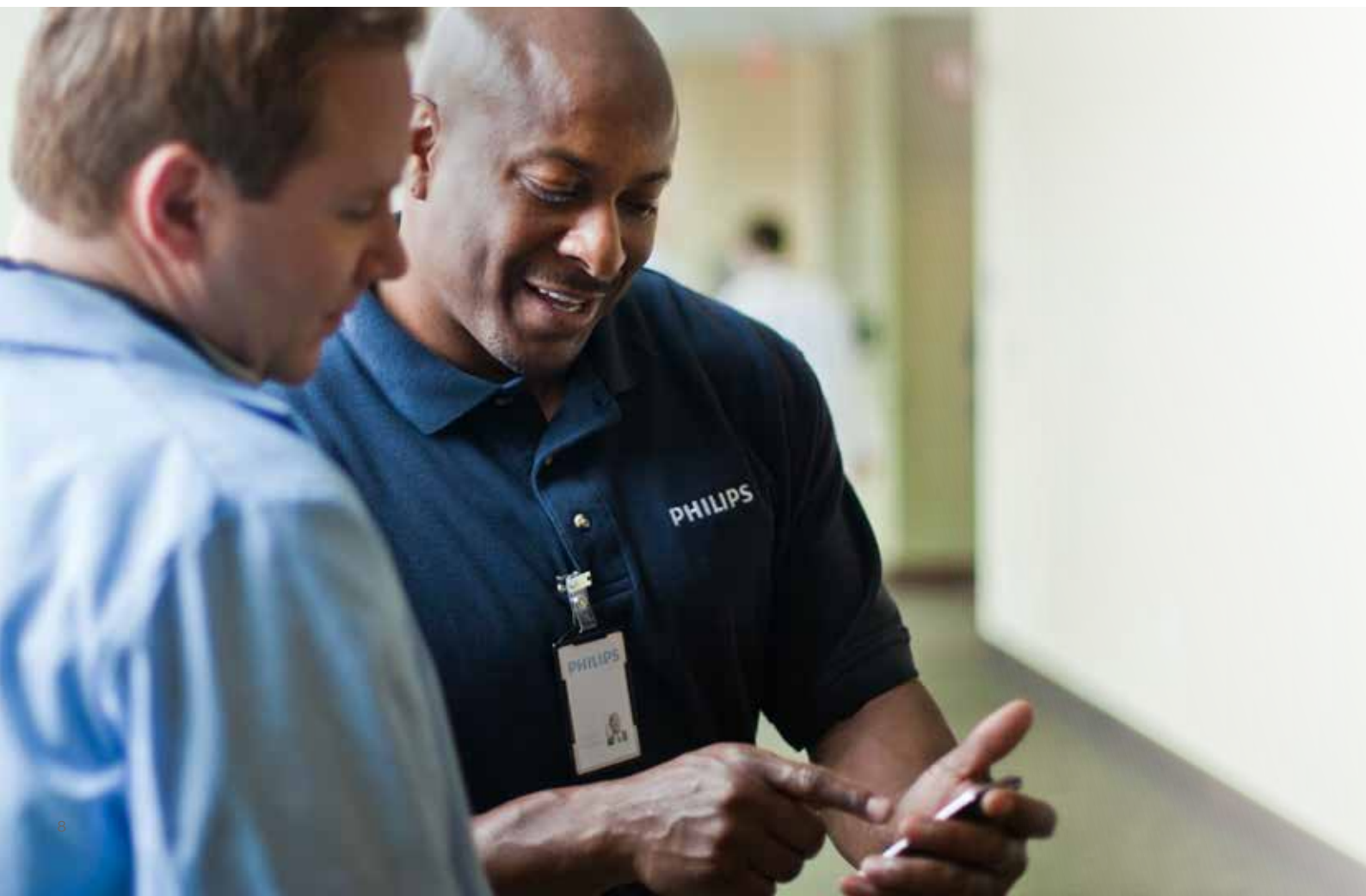
There are different choices available to customers in terms of the service they receive, which is detailed in service contracts, covering the types of maintenance required for a specified amount of time, onsite and offsite repairs, spare parts ordering and more.

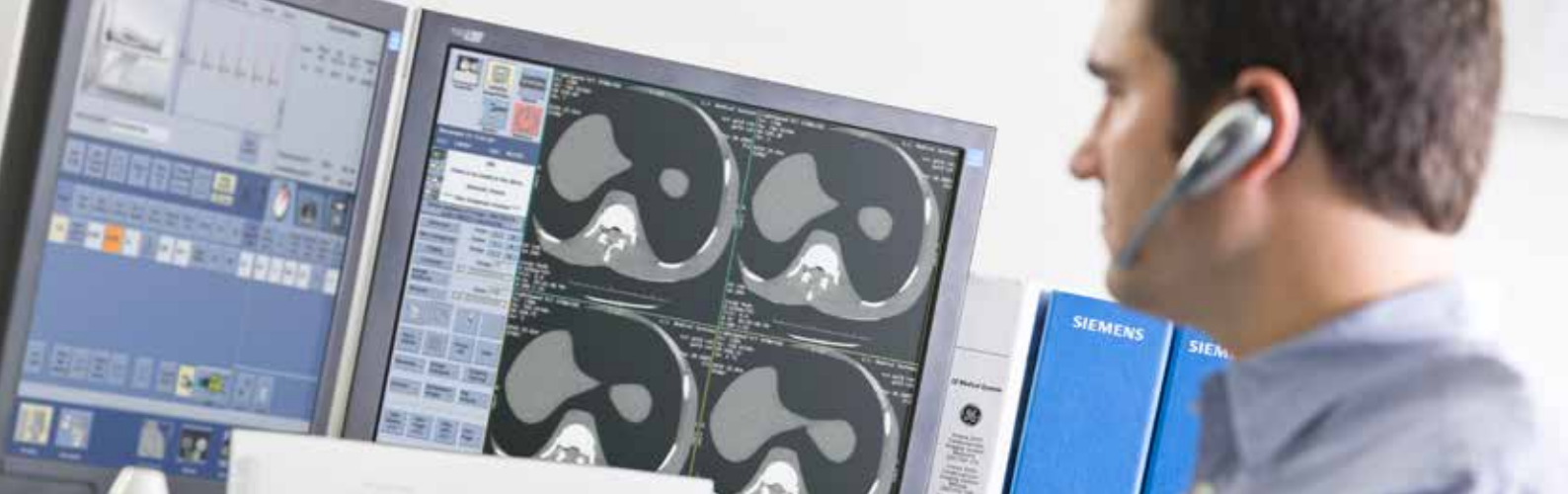
Service level agreements have evolved from the 'break-fix' or 'first responder' model, whereby urgent equipment repair only started when a customer called with a problem. While the majority of service requests are currently still solved in this 'reactive' fashion, responding when a customer has a query or complaint and sending a field service engineer to the site, around half of these cases can be solved proactively, through remote monitoring, according to Garry Jepp, Head of Services Operations at Philips.

He says potentially, a two-day customer visit can now be solved in a phone call. "Our goal is to double the amount of proactive maintenance we do, but we also want to increase the amount of remote resolution for these cases as well."

Maintenance has traditionally relied on its in-person service, largely because that is where customer expectations were set. But with the incorporate of new digital services — and real-time support enabled by advanced technologies, the model has evolved. The 'break fix' model also existed because field service engineers couldn't access or understand the service history of an MRI. With the ability to know when and why a piece of medical equipment fails — through new software and advanced technologies, such as the Internet of Things / Cloud — Philips Maintenance Services can self-assess, self-report and self-diagnose incidences. Advanced analytics, machine learning and monitoring technologies report a system's real-time status and feed back performance data — what the equipment is doing, the environment it is operating in, its condition — putting valuable insights into the hands of biomed/ hospital staff.

"The culture of providing excellent customer support through a visit by a field service engineer within a couple of hours is a culture that is evolving," Garry Jepp explains. "Because internally, we think this is great, and quite often our customer thinks it's great as well, they will sometimes bypass processes and call a field service engineer and someone will turn up on site. Actually, we're probably doing our customer a disservice, because had that customer contacted a remote service engineer, they may have resolved it in minutes over the phone. If it required a visit, they could have diagnosed it, worked out what the solution was, worked out what parts were needed, ordered them all and had it fixed first time by the field service engineer. Our goal is to be faster, better and always first time right."





Why predictive, proactive maintenance is already a game-changer

The great leaps forward in maintenance and supply chain management were led by the aviation industry where manufacturers monitor an engine's performance in real-time.

"If you look at the aerospace industry, they've been doing proactive maintenance for a while: the engine checks its own status as you're flying. But the health care industry has, until now, lagged behind. At Philips, we've been steadily working to help change all this through our various proactive offerings and innovation in predictive maintenance" explains John Schlanger, Head of Global Service Parts Supply Chain.

He continues: "Since 2015, we've been able to intervene before systems degrade. Rather than waiting for upkeep, medical equipment with increasing numbers of sensors will self-diagnose an issue faster and act to prevent future performance issues. Through automation, maintenance work can be scheduled and spare parts ordered automatically. The service engineer's role, minus the diagnosis and spare parts ordering, is focused only on the repair work, which is performed through virtual or augmented reality with instructions delivered in real time.

Garry Jepp explains why predictive maintenance is such an exciting prospect, "Today, around 20% of Philips solutions are able to solve problems predictively, but it's a key part of our innovations roadmap. Before long our solutions will be equipped with increasing numbers of sensors and data, and able to automatically tell the BioMeds what's wrong.⁵ Today, around 35% of all MR maintenance cases are solved predictively, while in IGT it is 20% and CT is 17% and we are developing these capabilities fast to constantly improve the customer experience. If you can predict it, you can prevent it and that's the sort of foresight and near sight we want to be able to ensure."⁵

A piece of medical equipment which understands its own lifecycle, can self-assess its own health and degradation, and communicate with other devices — or fleets of medical equipment — will open up new possibilities and business models, which focus on additional services.

Instead of responding to an incident reactively and manually — through visits, diagnoses and repairs -- hospitals will have the option of a proactive, automated maintenance model. This will mean that much less of their time will be spent diagnosing critical equipment, and through real-time performance monitoring of equipment, departments will save costs and be relieved of the pressure that comes with accounting for systems failures with an ever-growing fleet. The reduction in costs will come from reduced penalties for equipment downtime, unplanned repair work — and the customer experience of a product and organisation will be significantly enhanced as a result.

Ashishkumar Sinha, from Philips Services and Solutions Delivery explains: "The monitoring and maintenance of the future also goes beyond the health of a single system. Instead, we will monitor the health of the entire eco system where the machine resides in. We need to move from standalone machine-based maintenance to lab-based maintenance, exam room maintenance, where every system critical in the workflow of diagnosis and treatment of a patient is monitored around the clock. Customer down time is not because of a machine, but because of something that interrupts the workflow. This is where the future lies, preventing any downtime in the customer workflow and enabling our customers to use their machines to the full, and keep evolving their capabilities".

Ashishkumar Sinha continues, "One of the ways to realize the vision of Philips to improve lives of 3 billion by 2030 is when every medical device is utilized to its full operating potential till its End of Life without a downtime. This can only be realized when every service personnel remote or onsite delivers consistently first time right maintenance services to our customers."

The Knowledge management and AR opportunity

For field service engineers, the future will be more and more visual. Rather than searching for answers and waiting for documents to load, they will increasingly have access to an ever growing repository of information from thousands of other maintenance cases at their fingertips.

“We provide service engineers with advanced search tools to look and learn from cases that are solved by others all over the world. So, if I am a field services engineer in China and I have to deal with a CT system which I am not used to, but is regularly used in Germany, I can get all of the information about how the CT was repaired in Germany,” explains Mauro Barbieri.

He continues, “This allows field service engineers to become experts in everything, because whenever they don’t know something specifically, they can connect with someone anywhere in the world who does have the knowledge and quickly close the gaps.”

Philips is working on lots of Knowledge Management and AR applications in healthcare to help patients and doctors in ways we couldn’t imagine a few years ago, making complex tasks easier to achieve, visualising medical information for surgical procedures or enhancing medical training. AR will also guide engineers as they diagnose and repair equipment and devices, giving them access to a wide range of information and knowledge in real-time.

“We are experimenting with AR and ‘over the shoulder’ technology, which features a camera embedded into glasses, which allows experts to remotely support an engineer on site,” says Mauro Barbieri. “We are looking at how to

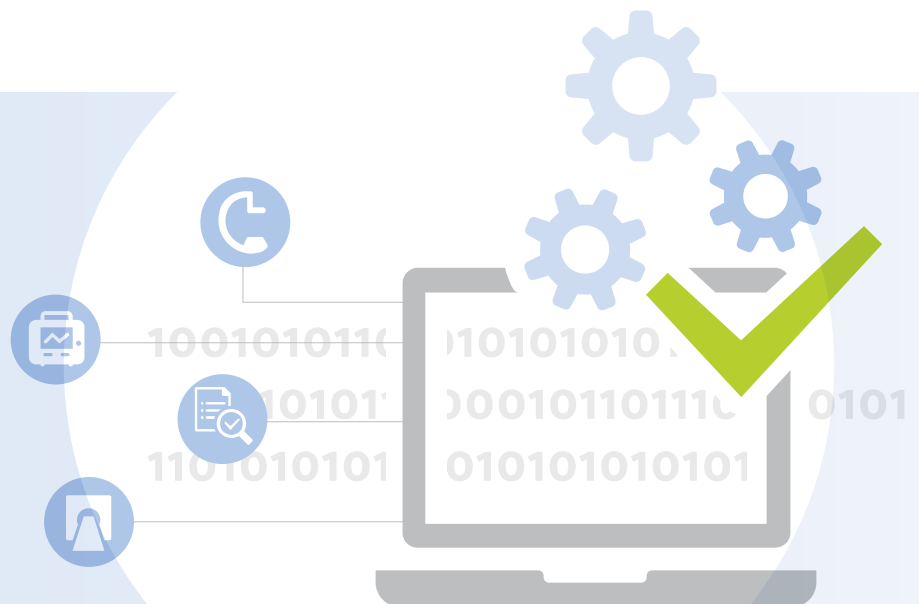
display information contextually in augmented reality, to let you see when you are looking at a device part that needs repairing, we will be able to superimpose in the image any documentation or information to help you act and achieve what you need to do.”

These are time-consuming tasks that would usually require an engineer to open up a laptop, read a PDF or open a diagram and search for information, using up valuable minutes while on site.

Mauro Barbieri adds, “These tools display this information in real-time while you are looking at a device or equipment. This is something we are testing as we think it belongs to the future of maintenance. Following the Covid-19 outbreak some of this technology is moving very fast, the over-the-shoulder technology could be introduced very quickly, the visualisation of all of the content for 3D augmented reality may take a little bit longer but it could be accelerated given the times.

Examples such as our Philips partnership with Microsoft to co-develop HoloLens are exciting indications of the work underway in this field.”

There is an additional customer benefit. How many times has an engineer had to explain how and why a particular component failed? Beyond the support for field service engineers, AR could also help explain to customers complex problems or faults with devices, giving customers, such as BioMeds, a deeper understanding of the device and its components, and enhancing the customer experience along the way.



From “spare part”, to invisible fix.

How service parts are undergoing a significant period of innovation

The process of diagnosing a problem, ordering a service part and having that service part arrive in a timely manner has historically been subject to various barriers. Getting products from a factory or warehouse to distributors or hospital sites around the world as quickly and economically as possible is critical for hospitals, yet fraught with challenges. However, the landscape for service parts has been rapidly transforming, with automated logistics and digital technology making the process far more immediate and less manpower intensive.

John Schlanger, Head of Service Parts Supply Chain (SPS), Philips Services and Solutions Delivery explains, “In recent years, we’ve completely automated our logistics to pretty much make the service part provision problem go away for our customers. To them, we’re now virtually invisible. In North America and Western Europe, our teams can get the service part – no matter how large or small – to its destination ready to be fitted within 4 hours and we can serve 98.3% of the world within one day. We’ve brought the ‘Amazon effect’ for healthcare, with advanced inventory management, automated zero touch and are closing the loop in terms of service parts sustainability. Our ASAP team – the All Special Assistance Parts team – deals with these without delay and it’s our shared vision for maintenance that we will be able to always enable our customers to extract value from their equipment by ensuring its always available, when and in the way they want to use it.”⁶

And yet logistics optimization is just the start of an exciting period for service parts, which is currently experiencing a period of significant innovation, from platform standardization through digital printing and, even digital twinning.

John Schlanger explains, “Right now standardization is building even more flexibility into service parts. Our engineers across Philips are standardizing our CT, MR and IGT components and this will have an increasing impact on the flexibility of our service. If the platforms our solutions are built on are consistent – for example, the same premium monitor across solutions – we can be ever more nimble and raise our repairable rates even higher. At present, we stand at 70% though which is pretty good.”

He continues: “3D printing to a lesser extent is also an opportunity we’re embracing. It’s more useful for low value parts since we can’t 3D print many of our complex, high value parts. Its relevance though is a solution for localization.

Increasingly our customers – and, indeed, triggered even more by Covid-19 – are focusing on what can be made locally. 3D printed parts can be made anywhere. 3D printing represents an on shoring opportunity.”

According to John Schlanger, drone deliveries are also making an impact. He explains, “Drone deliveries aren’t just about ease, they also help us access the hardest to reach spots of the world as the delivery infrastructure isn’t already there. However, there are physical limitations with regards to our products. As I often explain, “A drone is great for a delivery up to 2kg. With most of our materials significantly above this though, our challenge is less about flying a drone, and more about chartering a helicopter.”

The big opportunity on the horizon for service parts though, that John is excited by and is keen to explore, is digital transformation; most explicitly – digital twinning for service parts.

“Ours has traditionally been a very analogue, physical parts business and yet digital innovations such as digital twinning – a virtual representation of the service part – have the potential to transform the way we envisage what a service part and serviceable part actually is, or even how we envision our inventory management.

While our solutions, will have hardware components for the foreseeable future, those physical service parts will increasingly be able to be repaired or replaced virtually with digital twinning representing a zero downtime solution for our customers. By creating mirrored systems in control centers, we can extend our remote monitoring capabilities to diagnose, modify, repair, test and upgrade in real time with ever more precision.

When you add in the power of computational technologies such as artificial intelligence (AI), you can even identify potential problems before they arise, allowing for timely repair or replacement of critical components. For example, smart analysis of data transmitted from sensors in a jet engine during flight can provide 15 to 30 days’ advance notice of potential failures to always have the service part available.

We can also use virtual simulations to test the robustness and capacity of service parts and build digital prototypes of service parts that don’t simply replace existing parts but offer a new solution to be a previous problem.”⁶



Looking into the future. What will AI-enabled maintenance look like?

As data volumes in hospitals continue to grow, with information from more digital platforms, medical devices, wireless sensors, and billions of mobile phones, understanding how to connect fleets of equipment and ensure their performance is strategically advantageous. By leveraging more algorithms in hospital equipment fleets, opportunities will arise to design and develop new operating models such as pay-by-use or subscription-based services, where service activities can be dependent on the number of patients a hospital is treating.

The advent of more AI-enabled maintenance will alter future product designs and operating models. Firstly, through better visibility of how customers are using medical products and their performance data, we will have the potential to dramatically improve usage and next generation designs. A services-based model can increase customer experience by giving them an accurate overview of how their fleet is operating. By knowing more about how equipment is used, and its lifecycle, they are able to plan for zero downtime.

As AI capability grows it will in time influence the way products look and respond; self-diagnosing will be the norm.

“The next iteration of products will have smarter diagnostics and this AI capability built into it so they will be way more smarter at self-diagnosing. The improvement of equipment and product reliability was always defined by its design. That was how it always worked, and improvement arrived with a new design. In the digital age this is no longer true. The reliability of a product is not just in its design but in its serviceability, because we can get our heads around difficult technical problems independently from the design of the product. And that is something that excites me,” exhorts Onno Bense, Senior director Imaging System Remote Services at Philips.

What will happen to the field service engineers, maintenance gurus of the ‘break-fix’ model and now champions of this transformation in service delivery? According to Onno Bense, they will turn up to a customer site better equipped than ever before. Through the remote monitoring of a modality they will have diagnosed a system and ordered the necessary spare part before they arrive. The system will be repaired the first time. Spare parts will be inserted using augmented reality. Most importantly, disruption to patient care will be gone.

“The service engineer will turn up, backed up by a strong team and will be more effective, solving problems faster in one go. Customers will be able to connect with us in easier, more accessible ways. They will be more informed. Our digital age will bring more and more digital training to them when they want it, not just in the area of maintenance and serviceability. Modality and systems security will always be a no.1 priority. Sharing more data, in real time with the customer will go hand in hand with development of the technology. That will enable a future of maintenance that is reliable, predictable and efficient,” confirms Onno Bense with clear excitement at the prospect.



Contracted to win. Unlocking ‘lock ins’ through the evolution of maintenance contracts

Contract management (or service agreement management) is the process by which people or companies who sell maintenance services will be hired and supervised.



The evolution of maintenance, of course, is also about the evolution of the service agreement, also known as the maintenance contract. Gone are the days of signing on the dotted line and being tied into to a service agreement that might not grow with your needs, as part of its partnership model, Philips Maintenance Services is committed to shared risk and increasing flexibility.

Philips flexible service agreements represent part of the future of maintenance as they are designed to grow with the strategic needs of the healthcare partner. For example, the Philips RightFit customer service agreement portfolio offers 8 types of service agreements tailored to customer needs. The flexibility of these agreements, along with the uptick in services such as proactive and predictive maintenance, became even more vital.

As Burcu Sen, Sr. Product Manager, Philips Services, Service Portfolio Management explains, “Our customer service agreements are designed with flexibility and agility in mind. Recently, we worked with our customers to build in the opportunity to prioritise and scale up and scale down entitlements in response to the Covid-19 crisis requirements. Our 7,700 frontline field service engineers and +3000 remote service engineers together with our customer service agreements were essential in keeping equipment running effectively – especially when it was being used at unprecedented levels – and ensure proactive and predictive maintenance and repair.”



Making the future happen, today

With an ever increasing portfolio of maintenance services, a history of innovation and the breadth and depth of being part of one of the world's leading health technology companies, Philips Maintenance Services is leading the transformation from reactive to proactive and predictive maintenance, flexible service agreements and beyond.

While being a highly rewarding people-centric discipline, Maintenance Services will always be an extremely challenging and at the same time very competitive discipline. Understanding every customer need is key to engaging with the customer in the offering cost effective services without compromising the quality of service delivery, and this is where digital transformation in service delivery has an edge.

And yet proactive and predictive maintenance will not be enabled as a standalone. It has to be supported by enablers such as Connectivity and Reachability of systems to the ISO 27001 Philips Remote Services infrastructure. New age technologies like IOT will support the next steps to realize not only monitoring the health of customer machines, but also the health of the entire hospital ecosystem, including security monitoring, threat detections and unauthorized access to Philips systems.

And, as Eugene Ivanov, Service Project Manager, Philips Remote Services concludes:

"The new dawn of maintenance services is already here. The servicing of the future isn't about reducing downtime, it's about enabling healthcare systems to make full – and evolving – use of their sophisticated equipment and technology investments. With predictive maintenance, we are able to prevent issues from happening before they happen to continuously finetune and optimize workflows and usage, enabling more patients to be treated. And our flexible maintenance agreements, have the evolving strategic priorities of our customers and their patient care at their heart. This is the age of Operational Intelligence, where we combine people, process and technology to reinvent what operational efficiencies within healthcare facilities."



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