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The Care Continuum



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Thinking Digitally

IT is critical to the way Philips designs, develops and brings to market our products and services. IT is not just internal to the company, but integral to what we do. As CIO, having transformed the IT organization internally to be much more agile, I started working on the digital strategy of the company – not just e-commerce and knowing your customer through digital means, but by looking at what's happening in the technology world and how we can apply that to what Philips is doing. For example, the Internet of Things, monitors, senses and leveraging mobile technology.

Big Data

The biggest opportunity is with big data. We are truly in an exponential world where not only technology is moving very fast, but the adoption of technology is also moving way faster than ever before. If you look at the time it took for, let's say, radio or television to become truly widely accepted and compare this to social media or new mobile technology, you also see acceleration of adoption of technology by consumers. What you also see is that many businesses are kind of trailing behind and institutions are completely trailing behind.

Continuous Services

New business models are emerging, and we believe that there's going to be a big shift from capital investments to moving towards continuous services. For instance, instead of buying an MRI, you're buying a relationship that optimises both clinical workflows and the resource and assets. So instead of buying an MRI scanner, you buy an imaging service that has the outcome of optimising the number of patients you can put through the system in a very efficient way.

Monitoring Chronic Disease

Similarly, we are moving to models where, for instance, monitoring people with multiple chronic diseases from home is the most effective way to manage their care, and this is backed up by the evidence. It is effective in the sense that re-admissions are down 30-50 percent and visits to the ER are down by 70 percent. Clearly this has a big impact on the care and health of the people we support and also on the health system. Philips will optimise the technology, bring in the software, train healthcare staff and the health provider pays per patient. We are even willing to have a stake in the outcome, so that if readmissions don't hit their target, then we'll take the pain. We used to sell hardware and software, and now we are basically selling you a service, which is linked directly to your outcomes. This can only be enabled through these technologies, because it allows you to monitor, to really understand what metrics you are hitting, and to do preemptive work. To me, digital means not only e-commerce, but new business models that are grounded in those technologies and are really creating better outcomes, in this case in the clinical world.

Care Continuum

There is a change in the way healthcare systems are looking at incentives – from fee-for-service to reimbursement for outcomes on a population basis, for example for patients with congestive heart failure (CHF) or patients with prostate cancer or patients with CHF and diabetes, etc. The

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incentive is to actually optimise on outcomes, for example how quickly patients can move about, or get back to work, mortality rates, readmissions and so on.

There are a number of areas where you can look at whether you are getting better outcomes or better health at a lower cost. At the population level, if you impact peoples' lifestyle you will have a big impact on population health. In the Western world 80 percent of healthcare cost is taken up with chronic disease: heart, diabetes, COPD, and many forms of cancer these days are chronic as well. You continue to monitor and treat them, and if you look at where the real cost is, you understand that lifestyle is a big aspect of that, and you start thinking about how we can impact the health of the population. You have to start thinking beyond just acute care. Acute care will always be very important, but the real cost and impact is in a different area: how to help people live a truly healthy life. If you are at risk for congestive heart failure, how can I help you to avoid acute situations? How can I help you with the way you eat, with the way you are active? How can I mobilise not just the formal healthcare system but maybe also your friends and family?

I'll give you an example. My father lives at home. He has cancer, but with many complications, and he is on 15 different and very complex medications. We know that more than half of the people don't comply with their treatment plan, including medication, so what we have is a connective medication device where the tray pops open if you need to fill it or beeps if you don't take out the pill. An alert goes off. When he doesn't take his medication, I may be the best person to call him up. When that alert goes off, I get an alert and I call him up and say hey, you've got to take your medication. I just say I told my dad to take his medication, so the care team knows what happened.

We engage care in a wider context, and get healthcare staff the tools and make them feel a part of the care team that also consists of friends, family and volunteers. For example, the NHS in the UK has one and a half million volunteers, people who are willing to give their time to help other people. How can we give them the tools to be very effective and to really make an impact on people's health? The reason this is happening is because we are starting to move towards outcomes rather than procedures that are typically executed when things are too late.

We are moving more towards early detection, much more continuous monitoring, and we are starting to look at healthcare as a way to manage larger populations, but always at this point in time, as they can be anywhere.

At any time, a health professional wants to know which person need an intervention. You can do that by streaming the data, combining that with what you know about the patient, and then decide on algorithms. Now you need an intervention, for example taking medication or sending an ambulance or anything in between. What is the right intervention, under these conditions at this point in time? You are trying to move from a system that is kind of reactive, to a system that becomes very proactive, to provide the right intervention at the right time with the right person, which is a much more scalable model, a much more efficient model.

In the US there is much waste in the healthcare system. If you have a system that is based on having to go physically to a doctor, and the patient only goes to a doctor when something goes wrong, and then has to wait in a waiting room or wait for an imaging system to be available, then you are not optimising your resources. People are not aligned around the patients that need the intervention now. Only now can you give people a monitor at home which is affordable. The infrastructure is already there.

Already in the world, 96 percent of people have access to mobile phones, so can we leverage technology to bring it to such a price point, and combine it with largescale automation?

I used to work in financial services, and there I saw three phases in trading. Phase one, you have very smart traders on the floor, making trades from their guts. Phase two, they sit behind screens where you have highly visualised information. Phase three is algorithmic trading, fully digitized, which is the rule today. We are still in phase one when it comes to healthcare. We have well-educated, experienced people doing diagnosis and treatment, largely on their experience and expertise. They may look at an image that a radiologist has prepared, but we haven't yet collated all the relevant information about the patient. We are ready for the second phase where at the least you can visualise a holistic view of the patient so that you can make the right diagnosis.

My belief is that 70-80 percent can be made quite predictable if you have all the data, and therefore you can create new models. When it becomes predictable, you don't really need insurance. You need insurance for the unpredictable stuff. It will ultimately change the entire system, because payers and providers will start looking at it differently. Patients will also be given the tools to take more control themselves. So, you almost see risk moving from the payer to the provider to the patient. The provider is going to be more than just a professional provider. There are going to be care teams that take care of groups of patients at scale.

This is the best way to deal with problems that we haven't been able to solve: the greying population and escalating costs in the Western world, and in emerging markets access to care.

Data been collected without finding solutions. How is Philips envisioning this amazing opportunity which data brings?

You can see it on many levels. If you want to move to an outcome based model, you have to move to population heads. That means you've got to understand where the population is. You've got to understand where they are, what they are spending, what the outcomes are, and then you start to analyse how you can optimise behind it. Then, for instance, you may set up a program where you monitor patients at home, but you have to identify who are the right persons to enroll in those programs, and what are we measuring? Then we use the big data to identify, basically to segment, a population and help with optimising service for those populations. Then you use big data to determine who should enroll in what

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programs.

I call it the killer app — to me, the killer app is basically taking the monitoring data that comes from patients you monitor at home, taking the medical data, the clinical data of the patient, and then based on that you use big data algorithms to determine which people need what kind of intervention. Then you're really making the data actionable. You can make it actionable for the care team, but you can also make it actionable for the patient. Based on where you are today, now you should do this. We're working together with salesforce. com and there's a very simple reason for it. If you look at what Salesforce has done, they have really created a software platform that allows companies to collaborate around customers, to know everything about the customer but also to market to those customers. Basically, if I want to sell you a product, I can do what we call drip marketing. I can send you a message. I can send you an email. I can show an ad when you browse. When we started sitting with them, we said okay, you have this entire infrastructure where we're using your software to dispatch our field engineers. We are using your software to work together on our bids. Now what if we use your software to work together on a patient? What if we used the billions of dollars you guys have invested in marketing software to use the same mechanics to convince people to take their medication on time or to do almost the opposite of what other people do, stop drinking drinks with 30 percent sugar or stop eating processed foods?

I was talking to one of the biggest healthcare organisations in the world and the person told me they have nurses that go around in cars and that have appointments scheduled to meet with patients. Everything is always scheduled. I said, well I don't think that's an efficient way to do it. If you have our eCareCoordinator, you know exactly who needs to get a visit when and you optimise. But then you use software to dispatch your field engineers to tell them exactly which field engineer is where and you can dynamically reschedule. Hey, there is a patient three blocks away that needs an intervention now. Now, you go there — so you dynamically tell people where to go.

Other industries have solved these problems. Just like I said around traders, industries have solved the issue of how to deal with very, very complex data and information. Other industries have solved dynamically managing your resources to optimise your outcome. In healthcare, we don't need to reinvent it. We need to bring it in the right context, and we understand that we are dealing with life and death issues, so maybe we issue mission-critical capabilities there.

Salesforce will become Healthforce?

Yes, that's the whole idea. Basically that's why we are working with them. Of course, they don't have the clinical background which we are bringing, but they have all this off-the-shelf software. We are working with Radboud University Medical Center, one of Europe's most innovative hospitals in setting up a health community. I just want to configure it. I don't want to write software for that. We are not the first company that has gone and created community. That's been done in other contexts, many times over, so I just want to use the core capability to do that and then configure it for our specific environment. How can we help people with a chronic condition to hook up with other people?

This would be one of the killer apps ?

Yes, this would be one of the killer apps. For me, killer apps are really about, how do I know exactly when to do the right intervention at the right time and how can I mobilise the right people to do it? It may be for your desk, or it may be a cardiologist, because at this moment it is so complex, he is the only one who can make the right judgment on this. But it's got to be dynamic and it cannot be "I'll do it eight weeks from now" or "I have an appointment in three weeks" because it may be too late. I think the industry is still highly inefficient but it's primarily driven by the business model.

So, getting all this big data, showing which treatment for that small percentage that need it, then feedback into appropriate use and avoiding unnecessary....?

Exactly. You don't have to do fee-for-service because you want to do another test because it helps you reach your litigation and get reimbursed. Then there is no down side. It's a strange system. Clearly, I cannot claim that I am a healthcare specialist, but I looked at other industries and how they leverage information technology. We have seen all around how it is transforming industries and it was a big theme at the World Economic Forum. Digital is no longer a website or a mobile app. Digital is the fabric of your company. If you don't jump on it, you may be standing there in a couple of years and saying why didn't I see that coming?

You can redirect on the spot a parcel from A to B, so why shouldn't you be able to do the same for a nurse?

Yes, it's dynamic. The world has become real-time dynamic. Things change and therefore the system will allow me to change. The concepts are simple. It's just so far away from the traditional way of doing it, but at the same time, I see people doing it. They are forward-looking organisations, new organisations. I met a guy at the World Economic Forum whose mother passed away from complications of diabetes, and he started looking and he said this model is so broken. So he set up 40 or 50 diabetes centres around Mexico in a similar concept. You come in; we'll screen you. We'll capture the data. We'll give you tools to manage it and we'll do it on a fixed price. So he does it for \$200. The average cost for a diabetes patient is a \$1,000. He said, I do it at 20 percent of the cost, and I give you better outcomes because this is all I do. I have my teams organised and it's all automated. I don't have my best people in the clinics. I have my best people in Mexico City, as support staff.

Twenty years ago, you would go to a bank branch and the specialist would sit there. Now there is no bank branch in the world where they put their best people in the branch. They put it in New York or London, and they will support the people in the branch. That's a scalable model. Trying to put everybody so you've got to leverage the technology to really apply your expertise to when and where it is needed. These are simple business principles. They just have not been applied at scale. So, that's going to happen now because the technology will be there to apply it at scale.

The informed patient is an empowered patient. Encouraging them is a good thing?

I think so. A lot of it will be education, so I think if you look at this without really, really, thinking through how you educate the patient to understand what impacts their condition and how to nudge the patient to deal with their condition, it's not going to be effective. You've almost got to think as much about education, taking them by the hands, drawing them in, truly engaging them as well as making sure they take the medication on time and they stand on the weight scale once a day, etc. But again, other industries have done that as well. They spend a lot of time getting into the skin of a consumer and understanding how a consumer thinks. At Citibank, I was responsible for internet banking. We were one of the first companies to launch internet banking. We spent most of the time trying to understand how people are doing their finances. We didn't say technology is the answer. We thought, what are people struggling with? What do they need to get in control of their financial health?

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