

Fall prediction and prevention technology: an interview with Rob Goudswaard and Heribert Baldus from Philips

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insights from industry

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How much of a problem are falls in older adults?

Heribert: Falls in the elderly are a major health problem. It has emerged from data in the US that roughly 1 in 3 people over 65 fall at least once a year. Half of them experience the same again the next year.

Along with that there is an overriding fear of falling in seniors. There is the fear of falling alone and of the potential consequences of a fall. Falling is a leading cause of hospitalization along with losing one's independence. This altogether makes falling a fearful experience for people.

How did Philips' interest in this area originate?

Robert: A strong part of our interest was spurred by acquiring the Lifeline business in the US. We found out that emergency responses are considered by seniors after a couple of falls. There is this moment in people's lives where they realize that they're not tripping over the rug and they start falling. They often say things like, "next thing I know, I'm on the ground."

It is at this point that people say, "I need help". They realize that it is a problem they cannot control and that they need help.

This is where Philips became acquainted with the problem of the epidemic of falls. What we did in 2010 was to combine the deep knowledge of Lifeline services with the knowledge of Philips' - which is innovation. We used this knowledge to launch a product that was not new to the market, but has really had a revolutionary effect on both our business and the market as a whole.

Fall detection did exist previously, but it had a very low adoption rate. The reason was that it was not accurate enough and it didn't fit in people's lives.

By getting the insight into what we needed to tweak, we brought a product that was very successful and really helps a lot of seniors when they fall.

This is how we got into the areas of falls. If you look at the area of fall detection, it is logical also to say what are the next steps? What do people need beyond fall detection? Quickly we came to realize that if we could actually prevent falls that would be even stronger than attacking the consequences of long lifetimes - which is basically what fall detection does.

What were Philips' aims with regards to predicting and preventing falls in older adults?

Robert: Our aims were two-fold. Firstly, we wanted to look into how to prevent falls. This was a very logical thing to do for our subscribers as Lifeline has a vast number of subscribers who need help.

We also have sources available for people to get information about the problem of falls and how to deal with it.

In addition to helping seniors, there is another aspect: helping the healthcare system deal with the enormously increasing number of seniors that we see, because of demographic factors, and how to deal with the cost. This is because the cost associated with falls is enormous. We have an interest in helping people in their homes, so that they can live independently and stay out of nursing homes.

How much of a role do you think technology will play in achieving these aims?

Heribert: Technology has to be used in the right way. Firstly, this means the technology must be very reliable. People need to be able to trust the technology.

The second aspect is to make the technology unobtrusive. People need a system that can support them in their daily lives without being disturbed or limited by such a system.

This can be achieved with modern movement and fall detection technology, by using sensor technology in very small devices.

It is important to always keep the user in mind when designing the technology.

At what stage of research are you currently at?

Heribert: We know that we can detect falls well. As part of the iStoppFalls consortium with partners in the Netherlands, Germany, Spain, Austria, and Australia, we are now investigating technology that has the potential to predict falls and measure the fall risk of people over time. By understanding this we can support people and try to predict falls before they occur.

We are currently testing different technologies to do that. Our next goal, based on tests and assessments, is to find out which technology to apply.

We are working with several partners on identifying technology to monitor the risk of falling; to predict falls; and develop ways to prevent falls in the long term.

How did this new research compare to Philips' previous work on its Lifeline AutoAlert?

Robert: The Lifeline AutoAlert product is a pendant that you can wear around your neck. It looks quite attractive, so you can wear it around your neck all the time. With the initial Lifeline product there wasn't fall detection technology but there was a button on the pendant so people could press for help if they had fallen.

The AutoAlert was something that was incorporated into the same pendant, so that we could detect when the patient had fallen, and if the patient was unconscious we could set off the alarm so the patient could get help.

In summary, it was something that was very easy to use, it looked nice and it fitted into people's lifestyles. This is very important as even if something might help people in their need, if it is difficult to use or foreign to the user, then it won't fit into their lifestyle.

It is part of the approach of Philips to understand the real needs of users and build technology that is designed around them, so that it can really offer them meaningful innovations.

Heribert: In this sense Philip's new research is very related to its Lifeline AutoAlert as they both have the same development and research philosophy. The primary goal in both cases is compliance and fitting with the user's needs. We want to build a technology, like we did with Lifeline AutoAlert, which people can use in their daily lives and that meets their expectations.

Robert: The approach that Philips takes in its research is that it is people-centered. We want to come up with meaningful innovations that help people. We look at the needs that people have, so in this case it was addressing the fear and security of not being able to live independently in the future, and that is where we came up with the AutoAlert so we can sense when people fall.

Now we're looking at extending that to help people further and give them more security and maybe even help

prevent these falls. So we are looking at the needs of the people and looking at how we can best use technology to address these needs in a meaningful way – this is what Philips is good at.

This is where the approach of the AutoAlert and the new research is the same, but the current research is more advanced. We are looking at the next step of helping people even further with their needs in this particular area.

One example of something that really moved the needle on AutoAlert, and it is something that we're going to use in future research, is the fact that the technology is unobtrusive. Our Lifeline users already use a button. We built the technology into a button – the button didn't change. There is a lot of technology in the button, but on the outside, and the use of it is the same.

It is not something that people need to wear on their belt. On average our user is about 75 years old and they are often women. Consequently, they don't tend to wear belts. This is a simple example of how our technology is suited to people's needs.

Another example is that we don't ask seniors to change the batteries every 6 weeks. This was the case in products that were on the market before AutoAlert. Those are examples of how to fit the product into the user's life.

What are Philips' plans for the future?

Robert: We are developing solutions that help people remain as independent as much as possible. We are developing solutions that bring healthcare to the home and therefore you need, both on a medical level and on a consumer level, to design the right solutions.

The key aspects are finding:

- solutions that work
- solutions that help health care professionals and make their work more efficient
- solutions that help consumers by fitting into their lives

How do you think the future of fall prediction and prevention will develop?

Heribert: In the area of fall risk and fall prediction, it does not mean telling people that they will fall in 3 seconds from now, because that would not be useful. They need a warning early enough so that countermeasures can be taken.

Fall prediction, or fall risk monitoring, is rapidly evolving and we see a trend. In the past, and nowadays, fall risk monitoring has typically been done in the clinic. This technology is evolving and it is becoming possible for this to be done with home-based technology. We are researching so that people can have risk assessment unobtrusively during their daily lives.

In the area of fall prevention, we see from work at different places that people who managed to maintain a certain activity level managed to prevent falls. We see a trend of active ageing: people who are active during ageing, have a reduced risk of falling.

Motivating people to stay active and to exercise is also another area of research. The aim is to give people confidence to try to reduce the fear of falling.

Do Philips have any plans to use technology to solve other medical issues?

Robert: If you look in the unit that we belong to – home care solutions – apart from seniors and falling, we're also dealing with the chronically ill. We help to manage chronically ill patients. The ones that need most help and management are congestive [heart failure](#) patients and COPD patients.

We also help both chronically ill as well as seniors manage their medications. We have a medication dispensing service and are also looking to innovate in that area.

We have a sleep and respiratory business. We have products for people trying to deal with sleep apnea and also ones for people with respiratory problems like COPD, [asthma](#) etc.

These are the areas that we are active in home monitoring and home health solutions.

Would you like to make any further comments?

Robert: I just would like to emphasize that this is a good example of the way that Philips focuses on innovations that improve people's lives and the way that we work to do that.

Where can readers find more information?

Robert: They can find more information at learnnottofall.com. This site is dedicated to the problem of falls and is there for both seniors and caregivers. It contains information about falls, about how to prevent them, how to get up from a fall and so forth.

There is a lot of educational material on the website which comes from our cooperation with the University of Yale. We worked with Professor Dorothy Baker to develop a system that very easily describes to seniors how their fall risk builds up.

She literally uses the metaphor of building blocks. Those building blocks are issues like not managing your medications properly, or bad shoe wear, blood pressure issues and so forth. If you build a tower of blocks then you become very unstable.

About Rob Goudswaard and Heribert Baldus



Rob Goudswaard is the Senior Director of Innovation, and a member of the Executive Management Team for Philips Home Monitoring. He has been in this role since 2006, and is responsible for the expansion of new products and services and leading a team of upstream marketing managers and product managers.

Rob has been with Philips since 1994. During his tenure, he has held a variety of positions within marketing, sales and innovation for various business lines including healthcare, mobile phones and personal care in Europe, Asia and the United States.

Rob's career at Philips began in the Personal Care sector, as a Product Manager for shavers in The Netherlands, managing the Philishave Coolskin project from idea generation to launch. In 1998, he transitioned to a sales and marketing role in Singapore, focusing on business alignment during the Asia currency crisis.

After a two year stint as the Marketing Director for Wireless in Asia Pacific in the Philips Consumer Electronics division, Rob returned to the Personal Care sector as the Director of Product Management Shavers in The Netherlands.

Just prior to joining the Home Monitoring team, Rob was the Senior Marketing Director for Shaving and Beauty, a role in which he was tasked with defining and deploying the business' marketing strategy for all of Western Europe.

Rob holds an MBA from the University of Groningen in the Netherlands, and graduated from the General Management Program at the Harvard Business School.

Rob is based in Framingham, Mass., and has lived in the Boston area since 2006 with his spouse and two daughters.

Heribert Baldus holds a PhD on electrical engineering from Aachen Technical University, Germany.

He is working as principal scientist at the Personal Healthcare department at Philips Research Europe. He has led

various internal and international research projects on different areas of communication technology, home-networking and medical systems.

He has various publications in peer reviewed scientific journals, is co-author of several books on communication technology and their (medical) application, and holds more than 50 patents and patent applications.