

Interview with Ralf von Baer on “Health Telematics and eHealth”

Dr. Ralf von Baer was appointed managing director of Robert Bosch Healthcare GmbH (Waiblingen) in November 2011 with responsibility for Sales and Account Management in the German-speaking countries. Previously, he was managing director of Putzmeister Holding GmbH and senior consultant at HWP Planungsgesellschaft GmbH. Before going into management, Mr. von Baer studied Medicine (State Examination and Doctorate in Human Medicine) and worked as a junior doctor and consultant for Anaesthesia and Emergency Medicine. He obtained an Executive MBA in General Management from the University of St. Gallen. In addition to extensive expertise in the healthcare sector, he has broad entrepreneurial experience acquired outside the health sector.

DOI 10.1007/s12599-012-0247-z



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Published online: 2013-01-24

This article is also available in German in print and via <http://www.wirtschaftsinformatik.de>: Kirn S (2012) Interview mit Ralf von Baer zum Thema „Gesundheitstelematik und E-Health“. WIRTSCHAFTSINFORMATIK. doi: [10.1007/s11576-012-0349-8](https://doi.org/10.1007/s11576-012-0349-8).

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BISE: Dr. von Baer, in your experience, how do innovation processes in industry and innovation processes in the healthcare sector differ?

von Baer: In industry, business process orientation and optimization are established on a broad basis. They are the crucial factors in reducing costs and improving quality and hence also in determining a company's long-term success in a competitive market. Thus you could say that in industry innovation and standardization no longer only refer to products, but above all to business processes.

In contrast, the focus of the healthcare sector is often on technical or pharmaceutical developments in medicine. Process or step-by-step innovations (e.g., the introduction of analogs) receive only scant attention in the health system and in terms of cost reimbursement (self-management). In such cases, process flows are at most considered from a quality perspective, but usually not from a cost point of view or as a concatenation of cross-sector processes.

Unlike in practical application (e.g., 3D image reconstruction) and administration (e.g., ERP systems), only in isolated cases are processes standardized with the help of IT systems in diagnostics and treatment. Medical processes today have still not progressed much beyond the status of a traditional manufactory. Experiences from order-based industrial production have, however, shown that even from lot size “1” process standardization brings significant quality and efficiency gains. This is further confounded by the fact that stakeholders are frequently unwilling to invest in process optimizations, especially where the focus is on providing day-to-day healthcare. Consequently, they are also lacking the positive experiences that can give rise to meaningful cross-divisional process innovation.

Healthcare providers also frequently reject process support, for example in the form of assistance systems, because they fear a loss of their decision-making competence and increased transparency. The advantages that result from utilizing assistance systems, in particular being able to concentrate on the relevant decisions and activities, are all too seldom recognized. We can only hope this will change in the near future. The corresponding systems are available on the market and already have a proven track record.

BISE: Process optimization and innovation in industry is frequently directed at improving quality. Do similar differences exist here between industry and the health sector?

von Baer: The situation is very different. If you produce a defective product in

private industry, the market will penalize the manufacturer. If people are harmed as a result, you may even be held personally accountable, although this is usually the exception.

In the healthcare sector, the opposite tends to be the case. It is the individual provider who is held responsible, i.e. the attending physician and possibly the head of department. Only in very rare cases – when it was possible to prove clear neglect on the part of the organization – the organization was called to account. In addition, quality defects rarely have an impact on the revenue side in a short term perspective. The choice of hospital is therefore strongly influenced by other factors, such as proximity to the patient's home or the relationship to the referring physician. Healthcare facilities frequently show little interest in standardizing processes across organizational units, although the majority of stakeholders is conscious about the importance regarding the quality of results.

For patients, i.e. the consumers, it remains difficult to compare the quality of healthcare services. This is currently changing because the press is increasingly drawing public attention to quality defects, such as high rates of hospital-acquired infections. But we still have a long way to go to make product quality in the healthcare sector transparent for patients and other stakeholders not directly involved in treatment. According to a recent study carried out by the Boston Consulting Group with 9,000 participants in nine countries, the majority of consumers feel they do not have sufficient information to make an informed decision regarding their choice of healthcare provider.

BISE: Robert Bosch Healthcare GmbH which is nationally and internationally very successful addresses the two main telemedicine services submarkets telehealth and telecare with products at the leading edge of technology, such as the HTS 62 home emergency call system and the Bosch Telehealth system. In which of these fields are you anticipating the more dynamic growth in the coming years?

von Baer: Allow me first of all to more precisely define the two terms telecare and telehealth, as they are often confused. A good definition is provided by the *Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry* (<http://www.cocir.eu>).

It defines telemedicine as the overriding term for the delivery of health services through the use of Information and Communication Technologies in a situation where the actors are not in the same location. In addition to telecare and telehealth, telemedicine includes teledisciplines. Teledisciplines is used as an umbrella term to describe various approaches to provide medical services over a distance with the help of ITC (e.g., telepathology, teleradiology, ...).

Telecare describes systems designed to support the services of healthcare providers as well as being capable of social alert and social services (home emergency call systems). In contrast, the term telehealth covers systems and services linking patients with care providers (doctors, assistant staff) to assist diagnosing, monitoring, management, and empowerment of patients with long-term conditions (chronic patients) in their home environment. A distinction is made between pure telemonitoring, which is the remote exchange of patient data, and remote patient management. The Bosch Telehealth system belongs to the latter.

With the Bosch Telehealth system, patients record vital signs and symptoms and send them daily to a cloud-based database. The data are analyzed by qualified medical professionals at the telehealth center who are alerted if patients whose potential for complications or a worsening of their condition is assessed as high (risk stratification). Where necessary, the medical staff can contact the patient and/or family practitioner and take necessary action. Patients also receive information about their condition, enabling them to better cope with their disease (cf. <http://www.bosch-telemedizin.de>).

We are anticipating very dynamic developments in both telecare and telehealth over the next few years. This will also be supported by new applications such as Ambient Assisted Living (AAL) and improved ICT infrastructures, such as the "Internet of Things and Services" (IoTS). Automatic emergency recognition in everyday situations will lead to the development of new telecare systems capable of detecting risk situations in a timely and reliable manner from a wide range of data collected by different sensors. This will in future enable an emergency center to automatically initiate appropriate countermeasures. In the field of telehealth, on the other hand, we can expect to see assistance systems that will

improve the self-management of patients suffering from chronic diseases through context-related, patient education provided on an ongoing basis. In this context, patients learn to cope better with their disease and can call for help as and when needed.

Telehealth solutions therefore primarily address the prevention of a worsening of an already diagnosed condition. Telecare, in turn, serves as an early warning system in emergency situations. Accordingly, it is also to be expected that these two fields will grow together to secure comprehensive healthcare provision.

BISE: A hypothesis frequently cited in Business and Information Systems Engineering (BISE) indicates in connection with smart objects and smart environments the foreseeable "disappearance of computers". What does this imply for telehealth and telecare?

von Baer: Computers definitely will not disappear, but in the home environment we will no longer consciously perceive them. Data collected in our home setting by various sensors will be securely processed and, where necessary, sent to "computing clouds" in filtered form. The results will then be transmitted back to the user in the house or elsewhere via a wide range of user interfaces. In this respect, the smart computer will not disappear, but it will only become apparent when the user receives feedback or is required to take action.

In the future, telehealth solutions will use a wide range of peripheral devices in active mode (e.g., to measure blood pressure or blood sugar levels) or to an increasing extent passively (e.g., continuous pulse monitoring in combination with a watch sensor). This comprehensive information can help to detect risks earlier, purposefully improve patient education and develop their self-management skills.

In the field of telecare, telehealth data will be combined with other active and passive sensors, such as motion detectors, door contacts and the like so that help can be called quickly in the event of an emergency. The data are processed automatically with the help of intelligent algorithms, without any configuration by the user.

BISE: Since about 15 years, in Germany the large-scale project "Telematikrahmenarchitektur und Gesundheitskarte" (telematics framework architecture and health card) has been advanced. How

do you assess its development and the progress made to date?

von Baer: In the past few years, I have worked in fields outside the health care sector and for much of the time abroad. I have often seen extreme changes taking place in a very short time. Without going into the details, the questions I hear as a returnee after ten years relating to “telematics framework architecture and health card” are often all-too-familiar. In Germany, in contrast for example to Scandinavian countries, I can unfortunately see no noteworthy results when it comes to implementation.

BISE: Allow me to go into detail: IT projects are often highly complex, protracted, and for a number of reasons fraught with risk. One sub-area of business and information systems engineering is therefore looking into failed large-scale IT projects. Peter Mertens has presented an extensive documentation of unsuccessful public sector IT projects.¹ The large-scale “health card” project occupies a prominent place in this study. Is it (perhaps particularly in Germany?) especially difficult to successfully carry out large-scale public sector IT projects? Or (why) is it especially difficult in the health sector to see IT projects succeed?

von Baer: In my opinion, implementing large-scale IT projects in the public sector is not the real difficulty. Rather the problem is that these IT projects call into question long-established patient care infrastructures, define new processes and procedures, “attack” existing divisional structures, and redistribute “slices of the cake”. The resistance shown by those affected by these changes is correspondingly high. The public sector, if it successfully wants to implement these projects, has to assume the role of a “change agent” and replace the old infrastructures with new ones. However, in the public domain, the number of stakeholders and their respective interests are far more divergent than in the private sector. It is accordingly difficult to find alliances prepared to back changes that often require a complete “reset”. The reason we are seeing extremely rapid transformation processes in emerging or developing economies is that in these countries the

traditional infrastructures are often outdated or obsolete that a new beginning is much easier to implement there than it is in our country.

BISE: What challenges do the many specific national features of the health care systems and the very different care provision concepts present for companies like Bosch Healthcare?

von Baer: The Bosch systems address patients in their everyday environment, i.e. national surroundings. Accordingly, the proposed solutions have to be adapted to the existing structures and processes in each country which increases costs in addition.

In contrast, the ideal vision of patient care has been uniformly defined by many institutes and scientific institutions with minimal deviation for all developed nations. However, this provision of healthcare tailored to patient benefits and based on costs, quality, and access is unfortunately implemented in too small steps. The social challenge now is to reorganize the provision of healthcare in all European countries in line with these insights. This could take place by analogy with other industries in which in the past use of IT has led to massive changes.² An important driver will be the patient, who demands optimized healthcare provision – which will only become possible and financially affordable with the intensive use of IT solutions. At the same time, the European countries must abandon their individual solutions and adopt internationally proven and scientifically acknowledged standardized solutions – such as the Bosch Telehealth system with over 150,000 patients receiving telemedical care.

These effects in the healthcare sector are examined in the “Strategic Intelligence Monitor on Personal Health Systems”³ (SIMPHS 2) study concluded by the EU in 2012. After SIMPHS 1 showed that technical prerequisites for telemedicine are largely met, SIMPHS 2 to innovation regarding the introduction of telemedicine in the respective. According to the study, the barriers are particularly high in those countries with a large number of stakeholders (patients, health insurers, rehabilitation providers, hospitals, practicing physicians, independent

healthcare professionals, medical technology manufacturers, etc.) with divergent interests. Countries like the UK and Denmark, which have a strong national health service, are able to implement new solutions more readily than a country like Germany, albeit still more slowly than the rapidly emerging countries in Asia, Africa, and South America, where we can expect to see innovations in the coming years. The reason is that many patients who are self-payers privately define and finance the services they require in these countries. PWC has also recently substantiated this in an interesting study.⁴

BISE: We can observe that although new information technologies are developed over a period of many years and in close cooperation with the health sector, their implementation nevertheless appears to be extremely difficult and complex. What are the main reasons for this in your opinion?

von Baer: I see one reason in the heterogeneous customer expectations towards the precise implementation details. Each stakeholder wants to derive the maximum gain for its group. If this is not as high as expected, stakeholders will be less inclined to support the implementation or the implementation is blocked.

In the healthcare sector, in particular, especially in Germany and a few other European countries, it is quite simple to block innovations with simple reference to data protection. Patient-related information, especially if available electronically and therefore in processible form, is seen as an asset which is worth protecting. Interestingly, however, data protection in German waiting rooms or at doctors’ surgery and hospital reception desks is a different story. Not to mention the information flow in multi-bed rooms between patients themselves as well as during doctors’ rounds.

The health sector has not yet achieved the same level of transparency in service provision and quality in comparison to industrial and other service companies. Many reject it on data protection grounds, even if their motives may actually be of a very different nature.

¹Cf. Mertens P (2009) Fehlschläge bei IT-Großprojekten der Öffentlichen Verwaltung. 3rd edn. Working paper No. 1/2009. http://www.wil-mertens.wiso.uni-erlangen.de/veroeffentlichungen/download/SWP_Arbeitsbericht.pdf.

²Cf., for example, “The Digital Dimension of Health”, Report of the Digital Innovation in Healthcare Working Group 2012, p. 6.

³<http://is.jrc.ec.europa.eu/pages/TFS/SIMPHS2.html>.

⁴<http://www.pwc.com/mhealth>.

This is where I believe it is up to governments to promote implementation with voluntary and legislative measures. Ultimately the aim must be to reach the best possible benefit for the patient – and that is potentially all of us – independently of individual interests.

BISE: Two more current buzzwords are “mobile health” and “App economy”. Again, we can note developments in the field of business and information systems engineering taking place in close cooperation with the healthcare sector. One example is the EU’s eHealthMonitor project, in which Web 3.0 concepts are utilized for the development of patient-centered knowledge spaces that can be accessed via mobile interfaces. Must we anticipate that, perhaps even in the foreseeable future, hospital information systems as we know them will be substantially complemented or possibly even completely replaced by App-based solutions?

von Baer: As mentioned above, many barriers still exist that stand in the way of a standardization of processes and their underlying information systems. The past has shown that government intervention has proved less successful than voluntary approaches that have an anticipated economic benefit (e.g., lower charges for electronic health insurance billing as opposed to paper billing in the primary care sector). If such economic incentives exist in the future,

the information systems will voluntarily “open up”.

Access to the diverse patient data stored in many different databases will in all probability take place via meta-platforms. They offer the possibility to integrate data on the basis of distributed data management. The systems for accessing the meta-platform will almost certainly be App-based and permit automatic context- and user-related data access. However, department-specific IT systems on the other hand are less likely to be replaced.

BISE: Finally I would like to ask you a question that is particularly likely to interest our younger readers: What are the opportunities for young entrepreneurs from the fields of business and information systems engineering, information science, industrial engineering, or medical informatics in the rapidly expanding billion euro market for health telematics in Europe – and what specific risks must they be prepared for?

von Baer: First, I would question the size of the market that you claim. Despite the widespread euphoria, it is by no means certain that a single billion-euro market for health telematics will develop in Europe, especially if the single European nations fail to harmonize their systems. There is the risk that many smaller local markets will develop offering less economies of scale. This may also hinder the continuous development of the systems.

Conversely, however, this market situation also provides many opportunities for young entrepreneurs. Whereas in other fields of industry, the markets are dominated by large, established providers, health telematics still has to catch up. In many cases, there is a demand for solutions with a manageable amount of complexity that can also be provided by smaller companies or startups. With some fortune and active marketing, these outstanding new solutions then generate demand among many other users.

On the other hand, due to the high demands, many health telematics solutions can only be produced by small companies at great expense or a high level of risk. This applies above all to regulatory requirements arising from the Medicinal Devices Act and medical data security. In this context, young entrepreneurs would be better advised to contribute their skills and energy to partnerships with established larger partners. And finally, they should cast their eyes across the borders, where demand for affordable health services in the rapidly growing emerging economies as well as in developing countries will lead to highly innovative business models. Developments in these countries could lead to the European market being overtaken more rapidly than anticipated.

BISE: Dr. von Baer, thank you very much for this highly interesting interview!