

Talking point

eHealth: Industry 4.0 can serve as the model for digital healthcare

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The healthcare sector uses advanced digital equipment that is supposed to accelerate medical progress and at the same time ensure economic efficiency. However, the gaps that exist are extremely worrying. In many highly developed advanced economies, and especially in Germany, there are already signs of the coming challenges connected with predicted population ageing and the associated shortage of doctors and the pressure on costs in the healthcare system. Here, technological progress in all its facets, from teleconsulting right through to 3D bioprinting, can dampen the increase in healthcare costs without adversely affecting quality. However, before this potential for boosting macroeconomic efficiency can be tapped there are economic, legal and societal obstacles that need to be surmounted (with regard to data protection, remuneration systems, education and network expansion, for example). The first steps in the right direction have already been taken – albeit with extreme caution and circumspection in some of these cases. In this respect it can certainly help to take a look at the industrial sector where digital technology is already making inroads under the “Industry 4.0” moniker.

Digital technology is on the advance, but at differing intensities in the personal and commercial spheres. The healthcare sector, too, has long been making use of the latest digital equipment that is intended to accelerate medical progress on the one hand, and to ensure economic efficiency while cost pressure intensifies on the other. However, even in the healthcare sector there are niches which have hitherto remained largely untouched by digital technology. Examples are the sending of medical reports and the referral process from general practitioner to specialist.

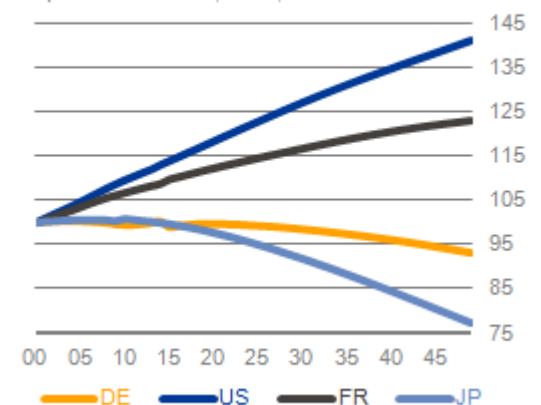
Such digital gaps are of concern because the challenges facing many very advanced economies are already now becoming apparent in the form of predicted population ageing together with the associated shortage of doctors and cost pressure in the healthcare system. That is why especially in Germany, with its specific demography, it is absolutely essential to reap the benefits associated with digital healthcare – ranging from diagnostics at the general practitioner's surgery, treatment in hospital and home care right through to the licensing of new drugs.

Telemedicine and 3D printing in particular offer huge potential for boosting efficiency in a variety of areas. On the one hand, patients can now use advanced telemedicine to immediately consult the appropriate specialist regarding their symptoms, even over long distances. Such teleconsultations make treatment more efficient, simply because they save patients the numerous journeys and waiting times involved in seeing a specialist.

Telemedicine offers considerable potential to boost the efficiency not only of the patient-doctor relationship but also of the relationships between doctors themselves. The technology now enables the local doctors treating the patients to directly involve a highly qualified specialist at a different location. Unlike before, this can now take place without a time lag, because the specialist at a distant location can access all patient information in real time – exactly like the local doctor administering treatment to the patient. This type of teleconsultation is probably only the beginning of a wide-ranging development. It is, for instance, entirely conceivable that the outside specialist could also participate remotely in the required operation (especially with the aid of augmented reality technology), although initially this will undoubtedly be more of an advisory function to the surgeon performing the operation locally.

Germany facing a special challenge

Population numbers, index, 2000=100



Sources: OECD, Deutsche Bank

Beyond the two levels of the doctor-patient and doctor-specialist relationships, telemedicine also provides completely new opportunities to boost efficiency in a third area – namely nursing care. Smartphones and wearables (i.e. garments and accessories fitted with sensors and actuators) could certainly enable patients to live far more independently than before without having to forgo immediate assistance in case of an emergency. For example, one obvious option is to add more functionality to the smartphone apps already successfully used by amateur sportspeople so that they automatically send out an early distress call as soon as the user's vital signs become critical.

The developments in 3D printing also open up interesting opportunities. For instance, 3D bioprinting, where organic tissue such as skin cells is printed three dimensionally, should soon make it largely unnecessary to conduct the standard cost-intensive and ethically debatable pre-approval substance testing on animals (especially in the dermatological field).

As these four examples show, modern technology can improve medical care, reduce the inconvenience experienced by patients, make the deployment of medical staff more efficient and simplify the approval processes. Modern technology is thus ideal insofar as it halts the hitherto inevitable rise in costs in the healthcare system without reducing the quality of care. This effect is all the more important given the unequal population distribution. The scope for improving efficiency in economically weak, sparsely populated rural areas is particularly pronounced.

However, before this huge potential for improving the efficiency of the entire economy can actually be tapped, there are economic, legal and socio-political obstacles to be surmounted. There is an urgent need for a societal consensus on the handling of personal data, which will then be anchored in a consistent legal framework that applies across the largest possible geographical area.

These demands on their own are already very ambitious. On the one hand, the restrictions on the collection and usage of personal data must not be defined too laxly, in order to prevent improper interference with individual rights (especially informational self-determination). On the other hand, however, these restrictions may not be so stringent that they directly stifle the economic potential that is so absolutely vital given current demographic developments. One specific issue, for example, is the potential conflict between advanced analytical methods, which can lead to personalised efficient therapies on the one hand, and the unauthorised use of such data which constitutes a major breach of fundamental individual rights on the other.

Solutions in the ambitious area of data protection and data security are thus urgently required. Furthermore, there is an urgent need for sustained network expansion efforts. After all, only high-quality networks can guarantee that the relevant data for medical treatment arrives quickly and reliably. So the issues at hand are not only infrastructure financing but also modern network management, especially net neutrality. This is in turn a highly emotional topic, characterised by a clash between hitherto seemingly irreconcilable interests.

So some changes are still required not only in these general policy areas but also in the healthcare sector itself. For example, the costs of e-health services, such as the above-mentioned teleconsulting, still cannot be reimbursed, as they are not currently approved by health insurers. Longstanding rules concerning the acceptance of medical services must thus be revised before digital healthcare can really get going.

To sum up, we can say for certain that the healthcare sector will undergo fundamental change. The primary driver of this change will be the demographic shift, while the primary instrument will be technological progress in all its forms, ranging from teleconsulting to 3D bioprinting. This fundamental change will result in a further blurring of the previously clear distinctions between the largely regulated healthcare sector and the non-regulated segments such as fitness, wellness, internet and consumer electronics. New competitors with completely new offerings and new business models will thus also force their way into the lucrative healthcare market. These new providers are bound to prioritise quality and security requirements in ways that are unfamiliar to the incumbents in the healthcare sector. Examples of this already unfolding development are smartphone apps, but especially also smart watches offered by firms from the internet, consumer electronics and telecommunications segments. These products constantly measure vital signs, which they then use to provide fitness and dietary advice – which is interesting not only for sporty people in good health, but also for the chronically ill.

Given the dynamism of the healthcare sector, those working in the realms of politics, business and research must urgently address the issues pertaining to digital technology. They mainly comprise data protection, the remuneration system for medical services, training and further education and the funding landscape, but also

include network expansion. The first steps in the right direction have already been taken – albeit with an extremely cautious and circumspect approach in some cases. Examples of this are the planned e-health law in Germany, the initiative started by the German health insurance schemes on teleconsulting, the EU initiative on the security of healthcare apps, and the planned EU data protection charter.

These steps should therefore be followed very soon by further steps, as the looming demographic and financial challenges will have a profound effect on the healthcare segment. Accordingly, the healthcare sector needs equally bold and visionary initiatives to further promote digital technology. A look at the manufacturing sector can certainly be of use. Digital technology is already making inroads there under the “Industry 4.0” moniker.

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