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# Digitisation 4.0: The transmission of patient data

## New methods of patient empowerment and communication with doctor

In the Mühldorf clinic, patients have been equipped with a 'smart visit' app in a pilot project to gain experience with a new instrument of data communication.



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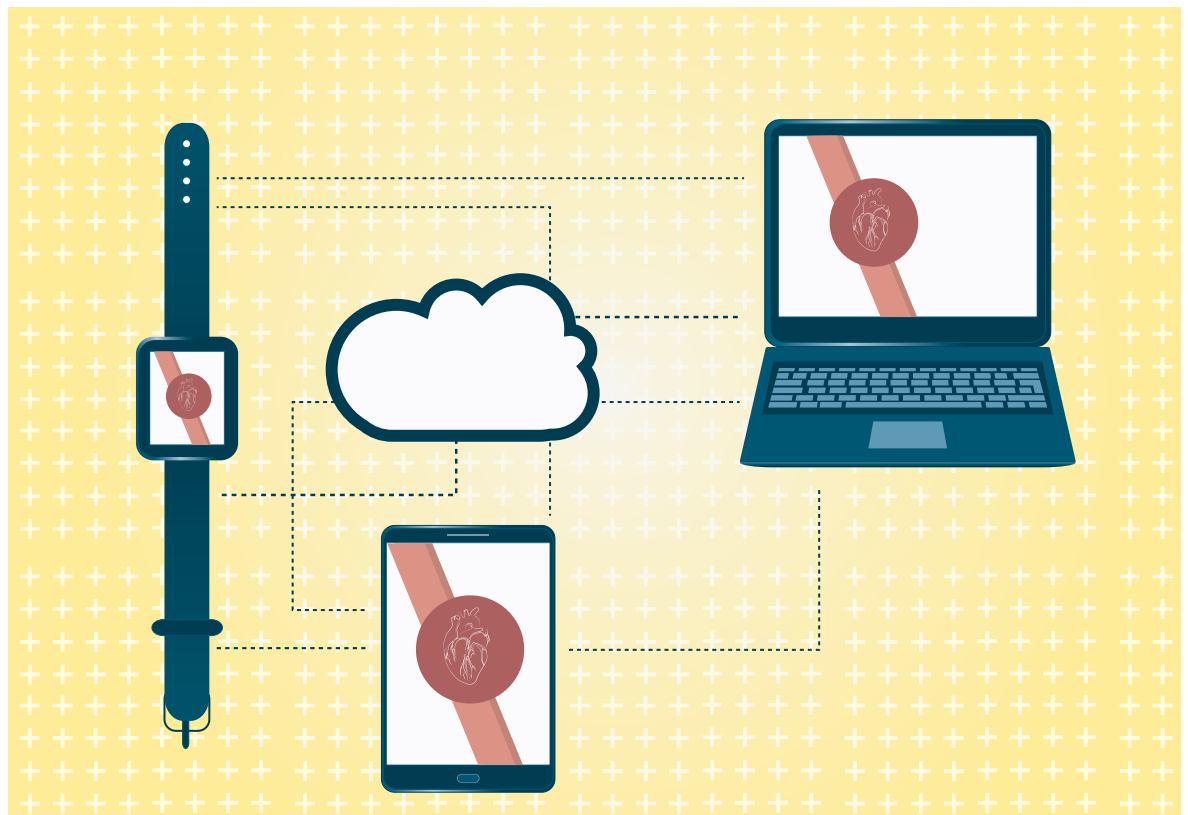
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There are numerous apps to assist people with a broad range of issues relating to health and illness, whether in the form of guides, assistance in illness situations or fitness trackers measuring data. Many people use these apps to log their physical status and monitor it for themselves. By contrast, there is still a large number of people who document their blood pressure, or other similarly measurable values, on paper. Both these groups have something in common: they are recording this information for themselves. A human advisor, such as a doctor, is initially unable to make use of this information. The doctor can only access it when the

user shares the information "manually", providing the doctor with the information in the form of a paper record, a scanned pdf or an exported table. This is inconvenient, and has other disadvantages too. Transmitting health-related information via email, for example, could be problematic from a data protection perspective.

Smartphones can do all of these individual functions: recording, storing, evaluating, and visualising data. They can also send data in compliance with data protection guidelines. So why not try to bring all of these functions together within one app, and share the recorded information with a trusted

doctor? Patient empowerment under medical supervision. As an initial approximation, this would offer patients and healthcare workers a good few advantages, with some economic considerations.

### A common interest develops

This idea led to the project “Digitisation 4.0 - transferring patient information from Apple's Health Kit and Care Kit” (HealthOn 2017). Initially, the app was intended to be configured by a doctor to suit a patient's medical needs. The patient would then be able to work with these specifications—collect data, use reminders to take medication, for instance—and send this information back to the healthcare professional in question. This makes the app a communication interface between the doctor and the patient. The technical capabilities of the Apple Health Kit and Apple Care Kit frameworks enable health-related information to be stored centrally on an Apple smart phone, which can be read and processed further if the app's user consents to it. Upon approval by the user, this information can be sent to the doctor's office using end-to-end encryption, and without intermediate storage on an Internet server.

Doctors are subject to technical and organisational conditions. For example, a clinician has to rely on the on-site hospital IT system having the appropriate functionality to use patient information in this way. Thus, the doctor's interest in using and evaluating patient information is not the sole determining factor; the interest of the organisation itself (ie the clinic and its management) are also necessary to contribute to the success of the project. This means that multiple parties need to come together. As a result, the IT partners aycan CEO Stephan Popp and Mühldorf am Inn clinics jointly presented this project proposal to Entscheiderfabrik (Decision Makers Factory) in 2017.

### Embarking on the journey

At this project stage, it became apparent that this novel data exchange did actually impact on the clinic's landscape. The electronic exchange of medical information, which is common practice between institutions (clinic and health insurer) is likely to be desired, if not requested, more and more by patients. The project was selected from among five finalists in Entscheiderfabrik and other interested clinics (Ategris, Sozialstift, FACT) and IT partners, particularly KIS manufacturers and network partners (Cerner, März AG), were prepared to launch the connection.

While the development work for what became the SmartVisit app progressed, in June 2017 the Entscheiderfabrik summer camp saw the current status reported on, and additional conditions and specifications discussed. Specific, concrete communication issues were clarified, and finally, in October 2017, it was time: the app reached the final development stage, and the first connection to the hospital IT system (Cerner Medico) in the Mühldorf regional clinic was set up. The server for communication with the app was installed – all that was left to do was to launch it.

### Gaining experiences and insights

The on-site installation was made possible thanks to players on both sides agreeing and being prepared. It was possible to access the hospital IT system with just a few clicks, providing authentication for the clinicians.

“THE APP CAN BE USED AND DEVELOPED AS A PERSONAL MEDICAL FILE OVER WHICH THE PATIENT HOLDS DATA SOVEREIGNTY”

The user authentication is carried out with a photographed QR code. Subsequently, the app can be configured using simple drag and drop. From the point of the healthcare profession, it does not take long to configure the app. For the user, too, the app is easy to use after a brief introduction. This is supported by the included guide.

The app offers a medication plan, records fitness values, health-related information, questionnaires and exercises. Furthermore, it supports the secure, bi-directional exchange of documents. For the first concrete attempt, the fields of diabetology, gastroenterology (reflux) and pain management were selected. Neurology (here, Parkinson's disease) was added in the second attempt. Interested physicians were available from all the specialist departments in the Mühldorf am Inn clinic.

It took until December 2017 for patients with suitable smartphones to be available following the distribution of various manufacturers' smartphones across the market. This experience in particular triggered the development team to set to work on

Android systems to begin to also provide the functionalities on this platform, in line with the specification. This expansion work is currently underway. One key focus of this is secure information transfer.

### The app as a medical instrument

An app of this kind is not a sure-fire success, from a medical or organisational perspective. It must first be established in both the doctor's and patient's mind as a tool to support patient compliance and patient empowerment. It makes a difference whether a doctor should require a patient to meet various stipulations and thereby attain compliance and empowerment, or whether a patient should independently carry out a range of therapeutic interventions. The extent to which the usage of the app can improve patient compliance in the long-term remains to be seen. In future, strengthening of "media literacy" will certainly be required to enable it to be used on a sufficiently wide scale as a medical tool, and to ensure that patient selection is not too strongly weighted in terms of those who are interested.

In the first approach mentioned, the app is now filled with simple, validated medical content and questions for the patient, which are provided with medical supervision. It is expected that development will be required here in the future. The need for development will also impact data aggregation and the recognition of patterns. To date, the information recorded has been collected and transmitted. It seems very important that a doctor can evaluate these records in detail, independently, but this is only possible to a limited extent. The introduction of one IT tool—the app—therefore leads to a need for additional IT tools.

The project was presented at a medical training course in the Mühldorf clinic, and was met by significant interest on the part of the doctors. It even provoked a discussion regarding the exchange of medical information. Topics such as the secure exchange of information were hotly debated during this. However, it appears that the basic need, and the requirement on the part of medical professionals, is a given, as is their readiness for it.

### Intersectoral connection - individual patient file meets institutional patient file

An app of this kind can only make full use of its functionality if it makes patient information available to multiple healthcare professionals, or, from the

patient's perspective, if the patient can make information available for multiple healthcare professionals. As such, the app can be used and developed further as a personal, individual medical file over which the patient holds data sovereignty—with regard to the Apple platform, not least in conjunction with Apple's electronic health file dubbed "Health Records". The information can then be shared with other healthcare professionals with the user's permission.

Looking at additional ways to view the sharing of patient information, another sub-area of the project comes into play: how the patient information can be integrated into an IHE-based inter-operability platform still needs to be tested. This should make it possible for information from authorised users to be available both within an institution and across institutions. The prerequisites for this are currently being created. ■

## KEY POINTS



- ✓ Many people use apps to log their physical status and self monitor
- ✓ Smartphones record, store, evaluate, and visualise data and can also send data in compliance with data protection guidelines
- ✓ The project "Digitisation 4.0 - transferring patient information from Apple's Health Kit and Care Kit enables a communication interface between the doctor and the patient
- ✓ The app offers a medication plan, records fitness values, health-related information, questionnaires, exercises and document sharing
- ✓ Doctors' and organisations' interests in using and evaluating patient information are both equally important so cooperation is key
- ✓ The project was presented at a medical training course in the Mühldorf Clinic to an enthusiastic response
- ✓ The future involves looking at additional ways to view the sharing of patient information which leads to the question of how information can be integrated into an IHE-based inter-operability platform