

Real time data:

New opportunities for healthcare

The combination of speech-based data acquisition with an AI system will deeply change medical processes.



We talked to Martin Peuker, CIO of the Charité Universitätsmedizin Berlin:

A nephrologist dictates the clinical reports of a patient into the electronic patient file on her tablet. In the background, an algorithm evaluates the information. If there are indications of acute kidney failure, the doctor is alerted. In the past, this was only possible retrospectively, i.e. the data was recorded and subsequently evaluated. In the future, we want to make this data usable in real time—even during data acquisition. For this purpose, we have created a speech-based infrastructure at the Charité Universitätsmedizin Berlin.

The Charité Universitätsmedizin at a glance:

- Almost 100 clinics and institutes organized into 17 Charité Centers
 - 4 Campuses with 3,001 Hospital beds
 - 4,255 Clinicians and scientists taking care of 152,693 inpatient, 692,920 outpatient cases and 5,442 births
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Comprehensive rollout without stumbling blocks

Charité Universitätsmedizin Berlin has been using speech recognition in all its locations for about 1 year. There are now 1,200 users in the system using Dragon Medical from Nuance. The solution is within the leading clinical system i.s.h.med by Cerner, provided on thin clients from VMware. In addition to the medical professionals, speech recognition is also used by administrative colleagues and other departments, since the solution is available as a stand-alone application for every system—both for the hospital information system and for emails or word processing.

The fact that the number of users has surpassed a thousand within a year is mainly due to the excellent recognition rate. Dragon Medical features a deep medical vocabulary and an extensive general recognition vocabulary. Only for neuropathology we needed to adapt the existing vocabulary to improve recognition accuracy. The ongoing vocabulary management can be done by the users themselves. They can add words to their personal voice profile. Words that are frequently added by several users are transferred to the central recognition vocabulary by IT. User administration—which in this project is still one of the „most complex“ IT activities—is also centralised and takes about 1 minute per user.

In order to implement this comprehensive speech-based infrastructure, we chose to install an “on-premise” voice cloud. This results in a sizeable, and manageable IT effort, and ensures that we always have an excellent connection. For us, it was also the simpler way to set up campus-wide voice recording in accordance with the uniform GDPR. In addition to the implemented voice cloud, we are pursuing further options for teamwork and mobile collaboration in the future, e.g. in the form of cloud services or hybrid scenarios.

From IT's point of view, we conclude that the rollout and the acceptance of speech recognition is a project with maximum positive results. This project was a proposal to the medical professionals at Charité which did not require any persuasion as it was speaking to a great demand. From today's point of view, the challenge of using technology to convert speech into grammatically correct text is now a challenge of the past. Our focus is on the future and on the opportunities of a speech-based infrastructure, for example, in the field of mobility.

The future: mobile and intelligent

Mobility is a decisive and trendsetting factor for the overall digitisation of Charité. For me, it is a guarantor of the future that permeates all processes of patient care. Accordingly, we have a large mobile sector with currently over 800 iPads in use—a tendency that is increasing. A first pilot project with speech-based data acquisition on tablets delivered very good recognition results despite the background noise often being much more pronounced during documentation than when working at a terminal. Speech recognition is also available via the Charité VPN on business trips or at home—including personal recognition vocabularies and voice profiles.

Thus, we are in the process of creating a speech-based infrastructure at the Charité—stationary, mobile and remote—which will ultimately lead us to data usage in real time described above. This is expected

to have an enormous impact on medicine and its processes—especially in connection with the use of artificial intelligence.

In this context, we will not “just” only develop algorithms that help to optimally and individually adapt processes to the patient. In the future, contraindications for drugs will be detected in real time, as will the relevance of certain data for clinical studies and basic research. Administrative processes ranging from coding and billing to collaboration with the medical service of the health insurance funds can also be automated.

It is imperative that we shape the challenges of digitisation not only with, but also for, our clinicians. With the creation of a speech-based infrastructure in connection with the use of artificial intelligence, a decisive building block has been laid for the overall digitisation of the Charité.