Where the future begins

Speech recognition at the Mannheim University Hospital

An orthopaedist talks to a patient; an artificial intelligence system records the conversation and extracts relevant content such as anamnesis and medication. The documentation writes itself.

Nuance presented the scenario described here at the HIMSS Global Conference 2019 in Orlando in the form of an examination room with *Ambient Clinical Intelligence*. It was an innovation highlight of the world's largest conference on digitisation in healthcare.

Dr. Lennart Jahnke, Chief Digital Officer at Mannheim University Hospital, attended the HIMSS conference and was thrilled with the demonstration.

“Nuance's AI demonstration was impressive. It is amazing what is already technically feasible today. In the future using AI, we will have digital assistants who will communicate by voice activation and support clinicians in many areas.”

However, this is not yet the case in Germany. Dr. Jahnke and his team from the Mannheim University Hospital have already introduced Dragon Medical Direct speech recognition for the HIS i.s.h.med from Cerner.

“Speech recognition is an early step in digitalisation,” says Dr. Jahnke. “When digitising processes, speech recognition and speech control should therefore be considered early.”

Dr. Jahnke and his colleague Dr. Benjamin Hoch, specialist in gynaecology and obstetrics, describe their experiences here.

The Mannheim University Hospital at a glance:

– Located in the centre of Mannheim and the Rhine-Neckar Metropolitan Region with 2.4 million inhabitants
– Inpatients: 51,773 per year with an average stay of 6.7 days
– Outpatients: 217,120 per year
– Emergencies: 67,791 per year
– Births: 2,032 (2018)
– Clinicians: approx. 560

The project at a glance

The Mannheim University Hospital acquired speech recognition software for the HIS i.s.h.med via the Nuance partner Cerner.

In 2017, 75 licences were ordered. The clinic now uses 560 licences for Dragon Medical Direct and is investigating further application possibilities, for example for administration or mobile use.

Speech recognition is provided by central servers in the Citrix environment on IGEL terminals.

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Questions from Management

We were able to answer them all positively

The purchase of more than 500 Dragon Medical Direct speech recognition licences and the corresponding infrastructure is “an important investment, so I can only advise you to involve your management from the beginning”, says Dr. Lennart Jahnke.

At the Mannheim University Hospital, the management is part of the IT board. Together, they wanted to ensure that patients receive their patient letters directly when they were discharged. However, with stays of less than 48 hours in some cases, this is difficult to achieve without technical support.

But is the investment also worthwhile financially – and when? Will the technology meet the requirements of the users? The University has 30 clinics and institutes, different user personalities and processes established over many years. Are recognition accuracy and use ready for hospital-wide use?

“We were ultimately able to answer all these questions positively,” says Lennart Jahnke. That finally convinced the management.

Their support was absolutely necessary, but not only from a financial point of view. Because parallel to a digital documentation workflow, changes in the organisational structure would make the internal processes more efficient.

“Of course, we asked ourselves whether we wanted to continue using personnel resources for our own typing pool or whether we could better deploy our employees in other areas. We opted for the latter. Organisational changes of this kind must be supported by the management and communicated accordingly within the company,” says Dr. Jahnke.

The central typing office no longer exists and employees work in other areas. The clinicians have also taken on new tasks, some of which were previously carried out by the typists.

Despite – or precisely because of – these organisational changes, we have achieved our goal and can now deliver patient letters more quickly to the patient, says Dr. Jahnke.

“The best solution for us.”

Why the University Hospital chose Dragon Medical Direct.

1) **Server based:** We can work independently of existing hardware and IT infrastructure. Dragon Medical Direct works in a Citrix environment with IGEL terminals in the HIS i.s.h.med from Cerner.
2) **Training:** The software is ready for use without further training of the voice profiles; this saves users time. However, application training to ensure optimal use and user satisfaction is essential – as with any project.
3) **Recognition rate:** The initial recognition rate is very good and improving continuously.
4) **Information security:** We have a full local installation that is GDPR compliant. The data does not leave our establishment.
5) **Hospital wide:** We decided to make speech recognition available to all clinicians – as part of the ongoing digitalisation in our hospitals and as a service for our clinicians.
6) **Compatibility:** Can be used with any software application, e.g. SAP, Word, Outlook.
7) **Intercultural competence:** Thanks to self-learning algorithms, users with accents achieve recognition rates just as good as German native speakers.
8) **Scalability:** We can provide speech recognition via the central server for all 560 users.
9) **Roaming:** Profile roaming allows clinicians to access their speech-recognition system from any workstation.
10) **Simplicity:** Implementation, roll-out, maintenance and use are easy; the stability is very good.

Tip: ConText Care

“The medical dictionary provides a large and valuable data set, so you don't have to worry about that.

The recognition of medical texts or drug names is much better than I expected.

However, names of referring clinicians and employees should be entered centrally to complete the existing database.”

Benjamin Hoch, *specialist in gynaecology and obstetrics*

Change Management

“We had to show that clinicians save time.”

Clinicians' time is one of the hospital's most precious resources. Many colleagues therefore had great concerns about the speech recognition process, reports Benjamin Hoch, a specialist in gynaecology and obstetrics.

“For example, we now have to include the medical reports in the patient letter ourselves. In the past, we dictated these instructions to the typists who then inserted for example radiographic reports or histologic examination results. And yet we are still faster overall with the language-based approach,” says Benjamin Hoch.

In the overall view, it is necessary to measure the actual typing speed, which is often significantly lower than the clinicians' impression. We needed to consider the effect on proofreading of the recognised texts, because this task should be done no matter how the patient letters are created, along with the efficiency gains for internal documentation.

Key users motivate colleagues
Specialist Hoch was a key user and involved in the speech recognition project at an early stage. This enabled him to quickly identify the problems of his colleagues. It quickly became clear to him that the need for user training was greater than expected.

“In order to use all the functionalities, training is required. I often did this in the morning meetings,” says Benjamin Hoch. He recommends scheduling training from the outset during the regular training periods so as not to burden clinicians further. With Dragon Medical Direct, it is not necessary to read training texts aloud. The training courses focus on voice commands and working with text blocks.

“You can't leave colleagues alone that are struggling with the new way of working,” emphasises Dr. Jahnke. “The workflows of the individual clinics are very different. Some clinics therefore benefit extremely well, others less.”

All in all, the speech recognition project was a success. Many colleagues who knew about speech recognition from their private lives were positively surprised and are delighted that the management introduced the software. Now Dr. Jahnke wants to involve more users, including administration.

Whether for reimbursement or compliance processes like MDK, there is still a lot of potential.

Lack of specialists

“Meanwhile we have big problems to getting access to specialists, especially in the patient care sector, that we cannot burden them with documentation.

Instead of filling out forms or issuing confirmations for half a working day, skilled workers should be doing their actual job.”

Dr. Lennart Jahnke,
Chief Digital Officer

Experience digitisation: “Every minute gained is well worth it.”
Patients are impressed and positively surprised by the transcription by “magic hand” and the technical possibilities of the 21st century.

“I usually tell my patients: If I have misunderstood something, please correct me on the spot when I dictate the summary of our conversation. This is received positively,” says FA Dr. Hoch.

The greatest advantage, however, can be realised in the documentation of progress notes.

We save an enormous amount of time with internal documentation, he reports. “We make a lot of telephone calls with patients about microscopic findings and the resulting measures. These calls often take ten to fifteen minutes. Dictating these telephone conversations in three minutes is fantastic.”

The dictation of discussions with other clinicians about a patient's case or of conclusions for the interdisciplinary tumour conference also saves time compared to handwritten or typed documentation.

Dr. Hoch sees further advantages for the creation and quality of surgery reports. In addition to saving time, speech recognition has the main effect that the reports are written much more individually and thus contain more details than the existing surgery report templates.

All this means that clinicians at the university hospital spend less time on administrative tasks. Time that ultimately benefits patients.

“The increase in efficiency through speech recognition generates many minutes over the course of the day,” says Benjamin Hoch. “Every minute that can be spent answering the patient's questions is well worth it.”

24x7

“Thanks to speech recognition, text modules are now more frequently replaced by free text. I see this as a gain because patients are dealt with individually.

Additionally, speech recognition can accompany me everywhere and at all times: on the ward, at night or in the emergency department.”

Benjamin Hoch, *specialist in gynaecology and obstetrics*