

Transforming the Healthcare Together

openEHR supports innovation

Initiatives in the world proves
the added value of openEHR

openEHR
International partners
transforming healthcare



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openEHR supports Innovation

Initiatives in the world proves
the added value of openEHR

Foreword Ale Houtsma

We see the same problems in healthcare everywhere in the Western world: there is an increasing shortage of doctors, nurses and other healthcare providers; a high administrative burden is associated with this; healthcare is in danger of becoming insufficiently accessible; the affordability of healthcare is under enormous pressure; and healthcare is not sufficiently sustainable and therefore has a negative impact on the environment in itself, but will also increasingly be confronted with the consequences of climate change.

We are dealing with a many-headed monster, and a complex problem. The solution is therefore not simple and requires a broad approach, with more attention to prevention, autonomy and job satisfaction, and smarter working. First of all, we will have to shift our attention from treating illness to promoting well-being and health; prevention and the connection between the social and healthcare domains are key to this. It is important to prevent illness through healthy nutrition, a healthy living environment and social cohesion. This will increase the quality of life and ultimately reduce the demand for care.

We will also have to organize and disrupt healthcare differently, so that the autonomy and job satisfaction of employees increase again; healthcare providers will then leave the healthcare sector less often and continue to choose jobs in care. Making healthcare more sustainable – in the sense of reducing the ecological footprint – will also increase the appeal, especially (but not only) for young people. But technological innovation is also an important key. On the one hand, this involves digitizing the provision of healthcare processes, and on the other hand, digitally exchanging and sharing data within and between the social and healtcare domains. Both interventions are necessary to be able to work smarter. In both areas, not only is the need great, but also the urgency. Digitization throughout the chain is necessary for the primary use of data, but certainly also for secondary use: for example for transparency, shared decision-making, outcome indicators and value-based healthcare, quality improvement, quality registers, scientific research.

In the Netherlands, we have invested heavily in standardizing data over the past decade, for example by opting for healthcare information building blocks. We must certainly continue with this. But it is a long-term and tough approach, which necessarily also involves a lot of energy being put into interfaces between the own solutions of each healthcare provider.

That is why I firmly believe that in addition to standardizing data, we should also focus more on standardizing applications and technology. Sometimes that seems taboo in our country. But the ICT & Health World conference of 2025 provided a large number of great examples from other countries.

I walked around there with great interest and participated in several sessions, from my perspective as a board member and supervisor in healthcare, and chairman of the national data governance committee for quality registers.Great examples of standardizing data came from Catalonia, Australia, Sweden, Finland, Norway. But due to the greater influence of national and regional governments, in those countries the choice for one record based on standard technology is often a no brainer.

I think that in the Netherlands we also should have the courage to choose standard technology and the joint use of one application and one record. Keeping this in mind the choice for openEHR as a technological platform for data storage and FHIR for data exchange seems promising. Supplemented with OMOP for data exchange for secondary use. The ICT & Health conference provided a nice overview of practical examples, and in this bundle you will find a reflection of the same experts.

With these kinds of examples we are truly able to bring about digital acceleration if administrators, health insurers, governments and citizens are prepared and have the courage to jump over their own shadow and opt for the common interest. That probably also requires a different governance, for which we could also find some inspiration in the countries mentioned before. Only then can we really solve the problems and continue to realize our well-being and care sustainably with good quality, accessibility and affordability.



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VITALY

Introduction

At the end of January 2025, the ICT&Health World Conference in Maastricht and the Highmed Symposium in Berlin took place. What interesting days and what impressive sessions we were able to attend. We don't want to keep the information given in these sessions to ourselves, that is why we created this document with all the important takeaways.

The accessibility and quality of healthcare are under enormous pressure. The question of how we can keep healthcare affordable and how we should tackle the increased healthcare demands for the aging population are topics that are being discussed on the different board tables frequently. With an increased demand for healthcare and a growing workforce shortage, this is becoming more and more of a challenge.

In the Netherlands, we are not alone in this challenge. All over the world, they are looking for solutions. Are we doing well in the Netherlands? Are we on the right track? How are those other countries doing? We were able to learn a lot during the ICT & Health World Conference and the Highmed Symposium. Incomparison ourselves with other countries, we think we can do much better. If we really want to change healthcare in a radical and constructive way, we have to look beyond data exchange and focus more on data availability and a Longitude Record.

In this document you will read many stories - which are presented at the ICT&Health World Conference - of countries that have opted for a patient-centric IT solution. In al these presentations a longevity file is used on an open platform for both primary and secondary care and secondary use. This platform is then used by various suppliers to add value to the healthcare process. During various sessions it became clear that the choice for a central solution does not only come from an ideology, but also because these countries and regions had a financial challenge to obtain sustainable funding for their IT landscape in the long term.

In addition, it will be necessary to delve deeper into the collaboration between the international standards HL7Fhir and openEHR. We will discuss international projects that enable interoperability between FHIR, openEHR and OMOP. Finally, we will also look into the governance of data models within the Netherlands and how this is arranged at an international level within openEHR international.

We would like to thank everyone who contributed during ICT&Health World Conference as well as afterwards in the preparation of this document. Without you we could not have done this. We added in the at the end of this document all the links to the videos and presentations that are given. We include also the Links from the presentation held a day later at the Highmed Symposium.

We hope you enjoy reading.

Jan de Lange en Igor Schoonbrood

2. Transforming Healthcare Together Track at ICT&Health World Conference

Session 1:
HL7 FHIR and openEHR communities collaborate towards better data availability.

By Igor Schoonbrood, Enterprise Architect Maastricht UMC; Rachel Dunscombe, CEO openEHR international; Stefan Schraps, openEHR Board Member and Vice President Business & community Management; Rien Wertheim, founder and CEO at Firely

In the bustling atmosphere of a world conference filled with passionate voices and groundbreaking ideas, the session titled "Transforming Healthcare Together" commenced. The stage was set, and as attendees found their seats, a familiar figure stepped forward to welcome everyone. Igor Schoonbrood, Enterprise Architect of Maastricht University Hospital, took the microphone with a warm smile.

"Welcome, everybody" he began. "A longside with Jan de Lange, we are thrilled to present eleven tracks at this prestigious conference. Today, I'll be your host for this session."

Igor gestured toward the vibrant backdrop of Maastricht University Hospital, expressing his pride in the institution. The conference was not just a gathering; it was a collaborative effort dedicated to exploring the forefront of healthcare transformation. "We have curated a diverse lineup of sessions focusing on topics such as standards, governance, tooling, and even artificial intelligence" he continued, hinting at the engaging discussions that lay ahead.

He then introduced a thought-provoking topic: the collaboration between openEHR and FHIR. "Why do we need openEHR? What does collaboration between FHIR and openEHR mean for us?" His questions encapsulated the essence of the conference, fostering an environment for deep dialogue on these vital subjects.

Before proceeding, Igor shared a recorded message from Rachel Dunscombe, the CEO of openEHR International. Although Rachel was unable to attend due to other commitments, she had important insights to share.

"Hello, Rachel Dunscombe here, CEO of openEHR" she began. "I want to extend my apologies for not being with you at ICT&Health World conference in Maastricht this year. Last year's conference was a wonderful experience for me, but I'm currently engaged in other meetings, including our first partnership meeting with SNOMED, which is truly exciting."

Rachel highlighted the progress made in 2024 and the ambitious goals set for 2025. "At the end of 2024, we signed a partnership agreement with SNOMED. Our aim is to work collaboratively to provide guidance for healthcare systems on how to implement SNOMED and openEHR together while ensuring consistent bindings across our various terminologies."

The collaboration was not limited to merely technical aspects, as Rachel emphasized the vital role of both clinical and technical communities in the process. "We're just kicking off our meetings now, laying the groundwork for future endeavors. We're also enthusiastic about our forthcoming work with HL7" she added.

Rachel's message illuminated the parallel efforts of strategic and technical groups within HL7, striving to align on their collective path forward. "We have made significant progress, including initial work on the International Patient Summary, and are excited to announce a mini-conference on June 2nd and 3rd in Amsterdam, focusing on actionable outcomes."

As Igor resumed the discussion, he expressed excitement about the global movement of openEHR and the many nations embracing its integrated records. "We're witnessing a significant amount of movement with openEHR across the globe" he



noted. “I can barely keep count of the countries we’re engaging with each week, from Australia all the way up to the Nordics.”

He continued to highlight the implications of openEHR’s impact on healthcare systems, including Greece’s upcoming utilization of openEHR for integrated records and anticipation of further announcements from other European countries. “We’re also seeing progress in Asia and are thrilled to be supporting the Spark Accelerator in Australia” he added.

Rachel’s recorded voice transitioned into detailing an exciting internal development: “We’ve just launched a new set of clinical governance that will enable us to effectively scale and collaborate with these international teams. This new initiative holds great promise for enhancing our community’s contributions” she emphasized.

Stefan Schraps, representing openEHR International in Rachel’s absence, was then invited to speak. “Thank you very much.” Stefan said, addressing the audience. “I’m here as a representative of openEHR International. I’ve been involved in Healthcare IT for the last 25 years and have served on the openEHR International Board of Directors for the past two years. My responsibilities include setting strategies, priorities, and growing the openEHR community.”

Rien Wertheim reflected on the origins of FHIR, highlighting the contributions of Ewout Kramer, their CTO. “Ewout and the team drafted the FHIR manifesto, focusing on ensuring that FHIR would be a technology standard applicable for software developers. They successfully leveraged technologies from logistics and finance, such as REST APIs and JSON, making it more relatable to developers.”

“What’s crucial” Rien continued, “is that openEHR is not just a newer option; it’s been around for 26 years as a technology standard. Our focus is on data consistency and harmonization. Data is fundamental, and everything should revolve around how to uniquely store and harmonize data across ecosystems.”

Building on this foundation, another participant expedited the discussion regarding the International Patient Summary (IPS). “I have a significant question regarding IPS, especially for our students here. The implementation standard for IPS is based on FHIR. If the world standardizes around IPS, what is the need for OpenEHR?” Igor asked.

Stefan Schraps took the floor. “The IPS is the International Patient Summary, and the critical point here is that it’s a summary. It represents a basic dataset agreed upon for data exchange between different stakeholders. It’s not about capturing everything but rather focusing on what is

essential. The implementation guide has gained traction worldwide and inspires many countries to create their own local specifications."

He continued, "But remember, IPS is a summary, not a source of truth. There will always be backend systems like EHRs or EMRs that hold the primary data. Here's where openEHR's role is crucial: FHIR focuses on health information exchange between systems, while openEHR is about the underlying data models and persistency. The synergy between FHIR and openEHR helps to achieve a more practical and standardized communication framework."

Stefan chimed in to elaborate further on the advantages of using openEHR in conjunction with FHIR. "First of all, it always comes down to the use case. For simple, isolated use cases, it makes sense to store data in FHIR and use this as a transport cache. But for more complex systems that rely on diverse data sources, using openEHR provides a robust framework. For example, take blood pressure data: while FHIR may offer four basic data points, openEHR can incorporate over 25 related data points, giving greater depth and contextuality."

He continued, "It's akin to watching an HD movie on an OLED screen compared to a black-and-white version. If you only rely on the four points in FHIR, you're missing the richness. The combination of both systems allows us to start with a solid foundation like the IPS while offering the opportunity to evolve into more complex scenarios later on."

As the discussion evolved, Rien interjected with a pressing need for collaboration in developing archetypes. "Of course, I want all archetypes mapped onto FHIR in the basic structure. Furthermore, I want to know what's happening globally with archetype development. There are many archetypes being developed in countries like Germany that are not shared internationally because they are considered 'not ready yet.' It's crucial to know early on that others are working on similar archetypes to promote collaboration."They also emphasized the need for a governance framework surrounding openEHR, stating, "openEHR is not just a technical standard; it's about governance. Maintaining archetypes and templates effectively requires robust governance to ensure that we capture the best practices from around the world. We need to harness developments from various regions so we can all benefit."

Stefan acknowledged these points and stressed the importance of establishing effective processes for sharing archetypes and other essential data models.

"Understanding the workflows within clinical processes, like surgical pathways or outpatient care, is fundamental to generating accurate archetypes that lend insight into the data. If we incorporate these workflows, we'll be better equipped to enhance the data we gather."

The conversation turned towards the importance of keeping archetypes generic to benefit a wider range of specialties. "It's vital to avoid going into non-specific specialists with our archetypes. We should focus on creating generic workflows to ensure that they are applicable and useful across multiple specialties" Stefan noted.

As the discussion came to a close, participants were invited to reflect on the pressing need for standardization and communication between various health systems to facilitate better data sharing. "The challenge lies in harmonizing the demands from the international community, as there are many different use cases and standards emerging from various locations. We need to establish our priorities clearly based on these needs" Stefan concluded.

As the session wrapped up, the attendees felt a renewed sense of purpose. The collective insights shared during the conference were just the beginning of what could be achieved through collaboration and a unified approach. Together, they would pave the way toward advancements that would ultimately shape the future of healthcare for generations to come.

https://www.linkedin.com/posts/rien-wertheim-7559653_openehr-fhir-activity-7292161471021543425-2Vy8?utm_source=social_share_send&utm_medium=member_desktop_web&rcm=ACoAAAFWaywBp84b7Ay-CMh_N2lR02Lu-omv3NwU



3. What can we learn from UCP and RSO South-Limburg

Session 2 part 1:
The Vision of a Seamless Healthcare Ecosystem in South Limburg

By Wim Eurlings, Director Director

In a world where healthcare knows no boundaries, collaboration becomes the heartbeat of effective patient care. Imagine a future where information flows seamlessly among all healthcare organizations, ensuring that every patient receives the precise care they need when they need it. This is the ambitious vision driving initiative in South Limburg.

Two years ago, a commitment was made to this vision, with aspirations of transforming healthcare delivery in the region within the next five years. This narrative is not merely about data; it's about creating an interconnected ecosystem that embraces competition while inviting organizations to join the cause of improved patient care.

The Data Ecosystem: A Path to Transformation

At the heart of this transformation is the concept of a data ecosystem. This is not just a buzzword; it embodies a strategic objective. The journey begins locally in South Limburg, with clear aspirations to build a solid foundation for organized care. By fostering discussions within the region, stakeholders can identify shared goals and pathways that will eventually scale to the national level. A key target identified by participants in this initiative is to accelerate innovation and transformation in healthcare. This can only be achieved if data is accessible to everyone, patients and caregivers alike. By making data available and manageable, care providers can foster the innovation necessary for meaningful transformation. The aim is to facilitate better care and add value to each patient's experience.

Collaborating for Synergy

The region-Zuid-Limburg initiative exemplifies this vision, forming a coalition of 12 caregiving organizations. Launched in 2022, this coalition includes hospitals, elderly care facilities, mental health providers, and general practitioners, collectively operating with a turnover of 2 billion euros. Despite being a small region with just 600,000 citizens, South Limburg stands at the forefront of this data collaboration. The goal is clear: to create a robust data network that enhances the quality and efficiency of care. The coalition focuses heavily on synergy, extending collaboration beyond regional borders and integrating with Germany and Belgium. This transnational approach is fundamental, as it allows for a more comprehensive healthcare strategy that adequately follows the movement of patients.

Choosing openEHR for Data Standards

A pivotal decision in this initiative was the selection of openEHR as the data standard. While other options exist, the majority of participating organizations have prior experience with openEHR, which is internationally recognized. This choice reflects a commitment to established standards, ensuring that the data eco- system remains adaptable and accessible. The implementation of a successful data ecosystem must prioritize completeness and accuracy. Healthcare providers have expressed a critical need for correct data to inform their decisions. Achieving this necessitates respecting decentralized autonomy, where data governance lies with those organizations that own and manage the data.

Phased Approach to Implementation

Creating this data ecosystem is complex and requires a well-structured approach. The project is divided into three primary phases: a Minimum Viable Product (MVP) phase, a scale-up phase, and a cultivating phase.

1. MVP Phase: In this initial phase, the focus is on assessing, designing, developing, and incorporating solutions into the data ecosystem. The MVP will feature a minimum number of participants, functionalities, and patients involved, providing quick early results to validate the concept.
2. Scale-Up Phase: This phase aims to expand on the success of the MVP by increasing participation and functionality. While the vision is ambitious, stakeholders acknowledge that realizing it may take time. The responsibility set for this phase is significant, aiming for successful integration by the end of it.
3. Cultivating Phase: Following the scale-up, the ecosystem will need continuous nurturing to adapt to new changes and additions. As organizations grow from 12 to potentially 20+, new use cases will continually emerge, ensuring that the ecosystem evolves to meet ongoing needs.

Successful Proof of Concept

The project hit a significant milestone in October when a successful proof of concept was conducted. This remarkable effort involved 26 organizations working together for free to execute what was the first of its kind in the Netherlands. Focusing on the patient journey, the proof of concept incorporated advanced care planning information, showcasing its effectiveness as a minimally viable use case.

In just three months, the team demonstrated that the federated open architecture and data-sharing capabilities could function effectively within the existing care landscape. Core members from participating organizations expressed confidence in the system's potential, proving that collaboration can yield swift and impactful results.

***Micheal Ehle**, Board Member Meander Groep Zuid-Limburg en Chair of Board RSO South LImburg*

"Through the Eco system that we are building in Limburg, based on standards such as Fhir and openEHR, we realize that the right information is available in the right place, in the interest of the patient. The quality of care can be improved here if the accessibility and affordability can also increase."

Prioritizing Data Use

The coalition positions itself to gather significant data from these journeys while ensuring that ownership of the data remains with the participating organizations and their patients.

Growth Beyond Borders

Overall, the project faces the challenge of expanding its ecosystem to encompass not just neighboring regions but also adapting to larger patient populations. As patients move between various

locations, particularly across borders, the effectiveness of a comprehensive data ecosystem is paramount.

> ***Joep de Groot,*** *board member CZ*
>
> ***"This is something we have been looking forward to for a long time, this is a very nice breakthrough"***

Conclusion: A Journey Towards Realization

As we conclude this presentation, we are reminded of the potential that lies ahead. The journey to transform healthcare into a seamlessly integrated ecosystem may be long, but the destination is clear: a community where patients receive the care they deserve, powered by the collective strength of data and collaboration.

This is not just a dream; it is a practical vision shaping the future of healthcare in South Limburg.

Together, let's take the necessary steps towards realizing this vision, ensuring every patient's needs are met with the utmost efficiency and compassion.

As we keep our eyes on this butterfly effect of Transformation, we invite everyone to contribute, learn, and grow within this dynamic ecosystem. The future of healthcare is only a collaboration away.

Proof of Concept Regionaal Data Eco Systeem RSO South-Limburg:

https://www.youtube.com/watch?v=jT5UTLRX5VQ&t=784s




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Column: Data Exchange, Data Availability and Longitude Record

By Igor Schoonbrood, Enterprise Architect MUMC+

The difference in Data Exchange, Data Availability and Longitude Record is illustrated in the story of Anna, a 45-year-old woman with a complex medical history. Her story illustrates the importance of data exchange, data availability and a Longitude Record.

Data exchange started when Anna was referred to the hospital. Her doctor gets with the referral the previous medical data from her GP, specialist and/or physiotherapist. Thanks to a system that uses standardized protocols, the data could be exchanged seamlessly. Within seconds, the doctor had access to Anna's allergies, previous treatments and medication. This ensured that the doctor could provide the best possible care, without Anna having to share all her information again.

Data exchange is therefore the process by which different healthcare providers and systems share information with each other to get a complete picture of the patient. The information is duplicated between the various Electronic Patient Files (EPD), Electronic Client Files (ECD) and, for example, GP information systems (HIS). Transfer takes place procedurally, for example during a transfer: data is pushed from one system to another.
As her treatment progressed, the need for data availability proved crucial.

During a check-up, the doctor noticed that Anna's blood values were abnormal. Coincidentally, her last laboratory test had been performed three days earlier in another hospital. Thanks to the data availability, these recent test results were immediately visible to Anna's doctor. The doctor could view relevant data at any time, regardless of where or when it was collected. This not only meant that Anna could be treated quickly and adequately, but also that unnecessary repetitions of tests were prevented.

Data availability guarantees that healthcare providers have an overview of the necessary information at all times to make well-considered decisions for their patients. The information remains with the source holder in her EPD, ECD and/or HIS or in a Longitude Record system if the source holder has this. Access can happen at any time: the doctor Pulls the data form another system to view (or to duplicate if needed).

Now, over time, it was important for Anna and her care team to create a longitude record. This record not only contained her medical history but was also designed to track her future. As Anna's life evolved, her longitude record would document her lifestyle, medical interventions, and changes in her health. This record would be essential for any caregiver who worked with Anna in the future, regardless of whether they were in the same city or even the same hospital. Caregivers used the longitude record not only to understand Anna's current health status, but also to gain insight into her past and future risks. This increased the continuity and quality of care she received. The information is stored once and never needs to be converted again. Even with an EPD replacement, no data will be lost due to conversions or migrations. Access can happen at any time: The doctor Pulls he data form another system to view (or to duplicate if needed).

A longitude record therefore has much more information than all EPDs, ECDs and Hisses combined. In addition to primary healthcare, this longitude record is essential for secondary use of data, such as prevention, research, population health and quality registrations.

As Anna's story unfolded, it became clear that data exchange, data availability and a longitude record are crucial elements in healthcare, all with Anna at the center. Thanks to a well-functioning system, care providers could work effectively and efficiently, which not only improved the patient experience, but also contributed to better health outcomes for Anna and many others.

3. What can we learn from UCP and RSO South-Limburg

Session 2 part 2: OneLondon, Blueprint for Advanced Care Plan (UCP), speed, scale and governance insights

By Phil Koczan, UCP Program Clinical Lead, NHS, England, London Region

In the heart of London, where history and modernity meet, a quiet revolution in healthcare is unfolding. Phil Koczan, an experienced general practitioner with three decades of practice, has played a unique role in this transformation. As a pioneer in the use of technology in medical practice, he was one of the first general practitioners in the United Kingdom to adopt a paperless practice. His journey through the digital world of healthcare is a story of perseverance, collaboration, and the ongoing quest for better patient care.

An Early Start with Technology

Phil's interest in technology began early in his career. Driven by the desire to improve the efficiency and effectiveness of his practice, he started recording consultations on a computer. This seemed like a simple step, but it laid the foundation for a much larger challenge: sharing vital patient information among different healthcare providers. Thirty years later, he continues to work on resolving these issues.

Complex Healthcare Structures in London

London, with its complex healthcare structures and five Integrated Care Boards (ICBs), presents unique challenges. These ICBs are responsible for coordinating integrated care systems. To bring these various healthcare institutions together, the London Care Records Health Information Exchange was launched a few years ago. This innovative system collects and connects data recorded in the different healthcare systems throughout the city.

However, merging data from various major players in London's healthcare system is not an easy task. "The power of trust among healthcare providers is crucial" Phil notes. "We bring information together to enhance patient welfare."

Improved Access to Patient Information

The results of this collaboration have been promising. Thanks to the Health Information Exchange, doctors can now easily share information. Imagine a patient who saw their GP yesterday showing up in the emergency department today. Emergency department staff now have access to the information written by the GP. This enables them to make quicker and more effective decisions, which significantly improves the quality of care. Phil describes the first phase of this project as "fantastic." However, he also acknowledges the challenges. "If you don't know what you're looking for, the system can be overwhelming" he says while explaining the screen layout of the system. The data is spread across different sections, making it sometimes difficult for healthcare providers to quickly find necessary information.

Innovation in Patient Care

One of the most impactful initiatives within this project is granting healthcare facilities access to data in the urgent care plan. This has led to remarkable outcomes, especially for patients at the end of their lives. Phil explains that ambulance staff now have access to this data, allowing them to apply the right treatment at the right time. "Our analysis shows that 70% of people in London who are in the final stages of life pass away at their preferred location, such as at home or in a hospice" Phil proudly states. This statistic illustrates how valuable access to this data is for maintaining patients' quality of life.

Yet, Phil emphasizes that technology alone is not sufficient. "We can't just throw technology over the wall and expect clinicians to use it" he observes. "We must make it as easy and intuitive as possible, without adding extra burdens."



The Role of Patients and Technology Integration

A crucial part of this digital transformation is involving patients in their own care. Thanks to the NHS app, which was developed before the COVID-19 pandemic, patients can now view their medical records and understand what is happening with their care. "We've integrated the NHS app. This allows patients not only to view the data recorded for clinicians, but soon they will also be able to edit certain fields" explains Phil. This gives patients more insight and control over their care, which is a step in the right direction. Moreover, connections have also been made with GP Connect, a technology that provides access to live data from general practitioners, particularly concerning medications, this ensures up to date medications from the GP record are availiable. Sharing via the National Record Locator service allows wider access. "When patients end up outside London, ambulance staff can view a copy of their care plan" says Phil. This not only makes care safer but also more efficient.

Training and Implementation

The implementation of new technologies must consider both healthcare providers and patients. Phil and his team have developed resources to simplify the use of these systems. "Rather than extensive training for thousands of users, we created short training videos and organized learning sessions" he clarifies. This approach ensures that healthcare providers and patients can quickly get started.

Financing and Sustainability

Phil explains that financing these initiatives has always been a challenge. "Fortunately, we have been able to leverage historical funding from prior programs in London. That funding is protected and allows us to launch new projects without searching for much new money" he says. "Moreover, adding new functionalities, such as care for sickle cell disease, incurs relatively little cost because we already have an existing platform." The success of these initiatives is also due to the trust that has been built between clinicians and the system. "When clinicians see the benefits of this technology, they are more willing to embrace it" he adds.

Future Developments and Expansions

Now that the end-of-life care project is complete, the team is focusing on expanding to other areas of care. From elderly care to managing diseases such as sickle cell anemia and diabetes, various new initiatives have already been launched. The recent live deployment of a care plan for "aging well" has shown promising initial results. Phil emphasizes the importance of data integration: "We have migrated our data to the open-EHR platform and developed a dashboard for clinicians, allowing easy access to information about their patients, including necessary updates." This saves time and increases the effectiveness of care delivery. By utilizing low-code tools, updates can be deployed quickly. "Updates can often be accomplished the same day, greatly enhancing the feedback cycle" Phil states.

Data Ownership and Responsibility

However, challenges exist in managing information. "The responsibility for entering data lies with

individual clinicians, and they bear ultimate responsibility for the accuracy of that information" Phil explains. This can sometimes lead to confusion about data ownership but also highlights the importance of diligence in managing patient information.

Conclusion

Phil Koczan's story is one of dedication to innovation and collaboration in healthcare. By embracing technology and effectively sharing data, healthcare providers in London can serve their patients better. The journey toward improved patient care is long, but with each step taken toward a more connected and structured healthcare system, the future looks much brighter. Phil's journey serves as an inspiration for healthcare providers worldwide who strive to integrate technology into their practice for the health and well-being of their patients.

4. Future Directions of Cognitive Architectures in Healthcare

Session 3 part 1: Lecture at ICT&Health World Conference 2025

By Erik Vermeulen MSc, EY Global Health Technology Leader

In my lecture, I shared insights from over 70 years of AI history, drawing upon key findings from landmark publications in both AI and cognitive science. I believe that various research domains are on the verge of convergence, ready to further accelerate AI development.

Our journey through this period explores the two dominant paradigms in AI: Connectionist AI and Symbolic AI. Symbolic AI employs explicit rules and formal reasoning methods, representing knowledge in well-defined statements that provide transparency and traceability. In contrast, Connectionist AI learns patterns from vast datasets without predefined rules, distributing knowledge across interconnected neurons. Connectionist AI models like LLMs excel at pattern recognition. I argue that, by design, current LLMs do not possess genuine reasoning capabilities. What appears as reasoning stems from echoing patterns learned during training. Consequently, their performance suffers when trained on data containing poor reasoning or when prompts directed at them include irrelevant information. As we explored AI history, I also highlighted relevant insights from logic and cognitive science.

We started our journey in 1943, the year Warren McCulloch and Walter Pitts published an influential paper that introduced a model for neural networks, where neurons are represented as binary units based on the all-or-none property of neurons. This model provided a theoretical basis for understanding how machines could learn and reason analogously to the human brain. The paper uses symbolic logic to express the mechanisms of neural networks.

Symbolic logic emerged in the late 19th century and has undergone a steady evolution over the past approximately 150 years, during which its application scope has broadened. Modern logic can handle uncertainty, manage contexts, contradictions, dynamics, and uncertainty.

Various logical programming languages have also been developed, including Prolog (1972) and Answer Set Programming. I shared an example from the Finnish company Forsante, which uses Answer Set Programming (late 90s) for clinical reasoning. The example demonstrates how SNOMED CT is used in describing clinical rules. Recent developments around Symbolic AI are primarily focused on linking neural networks to logic.

We continue our journey in 1951, the year Marvin Minsky and Dean Edmonds built the first neural network using vacuum tubes, simulating "rats" navigating a maze. Due to a construction error, multiple simulated rats could navigate the maze simultaneously. Minsky observed that these rats seemed to communicate with each other; when one rat found a good path, the others tended to follow. Over three decades later, in 1986, Minsky proposed the "Society of Mind" theory. This theory suggests that intelligence arises from interactions between many simple components. He emphasized that these simple agents achieve complex and intelligent behaviour through cooperation.

“We shall envision the mind as composed of many partially autonomous “agents’‘-as a “Society” of smaller minds. ... I doubt that any part of a mind can ever see very deeply into other parts; it can only use models it constructs of them.” Marvin Minsky, In Cognitive Science, 1980.

In 1988, Bernard J. Baars, a cognitive neuroscientist, introduced the concept of the global workspace in his book "A Cognitive Theory of Consciousness." This theory describes a communication platform in the human brain that forms the basis of consciousness, where specialized agents compete for attention and access to the Global Workspace. This platform allows information to be shared with other interested agents, creating a "stream of consciousness."

In 1993, Tan introduced the concept of Multi-Agent Reinforcement Learning (MARL). He explored how multiple autonomous agents can learn to cooperate or operate independently in dynamic environments, benefiting from either collaboration or competition.

“Multiple agents if they are all independent, together will outperform any single agent due to the fact that they have more resources and a better chance of receiving rewards.”, Ming Tan, 1993.

I skipped the modern AI history that brought us deep learning and the transformer architecture, both using the Connectionist AI paradigm, to shed light on future directions.

Over the past 70 years of AI research, diverse ideas, theories, and methodologies from various paradigms have begun to converge into cognitive architectures reminiscent of Minsky’s Society of Mind. I anticipate that a crucial component of this emerging architecture will be the Global Workspace, as proposed by Baars. This Global Workspace requires that all components communicate using a common semantics to effectively convey shared concepts among algorithms. In the healthcare domain, openEHR archetypes linked with SNOMED CT offer a rich semantic framework, making them particularly suitable for integration with logical reasoning algorithms such as Answer Set Programming. Additionally, I anticipate that logical reasoning utilizing a dynamic body of declarative clinical knowledge, combined with advanced solving techniques, will represent another essential building block. The third building block consists of a robust set of AI agents that leverage a wide array of machine learning algorithms, including Large Language Models (LLMs), Small Language Models (SLMs), Convolutional Neural Networks (CNNs), logistic regression, decision trees, and Boltzmann machines. Finally, I anticipate that the fourth building block will encompass Multi-Agent Reinforcement Learning, which integrates a cognitive fabric, agent protocols, and automated guardrails to address issues such as hallucinations, toxicity, sentiment, bias, and groundedness. AI agents are evolving to possess sophisticated capabilities, including the ability to collaborate with one another through task assignment, information sharing, and reward systems. They can also engage with humans using natural language, delegate tasks to human operators, generate and validate code (including their own code, potentially leveraging Homoiconicity), and seamlessly operate applications. These advanced AI agents are forming the foundation for multi-agent sytems designed for

autonomous operation. These systems combine the strengths of neural networks with logical reasoning and employ dedicated workspaces alongside a shared global workspace. They dynamically select the most suitable agents for a given task, integrate humans into the process where necessary ("humans in the loop"), and dynamically adapt solution strategies to achieve goals, such as reaching consensus.

Session 3 part 2:
Accelerating AI in Healthcare: The Role of OpenEHR

By Mika Kiviaho, Head of Medical at Tietoevery Care

In the rapidly evolving field of healthcare, the integration of artificial intelligence (AI) is becoming increasingly crucial. Mika Kiviaho, a development-oriented doctor with over a decade of experience in various development activities, shares his insights on how AI, particularly through the use of openEHR and structured data, can revolutionize clinical tools.

Mika begins by highlighting the complexity of healthcare, which stems not only from the intricate processes and guidelines but also from the diverse and unique nature of human beings. He emphasizes that while AI has the potential to transform healthcare, its development is often hindered by the proprietary nature of most healthcare data. This data is typically stored in proprietary data models that are not adequately equipped to handle the complexity of human health, and access to this data is often restricted, creating silos that limit scalability.

One of the significant challenges in AI development for healthcare is the need for large-scale applications. Narrow point solutions are insufficient to demonstrate the value of AI in clinical settings. Mika points out that the majority of healthcare data is stored in proprietary data models, which are not only of inadequate quality but also difficult to access. This lack of access creates a barrier to implementing AI solutions back into the systems.

Mika discusses the use of AI in the DICOM (Digital Imaging and Communications in Medicine) environments, where data quality is ensured through strict specifications for data capture. DICOM environments provide a structured and standardized format for imaging data, which can be used for AI development. This data is stored in DICOM servers and can be accessed through open APIs, making it possible to scale AI solutions in the production ecosystem. The culture within DICOM environments is also AI-friendly, as doctors use AI-tools to assist in decision-making while retaining the final authority.

The openEHR initiative, which Mika co-chairs in Finland, offers a promising solution to the challenges of AI development in healthcare. openEHR provides a flexible and comprehensive data set for human health, separating actual data from terminologies and other elements. This person-centric and citizen-centric data model allows for the harmonization and standardization of data at the archetype level. Once data points are harmonized, they can be used to create templates and larger applications, making openEHR a powerful tool for accelerating AI-development.

Mika draws a comparison between openEHR and DICOM, noting that while DICOM environments benefit from machine-guided data acquisition, openEHR relies on template guidance to ensure data quality. The templates in openEHR facilitate good data documentation and acquisition, which is then stored in a clinical data repository (CDR).

This data can be used for AI development and subsequently reintegrated into the production ecosystem. The data remains visible in clinical documentation, allowing doctors and nurses to utilize AI tools effectively.

In Finland, openEHR is already being used in a Tietoevry's Livecare EHR environment, serving 3 million inhabitants and over 100,000 professional users. The openEHR data model supports digitalization and innovation, enabling new workflows and adaptability of data. Clinicians play a crucial


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role in modeling the data, ensuring that it is clinically relevant and technically sound. Mika also addresses the integration of AI tools with clinical applications.

AI models, including large language models (LLMs), can assist clinicians by providing applications such as smart notes and speech-to-text improvements. These tools can be integrated into openEHR clinical applications, enhancing data entry, documentation, and the interpretation of structured data elements.

In conclusion, Mika emphasizes the importance of having a solid foundation for leveraging AI tools in healthcare. openEHR provides this foundation by offering a standardized, machine-readable, and clinically relevant data model to implement AI-tools. By integrating AI tools into clinical workflows, healthcare professionals can enhance their decision-making processes and improve patient outcomes. The ongoing efforts in Finland demonstrate the potential of openEHR to transform healthcare through the power of AI.

5. Towards Sustainable Integration of the Electronic Health Record

Session 4: A Crosswalk between openEHR, FHIR and OMOP

By Severin Kohler, Health informatician: AI, openEHR, FHIR, DICOM, IHE, OMOP at Charité, Berlin, and Gasper Andrejc, Interoperability Specialist, FHIR Consultant and founder of openFHIR

Introduction

Gasper and Severin discuss the integration of electronic health records (EHRs), focusing on a co-existence of openEHR, FHIR and OMOP standards. Severin introduces the topic by highlighting the challenges in integrating EHRs due to their heterogeneous structure and semantics.

The Problem

The main issue in health informatics is the integration of data from various systems. German hospitals, for example, have over 600 subsystems, making data integration complex and while technically achievable – still very costly. An ETL approach – extract, transform and load – which is often taken, involved proprietary integrations between a source system and other systems. Such integrations have to be done several time, each integration being a project on its own which is expensive, resource intensive and most important of it all – unscalable.

For decades, Health IT has relied on interfaces to enable system interoperability. Recently, vendors have become more flexible, offering some data access via APIs, leading to faster adaptation. However, challenges remain, including:

* Symptom treatment rather than addressing root issues.
* Fragmented data access due to selective API offerings.
* High costs from recurring fees for each interface.

Solving interoperability problem at the root

openEHR aims to standardize EHRs at the point of data capture, reducing the need for expensive and complex ETL (Extract, Transform, Load) processes. It uses inclusive modeling to capture as much relevant information as possible. openEHR's international models, developed by clinicians and informaticians, help ensure comprehensive data representation. This approach promises to solve integration issues at the root by standardizing data from the moment it is entered into the system.

Lowering cost and effort of ETLs

The session highlighted the advantages of openEHR, emphasizing its role in streamlining ETL processes. The key idea presented was that ETL should be performed only once—between the source system and an openEHR clinical data repository.



After this initial step, all subsequent integrations are built on top of openEHR, ensuring scalability and standardization. This approach creates a stable foundation for seamless integrations while reducing costs and effort in future projects.

OMOP and FHIR

Gasper and Severin furthermore delve into the benefits of FHIR and OMOP. OMOP (Observational Medical Outcomes Partnership) is a standard for secondary use of primary data. Together with OMOCL – a language for mapping between openEHR and OMOP – it makes for a nice combination with openEHR.

FHIR (Fast Healthcare Interoperability Resources) is widely used for data exchange due to its flexibility and ease of implementation. As such is accelerates innovation and enables quickly scalable use cases. However, FHIR's over-use of extensions and a flood of FHIR profiles can lead to interoperability issues, data loss and non-scalable integrations.

Combination of all the best worlds

Gasper continues the session by exploring how to develop a patient-centric, research-driven, education-focused, and sustainable data strategy within a highly diverse Health IT ecosystem. This complexity arises not only from the presence of multiple vendors, systems, and standards but also from the variations that exist within a single standard. An example is drawn from FHIR and its implementation of a patient summary, where different versions—such as the International Patient Summary, European Patient Summary, and Dutch BgZ—model the same concept with slight variations.

The positive takeaway is that the ecosystem now recognizes that different standards serve different purposes. For instance, openEHR excels in a data-centric approach with its granularity and structured modeling, while FHIR is optimized for data exchange, driving innovation and enabling a wide range of use cases.

Community work

Recognizing the challenges outlined throughout the session—challenges that make a cohesive data strategy nearly impossible—Gasper introduces a community-driven initiative that has been in development for the past few years. Originally Initiated by Better and later joined by openFHIR (Gasper), HighMed (Severin), and a team from MedBlocks, this collaboration led to the creation of the FHIR Connect specification. This specification establishes a standardized language for writing

bidirectional mappings between openEHR and FHIR, enabling an architecture that seamlessly integrates both standards and leverages their respective strengths.

A vendor agnostic architecture

By adopting this approach, organizations can establish a fully vendor-agnostic architecture. openEHR serves as the clinical data repository—designed by clinicians, future-proof, granular, scalable, and independent of specific profiles or use cases, ensuring data longevity. FHIR, on the other hand, functions as the exchange standard—fostering innovation, driven by specific use cases, and enabling seamless data access while remaining separate from the clinical data repository. Sitting between them is FHIR Connect, facilitating modular and reusable mappings through an open-source specification.

Integrating openEHR, FHIR and OMOP with add-ons like FHIR Connect and OMOCL enhances data mappings, lowers costs, and improves data quality. This collaborative effort strives to build a sustainable and interoperable health IT ecosystem.

Gasper and Severin emphasize the critical role of community involvement and open standards in achieving these objectives.

Detailed Discussion Points:

1. Introduction to Interoperability Challenges:
    a. complexity of integrating electronic health records due to the heterogeneous nature of data structures and semantics in health care systems.
2. The Nature of the Problem:
    a. The primary challenge in health informatics is the integration of data from multiple systems, which is often hindered by proprietary and non-standardized data formats.
    b. German hospitals, for example, have over 600 subsystems, each with its own database and interface, making data integration a significant challenge.
3. The Role of openEHR:
    a. openEHR aims to standardize data at the point of capture, reducing the need for complex ETL processes later on.
    b. The platform uses inclusive modeling to capture comprehensive data, ensuring that all relevant information is represented accurately.
    c. openEHR international models, developed collaboratively by clinicians and informaticians, provide a robust framework for data standardization.
4. OMOP and OMOCL:
    a. OMOP is a standard designed for the secondary use of primary data, facilitating research and analysis.
    b. OMOCL, a language for mapping openEHR data to OMOP, and created an engine called EOS to automate these mappings.
5. FHIR:
    a. FHIR is widely adopted for data exchange due to its flexibility and ease of use, but its extensive use of extensions can lead to interoperability issues.
    b. Different implementations of FHIR may use varying extensions and profiles, complicating data integration efforts.
    c. Gasper and Severin discuss how integrating openEHR with FHIR can help address these challenges by providing a consistent and standardized data model.
6. The Development of FHIR Connect:
    a. FHIRConnect is an opensource specification for bi-directional mapping between openEHR and FHIR, allowing for reusable and modular mappings.
    b. This approach supports hybrid architecture where openEHR serves as the single source of truth, while FHIR facilitates data exchange and compliance with various standards.
    c. The development of FHIRConnect involved collaboration with multiple stakeholders, including industry partners and the open-source community, to ensure it meets the

needs of the healthcare industry.

7. Conclusion and Future Directions:
   a. The integration of openEHR and FHIR through tools like FHIR Connect and OMOCL can streamline data mappings, reduce costs, and improve data quality.
   b. Gasper and Severin emphasize the importance of community involvement and open standards in achieving a sustainable and interoperable ecosystem for health informatics.
   c. They call for continued collaboration and innovation to address the ongoing challenges in data integration and interoperability in healthcare.

Column : The european EHR network

By Severin Kohler, Charite

“openEHR has a vision of standardizing the Electronic Health Record (EHR) through international models, known as archetypes. These archetypes are defined by a global community, not just for individual projects or base models, but to encompass all relevant information related to a clinical concept. Combined with standardized data capture, this approach addresses the nightmare of interoperability, eliminating the need for recurring ETL processes and interface fees. It creates a sustainable architecture for healthcare providers. Additionally, it facilitates easier integration with other standards like FHIR and OMOP.

Today, there are numerous instances of openEHR in Europe, ranging from shared national records to Clinical Data Repositories (CDRs) in hospitals. All of these, under the premise of using international archetypes, are inherently interoperable. We reached out to some of these clinics and organizations and asked: Do we not already have a European EHR hidden in plain sight across all these institutions? From this idea, the European EHR Network was born—a vision of a european EHR driven by health-care institutions based on their needs, learning from the failures of the past decades. Currently, we are actively working to connect these institutions to bring this European EHR to life. The goal is to connect all the data contained in openEHR, not just a small subset or modules based on individual projects. “Less is more” has never been effective in healthcare and, in the worst case, can endanger patients. Archetypes not only allow us to exchange data but also enable federated analytics. This is particularly advantageous for research, as patient data does not need to leave the institutions. As a first showcase, we are currently working on cohort identification queries, as these access all relevant data without the need to share patient information directly—instead, they share simple counts.

The network is constantly growing and already includes already some of Europe’s most renowned university hospitals (Karolinska, Sweden; Charité, Germany; Basel, Switserland; Heidelberg, Germany) as well as entire regions like Catalonia, Spain and Limburg,The Netherlands.”



6. openEHR and Lowcode, a winning combination

Session 5 part 1: A New Future for Healthcare

By Martin van der Meer, Manager Business Development and Co-Owner at Code24

This presentation was led by three visionary leaders in the sector: Martin van de Meer, Business Development Manager and co-owner at Code24; Hans Canisius, CEO of Usoft; and Bouwe Koopal, CIO of Maarsingh & van Steijn. As the audience focused on the stage, Martin introduced himself, sharing his extensive experience of over 39 years in IT and health-care, including an impressive 25 years at the Medical Center Alkmaar. His journey with openEHR began in 2006, and in 2010, he helped to establish Code24, a company that has since become a powerful player in digital healthcare solutions.

Martin took his audience into the world of openEHR, a collection of specifications that form the foundation for electronic health records (EHR). He asked attendees to share their knowledge of openEHR and realised that knowledge of this topic varied widely widespread. With patience and enthusiasm, he explained the essence of openEHR: it is not about technology, but about the information model and how healthcare data should be used in systems. These specifications of this information model are freely available and are essential for the integration of systems in healthcare, providing the blueprint for consistency and efficiency.

Martin demonstrated how Code24, with its 35 employees and numerous openEHR implementations across the Netherlands, plays a crucial role in transforming mental health care. With over 2 million electronic health records and more than 50 million compositions, the possibilities of openEHR in production environments are vast.

One of the key concepts presented was the separation of information and technology. Martin emphasised that healthcare information is constantly changing; every day, we learn something new.In contrast technology is relatively static and doesn't need to be changed daily. By separating information from technology, the technology remains stable while the information can evolve dynamically.

Martin also explained how the openEHR reference model plays a crucial role in this separation, supervised by domain experts who oversee both information and technology. "What do we want to record about the patient?" the medical professionals ask, while technical experts focus on the development process.
In the information model, archetypes and templates are defined that specify what information needs to be recorded. This structure ensures governance and control over the data that enters an electronic patient record (EPR). Attendees gain insights into how this separation and specification contribute to reliable and efficient data processing.

The presentation then moved towards the future of applications in healthcare, with Martin explaining the concepts of SMART on openEHR. These specifications allow for application portability, meaning an app can function across different platforms. This is crucial for collaboration among various healthcare providers and for sharing data seamlessly. Martin shared an example from a showcase held in Reading, UK last year, where Code24, the VitaGroup, and Medblocks demonstrated their capabilities. The connection between different Clinical Data Repositories (CDRs) enabled the simultaneous sending and retrieval of data from multiple databases, facilitating collaboration and data processing.

Martin also emphasised the importance of a new healthcare IT architecture. This model consists of various layers: an information model, functionality and data. At the data layer we have the open data

platform, supported not just by openEHR but also other standards like SNOMED and FHIR. The Smart Launchers at the functionality level ensure that apps can easily connect with various Clinical Data Repositories, regardless of the vendor. This gives app developers the freedom to deploy their products broadly without being tied to a single supplier.

The structure also enables federation, allowing different CDRs within one organisation to communicate with each other. This provides health-care professionals with a 360-degree view of patient information, even if that data is spread across multiple databases. The federation layer retrieves information and ensures that users always see the most current data, while also allowing them to make updates when necessary.

The presentation concluded with a sense of anticipation and possibilities for the future. The audience left with new insights into openEHR, and the potential impact this technolog could have on the healthcare sector. The message was clear: by collaborating and embracing innovative solutions, we can make healthcare more efficient and effective for both providers and patients.

This session was more than just a gathering; it was a step towards the future of healthcare, where technology and human care go hand in hand. With the powerful combination of openEHR, low-code, and the separation of information and technology, we stand on the verge of a revolutionary change in how healthcare is delivered and obtained.

Session 5 part 2: a story of innovation, efficiency and flexibility

By Hans Canisius, CEO at Usoft

In the dynamic world of technology and software development, low-code plays a crucial role, especially in healthcare. Hans Canisius, CEO of USoft, shares his insights about this innovative approach and how it can specifically contribute to improvements in the healthcare sector.

During the previous meeting, where Martin introduced data platforms such as CDR and openEHR, Hans explored the possibilities of low-code. “Before we move on” he began, “it’s essential to understand what low-code entails and what it can mean for our sector. The market is rapidly growing, with over 700 low-code platform providers worldwide. This presents both opportunities and challenges.”

Hans explained that low-code development revolves around application development within a spectrum of possibilities. “On one hand, we have off-the-shelf software packages, and on the other hand, traditional programmers. Low-code lies precisely in between.” He used an island analogy to further illustrate the spectrum: “The coastline represents simple applications, while the hills and mountains depict more complex, mission-critical applications.”

USoft does not focus on simple forms but rather on developing business-critical applications, such as those within electronic health records (EHRs) and other complex administrative systems. “So we find ourselves in the realm of the hills to high mountain areas of low-code platforms” Hans clarified, drawing a distinction between various types of platforms.

The benefits of low-code are extensive. Hans noted that these platforms are not only more flexible but also easier to maintain, resulting in a much better total cost of ownership (TCO). “This is interesting for Chief Financial Officers (CFOs) because costs are ultimately a critical factor. Depending on the platform, we are seeing an increase of 30% to even 70% in total ownership costs” he explained.

With low-code, applications can be easily reused or modified. “Imagine you built an application for value analysis and want to share it with another organiza-



tion within your group. You can easily do that, and if they want to make changes, they can do so as well and share those changes back or not, depending on their relevance" Hans elaborated. This ensures a high degree of flexibility with a clear separation of data.

Hans continued discussing the advantages of low-code in combination with modern openEHR CDR systems. "You can use low-code to extend functionalities within a modern EHR system without the need for implementing additional databases or technologies. You build upon what you already have and simply add more value."

He referred to a proof of value conducted with Code24. "We selected value analysis as a test case. Of everything you see here, 95% is automatically generated. Once we established the data model, everything is created for you. This allows you to focus entirely on functionality. Not only does this speed up the building process, but it also enables you to immediately test the applications with the business, adjust them, and bring them into production."

Hans explained that while a typical healthcare implementation can take months or even years, with low-code, you can build and implement modules within just a few weeks. "This provides a much more scalable architecture, both IT-wise and for the continuous delivery of value to the business, instead of waiting months for new solutions."

Hans concluded his presentation with the message that low-code is not just a trend but a sustainable shift that enables organizations to respond more quickly and effectively to changing needs in healthcare. "It offers opportunities for businesses, but especially for patients, who ultimately benefit the most from this innovative approach."

With these words, Hans encourages both employees and leaders in healthcare to embrace the potential of low-code and invest in a future where technology facilitates their work and enhances the quality of care. You can choose from the beach side to the hill country."

6. openEHR and Lowcode, a winning combination

Session 5 part 3: The dream of Maarsing & van Steijn: Innovation in Healthcare

By Bouwe Koopal, Evangelist of the combination of lowcode, openEHR and FHIR for modern information systems in health an welfare, Maarsing & van Steijn

In the bustling port city of Rotterdam, where towering buildings meet rolling waters, Bouwe Koopal grew up and lives now in Friesland. With his social commitment and technical expertise, holding both a medical degree and a background in software engineering, he creates solutions that can reshape healthcare guidelines. His current role as Chief Medical Information Officer (CMIO) of Maarsing & van Steijn, an innovative organization focused on mental healthcare and prevention, illustrates his vision to minimize the need for treatment through proactive strategies.

The project that Bouwe leads is an influential initiative mapping trends in low-code, no-code, and citizen development in the healthcare sector. With this project, Bouwe not only shares his knowledge but also offers a free atlas for healthcare professionals interested in the latest developments.

Maarsing van Steijn has the ambition to create a unique, flexible digital infrastructure that meets the specific needs of the organization. This includes collecting a wide range of data, not only to evaluate the effectiveness of their preventive measures but also to provide a regional perspective on mental healthcare. Bouwe and his team gathered diverse data in their electronic health record (EHR) system, including patient encounters, diagnoses, and treatment plans.

After working hard for eleven months on their unique EHR system, which was necessary because existing systems did not meet their requirements, the application finally went live. The implementation encountered only two technical issues, which is remarkable in a frugal low-code environment. But this was just the beginning of their ambitions.

Bouwe and his team decided to offer their innovative software as open source to the market so that other healthcare institutions can adopt and benefit from their platform. This is not only strategic but also unprecedented; it drives the healthcare market towards change, where a smaller group of suppliers gives way to a more collaborative environment.

An important aspect of their vision also included working on a federated regional data project, sharing information without the need to duplicate it. This could lead to an improved overview of data within the region, which is crucial for the effectiveness of prevention efforts.

As they continue this journey, Bouwe and his team learn that it is not a technical project but rather an organizational change. The initial months after going live were challenging, and they realized that healthcare institutions often get stuck with off-the-shelf software, which makes it difficult for them to define their own processes and functionalities.

In discussions with other experts in the field, such as epidemiologists, the necessity for extensive data transfer emerged. They are aware of the obstacles posed by closed EHR systems that refuse to share data.

Bouwe clarified that, although there are sometimes legal restrictions, data can often still be made accessible by openEHR federated techniques, which can be key to unlocking crucial information.

As Bouwe closely monitors the future of the openEHR market and the role that Maarsing & van Steijn can play in it, he sees a positive trend. The increased acceptance of open EHR solutions comes at the right time, with more and more tenders asking for open platforms and collaborative solutions. This could expand their capabilities; especially as large hospitals



revisit their EHR strategies to make room for a more open and flexible execution.

The discussions about the benefits of open standards and collaboration resonate strongly within the community, and Bouwe believes that the next five to ten years will be a crucial period during which organizations must innovate to remain relevant. The path to the future is fraught with challenges, but with each new implementation and partnership, they come closer to their goal.

Bouwe Koopal exemplifies how passion and perseverance can lead to meaningful changes in healthcare. As he journeyed from Rotterdam to Friesland, he discovered not only new landscapes but also new pathways to innovate, learn, and grow. The future of Maarsing & van Steijn is promising, and Bouwe is convinced that their dreams will come true, step by step, project by project. With each new decision, every learning process, and each constructive collaboration, they are well on their way to a revolutionary approach to mental healthcare, with a bright future ahead for patients and healthcare professionals alike.

7. What can we learn from the Nordics?

Session 6 part 1:
openEHR and Lifecare EHR: Transforming Finnish Wellbeing County

By Teemu Mäkelä, Digital Transformation Professional Finland

For the past five years, an experienced healthcare professional, Teemu Mäkelä, at Wellbeing Services County, located 500 kilometers north of Helsinki, has gained valuable insights into the dynamics of public healtcare in Finland. This organization, responsible for healthcare, social services, and emergency services for approximately 200,000 residents, is also the largest employer in its region, with around 8,000 employees and an annual budget of just over 1 billion euros.Teemu began by sharing his previous experiences with various large Finnish companies, where he gained important knowledge in the finance sector, manufacturing, and the forestry industry. This background has helped him better understand the current structure of public healthcare in Finland. He proposed a special partnership between eight counties that have joined forces to improve and integrate electronic health records, an initiative that, unlike previous collaborative efforts, has proven successful.The collaboration between the counties offers a unique opportunity to learn from one another's experiences.

Teemu Mäkelä, Digital Transformation Professional Finland

"Due to long-term budget limitations, regional integration across service boundaries was necessary openEHR provides the IT Solution for it"

Although Finland has a total of 22 counties, these eight regions work closely together, enabling them to tackle similar challenges. "These counties not only share geographical characteristics but also socioeconomic factors such as multi-generational unemployment, low educational levels, and an aging population" Teemu explained. These challenges result in an increasing demand for wellness services, making collaboration crucial.

"Due to long-term budget constraints, we have been forced to achieve regional integration" he continued. This integration involves not only cooperation between primary and specialized healthcare but also with social services and emergency services.

From an IT perspective, openEHR is the solution that makes this integration possible. "Fifteen years ago, each municipality had its own system. Now we work with one integrated system" Teemu stated. This transformation has led to a streamlined approach where each participating county now only has one instance of the Life Care system. The use of a single database for all eight counties helps ensure consistency and reliability in the data. Collaboration between clinicians and IT professionals is also vital in this process.

"Clinicians primarily focus on functional requirements, while his IT colleagues concentrate on non - functional requirements. This ensures that Lifecare works smoothly with various other IT solutions"

Teemu explained. Additionally, there is an obligation in Finland to transfer essential data to the government's central repository, which is becoming increasingly important as funding is now tied to data transfer.

Teemu also emphasized the importance of innovation from the private sector. "With my background in the private industry, I consider it valuable that Lifecare has a 'brother' in Dynamic Health, the market leader in private healthcare. It is crucial that we can easily transfer innovations from the private sector to the public sector" Teemu remarked.

The evolution of the Life Care system began in the 1990s with the desktop application Effica, which consisted of independent computers and data silos. About ten years ago, a transformation began towards a new application with a service-oriented architecture and a common user interface. In 2017, openEHR was introduced as the main data model, leading to a new approach to API management and a platform-based method.

“What is openEHR? It is an open standard, vendor-neutral, and based on ISO standards” Teemu explained. This model enables developers to translate clinical concepts into the IT world. With a focus on patient-centered care and the creation of shared health records, key concepts such as ‘archetypes’ are utilized. “An archetype defines a particular piece of information, such as blood pressure or body temperature, which can be used as a kind of Lego block to create various templates” Teemu added. One example Teemu mentioned was the hospital admission form. “When I go to the hospital, I need to fill out a form with specific information they want to know about me. This is a collection of data” Teemu said. This process includes several archetypes, but as Teemu emphasized, this is still not a user interface. The actual user interface is developed by IT professionals, and openEHR plays a crucial role in this. Regarding the user interface, Teemu noted that it consists of a collection of ‘widgets’ that allow users to customize their view. “Depending on the process and the role they play, users can select widgets and arrange them in the desired order” said Teemu. This usability and ease of using the application are essential today, especially in light of increasing government regulations about what information needs to be stored.

“It is essential to have the most frequently used components in clear locations and to implement logical checks to ensure data accuracy” Teemu continued. The contribution of a group of clinicians is crucial, as they lead the development of Life Care. “They act as champions of change” Teemu stated.

Teemu stressed that multi-disciplinary teams are essential in this process, with representation from various healthcare disciplines, including specialized care, medicine, primary care, social care, and dental care. “We are bringing all aspects together to form a strategic partnership” Teemu added. It is important that these teams not only collaborate within their own professions but also across county borders.

In Finland, there still exists a situation where the treatment of patients in the eastern part of the country differs from that in the western part. “But there is actually no real reason for this” Teemu noted. “We have already worked on standardizing processes at the county level, and now we are continuing this effort at the national level.”

To become a member of this group of clinicians, approval from their supervisors is required so they can free up time for these activities. “It’s not a full-time job, but it still requires significant time investments” Teemu summarized.

“They need to be respected individuals in the organization” Teemu continued, “who have active connections to management, IT staff, and, importantly, other clinicians. It is also essential that they have hands-on experience using the solution so that they understand what they are doing. The goal is to enhance leadership within the organization so that people experience an atmosphere and organizational culture of ‘we do this for ourselves.’”

“The second chance is to take accountability and not place the blame on someone else; we are in charge. We do this for ourselves” Teemu added.

On the IT side, represented by Teemu, there is also involvement and collaboration. “The IT leaders meet approximately every two weeks to discuss these topics. Our superusers have their own groups” Teemu said. “We have formal agreements, defined roles, responsibilities, and deliverables.” There is a facilitator who ensures that the meetings are run effectively and that agendas are in place.

Joint development takes many forms, including knowledge transfer. “For example, we share test cases, information about bugs, and training materials to help each other” he noted. Balancing the relationship between suppliers and customers is another important aspect. “When we were alone, a

small customer with a large supplier, the relationship was imbalanced. But nowadays, with eight customers together with a large supplier, the relationship is more balanced."

"A shared vision is crucial" Teemu emphasized. "Creating a common ground where everyone can proceed with a unified approach. We have found that openEHR provides a great foundation for that. It gives us a clear data structure, reduces integration costs, and acts as a catalyst for collaboration between different professions, both within healthcare and with IT."Teemu also expressed his future expectations. "I look forward to seeing significant improvements. Nowadays, we have a saying that doctors are taking care of computers instead of patients. Hopefully, that will change" Teemu said. After the presentation, the speaker was prepared to answer questions. A question about processes using artificial intelligence came up. "Good point" Teemu replied. "As I mentioned earlier, we have moved to government funding. Nowadays, the amount of funding we receive is directly dependent on the recorded diagnoses. We use AI-supported data processing to recognize what is in the text. Currently, there are various demos and pilot projects in Finland where AI listens to conversations between patients and doctors, and that information is then transferred to a system. It looks promising."

In conclusion, Teemu reflected on the lessons learned since the start of this partnership and the importance of cooperation in improving service delivery in the region. "It is the joint effort, the shared goals, and the commitment of all involved parties that drives us forward" Teemu inspiringly concluded.

This presentation on the innovative collaboration in Finnish healthcare serves as a valuable source of inspiration for other regions and countries looking for ways to improve and adapt their healthcare systems to meet the growing needs of their populations. The example of Wellbeing Services County shows that through regional cooperation, technological innovation, and a strong focus on user experience, sustainable solutions can be realized in healthcare.

Session 6 part 2:
Regional data platforms: Helsinki University Hospital's premier data and AI platform powering data-driven care of the top level hospital

By Teemu Vähäkainu, VP Head of Data Driven Care at Tietoevry Care

How Collaboration, Innovation, and Courage Are Transforming Healthcare in Finland

Helsinki University Hospital (HUS) has written an impressive transformation story in recent years. By embracing collaboration, new technologies, and the use of artificial intelligence (AI), HUS has paved the way for a future-proof healthcare model that enhances quality of care, accelerates research, and fosters innovation. A significant part of this success is owed to the groundbreaking "Regional Data Lake" platform, now widely embraced by multiple healthcare regions across Finland. But how did this all come to fruition? This story reveals how a combination of technology, vision, cooperation, and, above all, courage has elevated healthcare to new heights—and what the rest of the world can learn from Finland.

The Early Commitment to Innovation

It all started in 2016 when HUS made a bold decision to invest in the cloud and AI technology. At the time, this was far from a standard approach in healthcare, as many organizations were cautious about adopting cloud technologies. But HUS saw its potential: leveraging the cloud would enable them to scale flexibly, integrate systems effectively, and accelerate data-driven innovation.

This decision proved to be game-changing. Other regions and organizations in Finland quickly

recognized the benefits, including improved clinical processes, boosted medical research, and the ability to deliver higher-quality care. As one participant aptly stated: “The cloud won’t kill us, it actually works, and how!” This initial step set the stage for other regions to join and establish their own similar initiatives. The platform soon became the largest big data system in the Nordics, reshaping not only Finnish healthcare but setting the stage for global innovation.

The Power of Collaboration and Trust

While technology is at the heart of this innovation, key figures like Teemu Vähäkainu emphasize that real success stems from collaboration and trust.

Teemu Vähäkainu, VP Head of Data Driven Care at Tietoevry Care

“If you have too many resources, you try to do everything on your own. But when resources are limited, you learn to collaborate—and that’s exactly what we did.”

“When you have fewer resources, you’re forced to seek help from others” Teemu explains. “If you have too many resources, you try to do everything on your own. But when resources are limited, you learn to collaborate, and that’s exactly what we did.”

In Finland, collaboration isn’t simply an idea, it’s a necessity. Various hospitals and regions work together to share technology and establish rules that benefit the entire country. This shared goal, rooted in a culture of mutual trust, enables the kind of bold action that moves the needle in healthcare innovation. Government support has also been crucial. The Finnish government plays a dual role: as a regulator and a partner. While regulation is necessary to safeguard privacy and security, it’s equally important that innovation isn’t stifled. In some cases, the lack of existing rules has even facilitated progress. “When you embark on something new, you often need to take bold steps because the rules don’t exist yet. Sometimes, it’s better not to wait.” Further, Teemu emphasized the importance of “co-creating” regulations with the government. This means working closely with policymakers to design standards and rules that uphold safety while fostering innovation.

Advanced Technology as the Backbone

The technological infrastructure of the “Regional Data Lake” is essential to its success. This platform aggregates data from multiple electronic health record (EHR) systems, as well as dozen of other sources, including financial systems, medical archives, and even outdated formats like PDFs. By unifying these streams, it provides healthcare professionals and researchers with a holistic view of patient information while unlocking powerful tools for advanced analysis. One shining example is the “ Patient360 ” application, which gives healthcare providers real-time access to a comprehensive overview of a patient’s medical history, no matter where the patient has been treated. This has significantly streamlined care delivery, reduced a dministrative burdens, and improved the well-being of healthcare providers themselves. Additionally, the platform has revolutionized medical research. Automated processes now allow researchers to securely and easily access cloud environments, eliminating the inefficiencies of traditional bureaucratic hurdles. With the ability to analyze data in real time, researchers can fast-track innovation while complying with Finland’s strict data privacy laws. The platform’s scalability is another major advantage. Users don’t need expensive hardware, and the system can seamlessly scale computing power for tasks such as analyzing medical images or training AI algorithms. This makes the platform not only flexible but also accessible to a wide range of users, from small research labs to large hospitals.

Courage: The Driver of Innovation

One key takeaway from HUS’s success story is that boldness is essential for breakthroughs.

“Someone needs to take the first step and begin” Teemu emphasized. This sentiment applies not only to organizations like HUS but also to individual leaders and policymakers.

A Model for the World

HUS’s “Regional Data Lake” project serves as an inspiring example for healthcare systems worldwide. It demonstrates how technology, paired with collaboration and courage, can fundamentally improve the organization and delivery of healthcare.

While challenges remain, such as further improving federated data-sharing between regions, or ensuring regulation remains agile without compromising safety, the Finnish model is undeniable proof that innovation begins with action.

In Teemu’s words: “Data isn’t just information. It’s a tool to make the world healthier, safer, and smarter. And it all starts with a handful of people who believe in what’s possible.”

Finland has shown that trust, collaboration, and courage can create a future where healthcare is not only more efficient but also more human. And that’s a vision worth sharing.

8. What can we learn from Jamaica and Switzerland?

Session 7 part 1:Keys to Success: Insights from Basel.

By Johannes Schmidt, Head of Tech & Inn at BetterProgram leader openEHR Basel, Zwitserland

In an era where healthcare is becoming increasingly complex, a unique opportunity emerged at the University Hospital of Basel. The speaker for the German-speaking region, collaborating with colleagues from Becker, faced a challenge.

Amanda, who was supposed to present, could not attend. Seizing the opportunity, this speaker shared important lessons learned from the partnership with this prestigious hospital. The University Hospital of Basel, located along the banks of the Rhine, is not just a medical institution; it is a center of research and innovation, employing over 8,000 individuals dedicated to patient health. With enthusiasm, the sponsor talked about the joy of meeting the dedicated people there and the valuable experiences he had gained. The session focused on the theme of “key lessons from Switzerland” particularly concerning Basel, where the project was currently unfolding. The first significant lesson shared by the speaker was about the unique approach taken by Basel: rather than starting from the application aspect, they prioritized the data first. This shift in perspective struck a chord. The hospital recognized that the longevity of patient data is key. Patient data was crucial for their future. They did not want to invest in systems that would eventually become obsolete or risk losing critical patient information. Basel was acutely aware of the value of data over the long term. The current systems - once they are end of life or you’re thinking about replacing them - require data migration.The speaker emphasized that this focus on data collection and preservation was vital. “Data must withstand the test of time” he asserted, and these words resonated deeply with the audience. The second lesson highlighted the need for hard work and commitment to achieve success. For half a year, the sponsor collaborated closely with a team in Basel, proving that their vision was attainable using the solutions they offered. Numerous challenges were encountered, but through determination and teamwork, their solution became a reality. The story of the speaker reflects a crucial message for the future of healthcare. The lessons from Basel are not only applicable to other institutions but also provide inspiration and direction for those aiming to innovate in the sector. Both process efficiency and the

sustainability of patient data have become more essential than ever. Basel's journey stands as an example of how creative thinking and collaboration can lead to lasting changes in the medical field. And thus, in the shadow of the Rhine, the sponsor's message echoed: "Let us work together to create a future where data is not merely preserved in the past but forms the foundation for the health of generations to come."

Session 7 part 2: A Vision for Health: The Jamaican Journey.

By Keisha Barwise, Medical Doctor,
Digital Health and Health informatics Consultant at the Ministry of Health & Wellness Jamaica.

In the world of digital health, size does not dictate impact—and Jamaica is proving just that. Known globally for its pristine beaches, sporting excellence, and trailblazing spirit, this small island nation is now making bold strides in healthcare transformation, offering lessons for even the most advanced health systems.

Jamaicans have long embodied the local proverb "little but tallawah"—small in size but mighty in strength. This ethos now fuels a strategic, patient-centered approach to digital health, ensuring interoperability, efficiency, and accessibility despite limited resources. With a focus on open standards, cost-effective solutions, and real-time public health data, Jamaica is building a connected, resilient healthcare system—one that speaks directly to the challenges facing the European Union's digital health agenda.

As the EU advances MyHealth@EU and the European Health Data Space (EHDS), Jamaica's experience provides a case study in agile, scalable digital transformation. The island's standards-first strategy, integrating SNOMED CT for terminology, which Jamaica joined in 2023 and openEHR for structured data, ensures that health records are patient-centric, portable, and interoperable. This model aligns with the EU's efforts to break down health data silos, enhance cross-border care, and future-proof digital health infrastructure.

But technology alone is not the answer. Equitable access, patient engagement, and adaptability are at the heart of Jamaica's approach. By prioritizing data-first solutions, integrating culturally relevant terminology, and ensuring real-time health data interoperability, the country is addressing gaps in digital inclusion that persist even in developed nations.

One of Jamaica's biggest success stories came during the COVID-19 pandemic, when it integrated two previously separate national databases as a proof of concept— a proprietary one for test results, and another open source for vaccinations—into a real-time public health record. This demonstrates a level of agility and responsiveness that many larger, more complex health systems struggled to achieve.

The lessons are clear: A well-structured, standards-driven digital health system doesn't require limitless resources—just the right vision, strategy, and governance.

As you engage with the insights in the following presentation, consider how Jamaica's experience can help accelerate the EU's digital health transformation—ensuring interoperability, cost-efficiency, and a more connected future for healthcare. Because if there's one thing Jamaica has proven, it's that being "little but tallawah" means making a big impact, no matter the odds.



9. What can we learn from Catalonia?

Session 8: The Third Generation EHR in Catalonia, the Future of Digital Healthcare: Developing a New Catalan EHR

By Jordi Piera Jiménez, Director of the Digital Health Strategy at Catalan Health Service.

In the rapidly evolving world of digital health, the region of Catalonia stands on the brink of an exciting development: the construction of a new Catalan Electronic Health Record (EHR). This project goes beyond mere technological innovation; it embodies a vision for a future where care is more efficient, accessible, and patient-centered.

A Paradigm Shift

The Catalan new EHR will be based on the principle of open platforms in healthcare. This approach fosters collaboration and innovation and is crucial for improving patient care and optimizing workflows in healthcare. Through this open approach, Catalonia is confident that the opportunities for innovation will significantly increase. The goal is not only to renew technology but also to transform our approach to and organization of healthcare.

A Participatory Approach

The participatory approach is a key cornerstone of the Catalan project. They recognize that the best solutions arise from collaboration with all stakeholders. Therefore, they have established an extensive participation process, utilizing scientific methods to inform our policy and make impactful decisions. Catalonia have taken four important steps that may be of interest to a broader audience:

1. Consensus Process: Together with the Spanish government, they have initiated a consensus process to reach an agreement on the needs and expectations regarding health information technology.
2. Co-design Process: Catalan has worked closely with diverse stakeholders, such as healthcare providers, patients, and health professionals, to define an EHR that aligns with users' wishes and needs.
3. Survey: They conducted a comprehensive survey to collect feedback on the current model and a vision for the future. With responses from 152 relevant participants, they gained valuable insights.
4. Events and Workshops: Organized events, such as this gathering, have helped them test ideas and gather valuable feedback, refining their approach.

The Situation in Catalonia

At the local level in Catalonia, there are significant challenges with the current model of Electronic Medical Records (EMRs) and EHRs. While healthcare professionals and providers wish to collaborate, the current system does not facilitate that. It is based on a combination of different systems, leading to a fragmented care structure where the patient-focus is lost. Healthcare professionals in Spain often have limited time per patient; a general practitioner has an average of just seven minutes. This tight schedule often forces them to copy information from other notes instead of recording new data from the patient. This so-called copy-pasting not only saves time for doctors but also jeopardizes the quality of the recorded information. When providers cannot effectively understand or accurately document data, this introduces bias into how we manage health information.

From EMR to EHR and Personal Health Record

Catalan aim to move from the EMR, which primarily provides a vertical view of a single healthcare provider, to the EHR, which offers a longitudinal view of all contacts an individual has with the healthcare system. Ultimately, they strive for a Personal Health Record that allows citizens to contribute their own information to their medical records.

This requires integrating many different information sources. In Catalonia, they conducted a survey among healthcare providers, and they found out that an average hospital has around 600 to 800 information

silos, in which patient data is divided. These silos are often stored in different formats, making it even harder to obtain a coherent view of the patient.

The Challenges of Data Integration and Interoperability

A major issue in healthcare is the fragmentation of data and the so-called data silos. While other sectors, such as banking or travel, have successfully established joint standards and integration processes, in healthcare they have yet to reach agreement on how to represent our sector within the technical landscape. This leads to frustration and inefficiency for healthcare providers.

An expert, Rachel Dunscombe, aptly stated: “if we assume that health data is for life, we should design and procure our systems differently”. Currently, healthcare faces many disparate systems in healthcare, each with its own data layer, often in an opaque and proprietary format. Even if there are open APIs from a vendor, interoperability remains limited—only 22% of all transmitted information is effectively understood when exchanged between different vendors.

Every connected application creates its own database with the best intentions and following their own criteria, they fragment the data again. This can be harmful because later, when integrating applications, this leads again to more complex connections and a continual transformation of our original data into a messaging structure. Each time data is connected, it leads to information loss and increases complexity. The concept of a postmodern EHR is to embrace the meaningful use of standards: use each standard for the purpose for which it was created and fully exploit the possibilities of each standard.

Generations of EMR and The Path to Improvement

In this context, the development of EMR systems can be categorized into different generations. The first generation of EMR: solutions from individual providers, is that translate paper processes into digital systems. Each module has its own database with a proprietary model. With considerable effort, they try to connect these different silos of information with limited interoperability. Everyone in Europe and the world is trying to address this fragmentation and create a comprehensive EHR.

The second generation of EMR encompasses systems that have evolved from the first generation, now offering more modules and functionality. Although this approach partly addresses integration issues by encouraging everyone to use the same products, the question is what this means for innovation within our ecosystem. Is there a vendor locking for all our new innovations? Can start-ups and small- and medium-sized enterprises (SMEs) still thrive in the ecosystem, or are they harmed by focusing on a single vendor that wants to do everything?

Most solutions follow the principle that if everyone uses the same product, everybody will work in the same way, which might be profitable in the short term. However, this monolithic solution could also potentially confine healthcare.

A New Path Forward

The Catalan proposal is to combine the best of both worlds in a third generation of EMR. They embrace the idea of a unique data structure but makes this data structure open. By unlocking the content and semantics of this data and providing APIs to interact with it, Catalonia can enable the market to develop solutions that are built on this data. This forms a hybrid model that combines elements of the first and third generation of EMR and allows Catalan to create an innovative ecosystem that accommodates new players and solutions.

This is the Catalan vision, and while they realize this is not scientifically substantiated, they have discussed it in several workshops with like-minded and less like-minded individuals.

The Path Forward

It is clear that Catalonia has made progress in implementing digital health solutions, but they still have a long way to go. The basic requirements for high-quality, patient-centered care have been known

EJordi Piera Jiménez

“Every time that a startup develops a new healthcare solution, with the best of their intentions, and they create their own database, they are fragmenting again, the data from the Catalans citizen or from citizen of the world. So, every time that the best intentions we create our own database following our own criteria, we are fragmenting data again and we are causing harm, because then later on we want to more linked it, and this will mean throwing more pipes to connect the data. And every time we connect the data is an effort and there is a loss, because we are transform our regional data into some messaging system. And in this mapping there is loss of information.”

since the Institute of Medicine's "Crossing the Quality Chasm" report in 2001, and yet they continue to lag behind in many areas. Investing in health information technologies is crucial for making informed decisions and improving the quality of care.

Their efforts are focused on embracing these challenges and opportunities to construct a future where technology is effectively employed to bring about real change in healthcare delivery. They are convinced that an integrative and participatory approach is key to creating a more collaborative, integrated, and patient-centered healthcare structure in Catalonia.



10. Vendor Neutrality in Action

Session 9:Open Platforms & SMART on openEHR

Dr. Sidharth Ramesh, Founder, and CEO of Medblocks; Sebastian Iancu - Software architect and co-founder of Code24; Stefan Schraps - Vice President of Business and Community Management at vitagroup

The session focused on the concept of vendor neutrality in healthcare IT, emphasizing the importance of open platforms and the SMART (Substitutable Medical Applications, Reusable Technologies) framework on openEHR. The speakers aimed to demonstrate how these concepts can simplify healthcare data management and promote the innovation of new applications on existing openEHR Platforms.

Key Points:

The speakers demonstrated how a SMART on openEHR application can be used in real-life scenarios - A Dutch patient with chronic asthma traveling to Germany and receiving treatment using interoperable healthcare systems.

Sidharth from Medblocks first showed an impressive live demo of a practitioner-facing voice dictation app working within both the Medblocks Platform using SMART on openEHR (figure 1). This app was used to capture information about Bettie who suffered from an acute asthma attack.

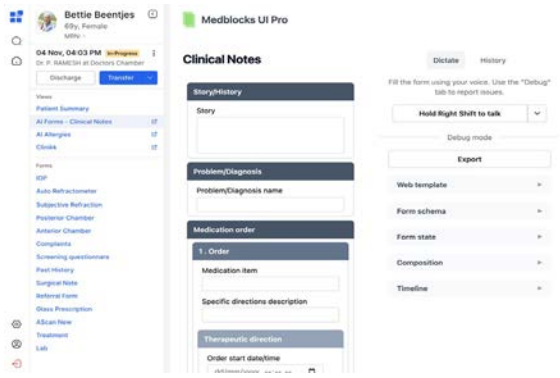


figure 1

They then demonstrated how the patient can get access to their own information using the SMART on openEHR protocol using it's consent mechanism. (figure 2)

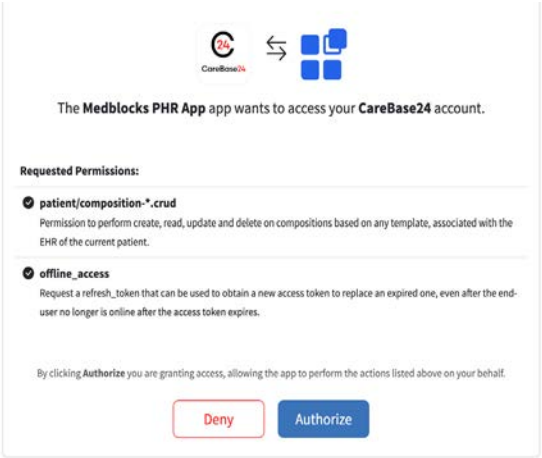


figure 2

They then showed how data can be transmitted from one openEHR CDR (from Medblocks) to another (to CODE24) by just having the patient copy over the data. (figure 3)

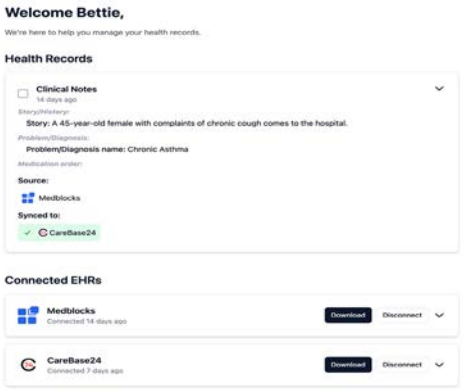


figure 3

Finally, they then showed how the same data now follows into CODE24's EHR - mConsole (figure 4)

As a cherry on top, they also demonstrated the use of the same voice dictation app to add new information to CODE24's openEHR CDR (figure 4), and this worked flawlessly out of the box in Dutch. (figure 5)

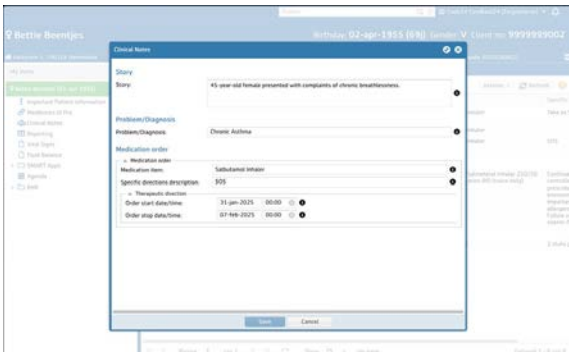


figure 4

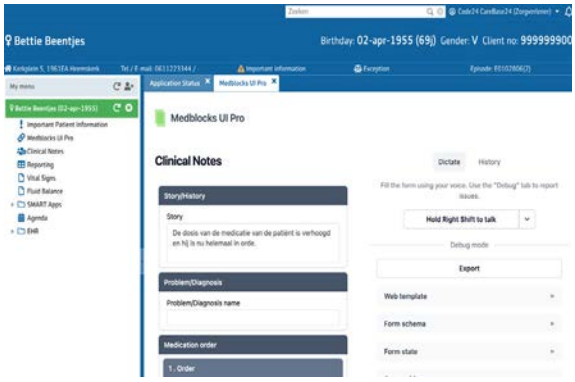


figure 5

Benefits of Vendor Neutrality and Open Platforms:

Simplifies the complexity of healthcare IT systems. Encourages innovation by allowing different applications to work together. Empowers healthcare providers and patients by giving them control over their data.

Challenges and Solutions:

Addressing data duplication and ensuring data integrity. Using standardized archetypes and templates to maintain consistency across different systems.

Conclusion:

The session highlighted the potential of vendor neutrality and open platforms to revolutionize health-care IT. By separating data from applications, healthcare providers can innovate more rapidly and efficiently. The speakers encouraged the adoption of open standards like openEHR and frameworks like SMART on FHIR to achieve this vision.

Q&A: The session concluded with a Q&A segment, addressing various technical and practical aspects of implementing vendor-neutral systems and open platforms in healthcare.

Detailed Discussion of the Session:

1. Introduction and Agenda: Stefan Schraps opened the session with an overview of the agenda and introduced the speakers. He emphasized the importance of vendor neutrality and open platforms in healthcare IT. The session aimed to provide insights into how simple and effective these concepts can be.
2. Background of the Speakers: Stefan Schraps: Vice President at vitagroup, with 20 years of experience in healthcare IT. He is responsible for strategic partnerships and community management within vitagoup. Dr. Sidharth Ramesh: Founder and CEO of Medblocks, he shared his story of developing scripts to automate data transfer between systems, but the system not being able to adopt these. He emphasized the need for innovation in healthcare IT, and SMART on openEHR as a solution to this. Sebastian Iancu: Software architect and co-founder of Code24. He works on promoting and adapting openEHR in the Netherlands.
3. What is Vendor Neutrality? Vendor neutrality means that different healthcare systems can work together without being dependent on a single vendor. This promotes interoperability and allows data to be exchanged between different platforms. The goal is to give control over data back to healthcare providers and patients.
4. The Importance of Open Platforms: Open platforms enable different healthcare applications to work together seamlessly. This promotes efficient data flow and allows for the development of innovative solutions. Medblocks, vitagroup and Code24 are examples of companies that support and implement open platforms.

5. The Role of openEHR: openEHR is an open standard for storing and modeling healthcare data. It emphasizes community collaboration and continuous improvement of data models.
   openEHR has been in development for 25 years and has gained significant momentum in recent years.
6. SMART on FHIR: SMART on FHIR is a framework that makes applications portable across different healthcare systems. It was introduced by the SMART Health IT Foundation and allows for the integration of various healthcare applications, making data more accessible and usable. The speakers discussed how SMART on FHIR can be combined with openEHR to create a powerful interoperable system.
7. Demonstration of SMART on openEHR: The speakers demonstrated how a SMART on openEHR application can be used in a real-life scenario. They used the example of a Dutch patient with chronic asthma traveling to Germany and receiving treatment. The demonstration showed how data can be seamlessly exchanged between different systems and how patients can access their own data.
8. Benefits of Vendor Neutrality and Open Platforms: Vendor neutrality and open platforms simplify the complexity of healthcare IT systems and encourage innovation. By separating data from applications, healthcare providers can innovate more rapidly and efficiently. This gives healthcare providers and patients control over their data and allows for the development of new and improved healthcare solutions.
9. Challenges and Solutions: The speakers discussed the challenges of data duplication and ensuring data integrity. They emphasized the importance of standardized archetypes and templates to maintain consistency across different systems. By using standardized models, data can be seamlessly exchanged and integrated.
10. Conclusion and Q&A: The session concluded with a Q&A segment, addressing various technical and practical aspects of implementing vendor-neutral systems and open platforms in healthcare. The speakers encouraged the adoption of open standards like openEHR and frameworks like SMART on FHIR to realize the vision of an interoperable and innovative healthcare IT.

11. Empowering nurses in Finland

Session 10:Building an Open Healthcare System

By Sofia Kauppila (Tietoevry Care)

The Future of Healthcare:
Innovation and Collaboration

In a world where healthcare is becoming increasingly complex and expensive, it is essential to find new ways to document and improve care. Sofia Kauppila, an experienced midwife and nurse from Oulu, Finland, shares her vision and experiences on how international nursing standards and open data models can contribute to a more efficient and patient-centered healthcare system.

Sofia's Background and Vision

Sofia began her career as a clinical nurse in Finland, Sweden, and now works as a portfolio lead at Tietoevry. Her dream of improving healthcare by leveraging knowledge and skills is becoming a reality. She emphasizes that rising healthcare costs and the increasing demand for long-term care, partly due to an aging population, require innovative solutions.

Challenges in Healthcare

Healthcare faces various challenges, such as rising costs, increasing demand for long-term care, and

an aging population. Additionally, there is a growing need for well-trained personnel as many nurses retire. These challenges call for new ways of working and documenting to ensure the quality of care with the available resources.

The Importance of International Nursing Standards

One of the key steps is the use of international nursing standards. These standards provide a common language, clear planning, and consistent documentation. Sofia explains that it is not enough to work in one's own way within each organization, region, country and health ICT Vendor; a uniform approach is needed. This not only helps improve communication but also in measuring outcomes and planning care.

Patient-Centered Approach

A patient-centered approach is crucial. This means that IT vendors must develop systems that place the patient at the center, leading to more efficient care, better health outcomes, and greater patient engagement. Sofia compares this to choosing the best products in a specialized store rather than buying everything from a supermarket. By opting for specialized solutions, healthcare providers can offer the best possible care.

Open Data Models and openEHR

The use of open data models, such as openEHR, plays a key role in this. openEHR enables data sharing and documentation in a way that is relevant to the patient. This model uses archetypes, similar to Lego blocks, that remain consistent and harmonize the data. This allows healthcare professionals to easily input and share data without worrying about terminologies.

Implementation in Finland

In Finland, Tietoevery has successfully implemented an open data model. This process began in 2016 and has led to close collaboration with various welfare regions. By working together and using input from clinicians, they have managed to harmonize documentation and care processes. Tietoevry´s collaboration model with 8 wellbeeing regions, a close clinician group and the flexibility and speed of the openEHR model has significantly improved efficiency.

Collaboration as the Key to Success

Sofia emphasizes that collaboration is the key to success. Not only between vendors and customers but also among the customers themselves. By opening doors and working together, we can elevate healthcare to a higher level. This means that vendors and customers jointly define strategic goals and establish measurable outcomes. Through this close collaboration, innovations can be quickly implemented and tested.

Examples of Successful Implementations

One example of a successful implementation is the reduction of manual steps in documenting diabetes care. Previously, ten manual steps were needed to document care, but with the new system, this has been reduced to five. These kinds of improvements are possible thanks to the flexibility and speed of the openEHR model.

Another example is the improvement in documenting diagnoses. By working with clinicians, they developed a system that increases the number of diagnoses entered with less work. These kinds of innovations not only help improve efficiency but also the quality of care.

Future Innovations and Collaboration

The future of healthcare lies in collaboration and innovation. By using open data models and international standards, we can improve and make healthcare more efficient. Sofia's story shows that by working together and innovating, we can overcome the challenges in healthcare and create a better future for patients and healthcare providers.



12. Modelling the Health Data Space: From national information models to international cooperation and governance

Session 11 part 1:The Dutch national information models and governance

By Gerda Meijboom-Cruiming, information architect, Nictiz

The session began with a warm welcome to the audience, setting the stage for a presentation on modeling the health data space. The speaker, Gerda Meijboom, introduced herself and explained that she would be covering parts of the presentation originally intended for her colleague Wouter Zanen, who was unfortunately absent due to illness. Another speaker, Vebjørn Arntzen, was participating online and would join later to provide an international perspective on governance, particularly concerning archetypes.

Gerda, a lead architect at NICTIZ with over a decade of experience in healthcare information exchange, outlined the session's agenda. She planned to discuss the current situation in the Netherlands, key developments in logical models, and future directions. She also intended to touch on European developments in this area.NICTIZ, as Gerda explained, is a competent center for digital information management in healthcare, dedicated to shaping a vision for healthcare information systems and developing standards for digital informtion management. Their motto, "better health through better information", underscores the importance of healthcare information availability in improving health outcomes. Gerda highlighted two significant laws in the Netherlands: the WEGIZ (law on electronic data exchange in healthcare) and the EHDS (European Health Data Space Regulations). These laws mandate specific use cases for data exchange according to set specifications. Additionally, the FHIR decision requires the use of FHIR R4 for information exchange in the Netherlands, and the Integral Healthcare Agreement (EISA) outlines data sharing and collaboration between healthcare providers and the government.

The national vision for the health information system, running from 2022 to 2035, focuses on three main goals: data availability, trust, and direction. Data availability ensures that healthcare providers, patients, and policymakers can access and use information effectively. Trust involves building reliable systems and relationships, while direction emphasizes clear roles and responsibilities.

Gerda introduced the concept of ZIBs (Healthcare Information Building Blocks), which are used to model information exchanged, stored, and registered in healthcare. ZIBs are based on the international ISO standard 13972 and are implementation-agnostic, making them versatile for various use cases.

However, ZIBs are more conceptual and do not contain all information, focusing instead on the most commonly used data.

The presentation also covered the distinction between data exchange and data processing in The Netherlands. ZIBs must describe information in a way that supports both processes. Gerda recommended viewing ZIBs as independent models, separate from technology, with openEHR as the standard for registering information and HL7 FHIR for information exchange.

Gerda discussed the importance of international cooperation in developing clinical models to ensure interoperability across borders. She mentioned ongoing efforts in Europe, such as the extended EHR program and the collaboration between openEHR and HL7, which aim to create international information models.

The session concluded with a discussion on governance. Gerda emphasized the need for effective governance of standards, including archetypes, templates, translations, and mappings. She

highlighted the Norwegian model of developing archetypes internationally from the start, which, although slower, reduces the risk of expensive rework. The Netherlands is considering a similar approach, with roles and responsibilities defined for governance. In response to a question from the audience, Gerda acknowledged the importance of trust between clinicians and citizens and suggested that the national vision's strategy might address this issue.
Overall, the session provided a comprehensive overview of the current state and future directions of healthcare information systems in the Netherlands, emphasizing the importance of data availability, trust, and international cooperation.

Session 11 part 2: The International information models and governance

Vebjørn Arntzen,Health Informatics, Oslo Universitetssykehus HF, CKA lead openEHR International

Vebjørn Arntzen, a dedicated member of the international openEHR community, shared his insights during a recent conference. Despite being unable to attend in person, Vebjørn connected from Oslo, ready to delve into the intricacies of his work.

Vebjørn began by introducing himself and his extensive background in healthcare and technology. Having worked at Oslo University Hospital since 1988, he transitioned from nursing to becoming a clinical modeler and architect. For the past eight years, he has been deeply involved with openEHR, a standard for electronic health records.

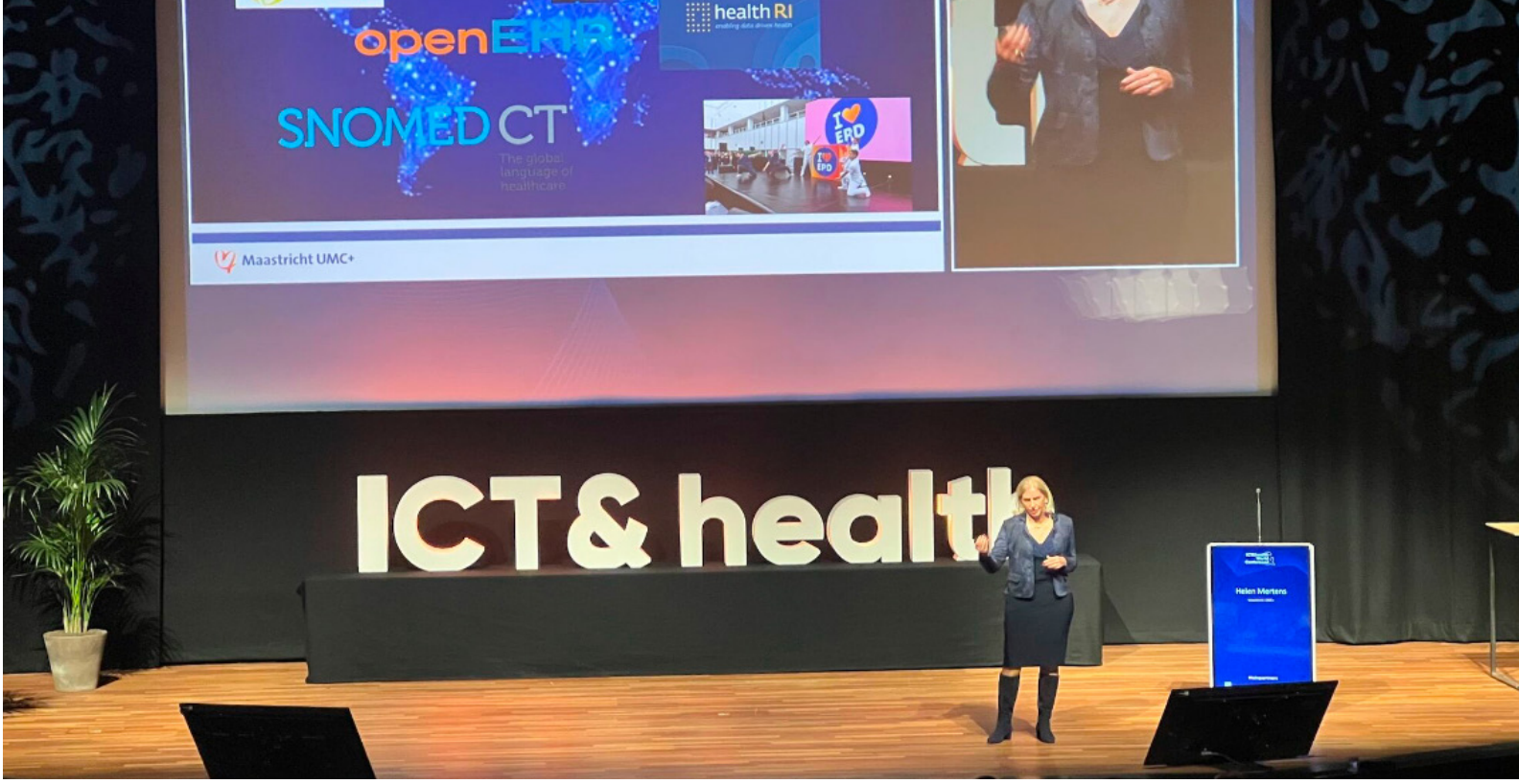
He explained the concept of archetypes in openEHR, which are information models representing clinical concepts. These archetypes can include observations like blood pressure measurements, instructions for medication, actions related to procedures, or evaluations such as recording an individual's ethnicity.The international archetypes are stored in a web repository called Clinical Knowledge Management (CKM), where they undergo a rigorous review process before being published.

Vebjørn highlighted the collaborative nature of this process, with users worldwide participating in peer reviews to ensure the archetypes meet all necessary requirements. Once consensus is reached, the archetypes are published and made freely available under a Creative Commons license.

He also discussed the challenges of creating high-quality archetypes. While it's easy to create an archetype, making a good one that aligns with existing models and covers all known requirements is much harder. The goal is to standardize these archetypes to avoid conflicts and duplications.

Vebjørn emphasized the importance of using English as the original language for archetypes to facilitate easier translation and broader adoption. He noted that locally made archetypes often face limitations and complications, especially when translating from languages other than English.
To address these challenges, Vebjørn introduced a new governance approach within openEHR. This approach involves a clinical operation program called COP, which aims to gather experienced modelers and administrators to work together. The goal is to raise awareness of the risks associated with localized archetypes and promote the use of international standards to avoid technical debt and ensure long-term sustainability.

He noted that locally made archetypes often face limitations and complications, especially when translating from languages other than English, but even more local archetypes sometime are too specific for a use case and not aligned with other archetypes with respect to design. In conclusion, Vebjørn encouraged the audience to explore the resources available on the CKM and join the vibrant community on platforms like BlueSky. He also



addressed questions about the use of older ZIBs publications and the potential for openEHR to replace ZIBs in the Netherlands, highlighting the need for a flexible and inclusive approach to standardization. Vebjørn's presentation underscored the importance of collaboration, standardization, and the continuous effort to improve and adapt healthcare information models for global use.

13. How do the current major EPD suppliers view this development?

The stories above describe a world where data is separated from applications. Data platforms on top of which applications can be built. However, traditional integrated EHRs also have their advantages. This thought kept haunting us, and that is why we felt that EHR suppliers also deserve a chapter in this document. After all, they have supported our care digitally in an adequate way for years. What view do current EHR suppliers now have on this open movement? So we presented them with the following 5 questions in writing which will be answered in this chapter.

1) The “National vision and strategy - health information system” talks about separating Data from Functionality. How do you view this point in this vision?
2) In the Architecture advice from Nictiz to VWS about the ZIB-Transition, openEHR is increasingly being considered as an information model. How do you view openEHR?
3) In the context of question 1 and 2, would you be willing to help synchronize data from within your application to openEHR? What are the pros and cons of this? What would need to be c onsidered in this synchronization? What would be a realistic time frame before we could have most of your EHR synchronized?
4) If we can achieve this synchronization at 1 facility, is this synchronization easily replicated to all health care facilities or is each facility still unique?
5) Eventually, healthcare institutions will have to work together more and more, to cope with the (future) problems in healthcare. We will have more and more regional and national (ICT) initiatives, more and more experimentation and innovation will have to take place in this regional context . How would you address this challenge?

13. How do the current major EPD suppliers view this development?



Question 1) The "National vision and strategy- health information system" talks about separating Data from Functionality. How do you view this point in this vision?

Use of data, in any model, should respect the rights of the owner, that is the patients and citizens. The use of data to fuel functionality should be in compliance with current and future regulation. In the One London Shared Care model our technology is used to collect and share data from participating actors. This data populates an OpenEHR repository upon which functionality for palliative care has been developed.

Question 2) In the Architecture advice from Nictiz to VWS about the ZIB-Transition, openEHR is increasingly being considered as an information model. How do you view openEHR?

It is one of several models which can be used. International standards are important for us as an international company. We see recent announcements about OpenEHR collaboration with HL7 FHIR as positive.

Question 3) In the context of question 1 and 2, would you be willing to help synchronize data from within your application to openEHR? What are the pros and cons of this? What would need to be considered in this synchronization? What would be a realistic time frame before we could have most of your EHR synchronized.

As mentioned we have already synchronized data to populate an OpenEHR repository. Our own EHRs are open and standards based. Our new architecture will use a rich semantic data layer, enriched by standards.

Question 4) If we can achieve this synchronization at 1 facility, is this synchronization easily replicated to all healthcare facilities or is each facility still unique?

We should be designing systems to be interoperable from the ground up.

Question 5) Eventually, healthcare institutions will have to work together more and more, to cope with the (future) problems in healthcare. We will have more and more regional and national (ICT) initiatives, more and more experimentation and innovation will have to take place in this regional context. How would you address this challenge?

We are working towards a new healthcare architecture designed to evolve and extend, enabling customization and adoption of new standards, tools, and priorities without requiring disruptive overhauls.

13. How do the current major EPD suppliers view this development?



Question 1) The "National vision and strategy - health information system" discusses separating data from functionality. What is your view on this point in this vision?

We support the concept of making data available to support all kinds of applications.
However, separating data and functionality is not a goal in itself. The systems are complex and there is a lot of data directly related to the operation of the application.

Question 2) In the Architecture advice from Nictiz to VWS on the ZIB transition, openEHR is increasingly being looked at as an information model. What is your view on openEHR?

We are pleased with Nictiz's recognition that exchange and registration are different concepts that need to be approached differently in terms of standardization.
We are of course following Nictiz's exploration of the role that OpenEHR can play in this in the context of standardization of registration / storage with interest in the context of data availability.

Question 3) Would you be prepared to help synchronize data from within your application to openEHR in the context of question 1? What are the pros and cons of this? What should be taken into account with this synchronization? What would be a realistic time frame before we can have the largest parts of your EHR synchronized?

We always like to talk to customers about these kinds of themes and the direct added value in practice. There are possibilities to make data available and also to view/request data from external sources.
In ChipSoft's vision, they do not provide data replication to HiX or vice versa from a synchronization perspective. We believe that data should remain at the source as much as possible and should have 1 clear owner.

Question 4) If we have this synchronization for 1 institution, is this synchronization easily be replicated to all healthcare institutions or is each institution unique anyway?

See our previous answer. We are not in favor of synchronization.

Question 5) Ultimately, healthcare institutions will increasingly have to work together to be able to deal with (future) problems in healthcare. We will increasingly see more regional and national (ICT) initiatives, there must be more experimentation and innovation in this regional context. How would you like to tackle this challenge?

ChipSoft fully understands the situation. There are several initiatives, legislation and regulations, standardization projects, etc. on a (inter)national scale to support cooperation. ChipSoft supports various regional initiatives. For new regional experiments, the use of capacity (of ChipSoft) must always be weighed up, in order to be able to continue to meet the guarantees towards our customers.

13. How do the current major EPD suppliers view this development?



Epic is a long-standing leader in healthcare interoperability: Epic built the first EHR-based interoperability network and continues to invest in standards-based APIs and analytics tools. At present, more than 750 APIs are available to developers for free on open.epic. Our interoperability, API, and analytics tools empower the Epic community to do more with data both inside and outside their Epic systems. As of today, all health systems that use Epic are fully interoperable. Notably, in the Netherlands, Epic hospitals alone exchanged 2.5 million patient records with other hospitals, using Epic or a different EHR system in 2024.

Epic declined to comment further on openEHR's specific questions

13. How do the current major EPD suppliers view this development?



Summary

Tietoevry is a leading EHR vendor in Finland and a provider of openEHR based clinical applications. Our goal is to offer modular platform based openEHR solutions for clinical documentation and visualization, ensuring that healthcare providers can use standardized, structured data across different systems.

Since 2017, openEHR has been our main clinical data model, allowing us to support vendor-neutral ecosystems rather than locking customers into proprietary systems. Our strategy is to follow healthcare standards, enabling a flexible, future-proof care ecosystem where different care organizations and professionals can seamlessly collaborate together and around the patient
By combining our EHR expertise with platform agnostic clinical applications, we ensure that healthcare providers have access to scalable, interoperable, and user-driven solutions, driving innovation in digital healthcare.

1) The “National vision and strategy - health information system” talks about separating Data from Functionality. How do you view this point in this vision?

The separation of data from functionality is a key enabler of rapid innovation in healthcare IT. By decoupling data from applications, healthcare providers can adopt new technologies without disrupting core patient records, ensuring system longevity and adaptability.

However, standardizing this separated clinical data is crucial for interoperability. Using openEHR as a vendor-neutral format ensures structured, reusable, and semantically rich data, supporting both primary care and secondary use (e.g., research, AI, population health).

This approach creates a resilient, scalable, and patient-centric health system, allowing healthcare IT to evolve while maintaining data integrity and accessibility across different platforms.

2) In the Architecture advice from Nictiz to VWS about the ZIB-Transition, openEHR is increasingly being considered as an information model. How do you view openEHR?

From our experience the openEHR enables a collaborative ecosystem, where multiple vendors contribute to and benefit from shared, standardized models. This vendor-neutral approach encourages competition, fosters innovation, and lowers barriers for new healthcare application providers, leading to a more dynamic and flexible healthcare IT landscape.

Moreover, openEHR models are internationally reusable, allowing seamless cross-border healthcare data exchange and alignment with global standards. This ensures that healthcare organizations can leverage proven models from other countries, reducing development efforts while enhancing consistency and quality in data-driven healthcare.

3) In the context of question 1 and 2, would you be willing to help synchronize data from within your application to openEHR? What are the pros and cons of this? What would need to be c onsidered in this synchronization? What would be a realistic time frame before we could have most of your EHR synchronized.

In Tietoevry solutions all clinical data is stored in openEHR format by default. Synchronization with openEHR is possible, but the key focus should be on interoperability between multiple systems and try to avoid complex synchronization efforts. Having one standardized data repository allows for rapid development and easier integration across healthcare applications.

The main advantage of openEHR is that data is structured and available for different applications, supporting a vendor-neutral and scalable ecosystem. However, synchronization between multiple systems increases complexity, making system development harder to maintain. Factors like data consistency, version control, and governance need to be carefully managed to avoid redundancy and discrepancies.
Ultimately, the priority should be interoperability, ensuring that systems can access and utilize standardized data efficiently rather than relying on costly and complex synchronization processes.

4) If we can achieve this synchronization at 1 facility, is this synchronization easily replicated to all health care facilities or is each facility still unique.

See the answer for question number 3.

5) Eventually, healthcare institutions will have to work together more and more, to cope with the (future) problems in healthcare. We will have more and more regional and national (ICT) initiatives, more and more experimentation and innovation will have to take place in this regional context . How would you address this challenge?

As healthcare institutions work together to address growing challenges, regional and national ICT initiatives will be key to enabling innovation, experimentation, and scalability. To succeed, these initiatives should focus on collaboration between technology providers, healthcare professionals, and decision-makers to ensure solutions align with real-world needs.

Our customer partnership model in Finland is a strong example of how bringing developers and end-users but also the healthcare organizations together can drive meaningful progress. By actively involving healthcare professionals in system development, this approach ensures that digital tools are not only technically advanced but also practical and effective in daily use. It enhances interoperability, accelerates development cycles, and promotes the standardization of healthcare practices across regions.

Additionally, this model fosters cross-regional dialogue and knowledge sharing, allowing healthcare organizations to learn from one another and harmonize best practices. As a result, healthcare ICT systems become more flexible, scalable, and sustainable, supporting long-term innovation while maintaining high-quality patient care.

To successfully address these challenges, we must prioritize structured collaboration, open platforms, and user-driven development, ensuring that technology serves the evolving needs of healthcare professionals and patients alike.

Jasper van Lieshout, Projectleider ICT in de Zorg, Directie Zorg, Autoriteit Consument & Markt (ACM)

Transparency: it is possible!

The ACM is in favor of an obligation of transparency of healthcare information systems. We are not only convinced that transparency is a requirement for good market functioning and the transition to customized network care. But also that existing legacy systems are technically capable of offering this transparency, based on their existing APIs. At ICT& Health, this image was also confirmed by various progressive ICT suppliers. They develop modular systems based on open standards such as openEHR, and hope to accelerate innovation in Dutch healthcare ICT with this, so that healthcare providers and patients benefit from lower administrative burdens and better quality care.

Column : Demographic Data in openEHR

By Sebastian Iancu & Jenny Luco, CODE24

One of the challenges concerning the storage of healthcare data, is that there are many different kinds of data and each comes with its own specific challenges. In this article we will zoom in on demographic data, such as name, age, place of residence, relations, etcetera.The openEHR Reference Model has been capable of storing such data since the very beginning, but many parties have opted to use HL7 FHIR to store demographic data instead, or they do not standardise demographic data at all. Why is this the case and couldn't we use openEHR instead? At CODE24, we have used the openEHR Demographic Model since we started – in this article we will share our perspective.

Challenges

One of the issues many face when they consider using the openEHR Demographic Model, is that the demographic data is not stored under the EHR, but 'next to it', in a sense. This way, you can associate an EHR with a patient, while ensuring the security of the data. However, it also means that you cannot use the AQL to query demographic data, since that kind of data not supported by the AQL specification yet. Another issue is that demographic archetypes needs types and definitions from a different namespace, which makes it difficult to use that data while you model clinical archetypes. For many years, the aforementioned lack of AQL support, the scarcity of available archetypes and the fact that there were no API specifications, meant that vendors did not see a need to invest in implementing the openEHR Demographic Model. There was no specific demand for it from healthcare organisations either – there were alternative solutions available, so it was not cost-effective to look at newer, more innovative

solutions. This lack of demand will also have been a factor in the lack of interest on part of the vendors. Thankfully, these days we do have specifications for openEHR Demographics APIs. There has also been a shift in the market, meaning there is a growing interest in what openEHR has to offer in terms of the storing and modelling of healthcare data - including demographics.

Starting fresh

At CODE24, we have the benefit of having used the openEHR Demographic Model since the very beginning. We could start with a blank slate, using only the openEHR specifications. At other organisations, there are often existing (administrative) processes for which solutions for storing demographic data are already in use, such as HL7 FHIR. Think of, for example, invoicing, user management or permission and audit trailing. We had no such legacy and were free to fully embrace all facets of the openEHR Specifications - including the Demographic Model. Over the years, we have been very happy with our choice to use the Demographic Model for the practitioner caseload, care teams, patient relationships, the admissions process, etcetera. It has proven to give us the flexibility we need and provides us with a solid foundation upon which to continue to build our portfolio of solutions. When you store more data according to the openEHR specifications, you can work from a single source to a larger extent and there is less need for mapping and copying data in order to shareit. Also, openEHR is very well suited to store the history of patient demographics, due tothe versioning mechanism available for all openEHR persisted data. With alternative setups, older demographic data is often lacking (such as an old address, or older care relations). Having this data available is valuable for both research and prevention.We much preferred using a single open standard as much as we could, in order to reduce the complexity of the code and system of what we were creating. Combining openEHR and FHIR specifications is, of course, in many ways still a standard way of working in the industry, but we prefer to store data according to the openEHR Specifications as much as we can. It has been specifically created for this purpose and we believe in its benefits.

The future is looking bright

For the past three to four years, interest in the openEHR Demographic Model has grown. There have been many meetings where we were asked to show the benefits of using the openEHR Demographic Model and Sebastian, as a member of the openEHR International SEC, has advocated for adding support for them in both the APIs and the AQLs. This has led to a draft version of these specifications for the APIs and we believe that a proposal for the AQL will follow before the end of the year. Considering where the market is now and what challenges the healthcare IT industry is facing, healthcare organisations are increasingly exploring what openEHR has to offer.

Subsequently, we believe that once API and AQL support is available, vendor support for using the openEHR Demographic Model will grow and more and more vendors will implement it. As CODE24, we would welcome such a development and look forward to sharing our experience with the openEHR Demographic Model with the community as needed.

14. Questions for the openEHR partners

First of all, we would like to thank the suppliers who made it possible to organize the Track “Transforming the Healthcare Together” about exchanging data and data availability. During the eleven sessions, no product stories were told by the suppliers. Only stories and experience from the users in healthcare organisations from all over the world. This paragraph we give more attention to the suppliers themsleves. But also here we didn’t want a sales pitch. So we ask them 6 questions. The suppliers are everyday struggling with of interoperability. From their experience they elect openEHR as dataplatfom to overcome they constantly burden of integration the many different healthcare systems to build value added applications.
We therefore believe that suppliers can provide a good answer to the questions below in the field of open dataplatforms:

1. Name and domain name?
2. What is your take away from this IHWC25?
3. Why did you choose to base your products or services on openEHR?
4. What is your specific added value; what do you do differently than the competition?
5. How do you see the data availability market developing in the coming 3 to 5 years and what are you going to focus on during this period?
6. What advice would you like to give the reader?



14. Questions for the openEHR partners?



1. Better, www.better.care

2. The event featured engaging keynote speakers and excellent presentations over three days. Key topics included data availability, collaboration in digital healthcare, governance strategies, trust, and digital transformation. Additionally, there was an openEHR track with over 20 fully booked presentations throughout the event. International speakers shared their insights and benefits regarding data availability, discussing different digital health standards like openEHR, HL7 FHIR, and OMOP. Experts from London, Catalonia, Germany, Finland, Switzerland, and other countries—who are at the forefront of the data availability initiative—described the need for a digital health platform, a phased approach to multi-vendor data-driven ecosystems, and the importance of leadership in digital transformation. These discussions hold significant relevance for the Dutch digital healthcare landscape and the vision of the Dutch Ministry of Health, Welfare and Sport Sport.

3. We have adopted openEHR in 2011, choosing to base our products on the standard that promotes vendor-neutral, interoperable, and future-proof healthcare solutions. By adopting openEHR, Better ensures that health data is structured, reusable, and exchangeable across different settings, facilitating seamless integration and improving patient care. This approach aligns with our mission to create an open, connected, and patient-centric digital health ecosystem, empowering healthcare providers to innovate without being limited by the existing systems.

4. Better technology stands out by using openEHR and FHIR standards that underpin vendor-neutral, interoperable digital health data platform, Low Code Studio for healthcare based on Better Design System thus ensuring long term flexibility and giving healthcare organisations full data ownership and ability to create and share new content quickly. Our modular solutions for electronic prescribing, shared care records, care coordination (Like Advanced Care Planning) and patient-reported outcomes (PROM), are seamlessly integrated into any existing systems.

5. We are already seeing the healthcare market shifting away from closed, single-vendor solutions that restrict data access, toward data-driven digital ecosystem at the regional/national level as well at the hospital level. This trend is set to accelerate over the next 3–5 years, driven by the growing need to create a unified patient record that will allow different applications to read and write in real-time across regions and between countries. This shift towards data availability is further accelerated by AI, which relies on structured, high-quality data. Additionally, collaboration between different open standards is increasing, as the industry recognises that working together increases data availability and ultimately improves patient care. At Better, we remain committed to expanding openEHR adoption, improving real-time data access, building a collaborative environment, and supporting AI and automation so healthcare providers have the tools to deliver more efficient, data-driven, and patient-centred care.

6. Prioritise digital solutions that connect on the data level, implement open data digital health platforms that support the data availability agenda (and not just the exchange of data) for point-of-care applications, collaboration and sharing of clinical content, and prevent vendor lock to ensure seamless data access, drive

innovation, and create a more efficient, future-proof environment that can meet changing healthcare needs. There is no need to start from scratch, as such solutions enable incremental digital transformation without overhauling entire systems.

CODE24

1. CODE24 – https://www.code24.nl

2. Awareness about both data availability and openEHR is growing! While a few years ago hardly anyone had heard of openEHR, events like this one tell a whole other story. People came to us with specific questions and are truly interested in what openEHR has to offer.

3. We were founded in 2010 and have been using openEHR from our very beginning. We were already familiar with openEHR before we started CODE24 and truly believed in what it has to offer in terms of the storage and modelling of healthcare data.

4. While many vendors have only started exploring the use of openEHR in recent years, we have over 15 years of experience to build on and have been an Industry Partner for years as well. One of our founders, Sebastian, is involved in both the SEC of openEHR International and one of the co-founders of openEHR NL. As such, we are very close to 'the source' when it comes to the development of the specifications. Also, we like to differentiate ourselves with radical openness –healthcare organisations should have the freedom to shape their own EHR landscape and this means that vendors have to be open to collaboration with other vendors – even if they are competitors. This is what we believe in and how we do business.

5. We believe that changes in legislation will drive things forward. Think of, for example, the EHDS, but also local legislation such as the IZA in the Netherlands. Data availability is not a 'nice-to-have', but a must and vendors must act accordingly. We do have to ensure that we do not dilute the meaning of the concept of 'data availability' – oftentimes, it is still used interchangeably with data exchange or people consider the capability to view data as sufficient, while we also need to provide the option to mutate it at the source as needed. We have to reach for the stars – otherwise we will end up with a diluted solution as well.

6. Embrace change and innovation as needed to be future proof. Look for collaboration with like-minded partners as much as you can – as an industry and as vendors specifically, we have a lot of work to do and we cannot do it alone, working in silos. We have to build on one another's strengths and create healthcare IT that is open, flexible and effective.



1. Sidharth Ramsh, www.medblocks.com

2. openEHR is growing rapidly and is bigger than ever.

3. I Having a single standard to store all of your data is more important than ever. We have always tried to find this one standard and initially decided on FHIR. But the data models were very immature. openEHR was the only standard with an incredibly mature maximal data model repository - 1000s of archetypes that was available publicly (International CKM). This was the main reason we adopted openEHR.

4. We provide training, services and products on top of open data platforms like FHIR and openEHR. What we do differently is we give full ownership and codebase access to all of our customers. They can learn more at medblocks.com/sprint.

5. I see more people adopting open standards instead of locking themselves in. Medblocks is committed to building tools, servicing capacity and training around this to ensure when the need arises, we are there to fulfil people's requirement for building on top of data platforms.

6. Explore open standards and APIs as an alternative to being locked in by vendors for life.



1. SICHT DATA (www.sichtdata.nl) is a project and an offering of Maarsingh en van Steijn.
https://www.maarsinghenvansteijn.nl/

2. Digitalization is one of the key factors in ensuring a sustainable healthcare system for the future. However, we cannot achieve this alone; collaboration is essential. While there are many IT building blocks, such as AI, low-code, and openEHR, as well as a wealth of knowledge available, it is crucial that we work together to effectively integrate these technologies into our healthcare system.

3.In 2023, we decided to develop a tailor-made EHR based on openEHR and FHIR, built using low-code and designed to be AI-ready.
We made this choice because we firmly believe that client data should not be locked away in proprietary data silos but should be widely accessible for various purposes. Our primary goal is to facilitate a 'left shift' in health-care—placing greater emphasis on prevention rather than focusing solely on care and cure.
To achieve this, in addition to leveraging existing communication and exchange standards such as HL7FHIR, we must adopt a proven standard for the lifelong storage of health data: openEHR.

4.We are a not-for-profit healthcare organization, driven not by competition or profit, but by the mission to transform healthcare into a more preventive and proactive system. We also advocate for a more open and c ollaborative healthcare ICT ecosystem.To support this vision, we offer our low-code software template, along with our expertise and experience in openEHR, as an open-source solution available to all healthcare institutions.

5. We believe the focus will increasingly shift towards standardizing data storage rather than continuously exchanging and duplicating data. In our view, standards for both data exchange and storage will reinforce each other, fostering the development of an open data ecosystem for health and welfare.
Our approach is to lead by example—implementing an open data ecosystem within Maarsingh en Van Steijn and at the regional level. Additionally, we are committed to sharing our solutions and expertise with other organizations in a collaborative, non-competitive manner.

6. Stop talking, start building. Begin as soon as possible with small-scale projects to experiment with openEHR, low-code, and AI.



1. Hans Canisius, www.usoft.com

2. It seems that the topic of openEHR is really booming. This is a very positive development, as data openness and standardization are critical. The next steps are going to be interesting, because when organizations start to adopt openEHR CDRs, the next frontier is working on the use cases that are built on top of these CDRs. This will require a different mind-set within health-care organizations, as you need to shift towards thinking about the solutions you need or desire, compared to implementing a standard EHR system and try to sidestep the missing functionality. It’s going to be interesting to see how organizations transition to this new situation. One thing is for sure, the potential benefits for patient care and health care professionals are tremendous

.3. I was inspired by the openEHR development around a year and a half ago and based on discussions with openEHR ambassadors like Jan de Lange and Bouwe Koopal. I think these developments including the increasing willingness and urgency of organizations to adopt these, are crucial for the health care sector to move forward in this digital age. Open data and data standardization are the foundation on which organizations can realize more efficient and innovative solutions support patient care and health care professionals.

4. USoft is a leading low-code platform revolutionizing healthcare IT by seamlessly integrating with openEHR standards. With 30 years of expertise in digitization, USoft empowers health-care organizations to triple the impact of their IT spend, enabling faster, more focused solutions at significantly lower costs. By leveraging openEHR's standardized data platforms, USoft delivers robust, interoperable applications that align perfectly with clinical requirements. With USoft, organizations can develop up to 10x, allowing you to do more with your existing resources while future-proofing your health-care systems. With USoft low-code and openEHR CDRs you're ready to transform your IT infrastructure and build solutions that fit the needs of health-care professionals

and benefit patient-care – fast, reliable, and purpose-built for health-care innovation.

5. I'm convinced that open and standardized data is going to be the norm. And for USoft it is going to be vital to make sure that health care organizations can easily and efficiently leverage any open data source they use for effective application development.

6. Open and standardized data is one thing, but utilizing this asset is something else. Rightfully so, the attention is currently directed to the data. But once this openness and standardization is realized, organizations will be challenged in ways that are relatively new. For many decades, health care organizations have primarily adopted and used systems as designed and offered by the providers in the sector. This required limited skills within the organization to think of own use-cases and innovations that would disrupt current practices. This will complete change in the years to come and to reap the full benefits, it is vital that health-care organizations develop this critical skill-set of use-case design and digital innovation.

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vitagroup
HIP
HEALTH INTELLIGENCE PLATFORM

1. vitagroup AG, www.vitagroup.ag

2. Netherlands is definitely on the move towards taking initiative on openEHR based open data platforms in Europe and Maastricht is one focus area consolidating many stakeholders and initiatives.

3. vitagroup has decided to refocus its strategic product offering around open data platforms about 7 years ago. Soon after the decision was taken that openEHR was the right technology to focus its efforts around

4.Our platform offering with the Health Initelligence Platfom (HIP) is open Source based with EHRbase an open source distribution that was developed predominantly by vitagroup and which is the de-facto starting point for most openEHR projects around the world. The HIP is the commercial platform offering around EHRbase providing enterprise components, services and features. Besides of the open Source starting point, the platform approach also focuses around an open ecosystem approach on the application and use-case side with the capability to integrate all kind of best-of-breed solutions available on the market.

5.There will be a tremendous development along longitudinal data centered patient records that drive the change and innovation in healthcare. This will change the whole landscape of how healthcare will and can be organized around the availability of data.

6. Start with taking the lead on digitalization strategies in your hospital or region that puts data into the focus. With such a data first strategy, all priorities will be derived from there. Take the lead and you will be among the winners.

OPENLINE VITALY

1. Open Line Vitaly, https://openline-vitaly.com/

2. On all levels (suppliers, healthcare providers and governing bodies) there is a growing consensus on how we should handle clinical data and how applicable standards like OpenEHR, FHIR and OMOP fit in. The number of implementations and solutions is growing rapidly and IHWC25 showed that. We are thrilled to be part of that movement.

3. Open Line Vitaly provides several solutions for network care, all involving some form of integration with information systems. We see that there is a growing need to store the data produced in network care, and make it available to other applications. Using an open data model like OpenEHR is the most logical step to take, and partnering up with Better in the last few years made that vision work.
4. Our solutions are mainly focused on providing SaaS-solutions for care across care organizations, such as multidisciplinary teams and advance care planning. We focus on supporting care processes while in the meantime realizing interoperability and reusability of data using FHIR and OpenEHR. This enables our customers to choose solutions (from us or other vendors) that suit their functional needs the best.

5. Data is currently stored in a lot of information systems relying on proprietary information models. These systems are hard to make interoperable and interoperability heavily relies on the roadmap of the specific vendors. By focusing on unlocking data use case by use case, we see a growing amount of data that is interoperable and reusable. We see a growing number of initiatives supporting this and following this path, so in 3 to 5 years we foresee a much more open ecosystem for health data.

6. Focus on use cases, but stick to the right data principles. Just focusing on data will not help care providers and just focusing on data does not make interoperability scalable. By sticking to data principles while enabling the care providers with the right functionality, we can make interoperability and unlock data.

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tietoevry

1.Mika Kiviaho, MD; Head of Medical, https://tietoevry.com

2. In this year #IWC25 we heard multiple sessions and keynotes of same areas - data, interoperability and patient centric care. For many years, there has been discussions about the importance of clinical data quality and the high professional demand for interoperability and data liquidity. In recent years, openEHR has emerged as the best global standard for clinical documentation, care services, and clinical research. There were many solid presentations in #IWC25 from openEHR international partners to proof this.

3. In Tietoevry Care, our EHR modernization journey began in 2016 with the clinical need for integrated workflows and the best possible user experience for care professionals. We aimed to be the most open EHR vendor in the Nordic market. Tietoevry Care has now modernized its market-leading Lifecare EHR into a modular, openEHR-based system to achieve this goal. This transformation has allowed us to provide a more flexible and efficient openEHR clinical solution that meets the evolving needs of healthcare services.

4. In the context of Tietoevry's implementations, openEHR has been successfully deployed in Nordics, providing a robust foundation for the openEHR clinical applications. The openEHR-based Lifecare Open Platform, including the Clinical Data Repository (CDR), is used to manage and store health data, ensuring high-quality and reliable data management. Our platform supports co-development with customers, offering both on-premises and as-a-service solutions. Its full potential has been proven now in the Nordics, particularly in Finland, where Tietoevry Care's openEHR-based Lifecare EHR serves as the comprehensive regional EHR. It covers social care, primary care, and hospital care in 15 out of 21 Finnish wellbeing counties, serving over 2.5 million citizens. Our openEHR applications work seamlessly together within a service-oriented architecture, with applications and platforms separated. Lifecare Open Platform enables a common UI for multiple applications from Tietoevry and even the ability to run needed third-party applications in the same Lifecare desktop UI. We strongly support digitalization and innovation, with clinicians and IT professionals driving the development focus. Our system offers high configurability to adapt to various care needs, ensuring that our solutions are tailored to the specific requirements of each healthcare provider. This approach sets us apart from the competition by providing a more adaptable and user-centric openEHR clinical solution. openEHR based Lifecare Open Platform and Clinical applications offers significant advantages for both end users and organizations. For end users, such as healthcare professionals, openEHR provides a unified user experience and reduces the time spent on clinical documentation and data visualizations.
The system is designed and validated by clinicians, ensuring that it meets their needs and enhances their productivity. The role and asset-based data visualization feature allows for personalized and efficient data access, improving clinical decision-making and patient care. For organizations, Lifecare Open Platform offers modularity as a standard, which means that it can be easily adapted to various clinical use cases. It is regulatory compliant and supports a wide range of clinical applications, from general practice to university hospitals. The open and standard openEHR data model ensures interoperability and scalability, allowing organizations to add new capabilities without replacing their entire system.
Additionally, openEHR minimizes upfront investments and accelerates time-to-market for new features, providing a cost-effective solution for healthcare providers.

5. Today, healthcare involves many transitions between care providers. It is crucial that clinical data follows the patient to ensure care continuity and the best possible outcomes. Care decisions are based on available clinical data, and high-quality clinical data in openEHR keeps patients safe. Over the next 3 to 5 years, we will focus on ensuring that clinical data is always available and of the highest quality to support patient safety and care outcomes. We anticipate that the demand for interoperable and high-quality clinical data will continue to grow, and we are committed to leading the way in this area. Also, European Health Data Space will provide needed extra push for countries and organizations to make data available for primary and secondary use.

6. The technology is now ready to start the modernization journey in non-interoperable systems, which rely on proprietary data models and closed architecture. Act now and start using openEHR as the primary data model for clinical data and care service documentation! Build a modular platform-based ecosystem and widely use open standards in clinical data and open standard-based APIs. Embrace clinical data standardization through openEHR, API-driven and event-based architecture, and introduce new functionality without code changes by modelling. By taking these steps, you can ensure that your healthcare systems are future-proof and capable of meeting the evolving needs of patients and providers.openEHR is an open specification for a health information model that facilitates universal interoperability among all forms of electronic and clinically relevant health data. It is vendor-neutral and technology-neutral, allowing healthcare providers to gradually build systems over time while avoiding vendor lock-in. Clinical professionals have more control over how their systems work, and patient data can be transported and shared freely between systems without sacrificing quality or accuracy. Organizations can add new capabilities without replacing their entire system, enhancing flexibility and adaptability.



1.Masterclass openEHR, www.masterclassopenEHR.com

2.Open data platforms and openEHR, in synergy with HL7 FHIR and OMOP, are rapidly gaining ground in the Netherlands as well as in and outside Europe.
Presenting together as an open group of like-minded partners with the same philosophy created a lot of trust among visitors.
Ultimately, we all need to work together, with an open vision, on better data availability.
Individual companies, healthcare providers, governments, authorities, patients, health insurers, educational institutions and managers need each other in this.
This was also evident from the many discussions and sessions in Maastricht.

3. In 2020 we decided to focus on openEHR, in synergy with HL7 FHIR and OMOP, based on the enormous fragmentation in the field of information systems for hospitals, general practitioners, nursing homes, the poor interoperability between these systems and the limited innovation power that resulted from this. We opted for our innovative training concept Masterclass openEHR to increase the international awareness of openEHR and to transfer more knowledge.

4. We combine the online courses, built up in clear modules that you can take 24/7 at times that suit you, so that you determine the speed yourself and where you can work out solutions together with peers, with lively webinars in which you are presented with examples of successful international openEHR implementations, combined with a lively discussion to gain maximum insight.
In addition, we help participants to build their own network.
Learn together, work together, transform together!

5. We see open data ecosystems pushing boundaries, improving data availability and improving collaboration in healthcare. Intramural, local, regional, national and international.
This will give innovative start-ups more opportunities and open data ecosystems will gain ground use case by use case.
This will force traditional monolithic vendors to also to open up, using international open standards.
Of course, European Health Data Space will also act as a catalyst here.

6.Look beyond your boundaries, look for qualitative and successful examples and try to learn from them. Many frontrunners are happy to share their experiences, including lessons learned, with you.
Avoid reinventing the wheel.
Collaborate and make yourself an open standard.


kids
Y SHOP

15. Endnote

Transforming Healthcare Together: openEHR supports innovation

We hope you enjoyed reading this document. This document describes the highlights of the ICT&Health World Conference, held in January 2025. This document was created with the help of turboscribe.ai, ChatGTP and Co-pilot. All texts have been verified by the presenters. The focus is on the challenges in healthcare, such as the accessibility and affordability of care, and how different countries, often with more limited budgets than in the Netherlands, successfully use innovative IT solutions to address these challenges.

Key sessions and insights:

1. Collaboration between HL7 FHIR and openEHR:

- The collaboration between FHIR and openEHR is essential for better data availability and interoperability.
- Examples of successful openEHR implementations worldwide show the benefits of a patient-centric IT system.
- openEHR and Fhir respectively provide a standardized way of storing and exchanging data, which leads to better interoperability between different systems and healthcare institutions.

2. Vision of South Limburg:

- South Limburg strives for a seamless healthcare system through a data ecosystem based on international standards.
- The region collaborates with 12 healthcare organizations to accelerate innovation and transformation in healthcare.
- The use of openEHR helps to create a robust data ecosystem that improves the quality and efficiency of care.

3. Future of cognitive architectures in healthcare:

- AI and cognitive architectures play a crucial role in the future of healthcare.
- Combining symbolic and connectionist AI can lead to better clinical decision support.

4. Sustainable integration of the Electronic Patient Record (EPD):

- The integration of openEHR, FHIR and OMOP standards can improve interoperability and data quality.
- A standardized approach reduces the cost and complexity of data integration.
- openEHR enables data to be stored and shared in a uniform way, which increases competition in the EHR market by reducing vendor lock-ins.

5. openEHR and Low-Code:

- Low-code platforms combined with openEHR offer flexibility and efficiency in the development of health care applications.
- Examples show how low-code can reduce implementation time and costs.
- By using openEHR, healthcare organizations can organize their processes more efficiently and gain more control over their data, which leads to more competition in the EHR market.

6. Lessons from the Nordics:

- Finland and other Nordic countries show how regional cooperation and openEHR can lead to better care integration.
- Innovations from the private sector can easily be adopted in the public sector.

7. Lessons from Jamaica and Switzerland:

- Jamaica has implemented SNOMED and openEHR to improve the quality of healthcare data.
- The University Hospital of Basel focuses on data-driven care and the long-term value of patient data.

8. Lessons from Catalonia:

- Catalonia is developing a new EHR based on open platforms to promote innovation and collaboration.
- A participatory approach with all stakeholders is crucial for success.

Recommendations:

• Collaboration and standardization: Promote collaboration between different healthcare organizations and use international standards such as openEHR and FHIR. Participate as a country in the international community
• Innovation and flexibility: Use low-code platforms to develop healthcare applications quickly and efficiently.
• Data ecosystems: Create regional data ecosystems to improve data exchange and availability.
• Patient-centric care: Focus on patient-centric IT solutions to improve the quality of care.

Takeaways:

• Implementing openEHR and FHIR can significantly improve interoperability and data quality in healthcare while keeping costs relatively low.
• Regional collaboration and data ecosystems are essential for the future of healthcare.
• Innovation and flexibility in IT solutions can increase the efficiency and effectiveness of care processes.
• The use of openEHR promotes competition in the EHR market by reducing vendor lock-ins and giving healthcare organizations more control over their data.

Appendix 1: References

Sessions Recording	URL-Link	Date
Session 1:	https://youtu.be/stHXuV6f--s	28 01 2025
Session 2:	https://youtu.be/wMLRHwxU1R8	28 01 2025
Session 3:	https://youtu.be/GwgnBEAgAvQ	28 01 2025
Session 4:	https://youtu.be/Zy51efnnmo0	28 01 2025
Session 5:	https://youtu.be/VhLYPGiPAJM	29 01 2025
Session 6: part 1:	https://youtu.be/XaUcv0WWNmg	29 01 2025
Session 6: part 2:	https://youtu.be/QvSx9sYNgms	29 01 2025
Session 8:	https://youtu.be/il4jxBmmPLY	29 01 2025
Session 9:	https://youtu.be/iUQrQrM7unE	30 01 2025
Session 10:	https://youtu.be/odeLAKqxh5w	30 01 2025
Session 11:	https://youtu.be/tHkeK5r9sug	30 01 2025

Sessions Presentations	URL-Link	Date
Session 1:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-1-Schoonbrood-S-Schraps-R-Wertheim.pptx	28 01 2025
Session 2 part 1:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-2-part-1-Wim-Eurlings.pptx	28 01 2025
Session 2 part 2:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-2-part-2-Phil-Koczan.pptx	28 01 2025
Session 3 part 1:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-3-part-1-Erik-Vermeulen.pdf	28 01 2025
Session 3 part 2:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-3-part-2-Mika-Kiviaho.pdf	28 01 2025
Session 4:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-4-G-Andrejc-S-Kohler.pptx	28 01 2025
Session 5 :	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-5-M-vd-Meer-H-Canisius-B-Koopal.pptx	29 01 2025
Session 6 part 1:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-6-part-1-Teemu-Makela.pptx	29 01 2025
Session 6 part 2:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-6-part-2-Teemo-Vahakainu.pdf	29 01 2025
Session 7 part 1:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-7-part-1-Johannes-Schmidt.pptx	29 01 2025
Session 7 part 2:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-7-part-2-Keisha-Barswise.pptx	29 01 2025
Session 8:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-8-Jordi-Piera.pptx	29 01 2025
Session 9:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-9-ICThealth-WC-vitagroup-MedBlocks-CODE24.pptx	30 01 2025
Session 10:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-10-Sofia-Kauppila.pptx	30 01 2025
Session 11 part 1:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-11-part-1-Gerda-Meijboom.pptx	30 01 2025
Session 11 part 2:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Session-11-part-2-Vebjorn-Arntzen.pdf	30 01 2025

Other Links	URL-Links	Date
Report Findings IBD Hackathon	https://itcadvies.nl/?p=177	24 10 2024
Grahame Grieve, Founder of HL7Fhir, about openEHR and Fhir working together	https://itcadvies.nl/?p=132	16 05 2024
How do the Dutch ZIBs compare with openEHR and Fhir how does CumuluZ fit into this?	https://itcadvies.nl/?p=127	09 04 2024
Converge or collide? Making sense of a plethora of open data standards in healthcare: an editorial	https://itcadvies.nl/?p=125	23 12 2023
Masterclass openEHR: A must fior everybody who want to know more about openEHR	https://masterclassopenehr.com	01 01 2025
Brief ACM aan VWS Zaaknr. ACM/23/187249 / Documentnr. ACM/UIT/638840	https://www.acm.nl/system/files/documents/acm-brief-aan-ministerie-vws.pdf	22 01 2025

Appendix 2: Speaker

Speaker	e-Mail	Company	Function
Bouwe Koopal	b.koopal@maarsingenvansteijn.nl	Maarsing & van Steijn	Evangelist of the combination of lowcode, openEHR and FHIR
Dr. Siddharth Ramesh	sidharth@medblocks.com	Medblocks	Clinician and advocate for open healthcare systems
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Gasper Andrejc	gasper.andrejc@tibaran.com	Open Line	Interoperability Specialist
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Appendix 3: openEHR international Partners



















Highmed Presentation links

Highmed Sessions	URL-Link	Date Sessions
Session 1:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Dunscombe_HiGHmedSymp-31-01-25-final.pdf	31 01 2025
Session 2:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Herbrand_HiGHmedSymp-31-01-25-final.pdf	31 01 2025
Session 3:	https://masterclassopenehr.com/wp-content/uploads/2025/02/HMeV_HiGHmedSymp-31-01-25-final.pdf	31 01 2025
Session 4:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Kaya_HiGHmedSymp-31-01-25-final.pdf	31 01 2025
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Session 7:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Sundvall-Ehrentraut_HiGHmedSymp-31-01-25-final.pdf	31 01 2025
Session 8:	https://masterclassopenehr.com/wp-content/uploads/2025/02/Wulff_HiGHmedSymp-31-01-25-final.pdf	31 01 2025



Appendix 4: Careproviders/Presenters



























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