AXREM Position Statement on Cloud-based Medical Voice Recognition Solutions

Transforming Radiology to Meet Today's Diagnostics Reporting Challenges

Introduction

AXREM is the UK trade association representing the interests of suppliers of diagnostic medical imaging, radiotherapy, healthcare IT and care equipment including patient monitoring in the UK. AXREM members supply the majority of diagnostic medical imaging and radiotherapy equipment installed in UK hospitals. In doing so, our member companies and their employees work side by side with Radiologists, Radiographers, Practitioners, Oncologists and a wide range of healthcare professionals in delivering healthcare to patients using our technologies.

Our members therefore have unique knowledge, experience and insight into the workflow and challenges faced by healthcare professionals on a day-to-day basis, which enables us to develop and offer innovative solutions to improve the speed and quality of diagnostic procedures and treatments with our ultimate aim of improving patient care.

Innovation has been, and continues to be, the life-blood of developments in technology. Today, cloud computing stands at the forefront of technological advances and modernisation of applications and systems that in some cases precede the year[1] in which the term 'cloud' came into widespread use.

Voice recognition in radiology reporting[2] has come of age. Its ubiquity has led to many solution adaptations and innovations. The combination of 'cloud and medical voice recognition' as a means to easily meet the constant and growing challenges that radiologists face, is the basis to a proposed transformative flexible solution that carries the much needed attributes to help shape the future of diagnostics reporting.

Human-computer interaction has changed. Historically humans have had to adapt to technologies and to integrating them into their daily work and lives. Medical voice recognition, as a technology, was developed to help clinicians adapt to meet workloads with the use of computing resource. Now, thanks to the rise of artificial intelligence (AI) and cloud-computing, technology is being designed to adapt to humans, making it easier to use and more accessible.

We find ourselves in an era defined by seamless connectivity and user-centric experiences, where one stance is clear: cloud-based medical voice recognition is not just an adapted convenience, but an essential component for the evolution of modern digital healthcare ecosystems to succeed.

QUESTION:

WHAT IS CLOUD-BASED MEDICAL VOICE RECOGNITION?

Cloud computing[3] is the on-demand availability of scalable computer system resources, especially data storage and computing power, without direct active management by the user. According to PwC[4], the rapid evolution of cloud and data technologies is the driving force powering digital transformation, disrupting markets and impacting all facets of an organisation. While it promises unbounded opportunity to reinvent business models and embrace continuous transformation, harnessing these technologies effectively can be an overwhelming prospect in the drive for efficiencies. Regardless of where an organisation is with its cloud transformation journey, the foundations, just like building blocks, have to be solid as well as firm, while it acutely focusses on the outcomes it wants to achieve. Success will also require a change of mindset.

Medical voice recognition[5] is a software technology that provides healthcare professionals with the ability to use their voice to instantly transcribe clinical data into a document, patient record/EPR, medical report, or diagnostic imaging system.

Literally "dictate once, and done".

Cloud-based medical voice recognition speeds up the transcription of patient information and patient diagnosis reporting, by converting spoken words directly into text, at the speed in which they are naturally spoken and then routing that clinical data across the different healthcare solutions, systems, platforms and devices it needs to eside in, or be accessed from. It does this seamlessly, securely and without any user intervention – shortening the reporting time to a fraction of the time used by traditional methods.

QUESTION:

HOW CAN CLOUD-BASED MEDICAL VOICE RECOGNITION (VR) HELP TRANSFORM RADIOLOGY?

To better help transform an already evolving imaging sector, any new solution should look to provide defined improvements that will positively impact results. Cloud-based medical VR has the potential to deliver on seven transforming categories, each providing further measurable advantages and benefits.

Empowering accessibility

Cloud-based VR as a technology, whether it is integrated into a RIS or PACs diagnostics imaging system, or a standalone product used directly by a consultant, democratises access to digital services for all users and all user types – whether these are individuals with mobility challenges, limited ability to use a keyboard or other disabilities. It allows reporting to be carried out wherever the user needs to report, providing access to any platform anywhere. By enabling system interaction through spoken language, cloud-based voice recognition ensures inclusivity by granting improved equal opportunities for users to engage with transformative radiology reporting solutions across the diagnostics imaging sector.

Seamless integration overcoming interoperability limitations of legacy systems

By leveraging cloud infrastructure, medical VR solutions seamlessly integrate across healthcare technology and patient data platforms, offering a consistent user experience regardless of the clinical system in use or the technical environment. This interoperability fosters fluidity in workflow interactions, allowing users to transition and report effortlessly between various applications and environments, be these legacy or new modern systems.

This interoperability can be benchmarked. Assessing network infrastructures, user connectivity setups and network bandwidths, prior to switching to a cloud-based service, will not only provide insight into legacy system performance issues, any latency risk from a medical VR solution, and user productivity, but can also be used as a benchmark to validate the positive impact the integrated cloud medical VR solution will have.

The added advantage of integrated cloud VR not only extends the use of existing (legacy) systems to wherever they need to be used seamlessly, but enhances and transforms their use, as well as the users' efficiency. The result will better assist transformation management at a flexible pace to ensure all stakeholders and technical environments are catered for.

Enhanced efficiency

Through the harnessing of limitless computational resources and data security, cloud-based medical VR solutions deliver improved and measurable efficiency gains in: time, cost savings, as well as efficiency in reporting outputs and in avoiding data and diagnostic errors. Tasks requiring manual input are completed through natural language voice commands at the same speed as they would be spoken. The result ensures a more streamlined secure, compliant workflow, and boosted productivity across all related diagnostic imaging touch points. These efficiency gains carry the added value of 'repurpose' in user time and IT resource. Cloud-based medical VR allows time, and cost savings to be repurposed to where they are most needed in radiology vs. being absorbed by imaging data output and its often non secure manual management. Hospital or contracted third-party IT support of on-premise (non-cloud) medical VR and transcription services is freed up and the role is remotely and securely relieved by the cloud-VR technology provider.

Upskilling and user empowerment

A medical VR solution that is secure in the cloud, intuitively easy to use, and requires no in-depth technical training has the ability to enable a faster successful transformation journey. As mentioned earlier, success requires a change of mindset, therefore by providing a less complex solution, accessible wherever the user is located and without hardware limitations, will encourage a wider involvement, ownership and responsibility by an organisation's clinical staff, which in turn promotes new cloud-based system adoption efficacy and reduced user hesitancy.

Continuous improvement

Cloud-based medical VR solutions possess the inherent advantage of continuous learning and improvement without the need for IT resources to upgrade them manually, system by system, or device by device. Through machine learning algorithms, they quickly adapt to user preferences and linguistic variations in pronunciation and accents over a very short time, delivering increasingly accurate and personalised experiences from first use. Some solutions powered by AI (artificial intelligence) already recognise contextual differences in medical dictations, as well as the many English accents from around the world. In addition, the ability to add medical specialist language and new words ensures that the AI engine behind a medical VR evolves with the user.

Data security and privacy

Data security and privacy in the digital age is of paramount importance. More so in healthcare. A compliant cloud-based VR will ensure it employs state-of-the-art encryption adhering to all the necessary stringent privacy standards, to secure user data, so that it remains protected and confidential throughout the voice recognition process. Maintaining compliance through Cyber Essentials, Cyber Essentials +, as demanded by UK GDPR, as well as other relevant privacy laws and regulations, delivers peace of mind to both the user and the data owner – the patient.

Ethical considerations

The deployment of cloud-based VR solutions should be mindful of the ethical implications it carries. A multidisciplinary approach is recommended to ensure data security, data privacy protection, compliancy, data minimisation, secure storage and transmission are maintained. Continuous solution performance monitoring of user metrics, user preferences, and application rules in parallel to controlled terms of use, as well as rights and obligations of user needs, will help providers make uninterrupted improvements to the medical VR solution via the cloud. Transparency, accountability, and fairness principles and standards need to be upheld in the use of the solution and in its own developed algorithmic decision-making in order for both to strive to mitigate biases.

In Conclusion

Cloud-based medical voice recognition represents not only a technological transformation for radiology but a societal advancement, empowering healthcare individuals, organisations, and communities to communicate, collaborate, and innovate in ways previously limited.

As champions of progress, AXREM is committed to driving the next chapter in the evolution of VR technology in diagnostics and imaging, to shape a more interconnected future for all healthcare.

To find out more about AXREM visit:

www.axrem.org.uk

For information on our Imaging IT Special Focus Group go to:

https://www.axrem.org.uk/pacs-ris/

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Footnotes, Bibliography and Glossary

1:    2006 saw the term cloud come into widespread use, when Amazon launched AWS with the Elastic Compute Cloud (EC2) service: https://www.techtarget.com/whatis/feature/The-history-of-cloud-computing-explained

2:    Voice recognition in radiology reporting was introduced in the early 1980s: https://insightsimaging.springeropen.com/articles/10.1186/s13244-023-01392-y

3   Cloud computing: https://en.wikipedia.org/wiki/Cloud_computing

4   https://www.pwc.co.uk/issues/transformation/cloud.html

5   Medical Voice Recognition is also known as clinical speech recognition, or digital dictation. These terms are often interchanged throughout the health-tech sector. For the purposes of this document, we will reference the term voice recognition or VR.

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