

# AI: Opportunities, Capabilities and Limits

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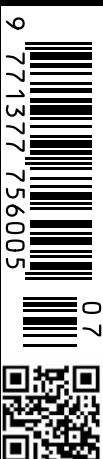
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# Artificial Intelligence – Impact, Challenges and Opportunities

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Dr Anjum Ahmed is the Chief Medical Officer at Agfa HealthCare. He has played an essential role in steering the company's innovation strategy for Enterprise Imaging and Artificial Intelligence. Dr Ahmed has over 23 years of global experience in solutions innovation, governance, change management and digital transformation. Before joining Agfa HealthCare, he spent 12 years implementing clinical and imaging IT solutions for a top-tier global vendor. He has published white papers in leading societies, including HIMSS Europe, and ESR, on timely topics such as value-based care and evidence-based use of AI. HealthManagement.org spoke to Dr Ahmed about Artificial Intelligence (AI) and its impact, challenges and opportunities in healthcare.



## How have you seen AI change from hype to reality over the last few years?

In recent years, there has been a lot of hype around whether Artificial Intelligence (AI) is real or something in the distant future. There are multiple applications of AI, ranging from deep learning and machine learning to natural language processing.

Over the last few years, several AI start-ups have developed these applications. There has also been a lot of hype that AI will replace radiologists or physicians. But the fact is that AI cannot be used in its own silo. It has to work with clinicians to augment their knowledge. A good majority of diagnosticians, globally, are advocating for embedding AI not only for clinical



use, but also trying to understand its impact on education and training.

**Did the pandemic impact the development and deployment of AI in radiology?**

During the pandemic, there was a need for systems automation, speed and efficiency, and enhancement of clinical workflows. This brought more attention to AI. There were also issues related to fast access to clinically relevant patient information with limited capacity and with clinicians working from home. There were growing requests regarding automation

is defined, one can set certain key performance indicators or metrics.

For our customers, the main challenge with AI deployment is implementing and embedding it into clinical use. The RUBEE™ framework developed by Agfa HealthCare revolves around five core pillars of the AI strategy, ranging from workflow orchestration, triage, advanced visualisation, automation, and precision reporting by capturing the AI generated intelligence. These five specific workflow aspects are what customers need to help address.

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## AI is not replacing radiologists. Instead, it allows them to focus on the clinical side of the analysis, which is much more meaningful

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and enabling triage for exams with specific or critical findings. All these are key workflow facets that facilitated the implementation of AI-related applications into clinical practice. Hence, the pandemic has had a remarkable influence on how innovations and technologies could be implemented in practical terms. It has also impacted how regulatory bodies, whether in Europe or the U.S. or Canada, started assessing the practical application of these technologies and their intended use in clinical practice.

**You have been accompanying a lot of large health institutions in the implementation and adoption of AI in medical imaging. What problems are these institutions usually trying to solve?**

The first thing that should be addressed is understanding that AI is not a product or a clinical application. It is a technology that can help healthcare organisations achieve an end goal.

Back in 2016/2017, when the hype around AI started, Agfa HealthCare partnered with a large private healthcare organisation to look at some common challenges related to chest screening. When it comes to diagnostic images, plain films of chest x-rays constitute more than 40 to 50% of the workflow; in some cases, even over 80% if it's a primary care screening setting. This organisation had 90% of their workflow allocated to screening and x-rays. That posed a challenge for them in terms of resources. In addition, there were also challenges related to productivity, staffing and burnout.

We collaborated with the healthcare organisation to develop x-ray-related AI technologies that would solve some of these challenges. We soon realised that AI, if developed in a silo, will remain in its silo, and will keep doing things on its own without influencing the outcomes. Hence, the first step is to define what clinical outcomes need to be improved. Once that

**How did the work you were conducting improve clinical confidence?**

AI is a new technology, and there are still discussions around trust and standards to evaluate the results that it can generate. Radiologists play a crucial role in providing diagnostic intelligence to referring physicians. If referring physicians receive evidence-based information, they can make more informed decisions. One approach we took in the early phases of testing was to validate the results from AI with the radiologist so that they could see the performance of these AI algorithms compared to the radiologist.

An important aspect of AI is machine automation. AI applications can improve the performance, efficiency and speed of certain tasks that humans would take more time to evaluate. The time that is saved improves efficiency and allows radiologists to look at findings and provide diagnostic intelligence. This is one aspect that can help improve the adoption of AI because it can help radiologists perform faster and be more efficient. AI is not replacing radiologists. It allows them to focus on the clinical side of the analysis, which is much more meaningful.

The other challenge is to improve confidence and the adoption rate. This can be done by providing peer-reviewed scientific data and publications. The better the data, the better the algorithm performance. Another way to convince radiologists is to enable them to see the clinical applications and action of their own data and population samples. This gives the clinical user confidence in how AI behaves in a case they may have already evaluated.

**Do you encounter any clinical use cases in particularly high demand for AI?**

Over the last few years, some of the top use cases that have



evolved where AI is being implemented, tested and validated are around cancer screening programmes. There are also use cases revolving around plain films or x-rays because x-rays constitute a large volume of diagnostic imaging done across public health, institutes, or hospitals.

Another use case that is evolving is the detection of intracranial haemorrhages or workflows related to stroke because speed, time and efficiency are of key relevance in early detection and saving patient lives. There are also emerging use cases related to detecting fractures of the bones or bone age and other musculoskeletal findings like osteoarthritis-related conditions.

The important thing is to look at the clinical areas that the healthcare providers are focused on and embed AI workflow into their current ecosystem. It's all about bringing the clinical relevance of AI into practice.

There are certain solutions in the market that allow radiologists to use AI on a need basis. This is called pay-per-use. The challenge with pay-per-use is that it does not provide automation and real-time assessment. The approach Agfa HealthCare has is in real-time, embedded into the workflow. AI works in the background, and radiologists can already see the results that are processed. That's where you see the benefits for clinicians in real-time.

### **AI comes with a price tag. What aspects should be considered when hospitals build their business case?**

AI is a new innovation. Many scientific publications demonstrate the sensitivity and specificity of AI, but this is based on retrospective data. There is some prospective data where certain studies indicate how it can perform as well as radiologists and how radiologists using AI can improve their productivity. But what does it mean? How do you translate it into numbers? The first thing to look at is speed and efficiency. How fast would the results be available compared to what is being done today? It is important to translate this into minutes – to show how much time is saved.

The other aspect is clinical programmes. It is important to know what clinical programmes healthcare providers are trying to improve. If the challenge is related to missing certain findings, it has to be addressed. If AI can pick findings that would otherwise be missed, that could impact patients' life expectancy and survival rates. The other indirect cost-related aspect of this is the clinical side. The earlier you pick up a particular challenge, the less cost is incurred on performing procedures and subsequent treatments.

The third aspect that certain hospitals look for is evidence. Some cases require more evidence to facilitate the right decision. If AI can provide that evidence, radiologists can help avoid unnecessary procedures and put the patient into the care paradigm earlier.

Another important aspect that customers want to address

is faster reporting turnaround times to allow more patients into the screening programme.

### **What are the three winning arguments to convince customers about AI?**

The primary argument favouring implementing AI is that it should be part of the workflow. If it is not part of the workflow, it will only assess and automate findings and results. These results must be accessible to the radiologist to demonstrate that AI is working for them in the background.

The second aspect is displaying results and reporting. There are several applications out there, and they have their own methodology in terms of how they display data. With RUBEE™, we embed and visualise AI results seamlessly in the existing workflow.

The third aspect is time. The goal of AI is to help radiologists save time by making clinical information easily available and providing automated comparisons to have all the information they need without running around to find a scan.

If we present all the above to a clinical user, it's a no-brainer that AI can be implemented and used successfully.



### **How do you help hospitals reap the benefits of AI - not only the deployment of AI but true augmented intelligence?**

Augmented intelligence is the intersection of machine learning and advanced applications where clinical knowledge and medical data converge on a common platform. That's where the enterprise imaging strategy comes in.

One key benefit that the IT organisation and hospitals acquire with the enterprise imaging strategy is consolidation – to break the silos of the imaging workflows and build a common platform. There are multiple AI application developers out there. But that should not mean organisations have to acquire a new AI technology or worry about integration every time. Agfa HealthCare's RUBEE™ framework, developed as part of the Enterprise Imaging strategy, addresses this problem. RUBEE™ comes with a series of carefully curated AI packages that include multiple applications to analyse and display results to the end-user. Clinical users should not have to worry about



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## The approach we have enables Augmented Intelligence, embedded into the workflow. AI works in the background, and radiologists see the results that are processed by AI in real-time

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integrating AI results or applications and automation.

**In this issue, we discuss the opportunities, capabilities, and limitations of AI. With this in mind, where do you see AI today?**

AI is as good as the data it has been trained on. It will have benefits if it is correlated with the clinical intelligence that resides in the systems already. There are multiple applications to consider when implementing AI. The challenge for the clinical decision-makers is to choose. We have addressed this with the RUBEE™ framework by curating clinical packages of relevant AI applications.

There is also the technology aspect and the importance of

engaging the vendor. When hospitals decide on a particular AI technology, the Enterprise Imaging solution provider should be engaged earlier. It should not be an afterthought.

The third aspect relates to the clinical informatics residing in the EHR. AI can bring automation, but the missing link is clinical intelligence. With machine learning and natural language processing algorithms, this information can be automated and presented to radiologists.

Overall, AI will continue to play an important role in healthcare. As long as the implementation and integration process is handled smoothly, it will help clinicians make evidence-based decisions faster and more efficiently. ■