# AI & Robotics
## Implementation and Pitfalls

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# What We Have Learnt from AI Development – Can it Be a Feedback in Our Daily Routines?

Let's professionalise procurement by giving decision-makers (doctors, board, ...) decision-making tools that bring objective, patient-centred and cost-oriented VALUE to the hospital sector. Procurement is part of healthcare management and holds the key to all topics that are lessons learned from COVID-19: supply chain management, sustainability, transparency, digitalisation, patient experience, innovation & economies.

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## key points

- The use of AI brings much more benefit and challenges than growing fears.
- Getting acquainted and involved more and more into AI I then realised that AI-tools have a very similar philosophy that incorporates a quality oriented workstyle.
- All the stake-holders (radiological staff, clinicians, hospital managers, reimbursement companies  and regulators and even patients) should recognise that the use of AI-tools underlines the need and importance of an optimally structured, quality based and quality controlled clinical work environment.

## Introduction

There are some radiologists (and not few) who have fears that they will lose their jobs because AI-tools will replace their skills, are cheaper and do not get tired. I disagree.

Some think that the dearth of radiologists can be compensated with AI-tools, as they can compose reports themselves. The radiologist is only needed to approve and validate reports. I don't share this view.

There are many more such thoughts or beliefs which may be partly right (more or less) or wrong but they are only guess-work.

I look at the AI-development from another point of view. I believe the use of AI brings much more benefit and challenges than growing fears.

Maybe it will come to pass that AI-tools can perform much of our daily work but there is still a long way to go and in the meantime we are the ones who have to teach (train and validate) these tools. So I believe it unlikely that I would loose my job. Just the opposite, in fact.

I am waiting for the automated tool so that I will not have to spend my time with analysing follow-up tumor staging scans, searching for tiny lung nodules by myself or try to characterise small liver lesions. Worse, compare them in dynamic studies, maybe in examinations with different imaging protocols or from different venues, performed with different scanners.
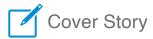
I have spent many decades dealing with quality management in addition to clinical radiological activities. At first, it was about implementing new imaging modalities into clinical practice, including protocol standardisation and harmonisation.

Later it was performing clinical audits in hospitals with subsequent roll-out of these nationwide.

I also had the opportunity then to contribute to QM activities of the ESR and in some international projects. And I have gained a lot from this experience.

It is my conviction that the clinical audit (which has been mandatory in Europe since 2018, see Euratom Directive 59/2013.) is the main tool for quality control and the subsequent quest for improvement is not just an administrative system but really a philosophy.

I believe this because if we perform our daily routine adhering to standards, do it with care, are diligent in

communicating our results, being open to feedback, then we basically perform the most important parts of clinical audit without any additional effort.

If we only quickly report the imaging and don't care about anything else that is another kind of, and to me inferior, workstyle and thus philosophy.

Getting acquainted and involved more and more into AI I then realised that AI-tools have a very similar

on sub-optimal images.

Sometimes it feels that we are expecting wonders from AI, whereas we only get from AI what we put in.

Therefore I strongly believe that all the stake-holders (radiological staff, clinicians, hospital managers, reimbursement companies and regulators and even patients) should recognise that the use of AI-tools underlines the need and importance of an optimally

> ## Maybe it will come to pass that AI-tools can perform much of our daily work but there is still a long way to go and in the meantime we are the ones who have to teach (train and validate) these tools

philosophy that incorporates a quality oriented workstyle.
How is that?

First we have to create an AI-tool. Then we have to train the tool. For this training process we need a huge number of data. This database should reflect what we do in our practice.

Thus not uniform because the equipments can differ, the patient populations differ etc.

This normal variation of data (diversity) is important but it has to be of a certain quality. For instance, when the data come from improperly performed examinations or not with standardised protocols then we cannot train the tool poroperly. For example, the protocol of contrast material administration in CT or even in MR, proper reconstruction algorithms, the appropriate use of different MR sequences (including parameters), imaging planes and many others.

When we then talk about different decision support tools, it is even more evident that the training data should be robust, evidence based, bias free and as precise as they can be. Of course sometimes we are faced with uncertainaty in our reports and that is normal and expected.

During the training process, and later on during application process, we have to control what the AI-tool tells us. We have to look at the images, analyse them and confirm agreement or disagreement, without strong emotions or blaming.

Shouldn't we always work in that manner? With or without AI-tools? Is a decision making AI-tool able to make any decision without data? No!

The same way as we can't compose a correct or precise report without knowing the clinical data or based

structured, quality based and quality controlled clinical work environment.

This is what an AI Company tells about this issue (talk with Catalina Barzescu, Aidence):

Data is crucial to building well-performing models that improve clinicians' workflows and help them deliver better patient care. As an AI radiology company, we need large, diverse, and high-quality datasets from various scanners, hospitals, and countries. The quality of our algorithms essentially depends on access to this data.

However, obtaining raw medical data that is sufficient and diverse is a major challenge. We often rely on publicly available datasets – (anonymised) medical images that patients have agreed to make available for research or product development. These datasets are not always representative of different demographics. Public data often originates from centralised clinical trials, typically in one geographical area and one or more institutions. Within the EU, we face the additional challenge of the limited availability of large, curated training datasets.

Ultimately, to build state-of-the-art, safe, and robust medical algorithms, we must work with and have the support of clinicians, data owners, regulators, and policymakers.

So, in my view, this teaching/training of AI tools while at the same time learning from that is a beautiful challenge during the development of AI-tools and hopefully will speed up the evolution of AI-tools and even our NI-tools (natural intelligence).

## Conflict of Interest
None.

HealthManagement

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