Evaluation AIFI

Feasibility study for a national AI infrastructure for radiology in the Netherlands

Background

The demand for radiological examinations is growing faster than the capacity of radiologists, radiographers, and equipment. This is increasing workload and posing risks to care quality and job satisfaction. The Dutch Society of Radiology (NVvR) views AI as a technological opportunity to keep radiology work feasible and high-quality towards 2030.

However, implementing AI into clinical practice in radiology has proven challenging. A survey by Radboudumc and the NVvR found that hospitals often struggle with costs, limited IT capacity, integration into existing systems, and a lack of clinical validation. The benefits of AI frequently fall outside the radiology department, while the costs tend to land there. At the same time, successful adoption requires collaboration across multiple hospital departments. **Within the AIFI project, approaches to overcoming these obstacles were explored collaboratively.**

AIFI is an initiative by VZVZ and NVvR, funded by ZN.

AIFI is short for AI for Imaging. Until now, **the focus of AIFI** was to conduct a feasibility study with a clinical pilot, to explore the potential of a national infrastructure that enables radiologists and radiographers to use AI solutions across various clinical applications, in a way that is safe, cost-effective, and technically sound. The study addresses organizational, technical, and financial aspects to ensure responsible and scalable implementation.

Participating Hospitals:

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Participating AI Products & use cases:

- **BoneXpert** (Visiana): for bone age prediction
- **CINA-iPE** (contextflow, Avicenna.ai): for incidental pulmonary embolism (iPE) detection
- **RBfracture** (Radiobotics): for fracture detection

AIFI Artificial Intelligence for Imaging

Approach

To assess the feasibility of a national AI infrastructure for radiology, the AIFI project adopted a practical, hands-on approach with four concrete objectives: on the one hand to reduce overhead and costs, and on the other to encourage AI adoption and foster collaboration.

Five hospitals were selected based on diversity in institutional type, technical infrastructure (PACS and EHR systems), and maturity in AI adoption.

The technical infrastructure used during the pilot was based on the Twiin Portal. Each participating hospital was equipped with a local gateway connected to a central cloud environment, where the AI models were hosted, monitored, and tested. Integration with existing PACS systems enabled secure data exchange and alignment with clinical workflows. In the cloud environment, the AI solutions were centrally available and their performance was continuously monitored.

In parallel, a systematic and thorough clinical selection was made of both use cases and AI solutions. The folowing products were selected:

- BoneXpert for bone age prediction
- RBfracture for fracture detection
- CINA-iPE for incidental pulmonary embolism detection

Extensive testing was done with all three AI applications, evaluating both technical performance and clinical usability. Implementation was phased, with the three AI solutions gradually rolled out across the five hospitals. This allowed insights gained during the process to be immediately applied to optimize workflows and guide further deployment.

The experiences during implementation and the practical use of AI form the foundation for addressing the four objectives, which are elaborated in the following pages.

Findings and Results

Objective 1: Faster AI Implementation Through Reduced Overhead

The AIFI approach demonstrates that collaboration pays off: hospitals appreciated the centralized setup, in which legal, technical, and organizational processes were jointly addressed. This led to an estimated time saving of 34% compared to individual AI implementations.

The infrastructure operated reliably and met availability requirements. However, the speed at which AI results became available varied depending on the type of examination and whether transmission was manual or automated. In acute situations (such as fracture detection), processing times, although within the required limits, were still perceived as disruptive by half of the surveyed radiographers.

The project also revealed that legal alignment and governance require significant time and effort. For broader scaling, a widely supported legal and organizational framework is needed that can be easily reused.

Key Points:

- A centralized approach reduces implementation burden and fosters collaboration.
- The infrastructure was stable, but the required speed depends on multiple factors.
- Clear legal frameworks are essential for scaling up.

Objective 2: Lower Costs Through Joint Procurement and Implementation

The centralized AIFI infrastructure proved more efficient than individual implementations: hospitals only had to go through technical and legal processes once, saving both time and money. Costs per hospital decreased especially when multiple AI applications were used and multiple hospitals participated. Joint procurement also resulted in volume discounts.

However, uncertainties remain. Comparing AIFI with commercial AI platforms is difficult due to differences in functionality, service models, and unclear pricing models. In addition, the benefits of AI applications were largely based on estimates from healthcare professionals rather than on objective measurements.

Key Points:

- A centralized approach reduces costs, especially when applied broadly.
- Volume discounts make joint purchasing attractive.
- Comparing with alternative platforms is challenging due to diversity in features and pricing models.

Objective 3: Increased Adoption of Using Responsible AI

The pilot demonstrates that AI solutions were actively used and valued, though uptake varied considerably between applications. The AI application for bone age prediction (BoneXpert) achieved high adoption rates (>90%) and provided both time savings and greater confidence for radiologists and pediatricians. The fracture detection application (RBfracture) was used by more than half of the users in at least 70% of cases and led to adjusted workflows in some hospitals, allowing radiographers to act more independently and quickly.

The AI solution for pulmonary embolism detection (CINA-iPE) was less commonly used, mainly due to the complexity of integrating it into the care process and doubts about its clinical relevance. Only two hospitals linked the output to the PACS system.

The evaluation highlights that the success of AI strongly depends on clinical context, integration, and ease of use.

Key Points:

- **BoneXpert** (bone age): widely used and appreciated; increases confidence and efficiency.
- **RBfracture** (fracture detection): led to adjusted workflows with faster patient throughput.
- **CINA-iPE** (pulmonary embolism): limited use due to challenges in integration in the care process and doubts about clinical relevance.
- The value of AI in clinical practice depends on many factors.

Objective 4: Fostering Effective Knowledge Sharing Among Hospitals

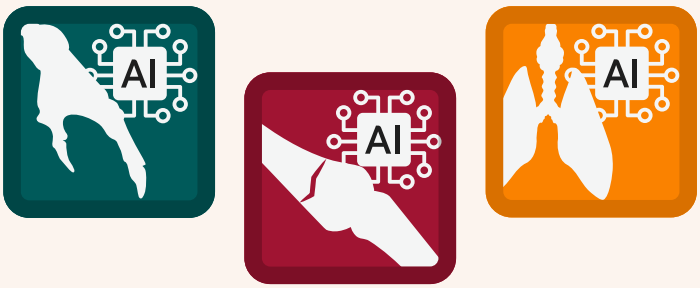
The intensive collaboration between hospitals was highly appreciated. Joint sessions helped healthcare professionals better understand each other's contexts and reflect together on legal, technical, and clinical issues related to AI. This collective learning process fostered trust and motivation to engage with AI.

On the other hand, it remains uncertain whether this kind of intensive in-person collaboration can be scaled to a larger number of institutions. Differences in needs between academic and general hospitals require tailored approaches. Experimental areas, such as autonomous AI or new funding models, remained largely unexplored.

Nevertheless, AIFI has proven to be a powerful learning platform. If well facilitated, it could evolve into a structural driver for AI implementation across healthcare, supported by shared frameworks, knowledge, and experience.

Key Points:

- Collaboration enhances understanding, trust, and decision-making.
- Scalability of the model is uncertain; customization remains necessary.
- The platform has strong potential for learning and development, although this potential has not yet been fully utilized.



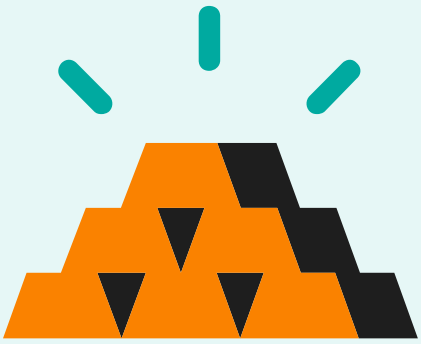
Can AIFI Function as a National Infrastructure?

The AIFI pilot demonstrates that a national AI infrastructure for radiology is both technically and organizationally feasible, and is appreciated by the participating hospitals. The collaborative approach initiated momentum within organizations, but further scaling requires strengthening and elaborating several key conditions.

To move forward, a shared legal and organizational foundation is needed, including standardized documents, clear role definitions, and a well-supported governance structure. A sustainable funding model is also essential to enable participation from both large and smaller healthcare institutions.

From a technical perspective, it is necessary to explore which AI platforms are available and what requirements they must meet to be deployable within AIFI, such as scalability, monitoring, PACS integration, and orchestration.

The willingness to continue is strong: all pilot hospitals want to actively contribute to the further development of AIFI. They are asking for centralized coordination, reusable frameworks, and practical support. The pilot provides a solid foundation for a joint, scalable approach to AI in Dutch radiology.



Next steps

The AIFI pilot has been extended until June 30, 2026. Four pilot hospitals will continue using the infrastructure, and all five hospitals remain involved in the next phase of AIFI. This follow-up will be divided into three phases with decision-making moments.

Q3 2025

1. Follow-up Research

- The development of AI is progressing rapidly. AIFI was initiated with a clear set of questions and objectives. During the follow-up research, it will be assessed whether these objectives are still relevant or whether the needs of hospitals have changed.
- The possibilities for long-term funding will be explored, along with the structure for governance and legal frameworks.
- Consideration will be given to the pros and cons of having no, one, or multiple AI platforms, and the required functionalities.

Q4 2025

2. Implementation Plan

If a continuation of AIFI is decided, an action plan will be developed to realize the selected direction for the next phase of AIFI, based on the follow-up research.

Q1 en Q2 2026

3. Implementing AIFI

If a positive decision is made, implementation will begin in Q1 2026, so that upon completion of the AIFI pilot, a sustainable and scalable solution can be offered.

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