Enhancing Efficiency and Standardization in Teleradiology

A Case Study of TMC's Adoption of Curie|ENDEX™

Introduction

Telemedicine Clinic (TMC), a Unilabs company, is one of Europe's leading teleradiology service providers. Hospitals send cases to TMC because they don't have the capacity to report themselves. TMC uses Enlitic to improve the workflow of their radiologists, removing manual tedious tasks and allowing them to focus in reporting.

TMC's goal is to leverage innovative technologies that will improve their reach and the efficiency of their radiology services, thus overcoming the shortage challenges. In this context, TMC partnered with Enlitic and deployed the Curie|ENDEX™ solution to standardize their medical images and enhance the radiologists reporting workflow.

> "Radiologists may experience a lot of data variability in the exams they get daily, depending on the source organization."
> – Ernest Montañà

TMC
a Unilabs company

- **Established, 2002**
- **300 Radiologists**
- **1,000,000 Exams per year**
- **>150 Public Service and Health Authorities**
- **UK, Denmark, and Sweden**
- **Specialties:**
  - Body radiology
  - Neuroradiology
  - Musculoskeletal Radiology
  - Additional Expert Groups

Challenges in Teleradiology

Challenges include:

- Variability in study and series descriptions creates havoc with radiologists viewing preferences
- Increasing volume is surpassing the growth rate of available radiologists creating workflow challenges

Data Diversity

With hospitals and radiology departments sending studies from across different countries each study has different labels, acquisition parameters, and formats. A lack of data governance makes reporting workflows challenging.

Varying Case Types

Teleradiology coverage means different types of studies with a wide variety of images and accompanying clinical information. Radiologists need to be experienced enough to be able to report on these variables.

Display Protocol Configuration

Configuring display protocols for different exam types and clients was time-consuming for radiologists and PACS administrators. Many physicians didn't use display protocols because they failed to work consistently.
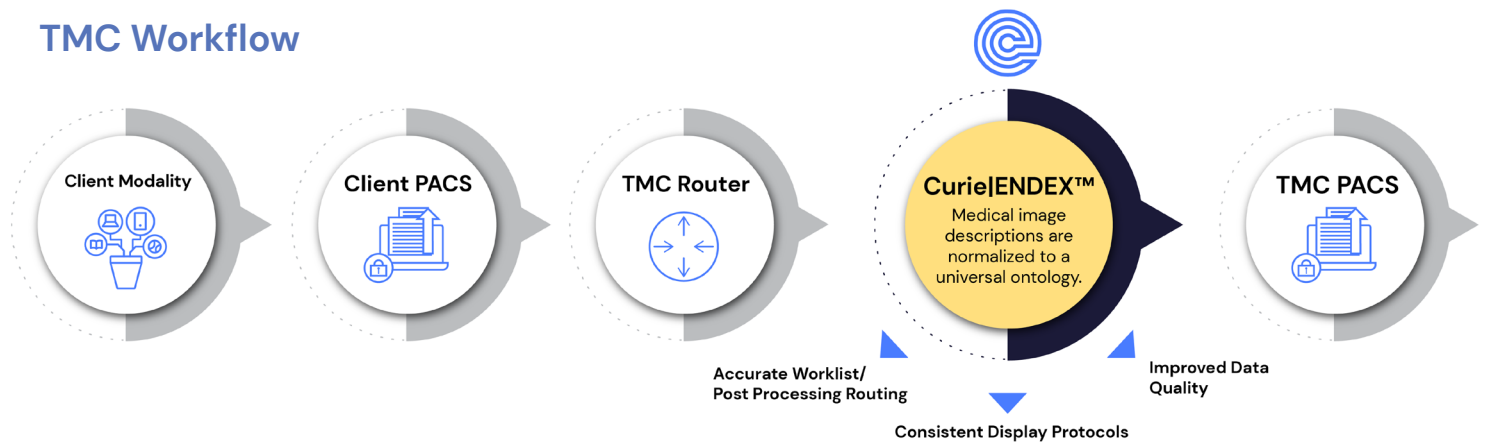
Addressing Data Diversity

Data diversity occurs in the wide range of imaging data acquired from various modalities and sources in the field of healthcare. It encompasses the differences in imaging techniques, protocols, equipment, and patient populations, resulting in a rich and heterogeneous collection of medical images. In medical imaging, different modalities such as X-ray, computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound produce distinct types of images with varying characteristics.

Data diversity also extends to variations in imaging parameters, such as resolution, image quality, contrast, and acquisition settings. Moreover, medical imaging data is obtained from a diverse range of patients, each with unique anatomical structures, pathologies, and demographic characteristics. Factors like age, gender, body habitus, and underlying medical conditions contribute to the variability seen in the acquired images.

Deployment of Curie|ENDEX™

TMC's collaboration with Enlitic began in 2019, recognizing the potential benefits of Enlitic's ability to standardize images and addressing data variability in studies and series descriptions. After testing, TMC decided to collaborate with Enlitic and adopted the ENDEX solution. The official deployment of ENDEX took place in 2021. ENDEX acts as an intermediary between the hospitals sending scans and TMC's Picture Archiving and Communication.

TMC Workflow

Client Modality → Client PACS → TMC Router → Curie|ENDEX™ (Medical image descriptions are normalized to a universal ontology.) → TMC PACS

Accurate Worklist/Post Processing Routing

Improved Data Quality

Consistent Display Protocols

The Impact of Standardization

Improved Efficiency
Radiologists experienced a 10% increase in productivity, spending 1 to 1.5 minutes less on each examination, resulting in faster reporting.

Enhanced Capacity
With increased efficiency, TMC could handle higher volumes of exams, ensuring clients' needs were met.

Standardized Data
ENDEX facilitated the use of display protocols by eliminating data variability, ensuring that relevant cases displayed correctly and consistently.

Scientific Validation
TMC is in the process of collecting data on ENDEX's impact and plans further scientific analysis to validate the solution's effectiveness.

Positive Feedback
Radiologists appreciated the improved functionality and workflow provided by ENDEX,. TMC supported radiologists in configuring display protocols, helping them adapt to the new system.

Infrastructure Development
TMC gradually allocated more resources to ENDEX, building a dedicated infrastructure for optimal performance and to support the analysis of millions of exams efficiently.

Improving Efficiency with Display Protocols

TMC identified several tasks unrelated to reporting or image interpretation that could be made more efficient. Through a shadowing project, they identified the need for improved hanging protocols. Initially, only a small percentage of radiologists used display protocols due to the high variability in data.

With Curie ENDEX's standardized data, the number of radiologists using display protocols increased from **10%** to over **70%**.

Radiologists now configure their own display protocols more easily, leading to a **10%** increase in efficiency.

Implementation Challenges and Resource Allocation

The implementation of ENDEX at TMC initially presented some challenges, primarily related to the requirement for substantial computer resources and concerns regarding data integrity and traffic management. TMC approached this situation cautiously and progressively enhanced resource allocation to guarantee the solution's safety and effectiveness. Presently, the company is actively developing a dedicated infrastructure for ENDEX, which will enable efficient processing of all incoming exams.

Expansion and Future Plans

TMC initially rolled out ENDEX to 25 sites in the UK and has expanded to 50 sites. TMC plans to implement ENDEX in the Swedish and Danish markets, leveraging the solution's benefits for standardizing study and series descriptions.

Conclusion

TMC believes that any radiology service grappling with inconsistent data from clients could benefit from adopting Curie ENDEX. The deployment of Curie ENDEX requires careful consideration and collaboration with Enlitic, given the technical challenges involved. However, the results are worth the effort, as Curie ENDEX provides a reliable solution for addressing data variability and improving display protocol efficiency.

> **"If you cannot easily control the way the studies and series descriptions are reaching you, then you need something like ENDEX. Because otherwise, how do you expect the display protocols to work?"**
> **– Ernest Montañà**