



CDE Definition Stubs: Building a Scalable Foundation for Structured Radiology Reporting

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Background/Problem Being Solved

Radiology reports are rich with clinical information but predominantly exist as unstructured free text. Standardized structured reporting, which represents findings as FHIR structures labeled with Common Data Element (CDE) identifiers, promises to revolutionize imaging workflows. However, developing CDE definitions is complex and time-consuming, and the lack of published CDE definitions covering the breadth of findings described in clinical radiology has hindered adoption. Recent work has demonstrated that LLMs can help to accelerate CDE development. The next step is to apply this capability to create usable CDEs at scale.

Intervention(s)

To address this challenge, we introduce the concept of the CDE definition stub, a bare-bones data model of a radiology finding that includes:

- 1. The name of the finding and an Al-generated description.
- 2. Basic attribute definitions for Presence (whether the finding is present) and Change from Prior (unchanged, new, or changed).

While these stubs are simple and would not characterize findings' details, they encode sufficient information to enable applications based on structured imaging findings data. Furthermore, they serve as first drafts that can evolve into more detailed data models as processes mature to add more attribute definitions.

We developed a toolset that 1) allows users to enter the name of a finding, which is used to generate a JSON representation of the stub; and 2) converts the stub JSON into a format compliant with the ACR/RSNA CDE JSON schema, enabling submission for formal review.

Barriers/Challenges

While CDE definition stubs simplify the creation of structured data, validation and refinement still require radiologist input.

Outcome

Proof-of-concept testing demonstrated the toolset's ability to rapidly generate JSON outputs for selected findings.

Conclusion/Statement of Impact/Lessons Learned

The concept of CDE definition stubs, combined with a supporting toolset, addresses key challenges in scaling structured radiology reporting, paving the way for radiology reports to power downstream vendor applications, automated workflows, and precision medicine.

Figure(s)



Figure 1. Example of a CDE definition stub.

Keywords

Artificial Intelligence/Machine Learning; Clinical Workflow & Productivity; Communication Data Management; Emerging Technologies; Imaging Research; Standards & Interoperability