Keratoconus is a disorder causing a progressive thinning of the cornea. An example of an ontology such as SNOMED CT makes the following statements:

- The Cornea is part of the Eye.
- Keratoconus is a Cornea Disorder.
- Therefore it can be automatically inferred that:
  - any disease of the cornea is an ocular disease.
  - special care for eye patients are therefore applicable to patients with Keratoconus.

**Ontologies**

- Facilitate the structuring of information and data in a specific domain in such a way that computer systems can reason over them.
- Provide mechanisms that extend the representational and computational limits of traditional databases and other knowledge representation systems.
- Ontologies have been applied successfully in the biomedical field, where the medical ontology SNOMED CT is used.
- SNOMED CT is an ontology that addresses most areas of clinical information used for organizing medical record content.
- Provides a consistent mechanism to store, retrieve and use clinical data across medical specialties and sites of care.
- Uses a representation language that allows for automated processing, i.e., programs can reason over the implications and consequences of statements made by a user.

**OpenMRS Concept Dictionary**

- The OpenMRS concept dictionary:
  - a collection of unique, coded concepts used to generate forms and encode data that are captured within the system.
  - collaboratively developed by the OpenMRS consortium.
  - allows for the collection of coded, reusable data without requiring changes to the data model.
  - customizable for specific OpenMRS implementations.
  - can be regarded as a crude ontology.

**OpenMRS**

- Open source framework implemented in Java using a MySQL database.
- Enables the deployment of customizable systems to manage medical records.
- Implemented in countries such as Kenya, Rwanda, South Africa, Uganda, Tanzania, Zimbabwe and Peru, with scope to extend the adoption in multiple other locations.
- One implementation in Kenya [AMPATH] claims twelve million discrete observations collected for nearly 50,000 HIV patients with over $510,000 encounters.

**PROJECT STATUS**

- The project is in the conceptualisation and requirements investigation and analysis phase.
- Contact information:
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Integrating a mechanism to store, retrieve and use clinical data with a system to manage medical records enables better utilisation of medical data and improved healthcare.

The integration of SNOMED CT into the OpenMRS electronic medical record system framework

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**PROPOSED PROJECT**

- This poster introduces a research project that aims to extend OpenMRS and the OpenMRS concept dictionary by incorporating SNOMED CT and related ontology technologies.
- It aims to investigate beneficial outcomes of this integration, specifically aspects of methodology, enhanced functionality and reasoning.
- It is a collaborative effort involving the following South African institutions:
  - Knowledge systems group at the Meraka Institute (CSIR)
  - South African Medical Research Council (MRC)
  - University of KwaZulu-Natal (UKZN)
  - University of South Africa (Unisa).

**BENEFITS**

- Better standardisation of terminology across OpenMRS systems and other medical systems worldwide.
- Semantic interoperability where standardisation is not feasible.
- Enhanced data capturing.
- Improved data management.
- Better use and mining of captured data.

**FUNCTIONALITY TO BE DEVELOPED**

- Ontology-driven report generation.
- Ontology-driven report generation.
- Ontology-driven input-form generation for data capturing.
- Intelligent query processing using ontology reasoning technologies.

**CONTACT INFORMATION**

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