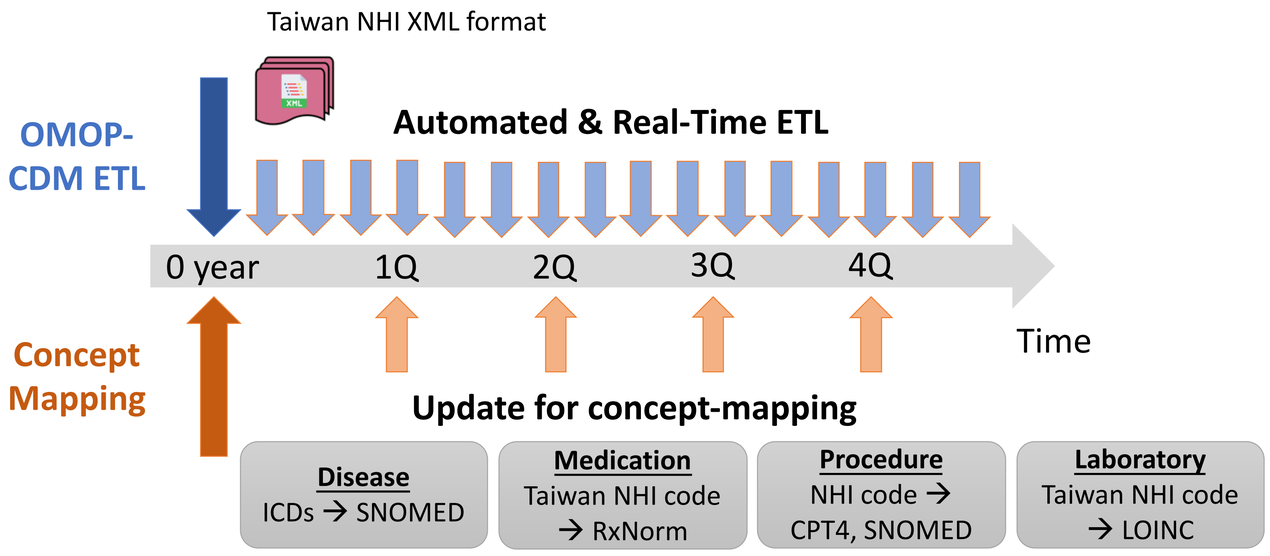
The implementation of an Automated and Real-Time (ART) ETL system enables **hospitals lacking specialized data engineers** to participate in the OMOP CDM journey. It serves as a valuable model for other countries seeking to **adopt a national standard** format.

Development of an Automated and (near) Real-Time (ART) OMOP-CDM ETL System in Taiwan

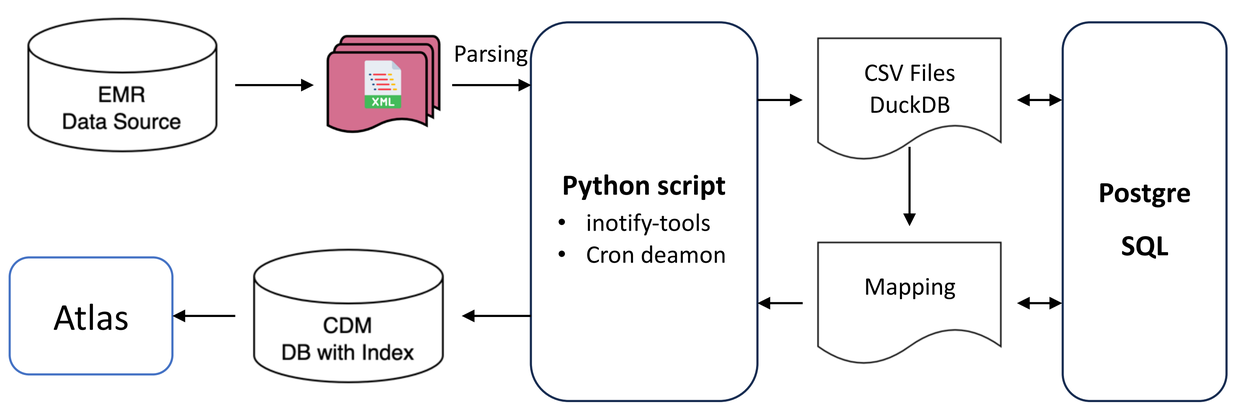
Background: The mapping of source values to standard concepts within this framework often falls upon subject matter experts who may lack expertise in ETL programming. Streamlining the ETL process could revolutionize the OMOP CDM journey, potentially rendering it accessible even to those without extensive data engineering backgrounds, while also reducing the workload of engineers within hospital settings.

Methods

1 Overview of ART ETL and Concept Mapping strategy



2 The Taiwan ART ETL system architecture



Strategies for the Taiwan ART ETL

We established the strategies of the Taiwan ART ELT by following requirements (Figure 1):

1. ETL Cycle: Data processing occurs daily, weekly, or monthly in accordance with Taiwan National Health Insurance (NHI) regulations.
2. Data Scope: The dataset includes information on outpatient visits, hospitalizations, emergencies, medications, laboratory tests, and procedures required for reporting to the Taiwan NHI.
3. Data Synchronization: Data undergo mapping and transformation into OMOP-CDM format using the Taiwan NHI XML format on a daily, weekly, or monthly basis.
4. Concept Mapping: Conceptual updates involve mapping Taiwan NHI codes (e.g., ICDs to SNOMED, Taiwan NHI Drug codes to RxNorm, Taiwan NHI Procedure codes to CPT4, and Taiwan NHI laboratory codes to LOINC) on a quarterly basis.
5. Backup: Original data from all sources are stored before being transformed into OMOP-CDM format.

Result: We developed the Taiwan OMOP-CDM system using the Taipei Medical University Clinical Database (TMUCRD) CDM including the Taiwan NHI XML report format. Subsequently, we implemented the ART ETL in 3 hospitals and validated the system in the 4th hospital.

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