

LOT 4 - INFORMATION ARCHITECTURE (WORKSTREAMS 6, 7 AND 8)

WS6: Information Architecture Model

Objective:

The objective of this work stream is to identify and implement a best practice 'Information Architectural Model' for the Irish Healthcare environment. It will take consideration of current information constructs, along with assimilation of best practices and models from other healthcare jurisdictions and provide a comprehensive and integrated data architecture for the Irish environment.

Context:

With the ever increasing requirement for the holistic integration of patient care data, and the requirement for a national EHR it is recognised that there is a pressing requirement for defining the data structures, information models and standards for core data, such as to ensure applications can share data in an integrated manner across the HSE's technology platform.

Whilst data constructs and repositories exist in many areas, they can no longer be considered in isolation, and it is in this context that this work stream is being initiated.

Deliverables:

Many different data models are available offering different sets of constructs from which the models can be built. For the purpose of this work stream and the Irish data model, the constructs of the model will include ENTITIES, the RELATIONSHIPS between data entities predicated on business rules established from Work Stream 5, and the DATAATTRIBUTES that describe the data entities.

The deliverables include-

Work Package 1:

1. Specification of data classes and data entities to be used in the ISF
2. Identification of an established and adoptable standards based data dictionary (ideally built largely on an existing model)

Work Package 2:

1. Identification of an established and adoptable standards based data model dictionary (ideally built largely on an existing model)
2. Specification of the Logical Information Model (LIM) or Logical Record Architecture (LRA) to be used in the ISF

Work Package 3:

1. Specification of the Services & Transportation Architecture

A Service Oriented Architecture (SOA) specification for the coupling of data repositories and services with platforms and applications. It will need to broadly define the integration of disparate applications for the future integrated platform of the EHR. The architectural specification will underpin a model that will have a web based orientation and use multiple implementation platforms. It will define a standards based SOA architecture that encompasses an Enterprise Service Bus (ESB) and EAI components.

The deliverables from Work Package-3 include-

- A high-level Blueprint of the SOA architecture
- A high-level Blueprint of the ESB architecture

Work Package 4:

1. Mapping Services & the Linkage Layer;

The deliverables from Work Package-4 include a specification for the mapping systems and services (EAI) that act as the go-between or broker between the multiple source applications and the EHR framework. It will also require identification of any databases that may require joining (adaptors) to facilitate completeness of the data architecture.

Work Package 5:

1. Allied to work packages 3 & 4 above this will provide the standards specification for the Data and Common User Interfaces (CUI) to the data models and repository.

Quality Requirements:

The quality requirements are-

- That the entity relationship diagrams will act as the road maps to extract, transform, and load disparate data from the data repositories.
- That the standardised data parameters and the data dictionary will constitute the defining parameters of the healthcare data model.
- That the outputs will provide for a single, consistent view of data across the enterprise.
- That the outputs will be governable and ensure improved data consistency and data quality.

WS7: Data & Information Repository Work Stream**Objective:**

The objective of this work stream is to define the current data and information repository assets and to establish a standards based data repository structure.

Context:

The current data elements which will underpin the EHR reside on a range of data platforms with differing formats and nomenclature. There are also silos of associated text based documents which need to be integrated into an aligned and standards based repository structure. The work stream also embraces the requirements for a unified meta data and markers specification which will facilitate the extraction and transformation rules described in work stream WS8, and the provisioning of data required to populate the data models.

Deliverables:

The deliverables for this work-stream are-

A standards based repository framework (IHE-XDS or equivalent) for the EHR data that encompasses-

- Structure and content specification
- Audit Repository specification
- An architectural schema
- Resource Catalogue
- Access Information Library

Quality Requirements:

The fundamental quality requirements for the repository are its capacity to store core data, documents and associated data in a standardised, transparent, linkable and persistent manner.

WS8: Transformation, Interfacing & Sourcing**Objective:**

To define the data transformation mapping and communication services required for linking source data applications to user interfaces within the EHR.

Context:

Healthcare data currently resides in a variety of heterogeneous systems and formats. To facilitate the development and effective functioning of the EHR requires the ability to access this federated data, to then read the data from these varied sources, clean it up, format it uniformly, and write it to the target repository for usage by the EHR.

Deliverables:

To achieve this objective requires the standards specification of certain key components through two work packages. The first work package covers source data extraction, transformation and loading (ETL), whilst the second work package defines the validation rules and their associated references and determinants.

Work package-1:

The deliverables from Work Package-1 include-

- **Extraction:** Specification of the data formats appropriate to transformation processing. It should also consider parsing requirements.
- **Transformation:** Specification of a series of rules governing the extraction of data from the repository source to derive the data for loading into the end target. Validation, transposing and joining are minimum parameters for inclusion.
- **Loading:** A high-level specification of the load requirements, and constraints for the data load process. This will include appendage rules, logging and audit requirements.

The work package also requires consideration of-

- The current functions and data interfaces to the data models and services that are to be provided.
- The compatibility of known future functions and their data interfaces to the services to be provided.
- Specification as to which (and whether) these elements can be aggregated.
- Specification as to which elements are to be aggregated.
- The ETL requirements and whether adaptors or ESB infrastructure is required.
- Specification as to how many services will be enabled, and what aspects of enablement should be consistent across the services.
- Specification of the basic communication protocols and standards (e.g., WebSphere MQ, SOAP, WSDL) and where more advanced capabilities (e.g. WS-Security, WS-Transaction etc) are needed.

Work package-2:

Validation Rules: The deliverables from Work Package-2 relate to the validation rules. The validation rules will render any terms or literal expressions used in a source data extract into a consistent expression. such that they can be standardised. They will need to be integrated with and tested against the data model and data dictionary.

The deliverables from Work Package-2 include-

1. Identification and specification of existing terminology sets
2. Specification of controlled vocabulary sets for the validation process
3. Specification of the format for textual expressions including local descriptors, abbreviations and code sets
4. Standardisation in accordance with relevant national code sets (ICD10-AM, LOINC, SNOMED CT, HIPE etc.)
5. A high level outline of the validation process

Quality Requirements:

The model must encompass all core feeder systems. The work-stream output should also include a high level mapping diagram.