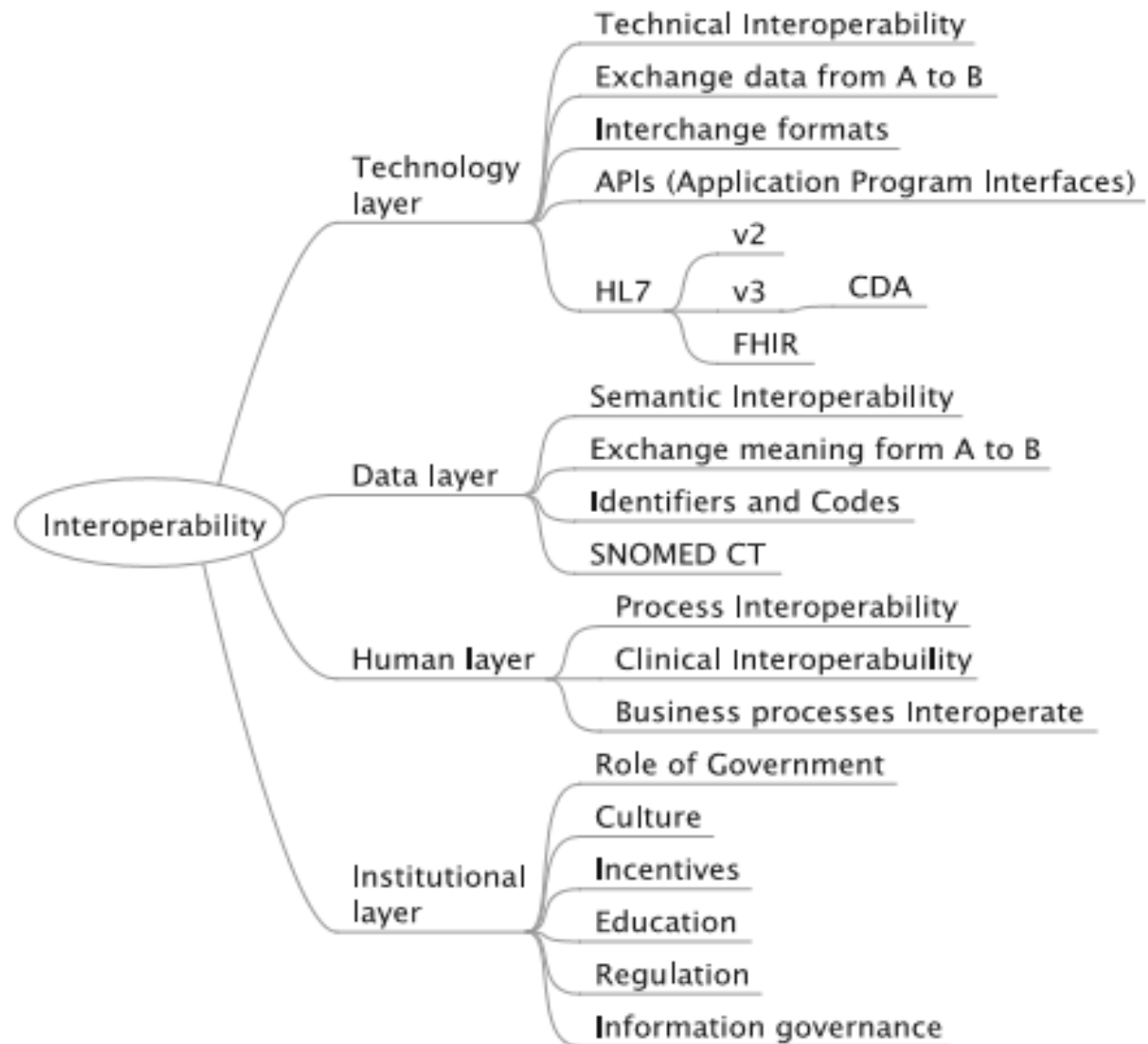


Interoperability

Layers and Types

Layers of Interoperability

- There are four main layers for interoperability
 - Technology
 - Data
 - Human
 - Institutional



Types of Interoperability

- **Technical Interoperability:** also named, channel or connection/communication interoperability
- **Information Interoperability:** also named, (Syntactic) Semantic interoperability
- **Process Interoperability:** also named, organisational or service interoperability

Technical Interoperability

- A **basic type** of interoperability
- Also known as connection interoperability
- Refers to the ability of exchanging data and information in terms of signals, at infrastructure levels
 - In other words, the ability to transfer data from A to B
 - Provides methods to establish physical and logical connections between two or more systems

Technical Interoperability

- **Domain** independent: independent of information or to what domain the information belongs to.
- Does not care about the meaning of what is exchanged
- Sending and receiving computers do not understand the message exchanged between them
- e.g., emails, or SMS: they can be used only to transfer data, irrespective of the domains.

Information Interoperability

- Refers to the ability of different systems to
 - Interchange data
 - Share information
 - Share knowledge

to deliver new services

Information Interoperability

- **Information interoperability** has many forms
 - Morphological interoperability: also named structural interoperability
 - Syntactic interoperability
 - Semantic interoperability

Information Interoperability

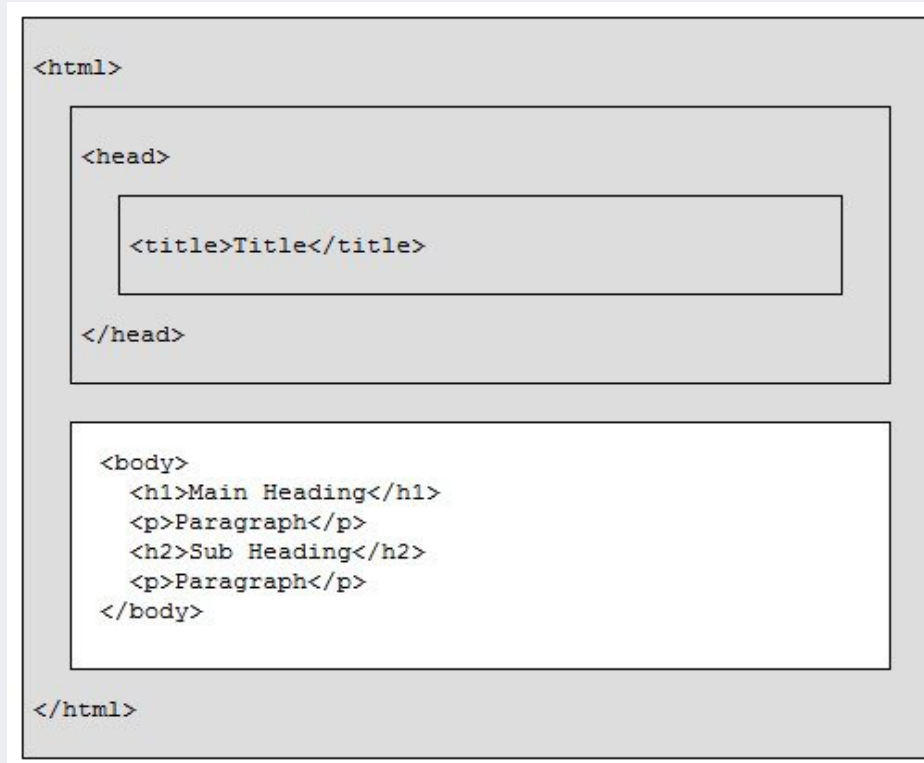
- **Morphological (Structural) interoperability**
 - Structural interoperability
 - Validates that the same data has the same (or understandable structure and) format

e.g. HTML
document structure

<html>

...

</html>



Information Interoperability

- **Syntactic interoperability**

- Information interoperability - the interoperability between systems that agreed on exchanging information, with the agreed upon syntax of the transferred information.
- **Guarantees** that a message **was delivered**
- **Does not guarantee** that the receiver receives (or comprehend) the message
- e.g. message syntax is consistent

tele no: 00970 2 233 2333

URL: <http://www.w3.org>

Information Interoperability

- **Semantic interoperability**

- Knowledge level interoperability

- Ability of different information systems to exchange information on the basis of pre-established meanings of terms and expressions

- The basis for achieving interoperability in healthcare

E.g. Actionable message: a message can be understood and an action can be taken/invoked.

<Message: “Call Adel”, Coding System: “English”>

<Message: “4548-4”, Coding System: “LOINC”>

Information Interoperability

- **Semantic interoperability**
 - **Guarantees** message recipient (or comprehension)
 - Uses *semantic mediation* to combine data from heterogeneous sources
 - *Semantic mediation*: converts clinical messages from their standard/common format into another local format or vice versa

Process Interoperability

- Refers to the ability of different systems to
 - Exchange clinical processes and workflows between clinical systems associated with clinical data
- A critical feature in health care is clinical process interoperability
- “Clinical process interoperability is the ability for two or more clinicians in different care teams [or organisations] to transfer patients [and/or their data] and provide seamless care to the patient”
- To achieve clinical process interoperability, transfer of workflow and standards supported by clinical systems is needed.