# *PROPOSED FRAMEWORK FOR PRIORITISING THE FUTURE DEVELOPMENT OF UK CORE*

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## Executive Summary

- FHIR UK Core needs to include a full suite of HL7 FHIR artefacts, not just resource profiles
- FHIR UK Core needs to be developed alongside Information Specifications and Context of Use Specifications

This is needed to enable prioritisation within the scope of the UK FHIR board.

This document proposes a framework for prioritising the future development of UK Core. It describes:

- the need for a new approach
- additional FHIR artefects beyond Resources
- the candidate artefacts
    - that are needed by developers and implementers and
    - that are 'intermediate' and provide a framework for development
- how FHIR artefacts can be developed alongside Information Specifications and Context of Use Specifications
- the importance of conformance and assurance and how to achieve this.

# Background for the need to define a prioritisation process

Health information matters. Delivering the right information, to the right people at the right time really impacts people in pain who need NHS treatment, or care from social services and the people looking after them. It improves the productivity and work experience of staff whilst also improving patient care, thereby also reducing staff stress.

The HL7 UK FHIR Board according to its Terms of Reference is responsible for the development of UK wide guidance on FHIR including UK wide FHIR Implementation Guides and related conformance artefacts and as part of that it needs to prioritise work efforts including use cases. Specifically it is responsible for:

- determining user needs and priorities
- development and review of national and/or regional level strategies, policies, programmes as well as end-to-end and related processes;
- overall scoping, planning and priority setting of central activities;

The HL7 UK FHIR Board set up a small workgroup to define priorities, but this group soon realized that it was unable to make progress because there was no process to identify candidate use cases and to then prioritise them. The Prioritisation Group then created a sub-group (known as the Sub-Group) of the original members to define a prioritisation process that would allow use cases to be identified and then allow these use cases to be prioritised against each other.

Simultaneously, NHS England has identified the need to have a process for prioritising interoperability uses cases, developing these, and having a release process across the NHS that would minimize time to peak adoption. With the DPDI legislation coming into force, this is urgent. NHS England has requested that as INTEROPen had already defined an "End-to-End Process" over five years ago, this should be reviewed and used directly or built upon to define this process.

The sub-group of the Prioritisation Group of the UK FHIR Board started to work with the INTEROPen End-to-End Process[1] as a basis for its work.

# Difficulties in Basing Prioritisation on the INTEROPen End-to-End Process

## The INTEROPen Process

The Sub-Group started its work defining the prioritisation process by reviewing the INTEROPen Process from 5 years ago and quickly realized that it was inadequate for the following reasons:

- The End-to-End process from INTEROPen was defined as a linear process but what is needed is iterative.

[1] https://docs.google.com/presentation/d/1OHPhbap1HFmdwCz26jcwXXVDvfdWXoDdkQi-ARRI6Sc/edit?usp=sharing

- The INTEROPen process did not have a way that use cases could be defined and prioritised. In fact, it was focused on testing out emerging FHIR standards and ensuring they were usable by system suppliers, they were fit for purpose, and released to achieve peak adoption.
- The INTEROPen process did not define what was required in an interoperability specification or it to be implementable in a common way.

It was concluded that there is more complexity to defining use cases than originally thought. This complexity needs to be understood both clinically and technically.

### Clinical Complexity

Any use case must be set within, for example a particular specialty as different specialties have different clinical/business processes, different actors etc. Examples of this are:

- There is no consistent definition of episodes across specialties; Maternity has a different episode definition to Respiratory.
- There are different actors involved in a clinical process. For example, an expectant mother is a different actor to a geriatric patient.

This shows the importance of understanding the context of use within which interoperable specifications need to be defined.

### Cross-Specialty Consistency

The UK FHIR Community need a process that enables new requirements that are identified in one specialty to be addressed, and any impacts on existing infromation flows to be managed. The iterative nature of the specification and standards process means that a UK Core FHIR specification may be defined for solving an information sharing requirement for one Specialty, but an information sharing requirement for another Specialty may be different which could result in incompatibility or the original UK Core FHIR specification having to be amended.

### Technical Complexity

To date NHS England IOPS have defined FHIR Resource Profiles in UK Core that include Code Systems, Value Sets and Identifier Systems. These are key artefacts that help developers build interoperable solutions, but the difficulty that architects and developers in both healthcare providers and system suppliers have in applying these to solve different problems within both the same and different contexts shows more is needed than just Resource Profiles.

### Consequences for the HL7 UK FHIR Board

The HL7 UK FHIR Board is responsible for prioritising the interoperability problems and requirements that need interoperability specifications developed. Without having a framework that can effectively manage this complexity, not only can the Board not prioritise specifications to be developed, it cannot ensure that what is developed is implementable and widely adopted.

# Artefacts

## Context of Use Specifications

Information is only worth having if it is useful and used in the delivery of health and care, or in the planning and evaluation of that care, or in the development of products and services that contribute to that care. The context of use specification defines those processes, activities, decisions, and events where care is delivered, or relevant information becomes available, as well as the metrics used to manage and assess the quality of care. This should be defined with organisations such as the CQC, MHRA and NICE, as well as the management organisations (NHSE, ICBs, Trusts, etc) and professional boies (Royal Colleges etc)

A context of use could be a domain or communicating community (e.g Maternity, Diabetes), or it could be a common interaction pattern (Transfer of Care, Scheduling, Orders/Requests).

## Information Model Specifications

For each context of use (or activity, decision, or event within a context of use), the information required to support it needs to be defined as it is from this information that the data in an interoperability specification will come. The information can be from a specification such as from the PRSB.

From this, the required FHIR Profiles can be defined or if Profiles required already exist, the action is to identify if and how they can be re-used, and if they reveal changes that are needed to the information models. The method of access can then be determined and a core part of the specification is defined.

Once the Profiles are identified and the data necessary to be in the Interoperability Specification has been defined, it is necessary to identify where APIs can be re-used or where different APIs need to be defined for the same set of profiles in supporting different processes.

Appendix 1 has more detail on this.

## FHIR Artefacts

As identified earlier just defining Profiles with Associated Code Systems, Value Sets and Identifier Systems is not enough to allow healthcare providers and system suppliers in applying these to solve different problems within both the same and different contexts. Profiles on their own cannot define how they should be mapped to data that already exists in systems.

For UK Core, UK-Wide Implementation Guides need to be created that not only include the Profile but also information on how to solve a particular problem, with associated documentation to support and clarify the usage. This also allows both healthcare providers and system suppliers to apply these profiles to solve different problems within both the same and different contexts.

A UK Core Implementation Guide could include possible, or candidate, FHIR conformance artefacts beyond resource profiles. These could be

- Capability Statements; expected capabilities of the UK Core Server actor which is responsible for providing responses to the queries submitted by the UK Core Requestors. The complete list of FHIR profiles, RESTful operations, and search parameters supported by UK Core Servers are defined
- Mappings (Structure Maps and Concept Maps) describe how other data models can be mapped to FHIR
- Questionnaire Instances

Other Implementation Guides that could be defined are:

- UK Core Access
- UK Core Care Provider Directory Services

Appendix 2 has more detail on this.

## Prioritising

The contexts of use specifications provide a consistent way to define use-cases and priorities so that they can be compared, adapted for local use, and tested for consistency.

An entire domain may be a priority (for example Maternity may be a national focus), or specific use cases wihin a domain or across multiple domains may be defined as priorities. The context of use specification will help to define what that use-case is, what the metrics are to be used to measure success, and what processes, activities or decisions need to be improved.

Prioritisation should not be solely determined by the needs of central bodies such as CQC and NICE or other central organisations. The needs that are identified and shared by health and care organisations are also important. For example an ICS could identify a context of use to meet its own needs but that also applies nationally.

Once the priority use cases are identifed, the required information specifications and FHIR artefacts can be determined

The HL7 UK registers of initiatives and implemented systems[2] should be taken into account to understand the capabilities of existing and emerging solutions across the UK.

## Conformance and Assurance

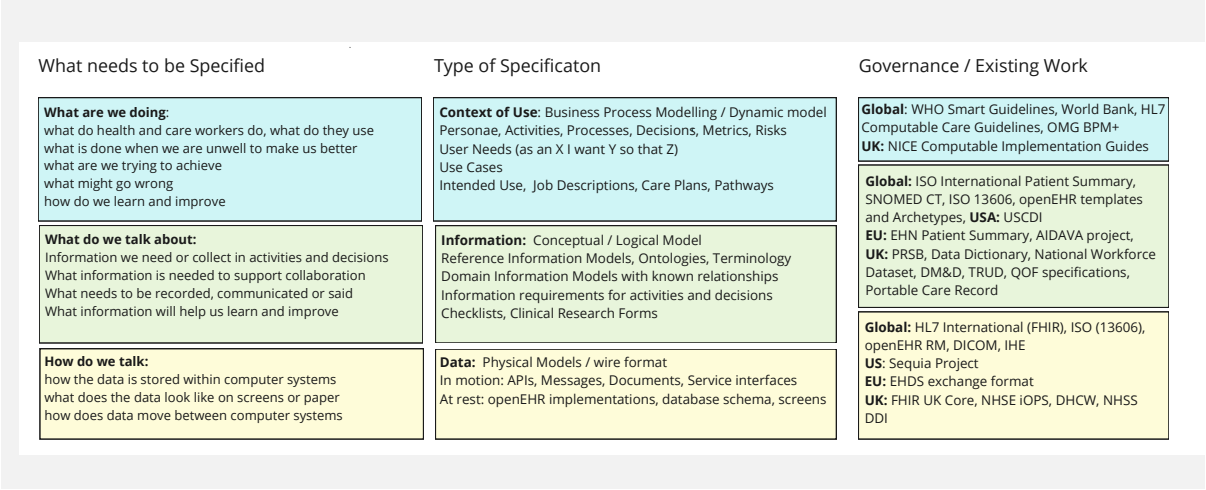
For UK Core specifications to be useful and used, those developing and those buying solutions need to be able to test whether the systems conform to the specifications, and where appropriate, receive third party assurance that such tests have been completed.

Conformance to the context of use and information layer specifications are out of scope for this document, but at the FHIR layer it is critical that FHIR UK Core artefacts take advantage

[2] https://confluence.hl7.org/display/HL7UK/HL7+UK+FHIR+Board+managed+implementation+artefacts

of the extensive tooling available within the FHIR ecosystem to support automated testing against FHIR specifications, as well as the assurance services in the wider FHIR, INTEROPen and IHE community such as hackathons, connectathons and projectathons.

# Appendix 1. Context, Information and Data Framework




## What needs to be Specified

**What are we doing**:
what do health and care workers do, what do they use
what is done when we are unwell to make us better
what are we trying to achieve
what might go wrong
how do we learn and improve

**What do we talk about:**
Information we need or collect in activities and decisions
What information is needed to support collaboration
What needs to be recorded, communicated or said
What information will help us learn and improve

**How do we talk:**
how the data is stored within computer systems
what does the data look like on screens or paper
how does data move between computer systems

## Type of Specificaton

**Context of Use**: Business Process Modelling / Dynamic model
Personae, Activities, Processes, Decisions, Metrics, Risks
User Needs (as an X I want Y so that Z)
Use Cases
Intended Use, Job Descriptions, Care Plans, Pathways

**Information:** Conceptual / Logical Model
Reference Information Models, Ontologies, Terminology
Domain Information Models with known relationships
Information requirements for activities and decisions
Checklists, Clinical Research Forms

**Data:** Physical Models / wire format
In motion: APIs, Messages, Documents, Service interfaces
At rest: openEHR implementations, database schema, screens

## Governance / Existing Work

**Global**: WHO Smart Guidelines, World Bank, HL7 Computable Care Guidelines, OMG BPM+
**UK:** NICE Computable Implementation Guides

**Global:** ISO International Patient Summary, SNOMED CT, ISO 13606, openEHR templates and Archetypes, **USA:** USCDI
**EU:** EHN Patient Summary, AIDAVA project,
**UK:** PRSB, Data Dictionary, National Workforce Dataset, DM&D, TRUD, QOF specifications, Portable Care Record

**Global:** HL7 International (FHIR), ISO (13606), openEHR RM, DICOM, IHE
**US**: Sequia Project
**EU:** EHDS exchange format
**UK:** FHIR UK Core, NHSE iOPS, DHCW, NHSS DDI

# Appendix 2. UK Core Implementation Guides and Conformance Artefacts

## Static Conformance Components

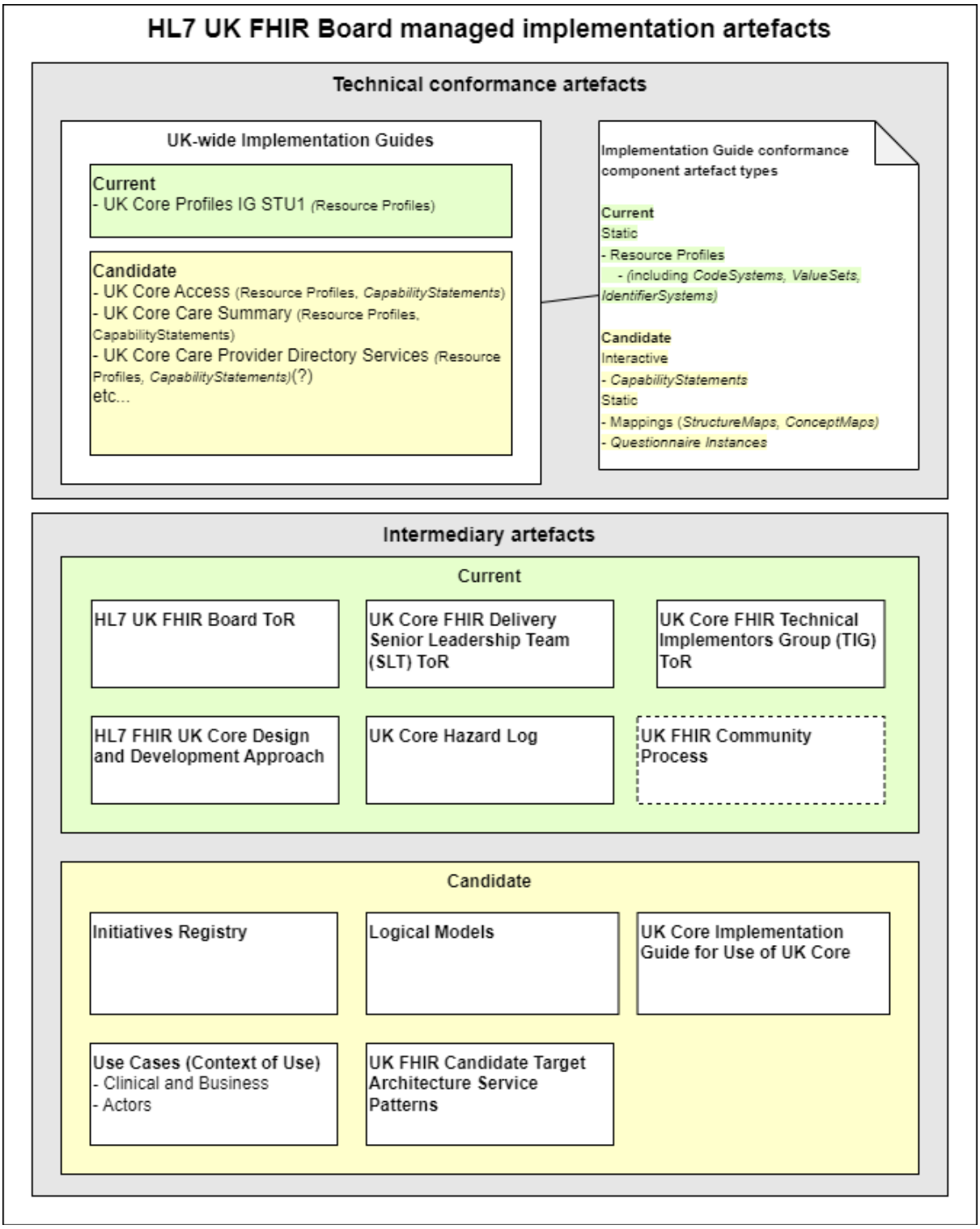
As stated earlier, for UK Core, UK-Wide Implementation Guides need to be created that not only include the Profiles but also information on how to solve a particular problem, with associated documentation to support and clarify the usage. These artefacts are in addtion to what exists today (Resource Profiles, CodeSystem Instances and ValueSets Instances) and therefore are candidate static conformance components that can be included in addition to the Profiles. As described earlier these include ConceptMaps, Structure Maps and Questionnaire Instances.

Additionally there are candidate resource profiles that include Composition Resource Profiles that include widely used patterns that can be used across multiple contexts of use. For example Inpatient Discharge Summary, Care Subject Summary.

## Interactive Conformance Components

Conformance components provide the guidelines to ensure that Resource Components are developed that conform to certain rules, thereby ensuring they have a definition of done. None of these exist in UK Core so there a number of candidate conformance components that can be developed. These can be Care Provider Serice that again transcend context of use.

These are all defined in the diagrams below.

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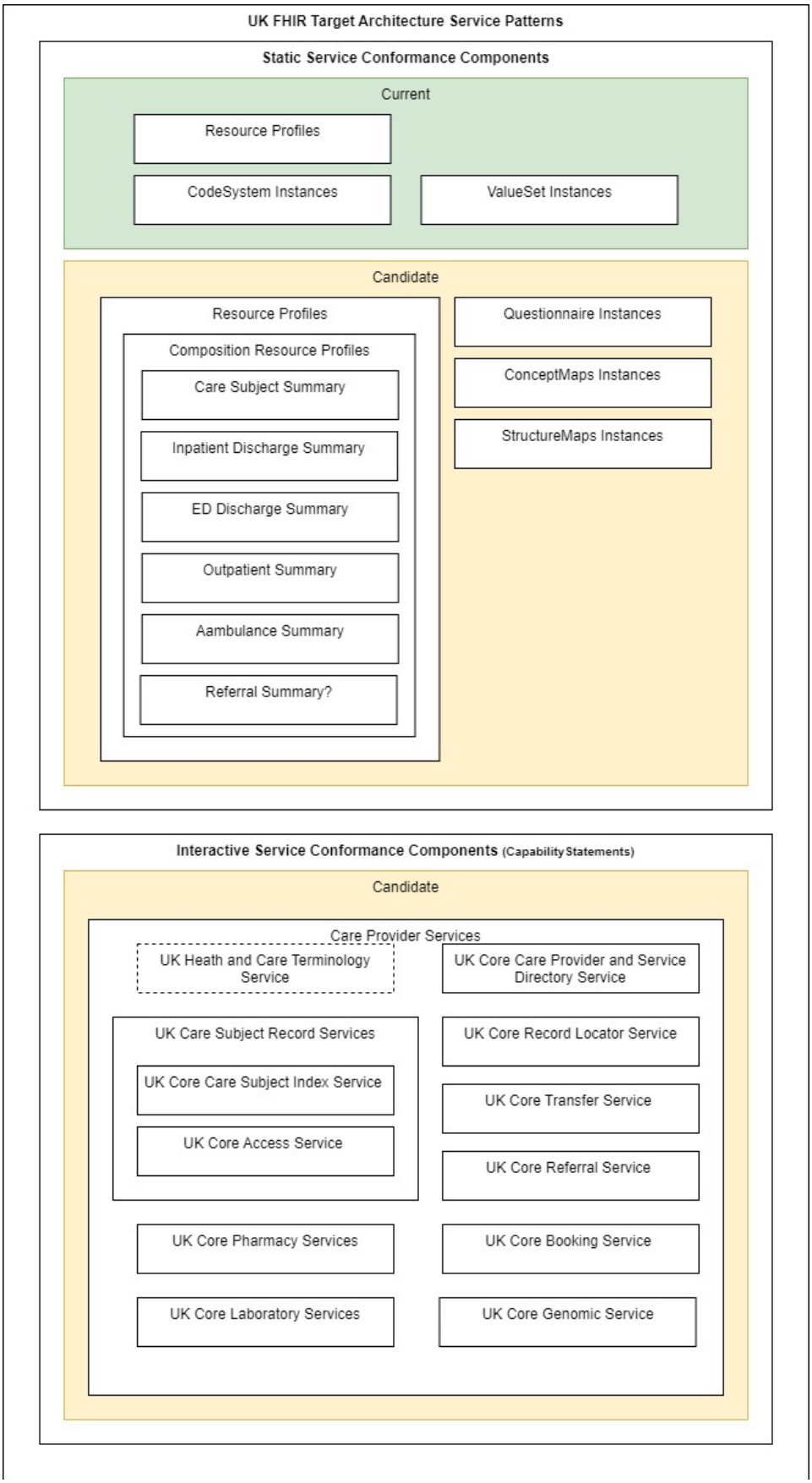


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