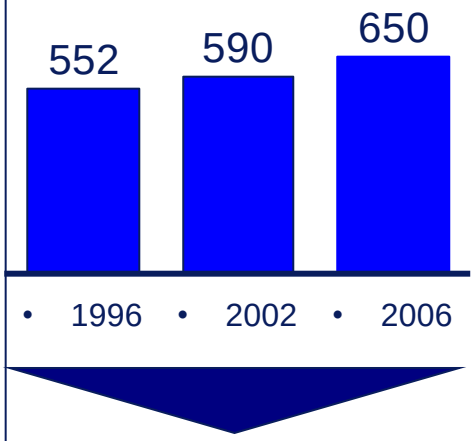
National Integrated Services Framework

The Foundation for Future e-Health Connectivity

Peter Connolly Nov 2012

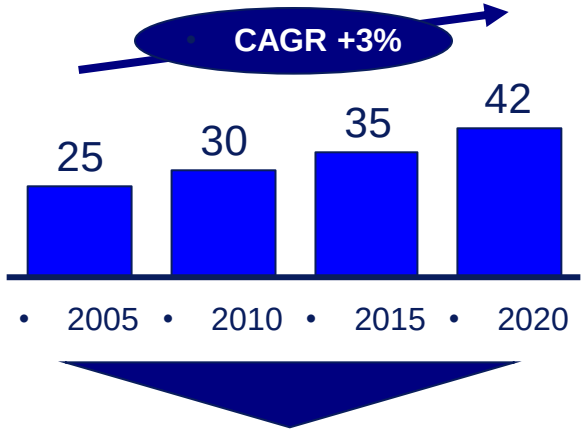
CHANGING DEMANDS

- **Population is aging**
- 000's, persons over 60



- Increase in demand from higher-dependency segment of population

- **The average number of cancer cases is predicted to increase**
- 000's, predicted no. of cases



- Increased requirement for prevention and specialist treatment

- Increasing prevalence of conditions such as diabetes, obesity, heart disease and asthma puts an increasing burden on the health service

Source: CSO, National Cancer Registry Ireland; CSO; Interviews; team analysis

CASE FOR CHANGE

- To drive and support safe, quality care for patients and clients.
- To bring decision making close to where services are delivered.
- To allow clinicians to shape and assure the services they work in.
- To get the best health outcomes for the money spent.
- To plan and organise around what we know people need and what we know works to give the best results.
- To organise to meet increasingly complex patient and client needs
- To remove barriers to integrated care.
- To provide an equitable UHI based model of care

WHAT DOES THIS MEAN

- Services will be more accessible locally, centred around the patient, rather than centred around an institution
- Shift towards prevention and better self care rather than a focus on acute care and treatment
- Right balance between inpatient, day case and community based care
- More efficient use of resources and more transparent accountability
- DATA must follow the patient throughout the care pathway
- Real time access to patient data
- Equitable UHI based healthcare provisioning (aka the Dutch model)
- Ensure that key pieces of data can be extracted, exchanged and interpreted in a consistent manner by both humans and interacting systems
- A requirement for a national patient record
- An integrated standards based platform to accommodate the patient record

WHY STANDARDS IN HEALTHCARE

- Data- entered once but used many times with consistent meaning
- Europe 2020: Digital Agenda and Directive EU 2011/24
- Record portability across member states
- Sharing information exchange for better patient care
- Laying a foundation for a national EHR
- Reduced implementation costs and timeframes
- Unambiguous testing methods and certification
- Minimum data sets for patient summaries and clinical programmes
- Facilitating semantic and syntactical operability
- Ensure function requirements and specifications are understood
- Removal of technical barriers
- Transfer of technology
- Sharing becomes possible only if interoperability exists
- Interoperability occurs only if a full set of standards in health care exist

THE INTEGRATED SERVICES FRAMEWORK

A ‘standards based’ single framework for the public health system

- A Technical Architecture
- An Applications Architecture
- An Information Model and Architecture
- An Communications / Network Architecture

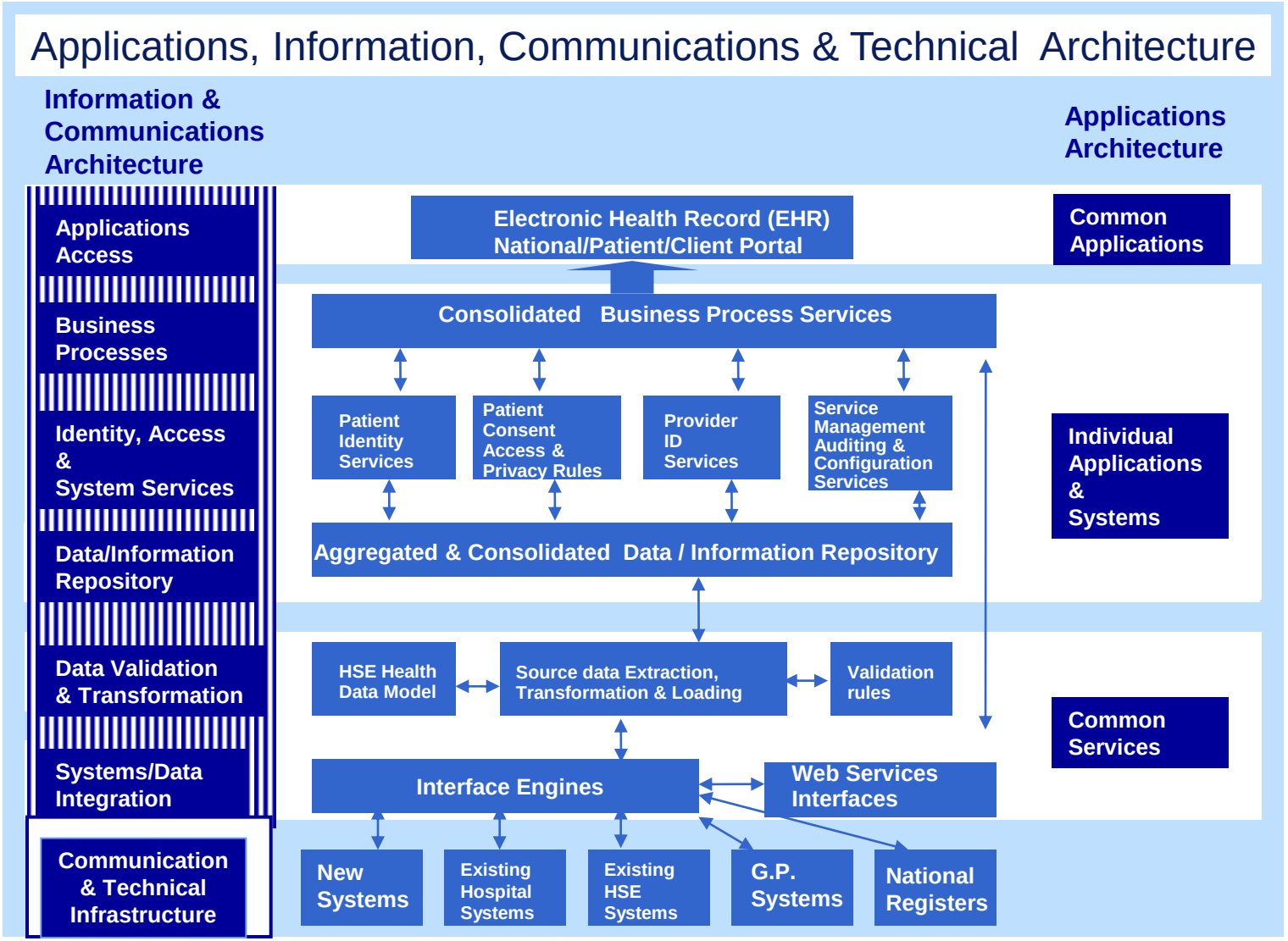
A Single Information Systems Framework to provide for integration and sharing of data and information

- Deliver the ICT Strategy work streams
- Strategic National Business Initiatives
- Develop, implement & support
- local & regional initiatives
- Develop the EHR Information Framework
- Develop & improve ICT Infrastructure

Secondary Deliverable

Foundation for the Electronic Health Record (EHR) and a National Patient/ Client Portal

INTEGRATED SERVICES FRAMEWORK COMPONENTS



A GLOBAL REVIEW

Denmark
The Netherlands
England
Wales
Scotland
Northern Ireland
Hong Kong
Taiwan
Canada
USA
Germany
France
Nordics
Estonia
Slovenia
NZ/Australia
Singapore
Hong Kong
Taiwan

What was your approach to the development of a national standards based platform?

What resources did this require and what is the allocated budget?

Who are your key stakeholders and how were they engaged?

What was your allocated budget and what timelines are you working towards?

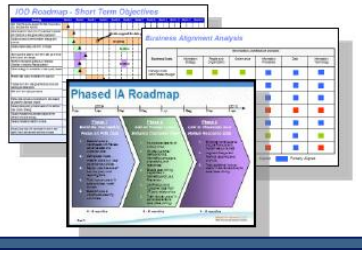
What approach did you adopt and why?

What standards did you review and which did you adopt?

How effective was the adopted approach, were there any lessons learnt?

Where were the big road blocks and how did you overcome these?

- There was a broad sharing of knowledge and material
- We assimilated the findings and identified best practices
- The way forward moved from obscurity to clarity



LESSONS LEARNED

KEY FINDINGS

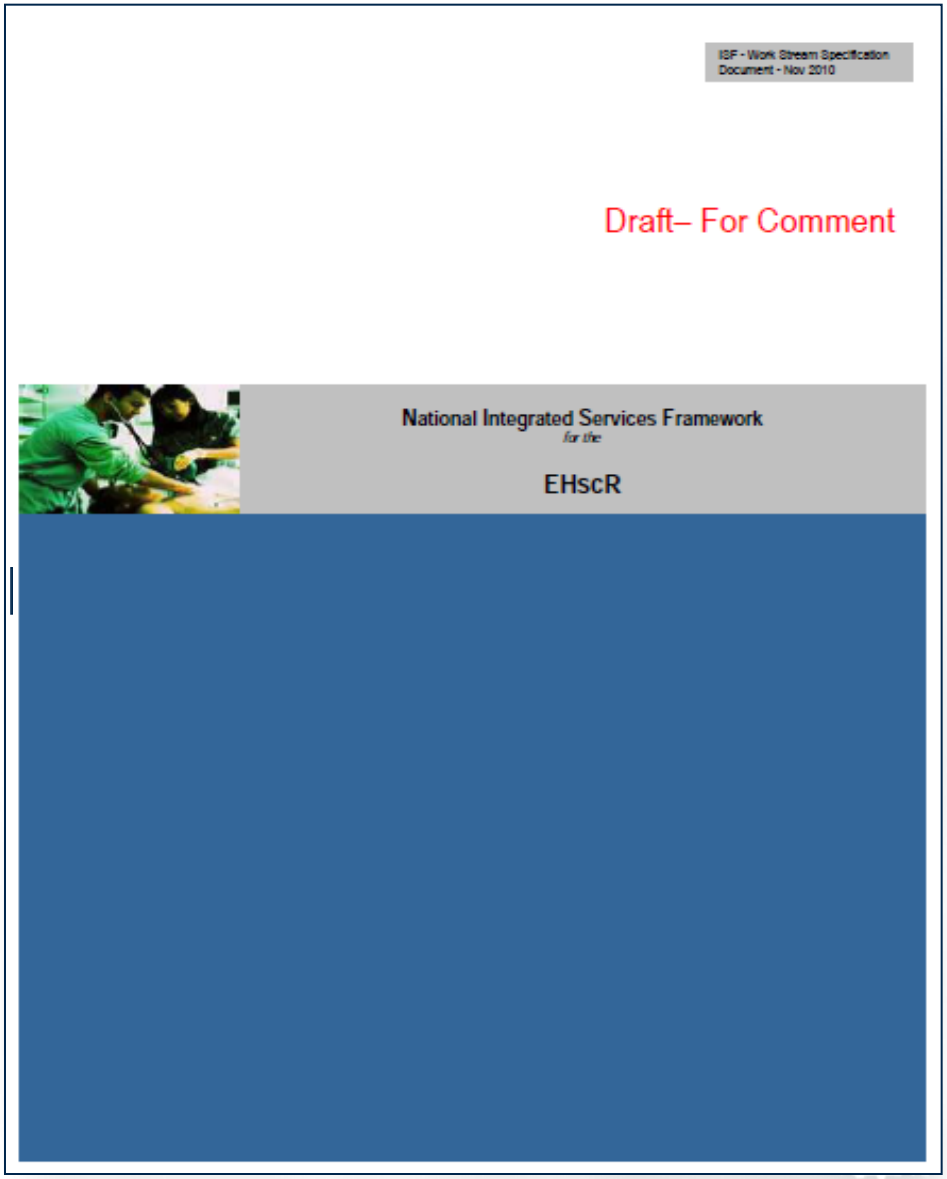
- The approach should include all key stakeholders and facilitate broad participation in order to achieve appropriate consensus and support.
- The fostering of mature partnerships with pioneering peer organisations will provide for effective collaboration and broaden the collective resource pool.
- An incremental approach should be considered, and in so far as practical adopt a ‘build on’ rather than a ‘rip and replace’ approach to existing infrastructure.
- Focussing solely on an accelerated implementation of an EHR platform is likely to extend the existing legacy and add an unnecessary degree of cost.
- No one single standard in likely to address all requirements.
- Significant value can be achieved by focussing on implementing a ‘ready-set’ of data standards that are mature and proven.
- Value can also be achieved through leveraging internal standards and aligning them with the Framework.

LESSONS LEARNED

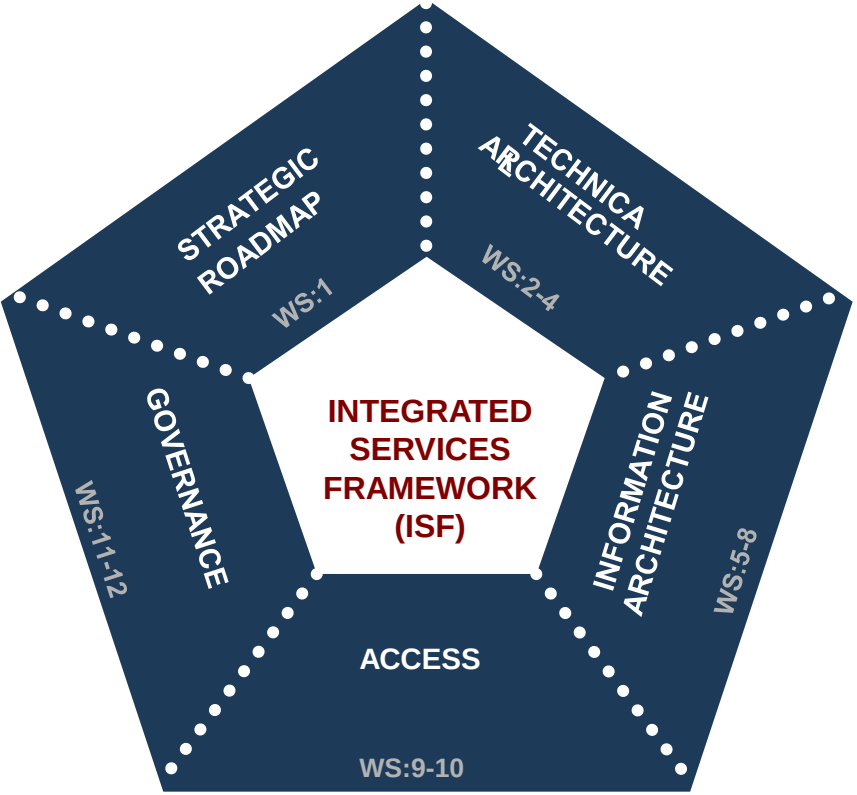
KEY FINDINGS

- Pursuit of a Summary Care Record based on an incremental build approach
- An incremental approach involving the adoption (and tailoring) of international standards
- Commence with defining a minimum suite of standards for data exchange
- Close coordination of data model development via a Logical Information Model (LIM)
- Minimal compliance burdens to encourage migration of existing data silos to the new standards based models
- A test and certification programme to ensure interoperability at each stage-gate of information architecture development
- An approach based on a secure portal or internet type access and data transport
- Ensure reliable authorisation and legislative support

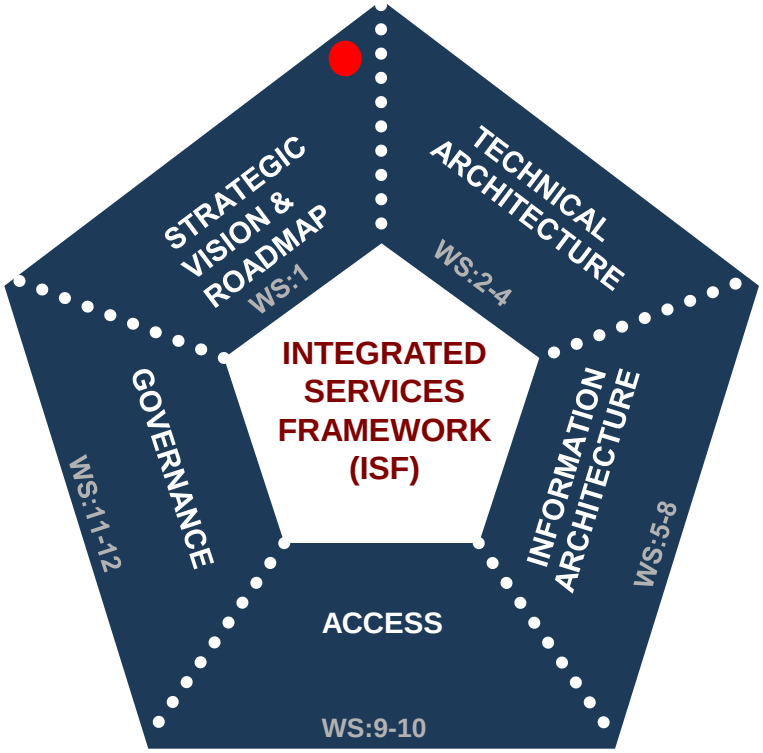
THE INTEGRATED SERVICES FRAMEWORK (ISF)



THE INTEGRATED SERVICES FRAMEWORK (ISF)



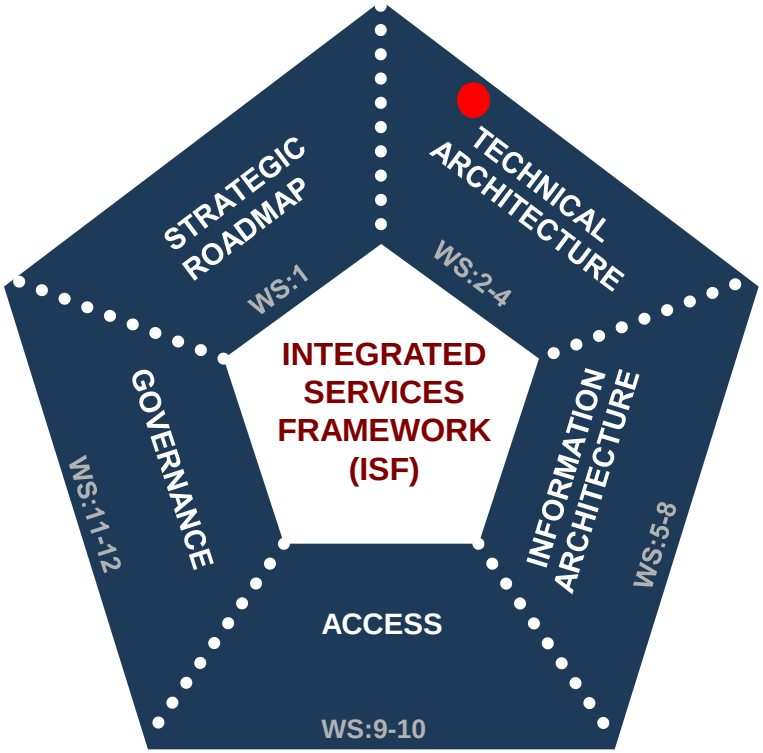
WORKSTREAM 1: VISION & STRATEGIC ROADMAP



Work-stream 1: ISF Vision & Roadmap

The conceptual and logical visualisation of the Integrated Services Framework. Sets the direction, purpose and rationale for the National ICT Integrated Services Framework (ISF). Articulates the principles and elements of standards based delivery platform. States the principles and best practices that should be applied. Outlines the approach, building on the shoulders of giants (ie the early adopters). Outlines the approach to collaboration and ongoing maintenance of the Integrated Services Framework.

WORKSTREAMS 2-4: TECHNICAL ARCHITECTURE



Work-stream 2: Technical Infrastructure

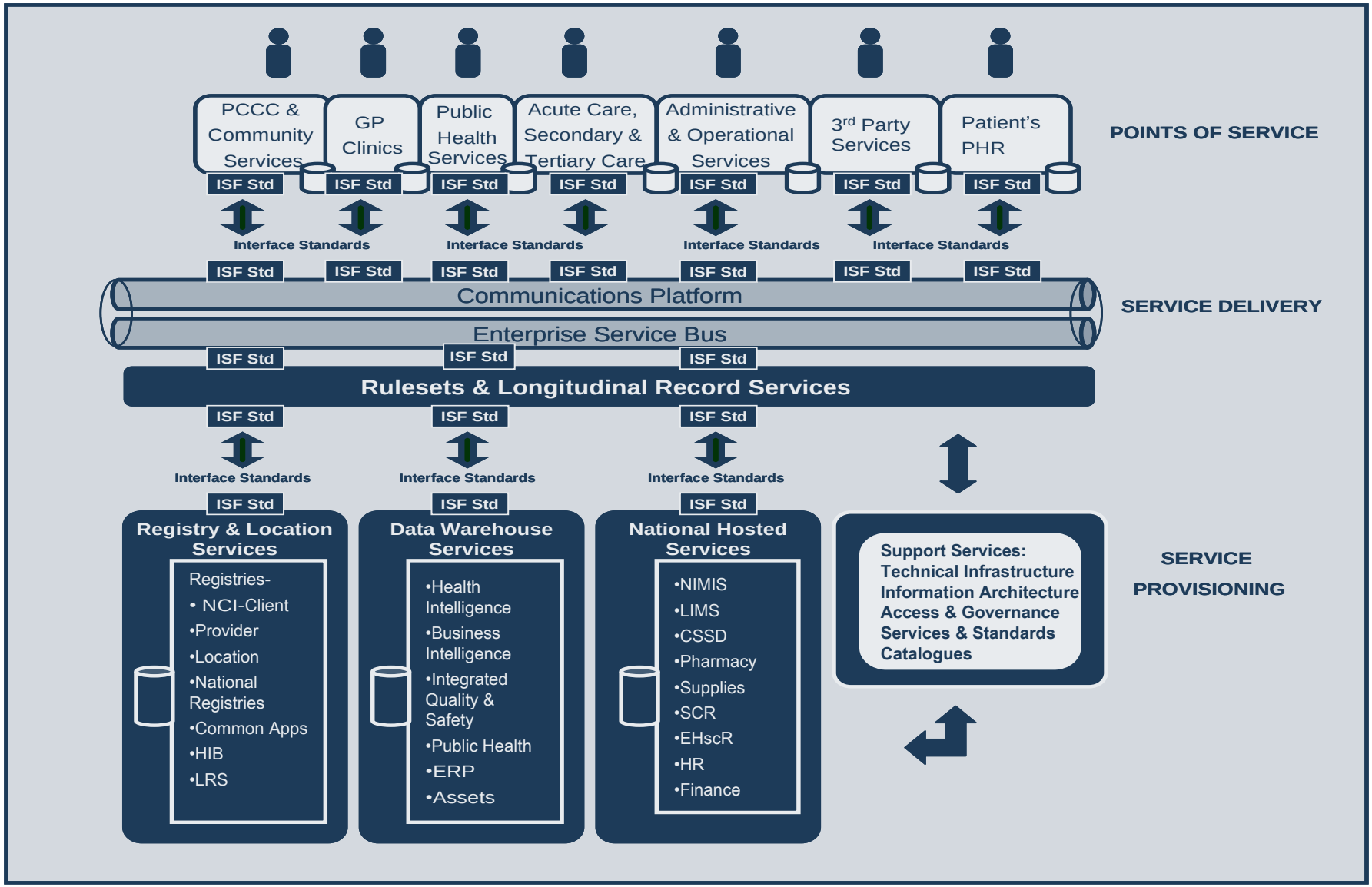
An overview and developmental roadmap for the standards based referential technology framework. It will provide overarching guidance on the identification and selection of compatible technical platforms and focuses on higher level standardisation and integration parameters of the model.

Work-stream 3: Applications reference Base

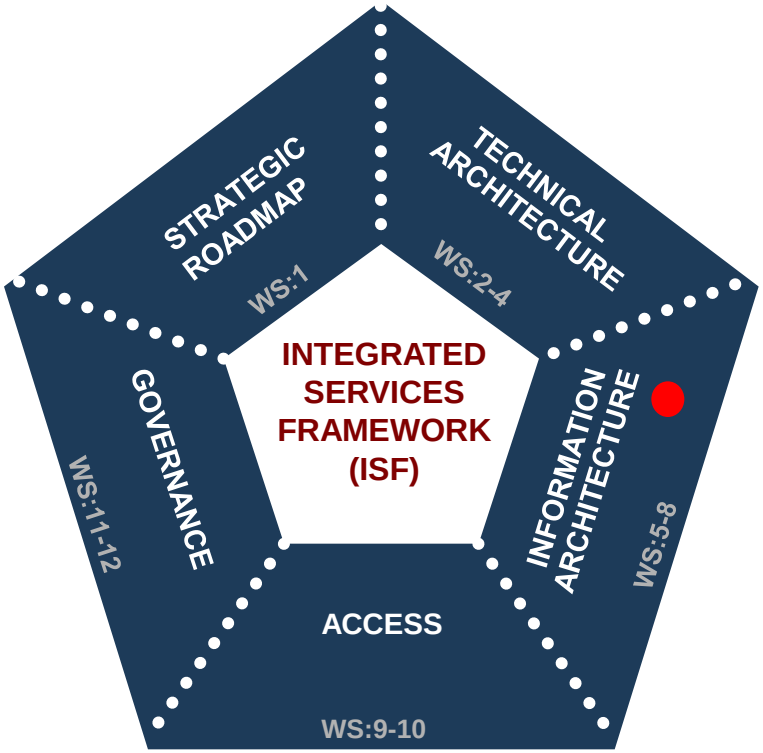
A referential portfolio of software applications and the associated standards for enabling integration of services. It will embrace both commercial and in-house software applications within its scope along with specification for maintenance standards.

Work-stream 4: Integrated Systems Management Framework The portfolio management arrangements for components and their associations within the Framework. It will provide governance over Framework components which may be affected by the revision or modification to adopted assets or standards.

TECHNICAL ARCHITECTURE



WS:5-8 INFORMATION ARCHITECTURE



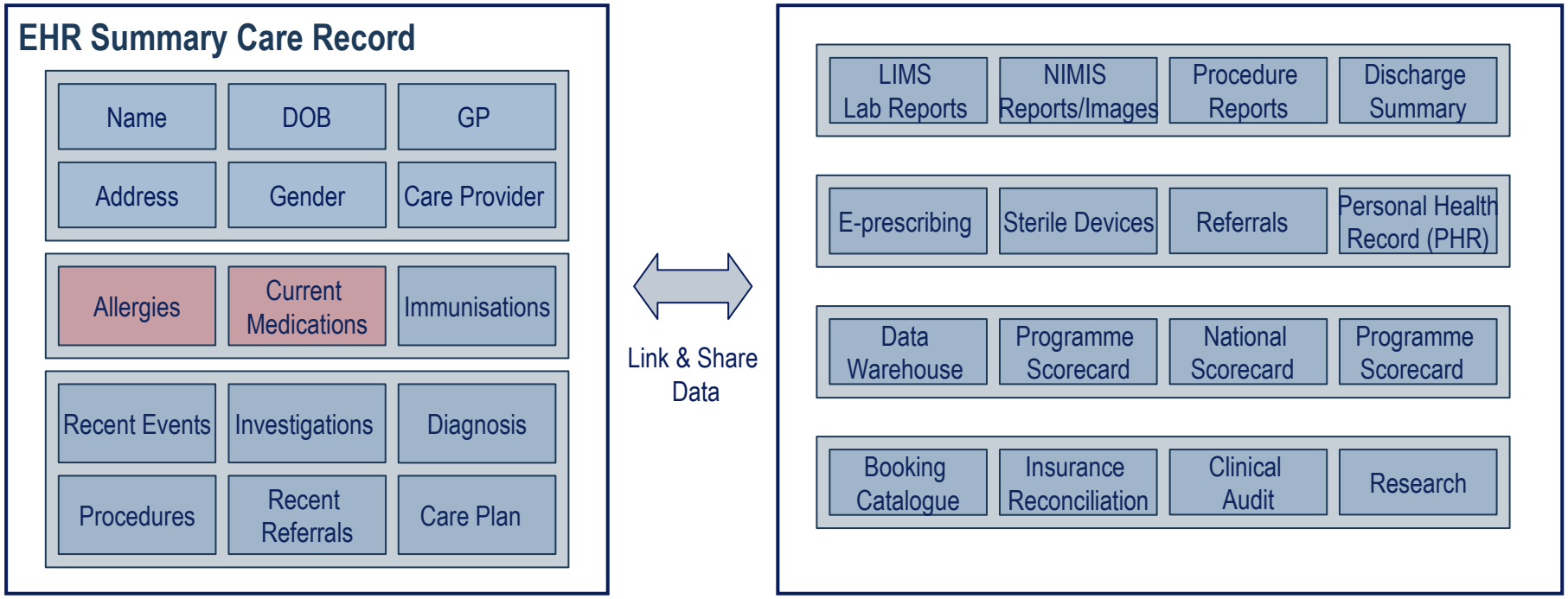
- **Work-stream 5: High Level Business Process Specification** A consolidated 'high-level' oversight of core business processes, architecture and associated data. Its outputs will include specification of data file types, data mapping and exchange formats.

- **Work-stream 6: Information Architecture Model** Specification of a best practice 'Information Architectural Model'. It will take into consideration current information constructs, along with the assimilation of best practices and models from other healthcare jurisdictions.

- **Work-stream 7: Data & Information Repository** The objective of this work stream is to define the current data and information repository assets and to establish an aligned 'standards based' data repository structure.

- **Work-stream 8: Transformation, Interfacing & Sourcing** To define the data transformation mapping and communication services required for linking source data applications to user interfaces. This will be done in harmony with the roadmap of E-HR components specified in workstream-1.

INFORMATION ARCHITECTURE

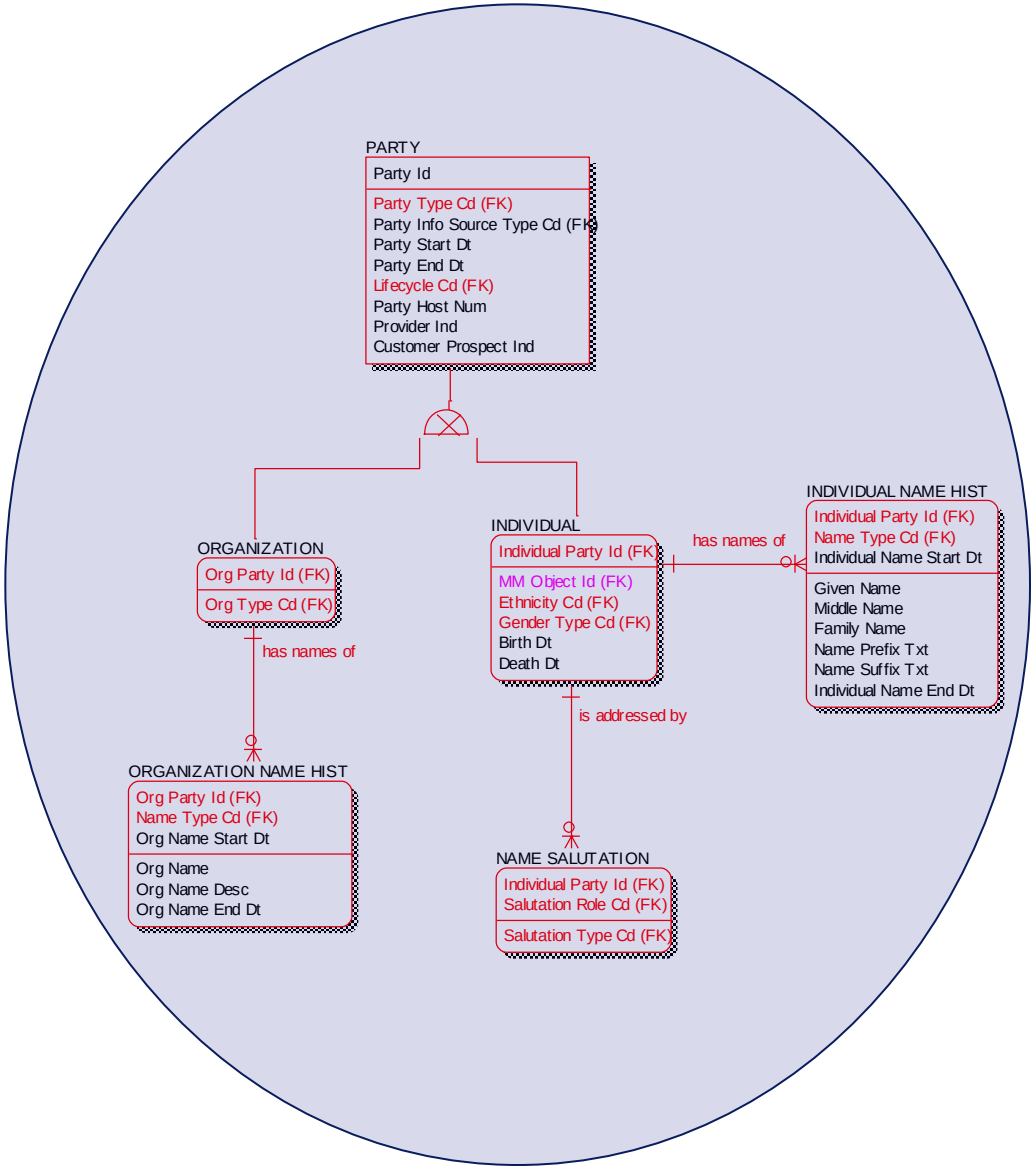


DATA DICTIONARY

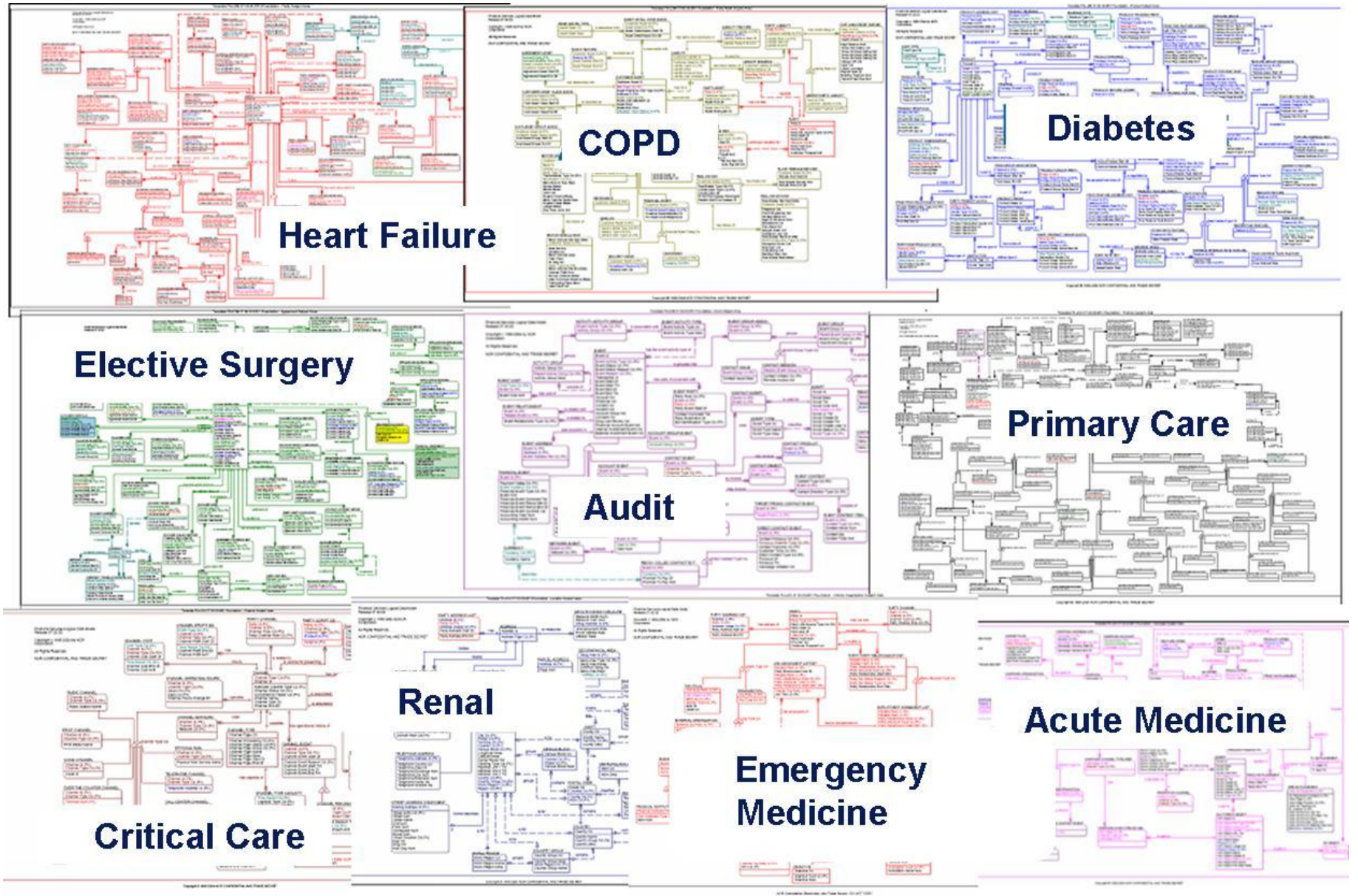
- Clinical Programmes are building their own Data Sets
- There is a requirement for a common data dictionary consisting of data elements and minimum health data sets
- A National Health Data Dictionary would enable the clinical programmes to share the same meaning of data
- Data Elements need to be aligned appropriately with each other
- Data Elements need to be aligned with national systems
- Adopting a proper structure and semantics will help also with interoperability
- A Sharepoint portal has been built by ICT for collaborative purposes
- Currently there is inconsistency across data set elements

DATA MODEL

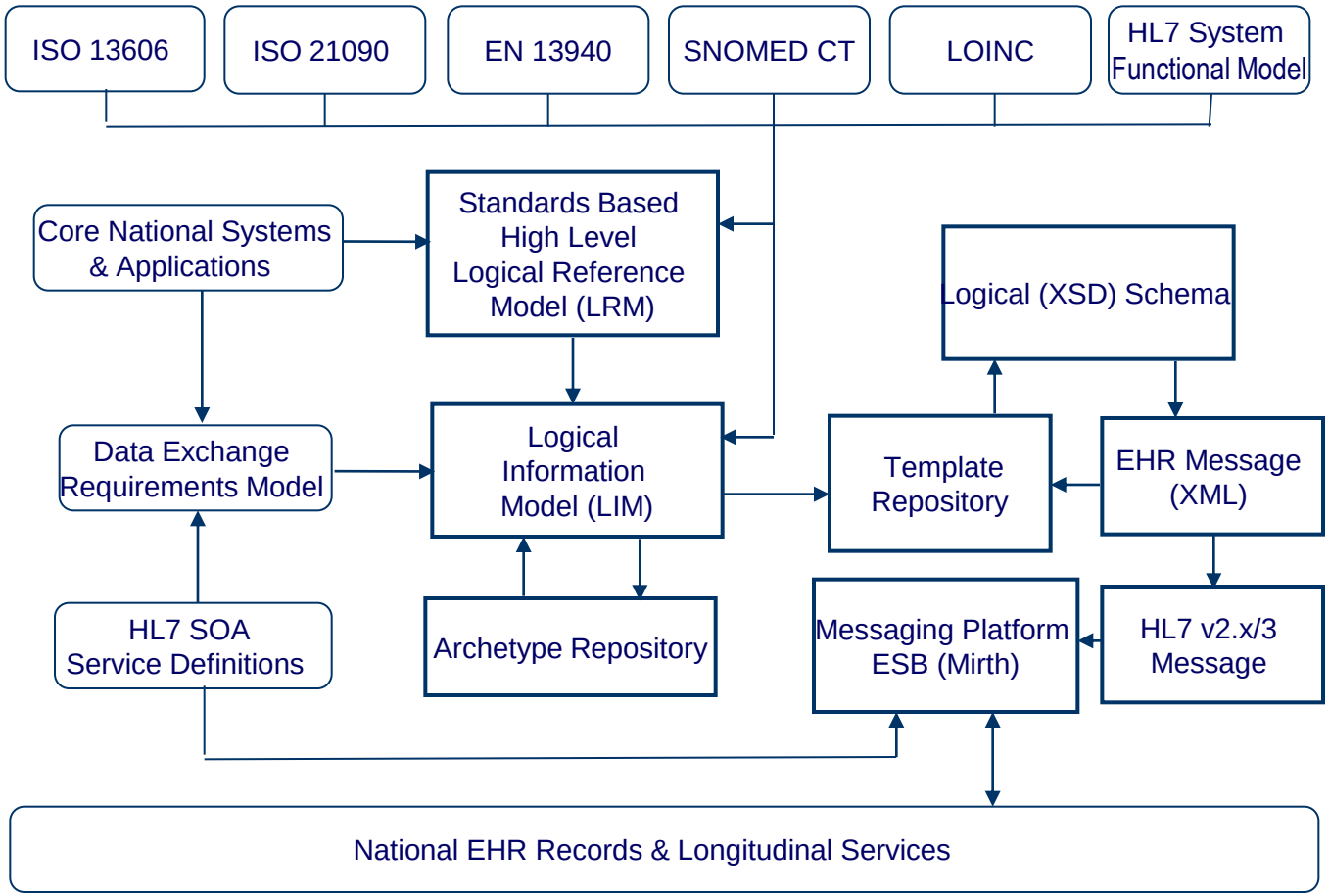
- A visual business representation of how data is organised within the enterprise
- It facilitates communication within the business (e.g. within ICT and the business)
- Identifies those things about which it is important to track information (entities)
- Facts about those things (attributes)
- Associations between those things (relationships)



DATA MODEL FOR CLINICAL PROGRAMMES



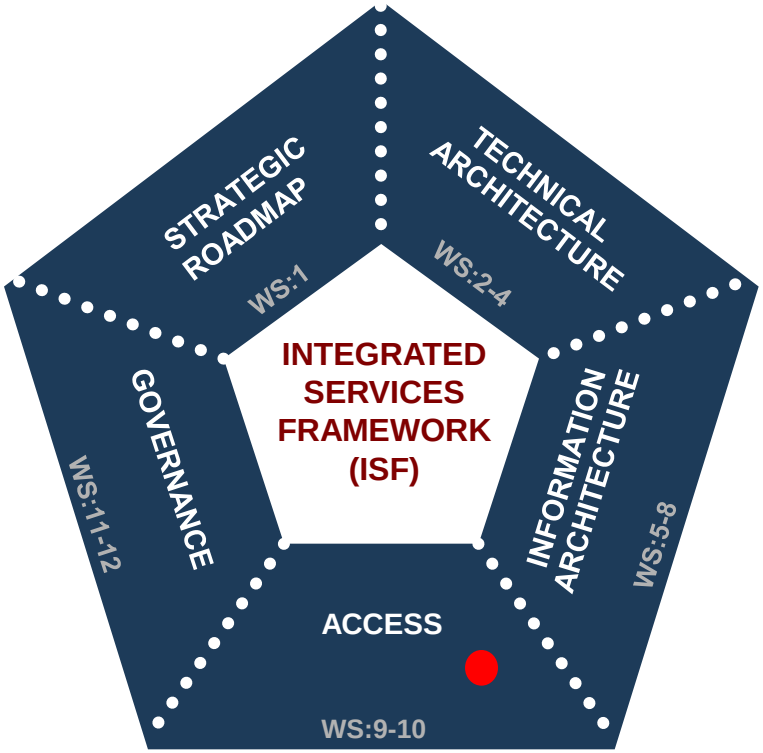
LOGICAL INFORMATION REFERNCE MODEL



STANDARDS ANALYSIS FRAMEWORK

	HL7 v2	HL7v3	CEN 13606	OpenEHR	CDA/CCD	XML/Web Service
Breath of Coverage to realise full EHR	☜	☜☜	☜☜	☜☜☜	☜☜	✠
Expressive power for clinical data	☜	☜☜☜	☜☜ (weaker RM)	☜☜☜	☜☜☜ (as per v3)	✠
Intelligent Querying	☜	☜☜☜ (Assuming a RIM parser)	☜☜ (there are problems with it)	☜☜☜	☜	☜ (Xpath)
Support for decision support	☜	☜☜☜	☜☜	☜☜	☜☜ (this is what the NHS are doing)	✠
Accessibility standards and specs	☜☜☜	☜☜	☜	☜☜☜	☜☜☜	☜☜☜
Tools and components	☜☜☜	☜☜	✠	☜☜	☜	☜☜☜
Vendor interest and support	☜☜☜	☜	✠ (no implementations)	☜	☜☜	☜☜☜ (widespread use across IT)
Reference implementations	☜☜☜	☜	✠ (no implementations)	☜	☜☜☜	☜☜☜
RIM stability & consistency	✠	☜☜	☜☜	☜☜	☜☜	✠
Support for knowledge management	☜	☜☜☜	☜☜	☜☜☜	☜☜	✠
Embedded security	☜☜☜	☜☜☜	☜	☜☜☜	☜	☜
Institutionalisation & governance	☜☜☜	☜☜☜	☜☜☜	☜	☜☜☜	☜☜☜
Support messaging	☜☜☜	☜☜☜	☜☜	☜ (no messaging support beyond content)	☜☜	☜
EHR persistence	✠	✠ (neither v2 nor v3 are persistence specs)	☜☜	☜☜☜	☜☜	☜
Terminology/Ontology bindings	☜☜	☜☜☜ (v3 has richer structured datatypes than better support post-	☜☜☜	☜☜☜	☜☜☜ (as per v3 esp CD datatype)	☜☜☜ (using RDF and OWL)

WS:9-10 ACCESS



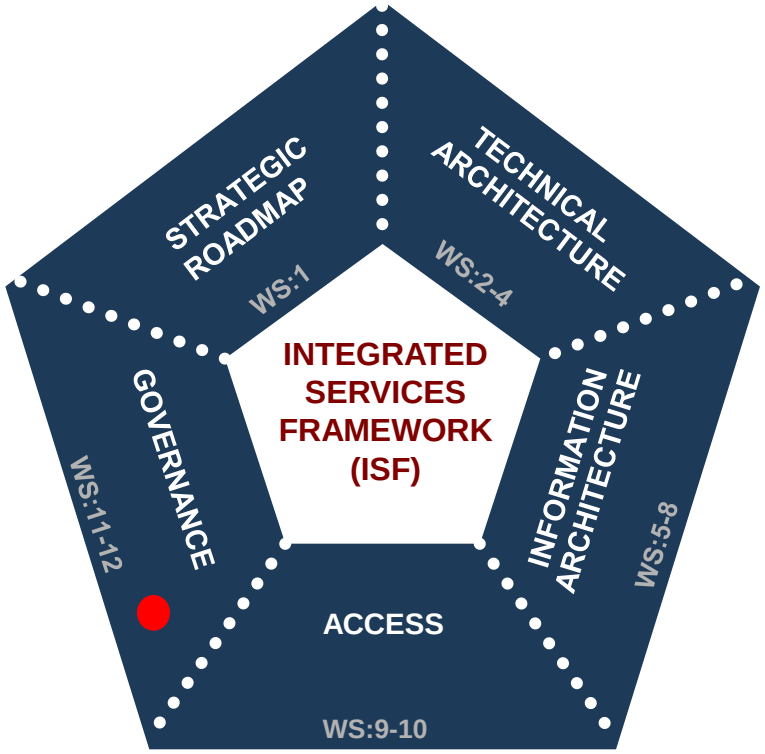
Work-stream 9: , Access & Consent Management

To establish a standards base for the Identity & Access Management (IAM) component of the Framework, including the baseline orchestration and conformance parameters to accommodate the capture and management of consent within the Integrated Services Framework.

Work-stream 10: EHR Portal & Presentation

The objective of this work-stream is the high level specification of the architecture and integration standards required for the portal and presentation domains for a future EHR, within the construct of the ISF Framework.

WS:11-12 GOVERNANCE



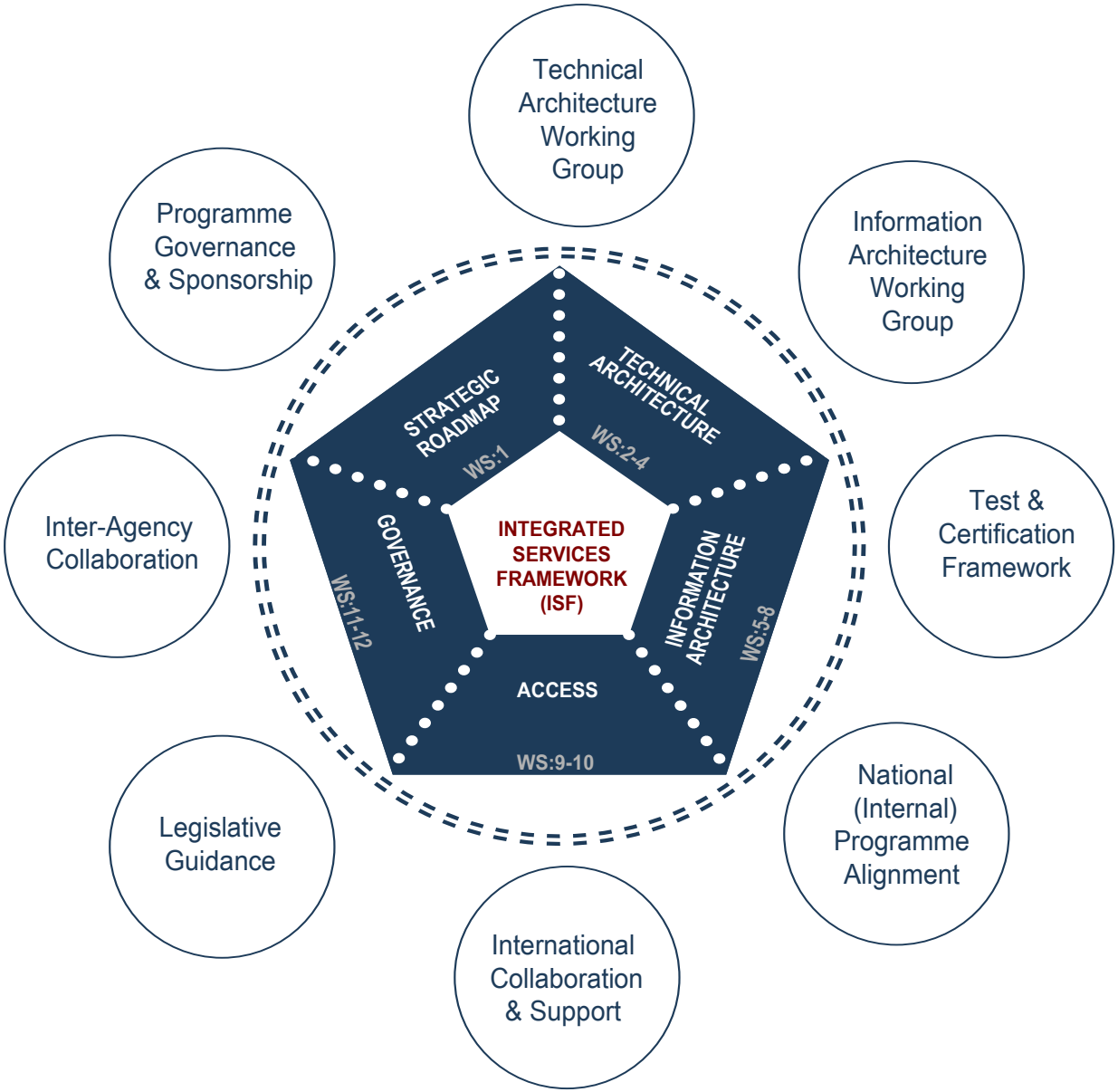
Work-stream 11: Architecture Documentation

To establish the criteria and architectural specification for the Integrated Services Framework's document repository, and also its associated management system. This includes storage, indexing, versioning, search, and retrieval of the inventory of material associated with the Framework.

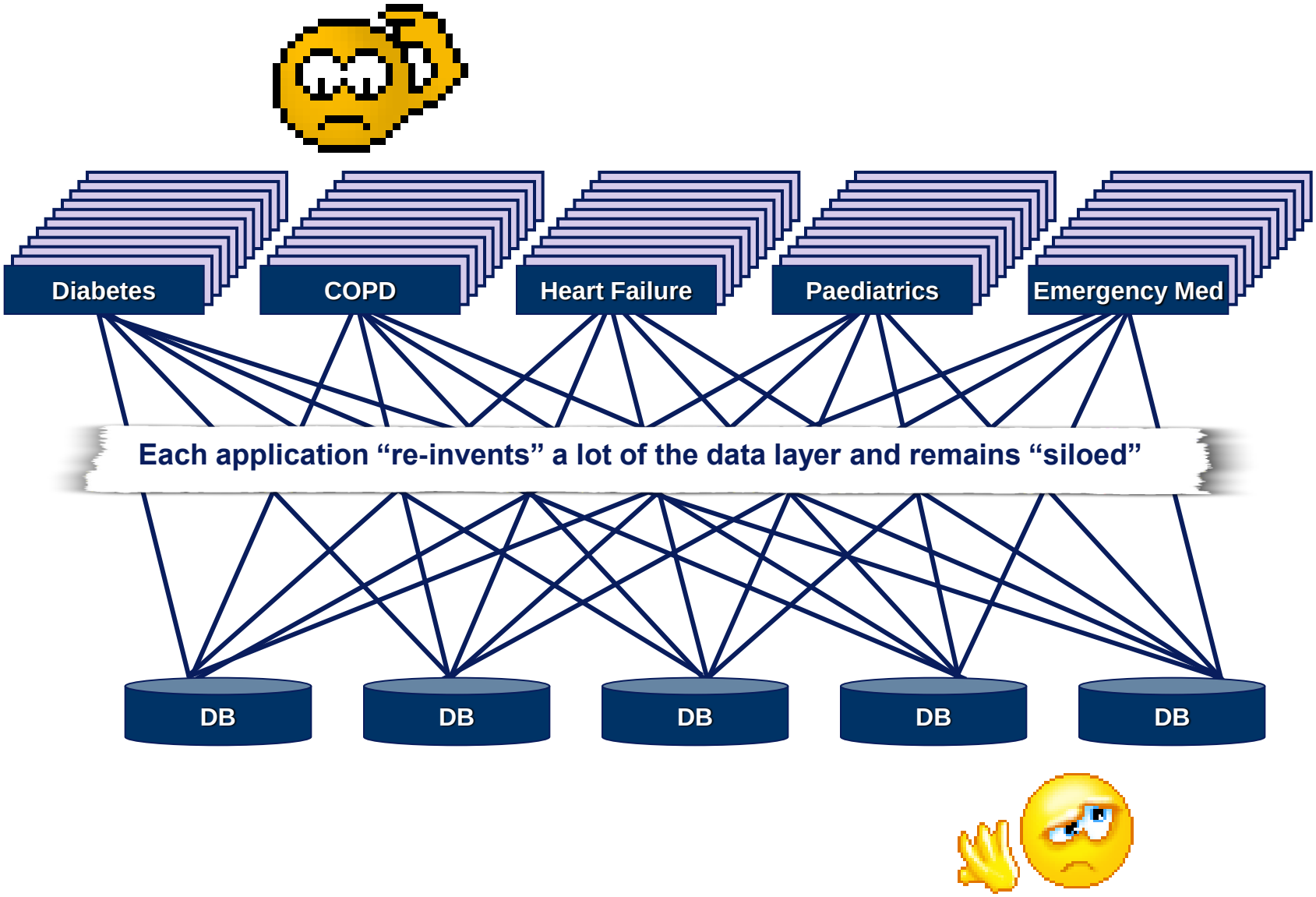
Work-stream 12: Governance Model

Being a dynamic platform, this workstream will define the appropriate oversight and direction to ensure all stakeholders have representation and can contribute both to the delivery and maintenance of integrated service value, and to its long term strategic road map.

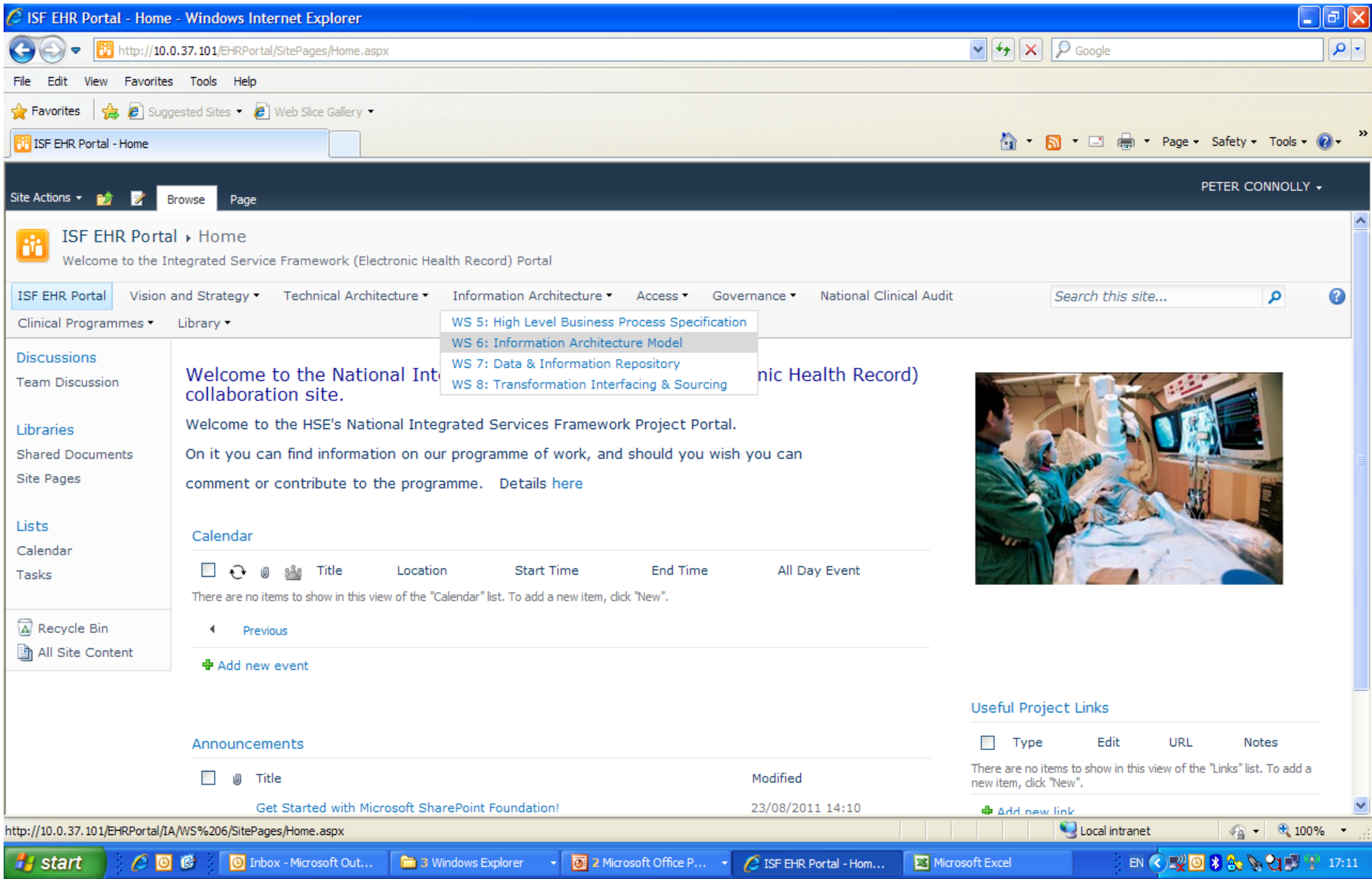
COLLABORATION



DATA CHALLENGE



COLLABORATIVE PLATFORM



COLLABORATIVE PLATFORM

National Diabetes Programme - Home - Windows Internet Explorer

http://10.0.37.101/EHRPortal/CP/EHR/SitePages/Home.aspx

File Edit View Favorites Tools Help

Favorites | Suggested Sites | Web Slice Gallery

National Diabetes Programme - Home

Page | Safety | Tools

Site Actions | Browse | Page

PETER CONNOLLY

National Diabetes Programme ▸ Home

Data Architecture for the National Diabetes Programme

Clinical Programmes | Heart Failure Programme | National Diabetes Programme

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Diabetes Programme

Diabetes is one of the nation's most prevalent chronic diseases. Type 2 Diabetes is approximately 10 times more prevalent than Type 1, yet it is preventable. By addressing obesity and sedentary lifestyles people at high risk of developing Type 2 diabetes can significantly reduce the likelihood of actually getting it.

Through the HSE's Quality & Clinical Programmes, we are seeking to reduce the risks of people getting the condition, to improve the quality of life for people susceptible to diabetes, and to minimise the onset of complications in those who already have it.

The management and care of diabetes is significantly enhanced through multifaceted interventions based upon the use of an EHR. As part of the National Integrated Services Framework for the EHR an electronic 'Diabetes Dataset' will be hosted within the programme.

As the programme advances, the diabetes dataset will gradually be rolled up into national systems, the national ICT dataset, and Summary Care Record. This site facilitates the sharing the advancement of this endeavour, and offers a general collaborative and document management environment for this purpose.

Relevant project material can be accessed through the 'Shared Document' link on the left hand side of this web page.

Useful Project Links

Type | Edit | URL | Notes

There are no items to show in this view of the "Links" list. To add a new item, click "New".

Add new link

Done | Local intranet | 100%

start | Inbox - Microsoft Out... | 3 Windows Explorer | 2 Microsoft Office P... | National Diabetes Pro... | Microsoft Excel | EN | 17:29

PROGRAMME

Initiation

- Scoping of Requirements
- Business Case
- CMOD approval
- PID
- Board Approval

2011 – 2012

- Global Review
- Engage with experts
- Document lessons learned
- Engage with stakeholders

2012 – 2013

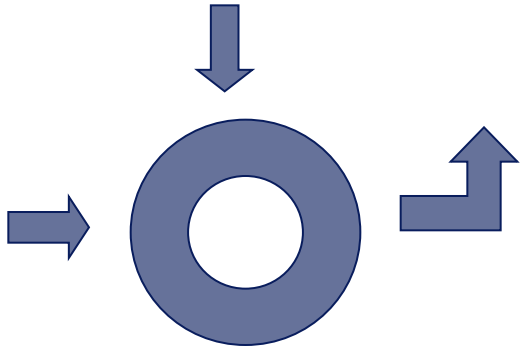
- Tender Framework
- Appointments to Framework
- Develop mini tenders
- Award of work packages
- Collaborative portal
- Agreement on data model

2013 – 2014

- Commencement of workstreams
- Validation of outputs
- Evaluation of Data Model prototype

2014

- Collation of workstream outputs
- Agreement on workstream outputs
- Publication of ISF Framework

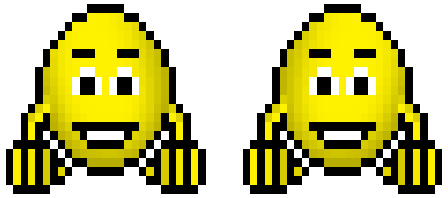


Stage Outputs inform the Data Model & Data Dictionary

FRAMEWORK DEVELOPMENT

- The progressive implementation of the ISF is made possible by-

- A Tender Framework for specialist services
- Collaborative agency inputs
- Collaborative international inputs
- Academic inputs



CONCLUSION

- There is no excuse for not learning the well documented lessons of history.
- Standards are the absolute foundation for interoperability.
- International Experts have validated the ISF and continue to contribute and peer review its development.
- The solution requires a collaborative endeavour and failure has significant implications for all of us.
- A Tender Framework is being released to acquire specialist skills as and when required.
- We have built a portal for collaboration and sharing of information.

END