Digital Health Ecosystem Wales (DHEW)

Introduction to Ecosystem

GIG CYMRU NHS WALES
Gwasanaeth Gwybodeg Informatics Service

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Llywodraeth Cymru
Welsh Government

What is the Ecosystem

DHEW is a network connecting developers and companies with innovative digital health solutions with the NHS in Wales.

It represents a collaboration between the Life Sciences Hub Wales and the NHS Wales Informatics Service (NWIS) and is funded through the Welsh Government's Efficiency Through Technology Programme

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Who we are ….

Life Sciences Hub

Bring together industry, clinicians, policy makers, academics and funders to create an environment where it's easier and faster to adopt digital healthcare technology in Wales.

NWIS Ecosystem Team

Open up NHS Wales systems and data to developers to ease the burden of integration and improve understanding of the digital architecture

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The team ….

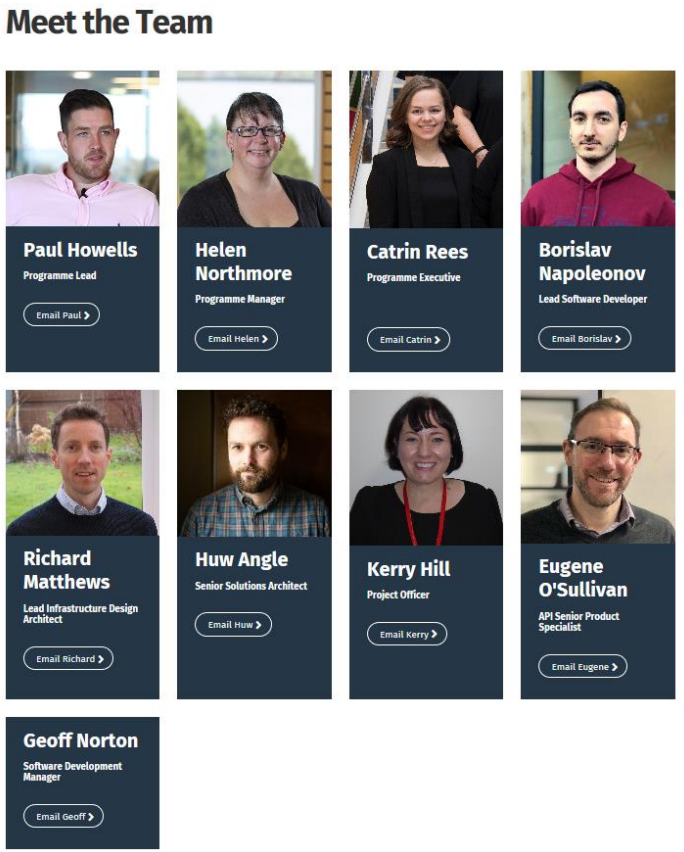
- Paul Howells – Programme Lead

Life Sciences Hub

- Helen Northmore - Programme Delivery Manager
- Catrin Rees - Programme Executive

NWIS Ecosystem Team

- Geoff Norton – Software Development Manager
- Eugene O'Sullivan – Senior Product Specialist
- Huw Angle – Senior Solutions Architect
- Boris Napoleonov – Lead Software Developer
- Richard Matthews – Lead Infrastructure Design Architect
- Kerry Hill – Project Officer



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Aims of the Ecosystem

- Accelerate the delivery and adoption of the latest digital solutions to improve patient outcomes and reduce costs
- Create a pathway for access to health and care data through the development of APIs in a test environment
- Foster innovation from all stakeholders, encouraging cross-sector co-operation and implementation
- Support the development of new products and services to drive business growth, job security and creation, ensuring prosperity for all

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WorkStreams

Connecting and Convening

- Various events and seminars held, e.g. Resource Tracking, Future Funding Opportunities, AI/Robotics, Data/APIs, Cybersecurity and the Internet of Things
- Exhibited at various events and presented at various conferences
- https://digitalhealth.wales/ Website developed
- Active Twitter feed - @DHEWales

Platform and API Development

- More later

Projects

- Providing some resource and our ability to connect and convene
- Contact support, referrals, Support in the development of bids
- Various projects being supported, e.g. RFID demonstration pilot, Supporting the Advanced Analytics Group

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Platform and API Development

Themes

- Infrastructure and capability
- API development
- Developer engagement

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API Development

What's an API

- Application Programming Interface
- an API lists a bunch of operations that developers can use, along with a description of what they do.
- URLs that receives or returns pure data responses

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API Development

Types of API

{REST:API}

HL7 FHIR

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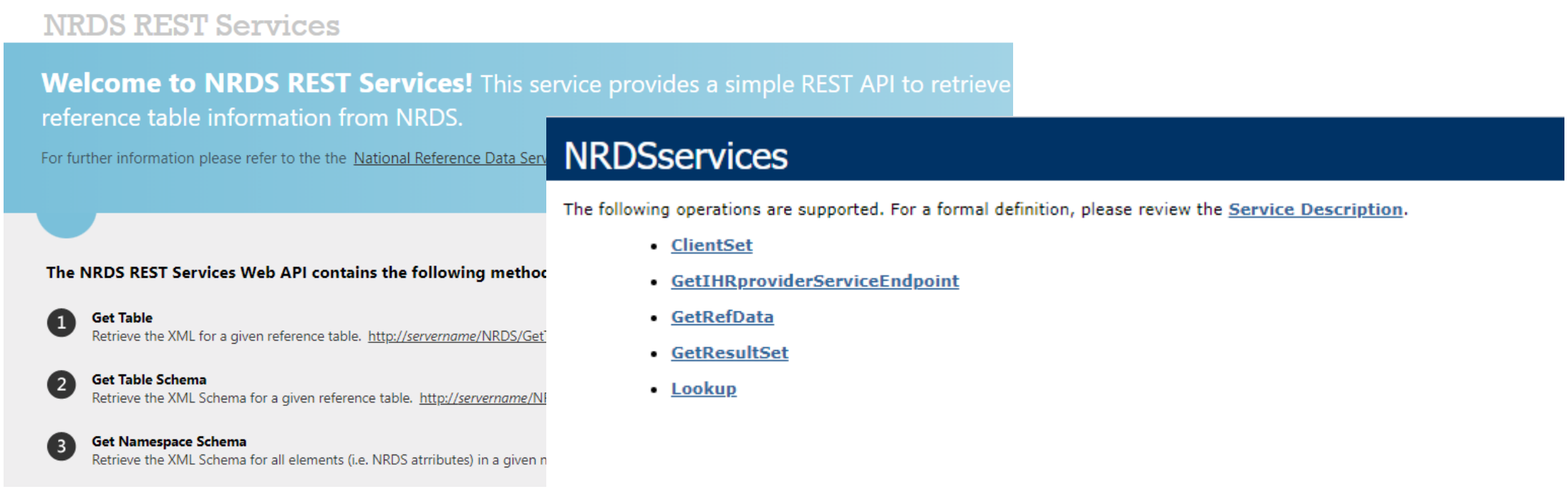
API Development

Example: WRDS/NRDS



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Example: WRDS Rest API

Request:

```
HTTP GET: NRDSServicesApi/nrds/gettable/nrds/gppractice?nrd:GPpracticeCode=W00005
```

Returns the all attributes for the entity defined by the tablename optionally filtering using the querystring values.

Response:

```
<nrds:ResultSet xmlns:nrd="http://www.wales.nhs.uk/nrds" xmlns:xsi="http://www.w3.org/2001/XML
Schema-instance" xmlns:nrds="http://www.wales.nhs.uk/namespaces/NSD">
  <nrds:Row>
    <nrd:AddressLine1>30 Thomas Street</nrd:AddressLine1>
    <nrd:AddressLine2>Abertridwr</nrd:AddressLine2>
    <nrd:AddressLine3></nrd:AddressLine3>
    <nrd:AddressLine4>Caerphilly</nrd:AddressLine4>
    <nrd:GPpracticeCode>W00005</nrd:GPpracticeCode>
    <nrd:LHBcode></nrd:LHBcode>
    <nrd:Postcode>CF83 4AZ</nrd:Postcode>
    <nrd:PracticeName>Meddygfa Tridwr</nrd:PracticeName>
    <nrd:SeniorGPname>KAUSHAL SC</nrd:SeniorGPname>
    <nrd:SeniorGPno>G8615383</nrd:SeniorGPno>
    <nrd:Telephone>0844 4778635</nrd:Telephone>
  </nrds:Row>
</nrds:ResultSet>
```

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Example: WRDS SOAP API

SOAP POST: /nrdsservices.asmx

Request:

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:mes="http://
www.wales.nhs.uk/namespaces/MessageRelease2">
  <soapenv:Header/>
  <soapenv:Body>
    <mes:GetResultSetRequest>
      <mes:AttributeValuePair>
        <mes:Attribute>
          <mes:Name>GpPracticeCode</mes:Name>
          <mes:Namespace>http://www.wales.nhs.uk/nrds</mes:Namespace>
          <mes:Description/>
        </mes:Attribute>
        <mes:Value>W97046</mes:Value>
      </mes:AttributeValuePair>
      <mes:LookupTable>
        <mes:Name>GPpractice</mes:Name>
        <mes:Namespace>http://www.wales.nhs.uk/nrds</mes:Namespace>
      </mes:LookupTable>
      <mes:AttributeToRetrieve>
        <mes:Name>postcode</mes:Name>
        <mes:Namespace>http://www.wales.nhs.uk/nrds</mes:Namespace>
      </mes:AttributeToRetrieve>
      <mes:AttributeToRetrieve>
        <mes:Name>PracticeName</mes:Name>
        <mes:Namespace>http://www.wales.nhs.uk/nrds</mes:Namespace>
      </mes:AttributeToRetrieve>
      <mes:ExactMatch>1</mes:ExactMatch>
    </mes:GetResultSetRequest>
  </soapenv:Body>
</soapenv:Envelope>
```

Response:

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="http://www.w3
.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <GetResultSetResponse xmlns="http://www.wales.nhs.uk/namespaces/MessageRelease2">
      <Row>
        <AttributeValuePair>
          <Attribute>
            <Id>ECCCA863-42B0-405F-938B-2863785B5F10</Id>
            <Name>Postcode</Name>
            <Namespace>http://www.wales.nhs.uk/nrds</Namespace>
          </Attribute>
          <Value>CF62 8AZ</Value>
        </AttributeValuePair>
        <AttributeValuePair>
          <Attribute>
            <Id>D5D15286-0B5F-41F7-BC69-01D691CF6431</Id>
            <Name>PracticeName</Name>
            <Namespace>http://www.wales.nhs.uk/nrds</Namespace>
          </Attribute>
          <Value>Ravenscourt Surgery</Value>
        </AttributeValuePair>
      </Row>
    </GetResultSetResponse>
  </soap:Body>
</soap:Envelope>
```

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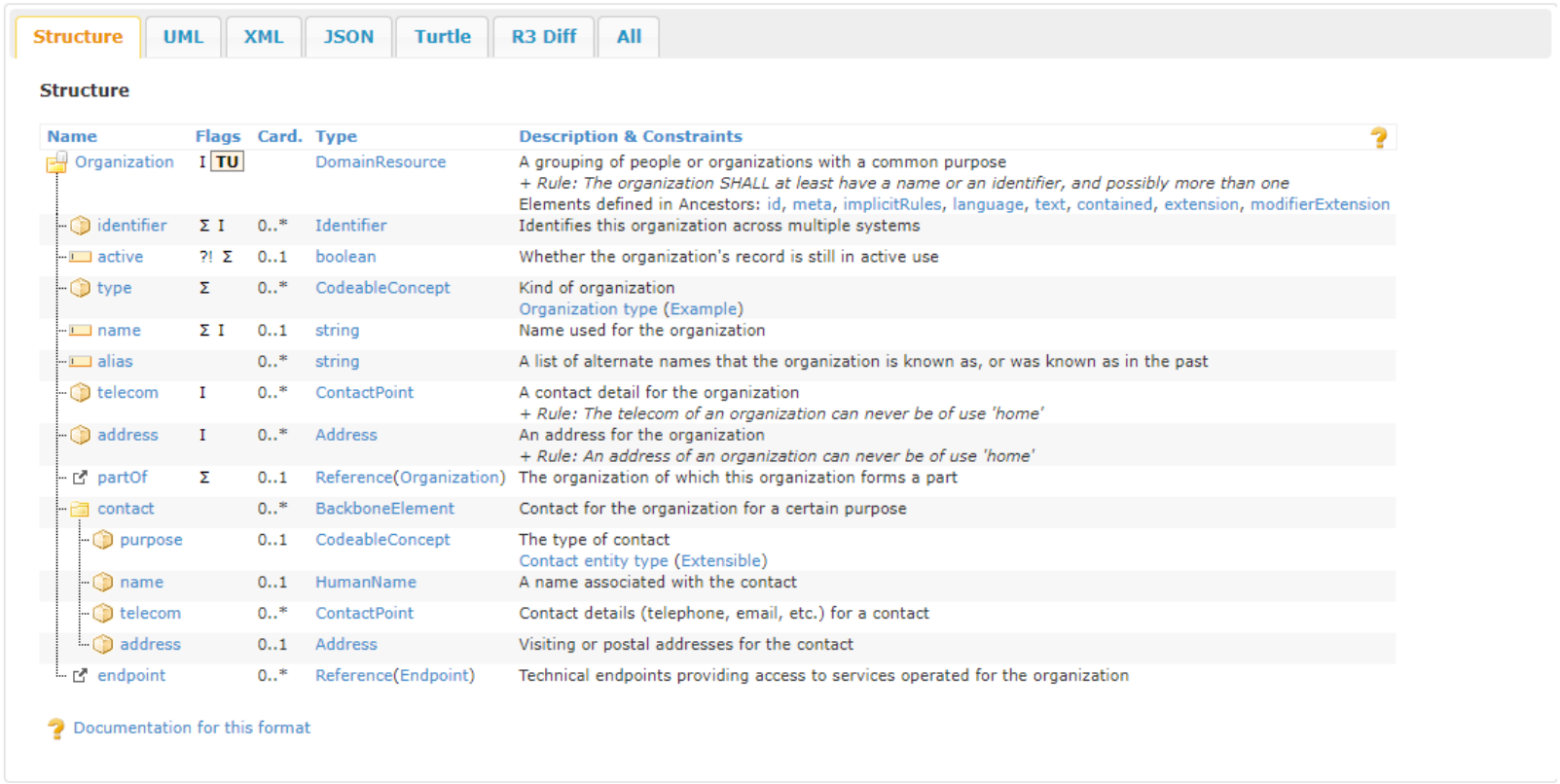
FHIR

https://www.hl7.org/fhir/organization.html



Structure | UML | XML | JSON | Turtle | R3 Diff | All

Structure

Name	Flags	Card.	Type	Description & Constraints
Organization	I TU		DomainResource	A grouping of people or organizations with a common purpose *+ Rule: The organization SHALL at least have a name or an identifier, and possibly more than one* Elements defined in Ancestors: id, meta, implicitRules, language, text, contained, extension, modifierExtension
identifier	Σ I	0..*	Identifier	Identifies this organization across multiple systems
active	?! Σ	0..1	boolean	Whether the organization's record is still in active use
type	Σ	0..*	CodeableConcept	Kind of organization Organization type (Example)
name	Σ I	0..1	string	Name used for the organization
alias		0..*	string	A list of alternate names that the organization is known as, or was known as in the past
telecom	I	0..*	ContactPoint	A contact detail for the organization *+ Rule: The telecom of an organization can never be of use 'home'*
address	I	0..*	Address	An address for the organization *+ Rule: An address of an organization can never be of use 'home'*
partOf	Σ	0..1	Reference(Organization)	The organization of which this organization forms a part
contact		0..*	BackboneElement	Contact for the organization for a certain purpose
purpose		0..1	CodeableConcept	The type of contact Contact entity type (Extensible)
name		0..1	HumanName	A name associated with the contact
telecom		0..*	ContactPoint	Contact details (telephone, email, etc.) for a contact
address		0..1	Address	Visiting or postal addresses for the contact
endpoint		0..*	Reference(Endpoint)	Technical endpoints providing access to services operated for the organization

Documentation for this format

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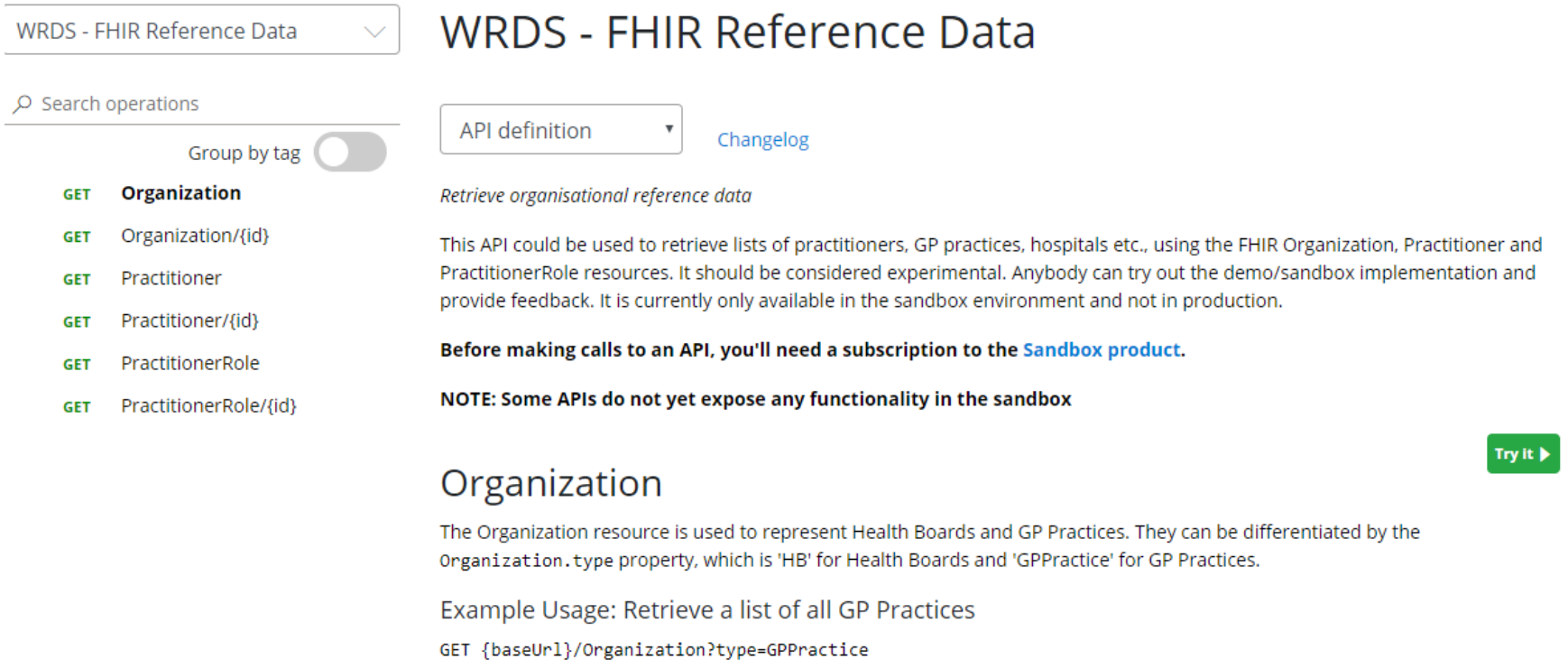
Example: WRDS FHIR



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API Development

API Catalogue

WCRS - Documents SOAP

Store and retrieve patient documents and perform basic searches

This API is used to store documents in the Welsh Care Records Service (WCRS), the central patient document store for NHS Wales. You can use it to store/retrieve patient documents in a variety of formats (e.g. XML, PDF, Microsoft Word) with relevant metadata. Using the search functionality you can query for a document by its metadata. This API is used make clinical documents such as Discharge Advice Letters, Care Plans, Referrals etc. accessible by other systems. It is available nationally and used in all Health Boards.

WCRS - Documents Advanced Search

Perform faceted search queries against the content and metadata of patient documents

We use Apache Solr to prvoide advanced search against patient documents in the Welsh Care Record Service. You can perform general searches across all document content as well as metadata, for which a standard set of fields is defined for all documents. Faceted search allows you to group and filter results by category until you find the document your looking for. The advanced search features are primarily used by the Welsh Clinical Portal to allow users to browse for relevant patient documents. It is available nationally and used in all Health Boards.

WDS - Patient Demographics SOAP

Search for patient demographic information such as Address, Date of Birth, NHS Number etc.

This API provides access to the Welsh Demographics Service. You can search for a patient by NHS Number or information such as name and date of birth and a standard exists for synchronising this data with a systems locally stored patient record. It is used by applications to keep patient information accurate and up-to-date. It is available nationally and used across primary and secondary care in all health boards.

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API Development

Developing Experimental FHIR APIs

- MPI
- WCRS
- WRDS
- WRRS
- More to come…

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API Management

Exposing these APIs

- Options Appraisal
- Sandbox APIs
- Control and Monitor Access
- Review Usage
- Production Ready

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Developer Portal

- API Catalogue
- Sandbox APIs
- SDK
- Standards
- Assurance

- Driver - open architecture approach, opening up access to NHS Wales data resources

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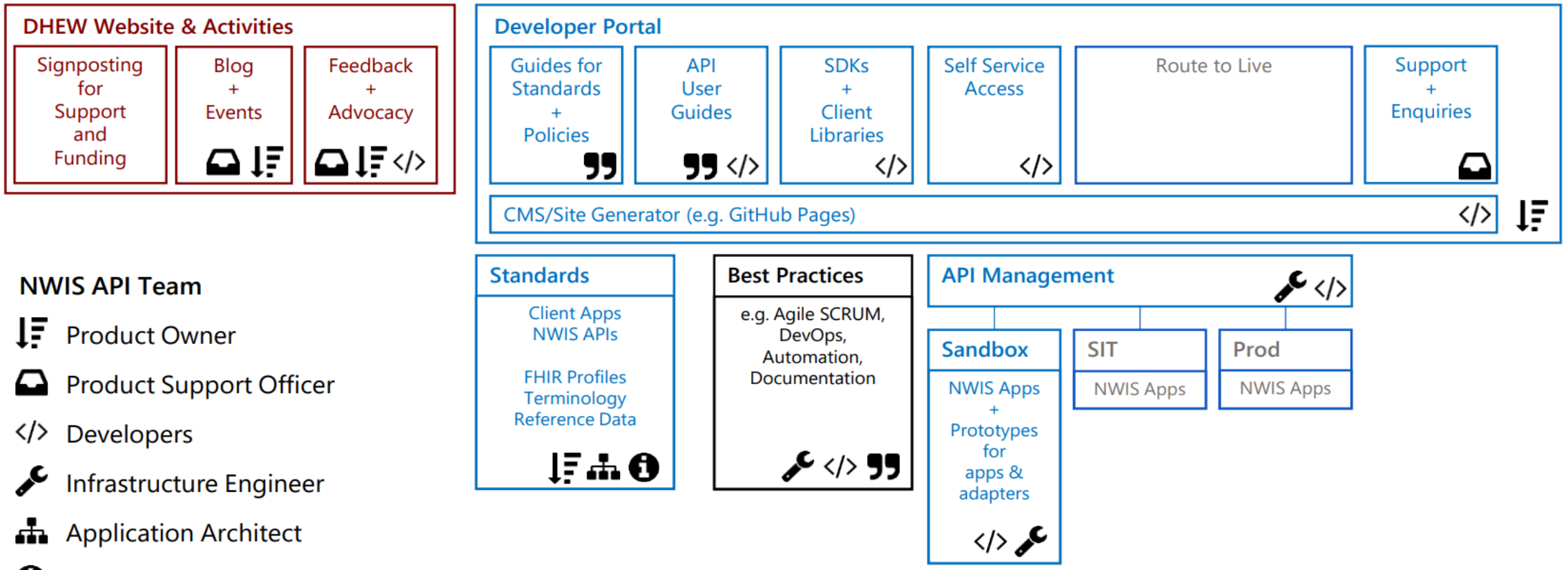
Team Roles



NWIS API Team

- Product Owner
- Product Support Officer
- Developers
- Infrastructure Engineer
- Application Architect
- Information Architect
- Technical Author

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2020/2021 Workstreams

- Launch of the developer portal
- API Management in Place
- Reference Data
- Ontology Data
- Citizen Facing API
- Wearables R&D
- Engage with Industry Partners
    - Concentric/Digital Solutions Fund

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NDR & Ecosystem

- FHIR APIs
- FHIR Profiling
  - Interoperability Working Group
- Production

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Resources .... websites

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Life Sciences Hub

NHS Wales Informatics Service

Developer portal

GitHub repository

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Contact us ….

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