Introduction to FHIR® Resources

The core of HL7® FHIR® is a set of modular components called "Resources." These form the basic data exchange format and model of FHIR. As of FHIR Release 4, there are 145 Resources defined across health care domains and supporting services, a number that grows with every release.

What are Resources?

In FHIR, health care data is broken down into categories such as patients, laboratory results, and insurance claims, among many others. Each of these categories is represented by a FHIR Resource, which defines the component data elements, constraints on data, and data relationships that together make up an exchangeable patient record. The philosophy behind FHIR is to create a set of Resources that, individually or in combination, satisfy most common use cases.

Each Resource contains data elements necessary for its specific use cases and links to relevant information in other Resources. For example, the Patient Resource[1] contains basic patient demographics, contact information, and links to a clinician or organization stored in a different Resource. Because they are based on modern World Wide Web technologies, Resources use Uniform Resource Locators, or URLs (also generally known as web addresses), to be located within a FHIR system implementation.

A Resource in its raw form does not require that most data elements be assigned a value; when it is customized for real-world use through the Profiling process, certain elements are then required so that the Resource can be functional. For example, a Patient Resource may be Profiled to require that a patient's name, address, and telephone number be supported to enable patient matching.

FHIR Resource Design Choices

A primary motivation behind FHIR's design is to enable interoperability through well-structured data models that use simple and efficient exchange mechanisms. To achieve this, FHIR adopted the following principles:

Reuse – FHIR Resources are designed to meet the general needs of health care to avoid an overcomplicated and redundant Resource set. Extensions and other customizations exist to allow resources to be adapted for specific use cases (the Profiling process). FHIR Resources also link to other Resources so that complex structures can be built.

Performance – Compared to previous standards, FHIR Resources are simpler in their construction, making them better-suited for exchange across a network and more easily understood and implementable by developers.

1. http://hl7.org/fhir/patient.html

Usability – FHIR Resources are designed to be understood by technical experts and non-technical people alike. Even if the details of the XML/JSON format are not understood, non-technical people can view these in a browser or text reader and understand their contents.

Fidelity – FHIR Resources have strict restrictions on intermixing of values with differing data types, like strings and numeric values. They can also be validated by their syntax in addition to defined sets of business rules.

Implementability – A core goal of FHIR was to create a standard that would lead to high adoption across disparate developer communities. Like the entire standard, FHIR Resources are designed to be easily understood and readily exchanged using industry standards, common programming languages, and established data exchange technologies.

Example FHIR Resource – Patient

The example below shows key parts of a Resource – the Resource used, a human readable summary of the data, an extension with its associated data, and the structured data itself.

```
<Patient xmlns="http://hl7.org/fhir">
    <id value="100"/>
    <meta>
        <lastUpdated value="2017-03-04T11:40"/>
    </meta>
    <text>
        <status value="generated"/>
        <div xmlns="http://www.w3.org/1999/xhtml">
            <p>John Doe, Male, DOB: 12/12/1979</p>
        </div>
    </text>
    <extension url="http://hl7.org/fhir/StructureDefinition/patient-religion">
        <valueString value="jedi"/>
    </extension>
    <identifier>
        <system value="http://hl7.org/fhir/sid/us-ssn"/>
        <value value="123-4465-8762"/>
    </identifier>
    <name>
        <family value="Doe"/>
        <given value="John"/>
    </name>
    <gender value="male"/>
</Patient>
```

→ Resource Identity & Metadata

→ Human Readable Summary

→ Extension with URL to definition

→ Structured Data:
   » MRN
   » Name
   » Gender
   » Birth Date
      Provider

Interested in learning more about FHIR?

See more of our Fact Sheet series at:
https://www.healthit.gov/topic/standards-technology/standards/fhir-fact-sheets.

ONC's FHIR Fact Sheets are a collaborative effort with HL7 to help educate and demystify FHIR for federal employees. These fact sheets summarize the key technical concepts that make up the foundation of FHIR, how it is developed in an open and public process, and why FHIR adoption has become the focus of the health IT standards world. Full details and developer documentation can be found at HL7's FHIR website.

@ONC_HealthIT