FHIR Extension in RDF

Extension in JSON

```
{
  "resourceType": "Device",
  "id": “example-udi2",
     …
"extension": [
 {
   "url": "http://hl7.org/fhir/StructureDefinition/device-din",
   "valueIdentifier": {
     "system": "http://hl7.org/fhir/NamingSystem/iccbba-din",
     "value": "A999713123456OO"
   }
 }
],
"udiCarrier": {
```

predicate

object

object type

Literal RDF Translation

```
<http://hl7.org/fhir/Deviceexample-udi2> a fhir:Device;
  fhir:nodeRole fhir:treeRoot;
  fhir:Resource.id [ fhir:value “example-udi2"];
        ….
  fhir:extension [
    fhir:index 0;
    fhir:Extension.url [ fhir:value "http://hl7.org/fhir/StructureDefinition/device-din" ];
    fhir:Extension.valueIdentifier [
      fhir:Identifier.system [ fhir:value "http://hl7.org/fhir/NamingSystem/iccbba-din" ];
      fhir:Identifier.value [ fhir:value "A99971312345600" ]
    ]
];
```

predicate

object

object type

http://hl7-fhir.github.io/device-example-udi2.ttl.html

Suggested RDF Translation

fhir:Resource.id [fhir:value “example-udi2"];

<http://hl7.org/fhir/StructureDefinition/device-din> [

a fhir:Extension;

difference between extension and core

a fhir:Identifier;

necessary if extension definition isn’t present

fhir:index 0;

fhir:Identifier.system [fhir:value "http://hl7.org/fhir/NamingSystem/iccbba-din"];

fhir:Identifier.value [fhir:value "A99971312345600"]

];

Ideal TTL Translation

- Requires validators to recognize any predicate whose target is rdf:type fhir:Extension.

- Requires an optional type-arc on every data-type

Alternative 1

fhir:extension [

fhir:index 0;

<http://hl7.org/fhir/StructureDefinition/device-din> [

a fhir:Identifier; **still needed because when external typing not available**

fhir:Identifier.system [fhir:value "http://hl7.org/fhir/NamingSystem/iccbba-din"];

fhir:Identifier.value [fhir:value "A99971312345600"]

]

]

Alternative

- Requires different code for extensions vs. root nodes
- Value access is common

Alternative 2

```
fhir:extension [

    fhir:index 0;

    <http://hl7.org/fhir/StructureDefinition/device-din> [
      fhir:Extension.valueIdentifier [

        fhir:Identifier.system [ fhir:value "http://hl7.org/fhir/NamingSystem/iccbba-din" ];

        fhir:Identifier.value [ fhir:value "A99971312345600" ]

      ]

  ]

]
```

Alternative 2

- Minimal change
- Minimal gain — special processing required for extensions. Code has alternative paths — “core” and “extension”

Modifiers
JSON

```
"valueQuantity": {
        "value": 1,
        "comparator": "<=",
        "unit": "U"
},
```

knowledge of schema required to know that !(value=1)

Modifiers
TTL

```
fhir:Observation.valueQuantity [

    fhir:Quantity.value [ fhir:value "1"^^xsd:decimal ];

    fhir:Quantity.comparator [ fhir:value "<=" ];

    fhir:Quantity.unit [ fhir:value "U" ]

];
```

same issue — non-monotonic(!)

Modifiers
TTL option 1

fhir:Observation.valueQuantity [

fhir:Quantity.comparator [

fhir:Quantity.value [fhir:value "1"^^xsd:decimal];

fhir:value [fhir:value "<="];

fhir:Quantity.unit [fhir:value "U"]

]

Modifiers
TTL option 2

fhir:Observation.valueQuantity_**comparator_mod** [

fhir:Quantity.value [fhir:value "1"^^xsd:decimal];

fhir:Quantity.comparator [fhir:value "<="];

fhir:Quantity.unit [fhir:value "U"]

];

same issue — non-monotonic(!)