



HL7 Version 3 Implementation Guide: URL-Based Implementations of the Context-Aware Information Retrieval (Infobutton) Domain, Release 2

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HL7 Informative Document

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Context-aware information retrieval (Infobutton) URL-based implementation guide

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1. PURPOSE

This document contains a recommendation for a URL-based implementation of the Context-aware information retrieval (Infobutton) standard. The intent of this recommendation is to support backwards compatibility with the majority of the infobutton and information resources that exclusively support URLs as the communication protocol. The ultimate goal is to enable a stepwise transition from URL-based implementations to an HL7 Implementation Technology Specification (ITS). Nevertheless, it is not the intent of this document to create a URL-based HL7 ITS.

2. SPECIAL NOTES AND DISCLAIMERS

This recommendation is not normative. The implementation of the URL-based recommendation is optional, but nonetheless important to support backwards compatibility with most infobutton and online resources implementations and improve interoperability. Organizations that implement only the URL-based recommendation cannot claim compliance with the HL7 v3 Infobutton standard. To claim compliance with the HL7 Infobutton standard, an implementation must be compliant with the normative edition of the “Context-aware information retrieval standard (Infobutton)” HL7 v3 standard.

This document assumes knowledge of the “context-aware information retrieval (“Infobutton”) standard. For a detailed description of the standard, readers should refer to the Infobutton section in the HL7 Version 3 Standard documentation.

3. URL-BASED IMPLEMENTATION

The URL-based representation is derived directly from the *Infobutton message model* RMIM. This method allows *Infobutton event notification* and *information resource event notification* message payloads to be converted from XML to URL-based using a simple automated process. The following rules shall be used to convert an XML-based *Infobutton message model* message payload to a set of parameters that can be included in an HTTP request using GET or POST methods:

- 1) Convert all XML attributes and elements that contain values to an HTTP parameter. The parameter shall be named by concatenating the element / attribute parent names (2 levels up) with the element / attribute name. Element / attribute names shall be separated by a dot as follows: [name of the parent element] + ‘.’ + [name of the parent element] + ‘.’ + [name of the element or attribute]. A few element / attributes cannot be unambiguously converted to a parameter name using the proposed rule. The name translations listed in Table 1 shall be used to generate parameter names in these exceptions.
- 2) To address URL length limitations imposed by the HTTP GET protocol, element / attribute names shall be abbreviated according to Table 2. Only elements / attributes that are derived from HL7 basic data types are included in the abbreviation table. Thereby, expansions to the normative *Infobutton message model* RMIM may not require changes to this implementation guide.
- 3) Parameter cardinality shall follow the same restrictions defined in the *Infobutton message model* RMIM, with the exception that attributes that are bound to a fixed or default value in the *Infobutton message model* RMIM may be omitted. In these cases, the default / fixed value shall be assumed by the message receiver.

Table 3 contains examples of XML representations extracted from an *infobutton event notification* message payload and the equivalent URL-based representations.

Table 1 – Exceptions to the parameter name translation rule

Xpath	URL parameter name
//performer/healthCareProvider/healthCarePerson/code	performer.healthCareProvider.c
//performer/healthCareProvider/healthCarePerson/languageCommunication/languageCode	performer.languageCode.c
//informationRecipient/patient/patientPerson/languageCommunication/languageCode	informationRecipient.patientPerson.languageCode.c

Table 2 – List of element / attribute abbreviations.

Element / attribute	Abbreviation
Code	c
codeSystem	cs
codeSystemName	csn
displayName	dn
originalText	ot
Value	v
Unit	u
Representation	r

Note: the proposed rule may lead to URLs that exceed the length limitations imposed by requests using the HTTP GET protocol. In case there is doubt about the possible size of requests that a given web server will be able to handle, it is recommended to use the HTTP POST protocol as opposed to HTTP GET.

Table 3 – Examples of XML representations followed by the equivalent URL-based translation.

XML representation	URL-based representation
<patientPerson><administrativeGenderCode code="F"></patientPerson>	patientPerson.administrativeGenderCode.c=F
<patientPerson><administrativeGenderCode code="F"></patientPerson>	patientPerson.administrativeGenderCode.c=F
<age><code code="30525-0"/> <value value="77" unit="a"/></age>	age.c.c=30525-0&age.v.v=77&age.v.u=a
<mainSearchCriteria> <code code="D018410" codeSystem="2.16.840.1.113883.6.177" codeSystemName="MSH" displayName="Bacterial+Pneumonia"> <originalText>Pneumonia</originalText></code> </mainSearchCriteria>	mainSearchCriteria.c.c=D018410 mainSearchCriteria.c.cs=2.16.840.1.1138 83.6.177&mainSearchCriteria.c.csn=MSH mainSearchCriteria.c.dn=Bacterial+Pneum onia&mainSearchCriteria.c.ot=Pneumonia

4. EXAMPLES

Each of the following examples contains an *Infobutton event notification* XML message payload and its equivalent URL-based representation.

- a) **Example 1:** In this example the user is looking at a coded problem list of a male, 77 years-old patient with Bacterial Pneumonia. The user clicks on an infobutton that presents a series of questions. The user selects “How do I treat Bacterial Pneumonia?” The following message payload represents the communication between the Decision Support System and the Information Resource.

XML representation:

```
<?xml version="1.0" encoding="UTF-8"?>
<infobuttonEventNotification>
  <effectiveTime value="20060706001023"/>
  <subject1>
    <patientContext>
      <patientPerson>
        <administrativeGenderCode code="M" codeSystem="2.16.840.1.113883.5.1"
codeSystemName="AdministrativeGender" displayName="Male"/>
      </patientPerson>
      <subjectOf>
        <age>
          <code code="30525-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LN"
displayName="AGE"/>
          <value value="77" unit="a"/>
        </age>
      </subjectOf>
      <subjectOf>
        <ageGroup>
          <code code="46251-5" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LN"
displayName="Age Groups"/>
          <value code="D000368" codeSystem="2.16.840.1.113883.6.177" codeSystemName="MSH"
displayName="Aged"/>
        </ageGroup>
      </subjectOf>
    </patientContext>
  </subject1>
  <holder><assignedEntity><name representation="Organization-Username"/><certificateText
representation="organization-password"/></assignedEntity></holder>
  <subject2>
    <taskContext>
      <code code="PROBLISTREV" codeSystem="HL7-Infobutton" codeSystemName="HL7-infobutton"
displayName="Problem List Review"/>
    </taskContext>
  </subject2>
  <subject3>
    <subTopic>
      <code code="Q000628" codeSystem="2.16.840.1.113883.6.177" codeSystemName="MSH"
displayName="therapy"/>
    </subTopic>
  </subject3>
  <subject4>
    <mainSearchCriteria>
      <code code="D018410" codeSystem="2.16.840.1.113883.6.177" codeSystemName="MSH"
displayName="Bacterial Pneumonia">
        <originalText>Pneumonia</originalText>
      </code>
    </mainSearchCriteria>
  </subject4>
</infobuttonEventNotification>
```

URL representation (643 characters):

```
http://www.e-resource.com/api?
infobuttonEventNotification.effectiveTime.v=20060706001023&
assignedEntity.name.r=Organization-Username&assignedEntity.certificateText.r=organization-
password&
patientPerson.administrativeGenderCode.c=F&patientPerson.administrativeGenderCode.dn=Female
age.v.v=77&age.v.unit=a
ageGroup.v.c=D000368&ageGroup.v.cs=2.16.840.1.113883.6.177&ageGroup.v.dn=Aged
taskContext.c.c=PROBLISTREV&taskContext.c.dn=Problem+list+review&
subTopic.c.c=Q000628&subTopic.c.cs=2.16.840.1.113883.6.177&subTopic.c.dn=therapy
mainSearchCriteria.c.c=D018410&mainSearchCriteria.c.cs=2.16.840.1.113883.6.177&
mainSearchCriteria.c.dn=Bacterial+Pneumonia&
mainSearchCriteria.c.ot=Pneumonia
```

Note: in this example, the parameters that are bound to a default / fixed value in the *Infobutton message model* RMIM were omitted.

- b) Example 2: the user (an RN) is looking at a non-coded medications list of a female, Spanish speaker, 8 years-old patient who came for an outpatient appointment. The user clicks on the infobutton next to “Racemic epinephrine” and is presented with a series of links. The user selects the “patient education” link.

```
<?xml version="1.0" encoding="UTF-8"?>
<infobuttonEventNotification>
<!-- the user (an RN) is looking at a coded medications list of a female, Spanish speaker, 8 years-old
patient who came for an outpatient appointment. The user clicks on the infobutton next to "Racemic
epinephrine" and is presented with a series of links. The user selects the "patient education" link.-->
  <effectiveTime value="20060706001023"/>
  <subject1>
    <patientContext>
      <patientPerson>
        <administrativeGenderCode code="F" codeSystem="2.16.840.1.113883.5.1"
codeSystemName="AdministrativeGender" displayName="Female"/>
      </patientPerson>
      <subjectOf>
        <age>
          <code code="30525-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LN"
displayName="AGE"/>
          <value value="8" unit="a"/>
        </age>
      </subjectOf>
      <subjectOf>
        <ageGroup>
          <code code="46251-5" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LN" displayName="Age
Groups"/>
          <value code="D002648" codeSystem="2.16.840.1.113883.6.177" codeSystemName="MSH"
displayName="Child"/>
        </ageGroup>
      </subjectOf>
    </patientContext>
  </subject1>
  <performer>
    <healthCareProvider>
      <code code="163W00000N" codeSystem="2.16.840.1.113883.5.53"
codeSystemName="HealthcareProviderTaxonomyHIPAA" displayName="Registered Nurse"/>
      <healthCarePerson>
        <languageCommunication>
          <languageCode code="eng" codeSystem="2.16.840.1.113883.6.100" codeSystemName="ISO639-2"
displayName="English"/>
        </languageCommunication>
      </healthCarePerson>
    </healthCareProvider>
  </performer>
<!-- This indicates that the recipient of the content is a patient who speaks Spanish -->
  <informationRecipient>
    <patient>
      <patientPerson>
        <languageCommunication>
```

```

202     <languageCode code="spa" codeSystem="2.16.840.1.113883.6.100" codeSystemName="ISO639-2"
203 displayName="Spanish"/>
204   </languageCommunication>
205   </patientPerson>
206   </patient>
207   </informationRecipient>
208   <subject2>
209     <taskContext>
210       <code code="MEDLISTREV" codeSystem="HL7-Infobutton" codeSystemName="HL7-Infobutton"
211 displayName="Medication List"/>
212     </taskContext>
213   </subject2>
214   <subject4>
215     <mainSearchCriteria>
216       <code code="045822-0322-0" codeSystem="2.16.840.1.113883.6.69" codeSystemName="NDC Codes"
217 displayName="Racemic epinephrin">
218         <originalText>Racemic epinephrine</originalText>
219       </code>
220     </mainSearchCriteria>
221   </subject4>
222 </infobuttonEventNotification>
223

```

URL representation (874 characters):

```

225 http://www.e-resource.com/api?
226 infobuttonEventNotification.effectiveTime.v=20060706001023
227 assignedEntity.name.r=Organization-Username&assignedEntity.certificateText.r=organization-
228 password&
229 patientPerson.administrativeGenderCode.c=F&patientPerson.administrativeGenderCode.dn=Female
230 age.v.v=8&age.v.unit=a&
231 ageGroup.v.c=D002648&ageGroup.v.cs=2.16.840.1.113883.6.177&
232 taskContext.c.c=MEDLISTREV&taskContext.c.dn=Medication+list+review&
233 performer.healthCareProvider.c.c=163W00000N&performer.healthCareProvider.c.dn=Registered Nurse&
234 performer.healthCareProvider.languageCode.c.c=eng&performer.healthCareProvider.languageCode.c.dn=Engl
235 ish&
236 informationRecipient.patientPerson.languageCode.c.c=spa&informationRecipient.patientPerson.languageCo
237 de.c.dn=Spanish&
238 mainSearchCriteria.c.c=045822-0322-0&mainSearchCriteria.c.cs=
239 2.16.840.1.113883.6.69&mainSearchCriteria.c.dn=Racemic+Epinephrine&mainSearchCriteria.c.ot=Racemi
240 c+Epinephrine

```