# Open Infobutton Responder Functional Specification

## Implementation details of the URL-request logic v0.2

**Supported Request Parameters** - coded fields only. Unless otherwise specified, display names (dn), original text (ot), and code system (cs) CD attributes are ignored when the Infobutton standard supports a single coding system for that parameter. The supported parameters for this version are as follows:

* mainSearchCriteria
* taskContext
* subTopic
* age
* ageGroup
* administrativeGenderCode
* informationRecipient
* performer
* encounter

Unsupported parameters received by the Responder that are otherwise supported by the Infobutton specification will be ignored until a future date. It is anticipated that each version will support additional parameters and/or parameter values.

The Responder will create a logical search phrase for each parameter it receives in a request from the list above. Generally, each parameter’s phrase will be AND’ed to the others.

The mainSearchCriteria and taskContext parameters/values are required in the request and the searched asset indexes. All other parameters and values MAY be indexed and will serve as optional criterion in the interpreted search query, i.e. <non-required-parameter>=NULL will be OR’ed to the overall parameter phrase so that assets that have not been explicitly indexed with the specified parameter are still considered to be valid hits.

Only nationwide/open VA assets will be used for this version. Parameters and strategies for managing location-specific assets will be added in an upcoming version.

Exceptions to these generalizations will be documented for each parameter. Infobutton request parameter interpretation logic and how each is converted into literal search phrases is expressed below.

**Parameter Interpretation, Indexing, and Query Logic**

*mainSearchCriteria*

* The *mainSearchCriteria* phrase MUST consist of a code and a code system for each mainSearchCriteria sent to the Responder. Future releases will support requests that contain a term using the original text (ot).
* Each received *mainSearchCriteria* code and associated code system are AND’ed together as a single *mainSearchCriteria* phrase (see examples).
* When there are multiple *mainSearchCriteria*, each *mainSearchCriteria* phrase (code and code system) is OR’ed together.
* Interpretation logic and query for assets is based on the code system.
  + ICD9-CM [2.16.840.1.113883.6.103]
    - Query for assets using codes sent in the request only.
    - Returned assets will be those that contain at least one of the ICD-9 codes sent in the request.
    - Assets indexed with ICD-9 codes will have their indexes expanded with child ICD-9 codes according to the ICD-9 hierarchy during the index loading process.
  + ICD10-CM [2.16.840.1.113883.6.90] (same as ICD9-CM)
  + ICD10 [2.16.840.1.113883.6.3] (same as ICD9-CM)
  + SNOMED-CT [2.16.840.1.113883.6.96] (same as ICD9-CM)
  + RxNorm [2.16.840.1.113883.6.88]
    - RxNorm codes received in the request are expanded, real-time, using the RxNorm REST services to retrieve potentially relevant codes.
    - Each RxNorm code retrieved from the REST service will be added as a *mainSearchCriteria* phrase and will be OR’ed with the others. See “RxNorm Indexing rules” for specific instructions.
  + MeSH [2.16.840.1.113883.6.177]
    - ?
  + NDC [2.16.840.1.113883.6.69]
    - Convert the NDC code to an RXCUI using the RxNorm REST service and then follow the RxNorm strategy.
  + LOINC [2.16.840.1.113883.6.1]
    - Query for assets using codes sent in the request only.
    - Asset index authors will be responsible for indexing assets with LOINC codes efficiently – there are no plans for automatic expansion for this release.

*taskContext*

* Required parameter; request error will returned if this does not exist.
* The Responder will support a single coded value assigned to *taskContext.c.c* parameter from the HL7 concept domain “ActTaskCode,” a hierarchical value set.
* Assets MUST have the requested code or one its hierarchical children indexed.
* Asset indexes will be populated with the hierarchical codes during the loading process and do not need to be managed/manipulated during the request interpretation.
* Multiple additional values will be ignored. Future versions may return an invalid request error.

*subTopic*

* A single *subTopic* code based on the Infobutton URL standard is supported.
* When the *subTopic.v.c* is specified the *subTopic.v.cs* is also required - the two code systems specified by the Infobutton URL standard are supported, MeSH and SNOMED.

*age*

* A single *age.v.v* parameter is supported according the Infobutton URL specification.
* When an age value is specified it MUST be accompanied with the *age.v.u* parameter and value representing the units of measure.
* *age.v.v* values will be converted to *ageGroups* phrases.
* \*\*\* alternative idea \*\*\* convert ageGroup codes to age in years at indexing time – ageGroup “adolescent” is 13-18, therefore index age=13, age=14, … , age=18.
  + Current key-value index does not support associating index properties
    - Would the property group work?
    - How to index age units associated with age value?
    - Solution - support a single age unit per asset
      * This asset supports age in years only

*ageGroup*

* Supported age groups are strictly based on the MeSH “AgeGroupObservationValue” value set as specified in the Infobutton URL specification and only exact code matches will be “hits” in the search.
* *ageGroup.v.c* is the only ageGroup parameter observed by the responder.
  + The *ageGroup.v.cs*, or code system, is not evaluated and does not need to be specified.
  + The *ageGroup.v.dn, or display name,* is not observed and does not need to be specified.

*administrativeGenderCode*

* The Responder will support *patientPerson.administrativeGenderCode.c* with values from value set HL7 AdministrativeGender.

*informationRecipient*

* The Responder will support a single coded value assigned to *informationRecipient* parameter, “PROV” (provider), “PAT” (patient), or “PAYOR.”
* Multiple additional values will be ignored. Future versions may return an invalid request error.

*performer*

* The Responder will support a single coded value assigned to *performer* parameter, “PROV” (provider), “PAT” (patient), or “PAYOR.”
* Multiple additional values will be ignored. Future versions may return an invalid request error.

*encounter*

* The Responder will support a single coded value assigned to *encounter.c.c* parameter from the OIB standard, a value from the HL7 ActEncounterCode value set.
* Multiple additional values will be ignored. Future versions may return an invalid request error.

**Examples:**

1. Provider searches for info for a 35 year old patient with viral pneumonia (two codes)
   1. Do not need the *ageGroup.v.cs* because only one is supported
   2. And same for the *informationRecipient*
   3. Returned assets MUST have at least one of the *mainSearchCriteria*
   4. Returned assets MUST have the correct taskContext
   5. Returned assets MAY have at least one of the *ageGroup*s
   6. Returned assets MAY have informationRecipient
   7. Returned assets MAY have performer

**Query Request Parameters**

*mainSearchCriteria.c.c=480 –> viral pneumonia*

*mainSearchCriteria.c.cs=2.16.840.1.113883.6.103 –> ICD9*

*mainSearchCriteria.c.c1=480.31 –> coronavirus pneumonia*

*mainSearchCriteria.c.cs1=2.16.840.1.113883.6.103 –> ICD9*

*taskContext.c.c=OE –> order entry*

*ageGroup.v.c=D000328 –> 19-44 years*

*informationRecipient=PROV*

*performer=PROV*

**Query Logic**

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*(mainSearchCriteria.c.c=480 AND mainSearchCriteria.c.cs=2.16.840.1.113883.6.103)*

*OR*

*(mainSearchCriteria.c.c=480.31 AND*

*mainSearchCriteria.c.cs=2.16.840.1.113883.6.103)*

*)*

*AND*

*(ageGroup.v.c=D000328)*

*AND*

*(informationRecipient=PROV)*

*AND*

*(performer=PROV)*