|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Data Categorization** | **Description** | **Source of Requirement** | **Example** | **Validation Context Assertion** | **Comments** |
| **No Data Element Validation** | | | | | |
| **Indifferent** | Data is not provided as part of the test case and there is no expectation of data but data is permitted. No example data is provided. | N/A | 1. Any element that is RE 2. HD   E1 – C(R/X)  E2 – C(R/X)  E3 – C(R/X)  E1 🡪 conindiff  E2 🡪 indiff  E3 🡪 indiff | None | Data is not provided as part of the test case. No assessment of the data element is made. Usually applies to elements with RE usage in which valuing the element or not is not relevant to the test case. Another case in conditionals where either may be valued (e.g., HD data type; we maybe want to check support for one or the other, therefore we make one content indifferent and the other indifferent. |
| **Non-content Data Element Validation – Presence Check** | | | | | |
| **Content Indifferent** | Data where the specific content is not relevant for the Test Case but is expected to be valued; data can be changed. Example data is provided. | Conformance Profile | OBX.23 – Performing Organization Name[[1]](#footnote-1) | R🡪 no action  RE 🡪 generates a presence check | Data that if changed doesn’t alter the interpretation or execution of the test case operation. |
| **Configurable** | Data that is typically configured by the system (customer-definable). Example data is provided. | Conformance Profile | MSH.3 – Sending Application | R 🡪 no action  RE 🡪 generates a presence check | Data that is determined at installation and is site dependent. |
| **System Generated** | Data typically generated automatically by the system, e.g., time of message. Example data is provided. | Conformance Profile | MSH.7 – Date/time of Message  Other example may include generation of identifiers. | R 🡪 no action  RE 🡪 generates a presence check | Data that is dynamically generated by the system. In some cases it is runtime dependent.  Normally, the IG should indicate that the element is system generated (other content indifferent is more appropriate, say, e.g., for a patient identifier. |
| **Test Case Proper** | Data that is consistent with the clinical backdrop of the test story. The data value might have to be coordinated to conduct test. Data can change with pre-caution. Example data provided. | Conformance Profile | OBX.8 – Abnormal Flags; The combination of OBX.5 (Observation Value) and OBX.7 (Reference Range) indicates an abnormal flag of H – High.  CVX code and date given. | R 🡪 no action  RE 🡪 generates a presence check | Data content that is significant to ensure soundness of the test case from a real world perspective or to enact operation of the test case. Data can be changed but with consideration. Data is important to demonstrate use/relationships of data elements. The indicator is informational in nature, but if not followed some systems may not be able to perform the test case because they ensure data quality. That is, their system may prevent the system from creating a message because the data is not sound. |
| **Profile Fixed - Presence** | A secondary requirement is specified in the Profile but is dependent on the presence of the element first. | Conformance Profile | RE element, that if, valued is constrained to a fixed or set of fixed values. | R 🡪 no action  RE 🡪 generates a presence check | Statement might be “If valued, OBX-43 (Some Element) SHALL be valued with ‘123’.” The categorization is needed to trigger a presence check even if the content is validated with assertions in the conformance statement. |
| **Non-Content Data Element Validation – Check for Non-Presence** | | | | | |
| **Not-Valued** | No data is expected based on the test story and functional requirements. Typically will apply to elements with RE usage[[2]](#footnote-2). | Test Case | Any case where we want to ensure an element is not-valued. | R 🡪 N/A  RE 🡪 generates a not-valued presence check | Typically will apply to elements with RE usage (which likely could have been specified as conditional elements). Functional requirements outside the scope of interoperability (content) specification might indicate improper use of the element or to detect systems that incorrectly provide default values. |
| **Content Data Element Validation – Presence and Value Check** | | | | | |
| **Profile Fixed** | Data that is fixed by the conformance profile; data can’t be changed. Specific data is provided. | Conformance Profile | PID.1 – Set ID | R🡪 no action  RE🡪no action | Likely to originate from a conformance statement (either explicit or implied in the text/comments). The categorization helps identify the origin of the requirement. Example conformance statement might be: “PID.1 (Set ID - PID) SHALL be valued with the constant value '1'.”. |
| **Profile Fixed - List** | Data that is fixed as defined by a set of allowable values by the conformance profile; data can be a valued within the defined set. Specific data is provided. | Conformance Profile | MSH.21 – Message Profile Identifier  **LRI-37:** If valued, OBR-11 (Specimen Action Code) **SHALL** be a value with “A”, “G”, “L”, or “O”. | No Action | Data is often a coded value and is constrained by a value set. One data value in the defined list is expected to be present.  Might be the case where the list is a subset of a value set (this is a case where the value set is not defined at the necessary granularity/preciseness). |
| **Test Case Fixed** | Data that is specific and fixed by the Test Case; data can’t be changed. Specific data is provided. | Test Case | (E.g., OBR-25 – Result Status) | R🡪 generates a constant value check  RE🡪 generates a presence check and constant value check | Data deemed by the test case developer to be specific data based on the clinical test story. Exact content of data is validated. |
| **Test Case Fixed - List** | Data that is fixed as defined by a set of allowable values by the test case developer; data can be a value within the defined set. Specific data is provided. | Test Case | OBX.3.1 – Observation Identifier; 1 of N valid LONIC codes for Hemoglobin. | R🡪 generates a constant value check from a list provided  RE🡪 generates a presence check and constant value check from a list provided | This is the case where we want to check for specific content, but depending on the implementation more than one value is acceptable (and no other requirement is specified that binds it to a constant). The test case developer provides a list of acceptable values. The example data picks one from that list and the validation accepts any from that list. This is applicable to inspection tests; where a |
| **Content Data Element Validation – Presence and Generic Content Check** | | | | | |
| **Test Case Fixed – Minimum Length** | Data in which the minimum length (size) of the data is specified by the Test Case; the length of the data has to be at minimum the length indicated. | Test Case | PID-5.3 – Middle Name  NTE-3 Comment | R🡪 generates a constraint check for the length of the value  RE🡪 generates a presence check and a constraint check for the length of the value | This covers the cases where we are indifferent to the content but want to test for support to a certain length. For example, some system only support a middle initial (this indicator could test support for a certain minimum length). Another example includes the length of comment notes. |
| **~~Test Case Fixed – Exact Length~~** | ~~Data in which the length (size) of the data is fixed by the Test Case; the length of the data can’t be changed.~~ | ~~Test Case~~ | ~~NTE-3 - Comment~~ |  | This case is too much of an outlier and I can’t think of a case where another category wouldn’t cover it. |
| **Implant Data In Error** | | | | | |
| **Error – Non Supported Element** | Indicates that the test data is in error with respect to the profile requirements. | Test Case | Any X element where we add data. | Nothing | Mostly used for messages that are intended to be received. |
| **Error -** |  |  |  |  | TODO: We can come up with a long list of more implanted errors. |

Categories are intended provide additional information about the test case to help understanding of the example message and to indicate what the validation is assessing. The data categorization is supplemental (additional) information to implementation guide; e.g., a requirement for a data element already addressed by a conformance statement in the conformance profile is not intended to be duplicated by the data categorizations. For example, there is no need for us to add a present check for an “R” element.

**How to handle Conditions:**

There is nothing special to do for conditions with respect to the data categorization. The test case developer manages the data that triggers a condition to fire. Once the conditional element is “in play” then it is treated just like an “R”, “RE”, or “X” usage is treated.

Example 1:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Location | Usage | Card | DT | Len | VS | Predicate | Data | Category |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.6 : Administered Amount | R | [1,1] | NM | [1,20] |  |  | 999 | Test Case Fixed |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/field.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7 : Administered Units | C(R/O) | [0,1] | CE\_IZ | [1,483] | UCUM | If Administered Amount is not valued "999" |  | Not-valued |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/component.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7.1 : Identifier | R | [1,1] | ST | [1,50] |  |  |  | Implied Not-valued |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/component.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7.2 : Text | RE | [1,1] | ST | [1,999] |  |  |  | Implied Not-valued |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/component.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7.3 : Name of Coding System | R | [1,1] | ID | [1,20] | 0396 |  |  | Implied Not-valued |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/component.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7.4 : Alternate Identifier | RE | [1,1] | ST | [1,50] |  |  |  | Implied Not-valued |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/component.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7.5 : Alternate Text | RE | [1,1] | ST | [1,999] |  |  |  | Implied Not-valued |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/component.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7.6 : Name of Alternate Coding System | C(R/X) | [1,1] | ID | [1,20] | 0396 | If CE.4 (Alternate Identifier) is valued. |  | Implied Not-valued |

Example 2:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Location | Usage | Card | DT | Len | VS | Predicate | Data | Category |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.6 : Administered Amount | R | [1,1] | NM | [1,20] |  |  | 15 | Test Case Fixed |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/field.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7 : Administered Units | C(R/O) | [0,1] | CE\_IZ | [1,483] | UCUM | If Administered Amount is not valued "999" |  |  |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/component.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7.1 : Identifier | R | [1,1] | ST | [1,50] |  | ml |  | Test Case Fixed |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/component.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7.2 : Text | RE | [1,1] | ST | [1,999] |  | milliliter |  | Test Case Proper |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/component.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7.3 : Name of Coding System | R | [1,1] | ID | [1,20] | 0396 | UCUM |  | Test Case Fixed |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/component.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7.4 : Alternate Identifier | RE | [1,1] | ST | [1,50] |  |  |  | Indifferent |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/component.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7.5 : Alternate Text | RE | [1,1] | ST | [1,999] |  |  |  | Indifferent |
| http://hl7v2-iz-testing.nist.gov/mu-immunization/resources/core-images/component.pnghttp://hl7v2-iz-testing.nist.gov/mu-immunization/faces/javax.faces.resource/spacer/dot_clear.gif?ln=primefaces&v=3.5RXA.7.6 : Name of Alternate Coding System | C(R/X) | [1,1] | ID | [1,20] | 0396 | If CE.4 (Alternate Identifier) is valued. |  | Indifferent |

**Specification for Injecting Error Conditions:**

Error – Not-supported element present

Error-Required Element Missing

Error-Maximum Length Exceeded

They indicate the assertion that needs to be generated (These are requirements for TCAMT/Woo).

For example, for Content Indifferent:

R  no action required/no need to generate an assertion; the regular validation takes care of it

RE  generate a presence check, because we know we have data for an RE element

From the user perspective, we need to write it a bit differently; they need to know what to expect during validation.

In some sense there is 2 layers here:

Content-indifferent with flavors:

1.       Indifferent

2.       Configurable

3.       System Generated

4.       Test Case Proper

5.       Profile Fixed – Presence

For the validation it is all the same. Not quite sure if we should have these 2 layers in the test categories.

OK I see, so for the conditional it is like a “real time” usage that is computed based on the condition predicate and the data the user already entered.

Also keep we need to  keep in mind that sometimes we will need to add assertion to R elements as well if they are nested under an RE parent (so it is not always that straight forward as R -> no action).

Example (taken from LRI):

PID.7 usage= RE, datatype = TS\_2

PID.7.1 usage=R, datatype = DTM

If a TCAMT user enters some data in PID.7.1, I still would expect TCAMT to generate a constraint even if the usage of that particular element is R. Without this constraint, a message with no value in PID.7 will not trigger an error because at the field level the usage is RE (so an empty value is accepted by the profile).

I am not sure this is really important at that point, but it is something we need to think about.

1. Assuming for the given test case this exact content of this element is not relevant. [↑](#footnote-ref-1)
2. Conditionals will resolve to R, RE, O, or X so we don’t envision this category applicable for these cases. [↑](#footnote-ref-2)