ANSI/MEDBIQ PF.10.1-2015
Performance Framework Specifications

Version History

Version No.	Date	Changed By	Changes Made
1.0	2015-04-17		

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1   Acknowledgements

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2   Documentation Conventions

This document uses the following conventions:

Convention	Description
Bold Text	When used with an XML element name, indicates that the element contains sub-elements.
Italics	When used in an XML element description, an attribute of the XML element.
`Monospaced type`	Sample XML tags, code, schema, or portion thereof.

The document uses graphics generated by Altova XML Spy® software, which uses the following graphical conventions.
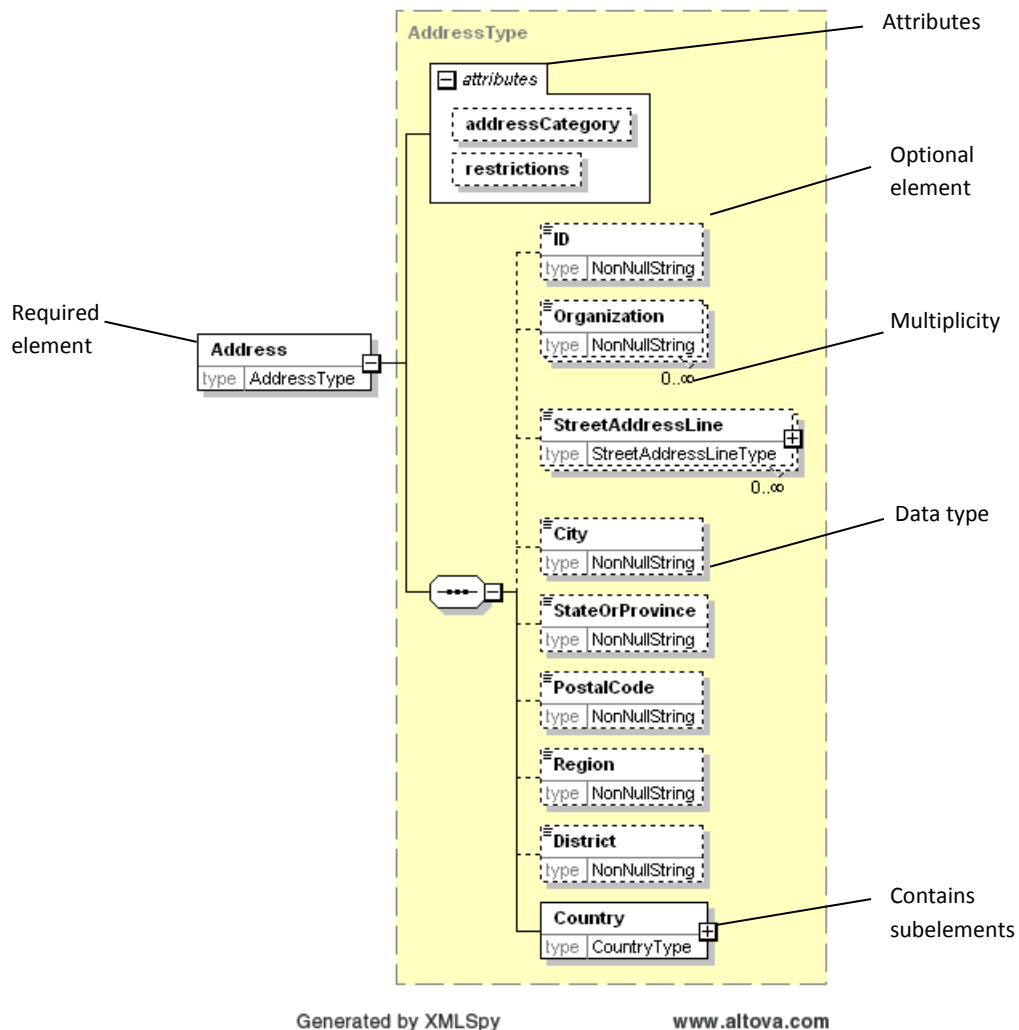
3 Conformance

To conform to the MedBiquitous Performance Framework specification, an XML document shall:

- Validate against the Performance Framework XML Schema available at:
  http://ns.medbiq.org/performanceframework/v1/performanceframework.xsd
- Conform to any additional requirements stated in this specification.
- Optionally include elements not defined in this document only in permitted areas and only if those elements are namespace qualified.

4   Common Data Types

Most of the elements and attributes in MedBiquitous XML documents use the data types defined by the W3C XML schema definition [XML]. In some cases MedBiquitous creates its own datatypes as part of its best practices or to meet a specific requirement. Commonly used datatypes are defined in the common.xsd file. For more information about common datatypes, see:

http://www.medbiq.org/sites/default/files/CommonSpecifications.pdf

5   Introduction

This document describes the MedBiquitous Performance Framework Schema in detail. It is intended for use by anyone who wants to create, implement, or create interoperable tools based on this specification.

The objective of the Performance Framework Schema is to provide a data structure that allows one to represent expected levels of performance related to a competency in a standard format. This structure may be referenced from other specifications to enable the exchange of data based on those performance scales, including learner assessment data.

The standard allows extensions so that data beyond the core set identified in this document may be incorporated. This specification is intended to work in concert with other specifications.

Competency-based learning and assessment is increasingly being applied within health professions education at all levels across the continuum. An important component of competency-based learning are performance levels, expected levels of performance related to a competency. In the US, the Accreditation Council for Graduate Medical Education (ACGME) has convened working groups to develop Milestones for each of the 26 specialties in its purview. In undergraduate medical education, several medical schools, including the University of California, San Francisco, are implementing milestones related to the developmental achievement of competence. In Nursing and other health professions, levels of performance are associated with the assessment and development of competence. Standards are essential to make performance data portable and easily understood across the continuum of a learner's career. This specification is one step towards making that possible.

6   Other Standards, Specifications, or Schemas Referenced

This standard references the following standards, specifications, or schemas. The informative references here, which describe how these references are used, link to formal references appearing later in this document.

- ANSI/MEDBIQ LO.10.1-2008, Healthcare Learning Object Metadata [Healthcare LOM]
  Healthcare LOM extends the IEEE LOM standard and provides a format for describing healthcare learning resources and activities. Healthcare LOM is used to encode metadata about the Performance Framework.

- DCMI Metadata terms [DCMI]
  The Performance Framework uses the DCMI format element to indicate the format of a referenced resource.

- MedBiquitous Common Specifications [Common]
  The MedBiquitous Common Specification defines datatypes commonly used across MedBiquitous specifications.

- MedBiquitous Competency Framework [Competency Framework]
  Competency Framework provides a way of specifying the hierarchical and non-hierarchical relationships among a set of related competencies, learning objectives, learning outcomes, etc. The Performance framework may define performance for competencies in a competency framework.

- MedBiquitous Competency Object [Competency Object]
  Competency Object provides a common format for representing competencies, learning objectives, learning outcomes, etc. The Performance framework may define performance for specific competencies.

- Resource Description Framework [RDF]
  RDF is used to link to competencies , competency frameworks, and additional information as necessary. RDF is the technology used to establish semantic web relationships.

7   Performance Framework Schema

The following sections explain the Performance Framework Schema grammar. Values in **bold** under XML Tags column indicate that the element has sub-elements.

All the elements having sub-elements will be defined in separate sections. All elements without sub-elements will be defined within the appropriate element sections that use them.

7.1   PerformanceFramework

PerformanceFramework is the root element. It contains subelements that describe one or more sets of performance levels to be used in assessing competence or performance.
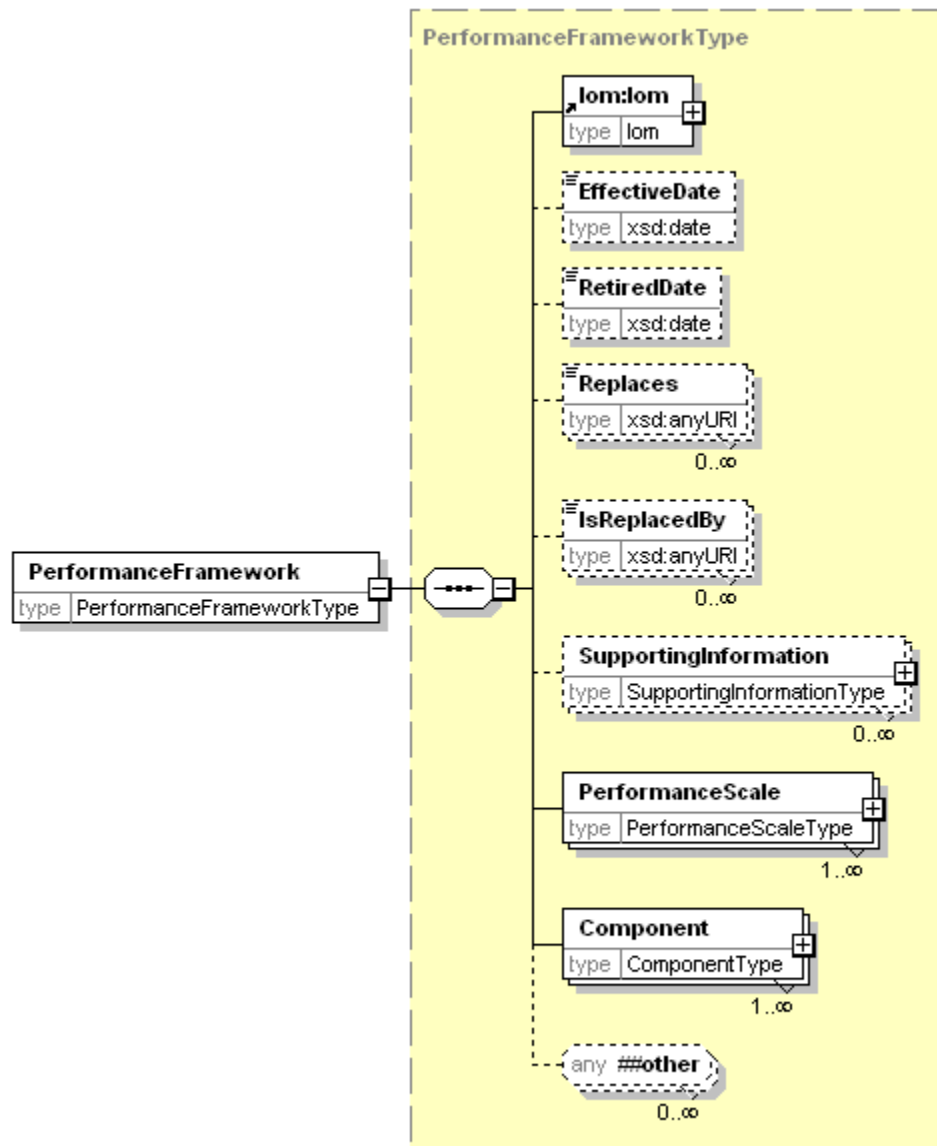
Generated by XMLSpy   www.altova.com

PerformanceFramework Element Information

Element	Description	Required	Multiplicity	Datatype
PerformanceFramework	PerformanceFramework is the root element. It contains subelements that describe one or more sets of performance levels to be used in assessing competence or performance.	Required	1	Container
lom	Lom contains subelements that define title, publisher, and other descriptive information about this performance framework. The lom element is defined in the Healthcare Learning Object Metadata standard defined by MedBiquitous. Please see the Healthcare Learning Object Metadata Specifications and Description document for more information on the sub-elements of lom. For information on which subelements of lom are required or recommended for Performance Frameworks, see section Lom Required and Recommended	Required	1	Container For more information, see [Healthcare LOM] and [LOM].

Element	Description	Required	Multiplicity	Datatype
	Elements.			
EffectiveDate	The date this performance framework becomes or became effective.	Optional	0 or 1	Date
RetiredDate	The date upon which this performance framework was retired.	Optional	0 or 1	Date
Replaces	A related performance framework that is supplanted, displaced, or superseded by the described framework.

Implementers must use a URI to represent the related framework.

Replaces is based on the Dublin Core term replaces. For more information, see [DCMITerms]. | Optional | 0 or more | anyURI |
| IsReplacedBy | A related performance framework that supplants, displaces, or supersedes the described framework.

Implementers must use a URI to represent the related framework.

IsReplacedBy is based on the Dublin Core term isReplacedBy. For more information, see [DCMITerms]. | Optional | 0 or more | anyURI |

Element	Description	Required	Multiplicity	Datatype
SupportingInformation	SupportingInformation contains subelements that include or point to supporting information, such as descriptions of the rationale for developing the framework and its intended use. See section SupportingInformation for more information.	Optional	0 or more	Container
PerformanceScale	PerformanceScale contains subelements that define a numeric scale used in this performance framework. See section PerformanceScale for more information.	Required	1 or more	Container
Component	Component contains subelements that define a component of this performance framework. See section Component for more information.	Required	1 or more	Container
Elements from other namespaces	PerformanceFramework may include elements from other namespaces provided those elements are namespace qualified.	Optional	0 or more	any

Example:

```
<PerformanceFramework>
  <lom:lom>
. . .
  </lom:lom>
  <EffectiveDate>2013-01-01</EffectiveDate>
  <SupportingInformation>
. . .
  </SupportingInformation>
  <PerformanceScale id="xyz">
. . .
  </PerformanceScale>
  <Component id="c123">
. . .
  </Component>
  <Component id="c234">
. . .
  </Component>
  <Component id="c345">
. . .
  </Component>
. . .
</PerformanceFramework>
```

7.2   Lom Required and Recommended Elements

Lom contains subelements that define title, publisher, and other descriptive information about this performance framework.
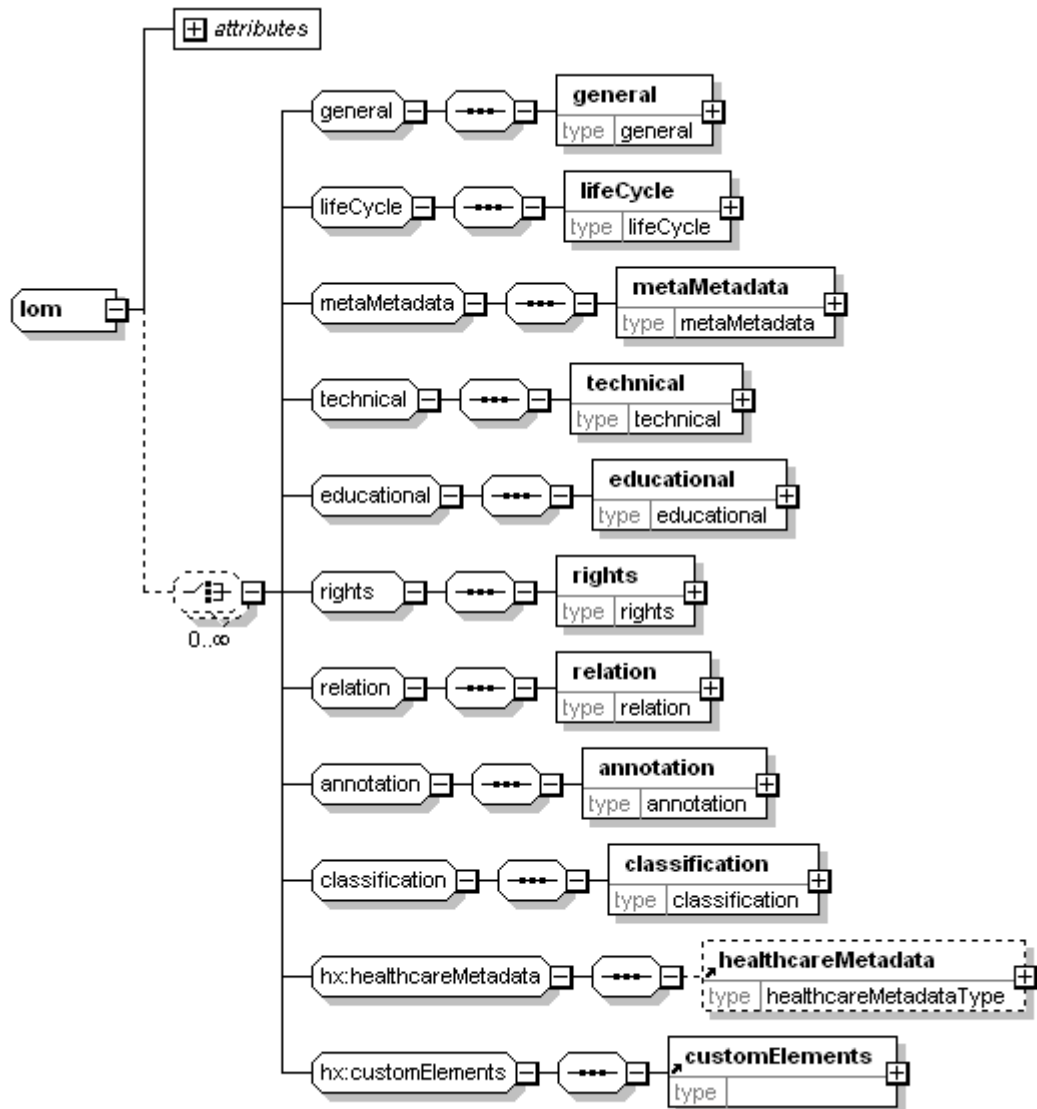
Generated by XMLSpy   www.altova.com

The table that follows indicates which elements of healthcare lom are required or recommended for use in the Performance Framework. Note that additional lom elements may be used.

lom Element Usage Information

Element	Description	Required	Multiplicity	Datatype
lom	lom contains subelements that define title, publisher, and other descriptive information about this performance framework. For more information on these elements, see [LOM] and [Healthcare LOM].	Required	1	Container For more information on lom and its subelements, see [Healthcare LOM] and [LOM].
general	A container for general metadata elements.	Required	1	Container
general:identifier	A container for identifier information.	Required	1 or more	Container

Element	Description	Required	Multiplicity	Datatype
general:identifier:catalog	The cataloging system for the unique identifier. For performance frameworks, the catalog must be URI. Note that organizations may include a catalog other than URI for use within local systems as long as a URI identifier is present in the XML document.	Required	1	Restricted. See Description for details.
general:identifier:entry	Defines a unique identifier for the performance framework. For performance frameworks, identifiers must be in the form of a URI. Note that organizations may include an entry other than a URI for use within local systems as long as a URI identifier is present in the XML document.	Required	1	anyURI

Element	Description	Required	Multiplicity	Datatype
general:title	Defines the title for this performance framework in one or more languages.	Required	1	LanguageString
general:description	A short description of the performance framework.	Recommended	0 or more	LanguageString
lifecycle	A container for elements relating to the lifecycle of the framework.	Recommended	0 or 1	Container
lifecycle:status	A container for elements describing the status of the performance framework.	Recommended	0 or 1	Container
lifecycle:status:source	The source of the vocabulary for status. Use LOMv1.0.	Recommended	0 or 1	Restricted See Description for details.
lifecycle:status:value	The status of the performance framework. Valid values are: draft, final, revised, unavailable. Use of draft and final values is recommended.	Recommended	0 or 1	Restricted. See Description for details.

Element	Description	Required	Multiplicity	Datatype
lifecycle:contribute	A container for elements the people and organizations that have contributed to the performance framework.	Recommended	0 or 1	Container
lifecycle:contribute:role	A container for elements describing the publisher and other entities involved in the development of this framework. Use the role and entity elements within the lifecycle element to indicate the publisher of the performance framework. Role should have a value of publisher and be paired with an entity describing the publisher.	Recommended	0 or more	Container
lifecycle:contribute:role:source	The source of the vocabulary for role. When describing the publisher, use LOMv1.0.	Recommended	0 or 1	Restricted. See Description for details.

Element	Description	Required	Multiplicity	Datatype
lifecycle:contribute:role:value	The role being described. To describe the publisher, value should be publisher.	Recommended	0 or 1	Restricted. See Description for details.
lifecycle:contribute:entity	Use the role and entity elements within the lifecycle element to indicate the publisher of the performance framework. Entity includes a vcard reference to the publisher and should be paired with a role that has a value of publisher.	Recommended	0 or more	CharacterString in VCARD format. See [LOM] for details.
educational	A container element for elements related to the educational aspects of the framework.	Recommended	0 or 1	Container
educational:context	A container for elements describing the educational environment for which the performance framework is intended.	Recommended	0 or more	Container

Element	Description	Required	Multiplicity	Datatype
educational:context:source	The source of the vocabulary for educational context. To use the MedBiquitous vocabulary, use HEALTHCARE_LOMv1.	Recommended	0 or 1	Restricted. See Description for details.

Element	Description	Required	Multiplicity	Datatype
educational:context:value	The educational context for which the framework is intended. Use a term from the following MedBiquitous vocabulary (described in HealthcareLOM): • patient education • caregiver education • primary education • secondary education • vocational training • undergraduate education • undergraduate professional education • graduate professional education • continuing professional development	Recommended	0 or 1	Restricted. See Description for details.

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Element	Description	Required	Multiplicity	Datatype
rights	A container element for information on copyright and other restrictions.	Recommended	0 or 1	Container
rights:copyrightAndOtherRestrictions	A container for elements indicating whether or not copyright or other restrictions exist on the competency framework.	Recommended	0 or 1	Container
rights:copyrightAndOtherRestrictions:source	The source of the vocabulary used to describe copyright and other restrictions. To use the lom vocabulary, use LOMv1.0.	Recommended	0 or 1	Restricted. See Description for details.
rights:copyrightAndOtherRestrictions:value	Indicates whether or not copyright and other restrictions exist. Valid values are yes and no.	Recommended	0 or 1	Restricted. See Description for details.

Element	Description	Required	Multiplicity	Datatype
rights:description	The description element within rights provides a brief description of the copyright or other constraints on the performance framework. The description may include a link to a license.	Recommended	0 or 1	LanguageString
healthcareMetadata	A container element for healthcare related metadata.	Recommended	0 or 1	Container
healthcareMetadata:healthcareEducation	A container element for healthcare education related metadata.	Recommended	0 or 1	Container
healthcareMetadata:healthcareEducation targetAudience	A container element for information about the target audience for whom this framework is intended.	Recommended	0 or 1	Container
healthcareMetadata:healthcareEducation:targetAudience:profession	The health profession for which this performance framework is intended.	Recommended	0 or 1	LanguageString

```
<lom:lom>
    <lom:general>
      <lom:identifier>
         <lom:catalog>URI</lom:catalog>
         <lom:entry>http://www.example.com/internal_medicine_milestones_2013_us</lom:entry>
      </lom:identifier>
      <lom:description>
         <lom:string>The framework is designed only for use in evaluation of resident physicians in the
context of their participation in accredited residency programs. The framework is for the assessment of
the development of the resident physician. It does not represent the entirety of  physician
competency.</lom:string>
      </lom:description>
    </lom:general>
    <lom:lifeCycle>
      <lom:status>
         <lom:source>LOMv1.0</lom:source>
         <lom:value>final</lom:value>
      </lom:status>
      <lom:contribute>
         <lom:role>
            <lom:source>LOMv1.0</lom:source>
            <lom:value>publisher</lom:value>
         </lom:role>
         <lom:entity>BEGIN:VCARD\nFN:Fictional Board of Internal MedicineEND:VCARD</lom:entity>
      </lom:contribute>
    </lom:lifeCycle>
  </lom:lom>
```

7.3   SupportingInformation

SupportingInformation contains subelements that include or point to supporting information, such as descriptions of the rationale for developing the framework and its intended use.

Element	Description	Required	Multiplicity	Datatype
SupportingInformation	SupportingInformation contains subelements that include or point to supporting information, such as descriptions of the rationale for developing the framework and its intended use.	Optional	0 or more	Container
Reference	A reference to the supporting information. The Reference element uses the ReferenceType datatype from the MedBiquitous Common Specifications.	Either reference or xhtml:div is required	0 or 1	Container For more information, see [Common].
xhtml:div	A div element is a mixed type element referenced from XHTML. The div element can include a mix of text and XHTML tags as specified by the XHTML schema.	Either Reference or xhtml:div is required	0 or 1	Container For more information, see [XHTML].

Example:

```
    <SupportingInformation>
        <Reference>
            <rdf:Description
rdf:about="http://www.example.org/performanceguide2013.pdf"/>
            <dcterms:format>application/pdf</dcterms:format>
        </Reference>
    </SupportingInformation>
    <SupportingInformation>
        <xhtml:div>
            <xhtml:h1>Foreword</xhtml:h1>
            <xhtml:p>
The College is committed to fostering the <xhtml:strong>highest
standards</xhtml:strong> of surgical care and professional
behaviour. Being a surgeon carries a responsibility for participation in
lifelong learning, and a
willingness to monitor performance in the workplace.
            </xhtml:p>
            <xhtml:p>
To aid these processes, and to complement the existing program, work was
undertaken by the <xhtml:em>
Assessment Steering Committee</xhtml:em> during 2010 and 2011, under the
governance of the
<xhtml:em>Professional Development and Standards Board</xhtml:em>.
            </xhtml:p>
        </xhtml:div>
    </SupportingInformation>
```
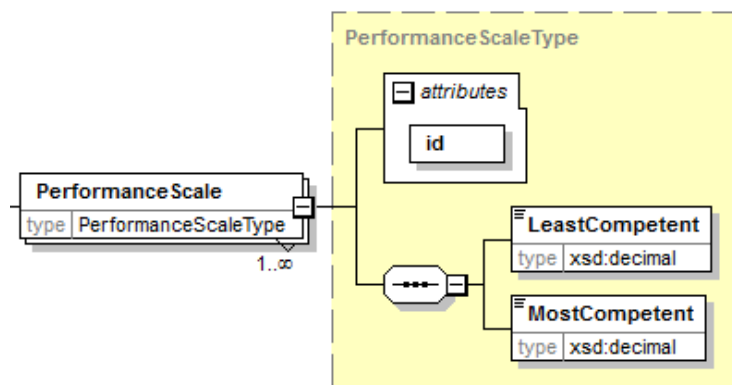
7.4   PerformanceScale

PerformanceScale contains subelements that define a numeric scale used in this performance framework. Most often scales are defined with higher numbers indicating higher levels of competence, but scales may be defined so that lower numbers indicate higher levels of competence. For example, on a scale of 1 to 5, 1 may be least competent or most competent.

PerformanceScale Element Information

Element	Description	Required	Multiplicity	Datatype
PerformanceScale	PerformanceScale contains subelements that define a numeric scale used in this performance framework. PerformanceScale has the following attribute: *id* a unique identifier for this performance scale. The identifier must be unique within the scope of this report. Use of the *id* attribute is required.	Required	1 or more	Container
LeastCompetent	The score indicating the lowest level of competence on this scale.	Required	1	Decimal)
MostCompetent	The score indicating the highest level of competence on this scale.	Required	1	Decimal

Example:

```xml
<PerformanceScale id="scale_1to5">
   <LeastCompetent>1</LeastCompetent>
   <MostCompetent>5</MostCompetent>
</PerformanceScale>
```

7.5 Component

Component contains subelements that define a component of this performance framework. A component may have nested components defined. Each component describes a spectrum of performance levels and related background or descriptive information.
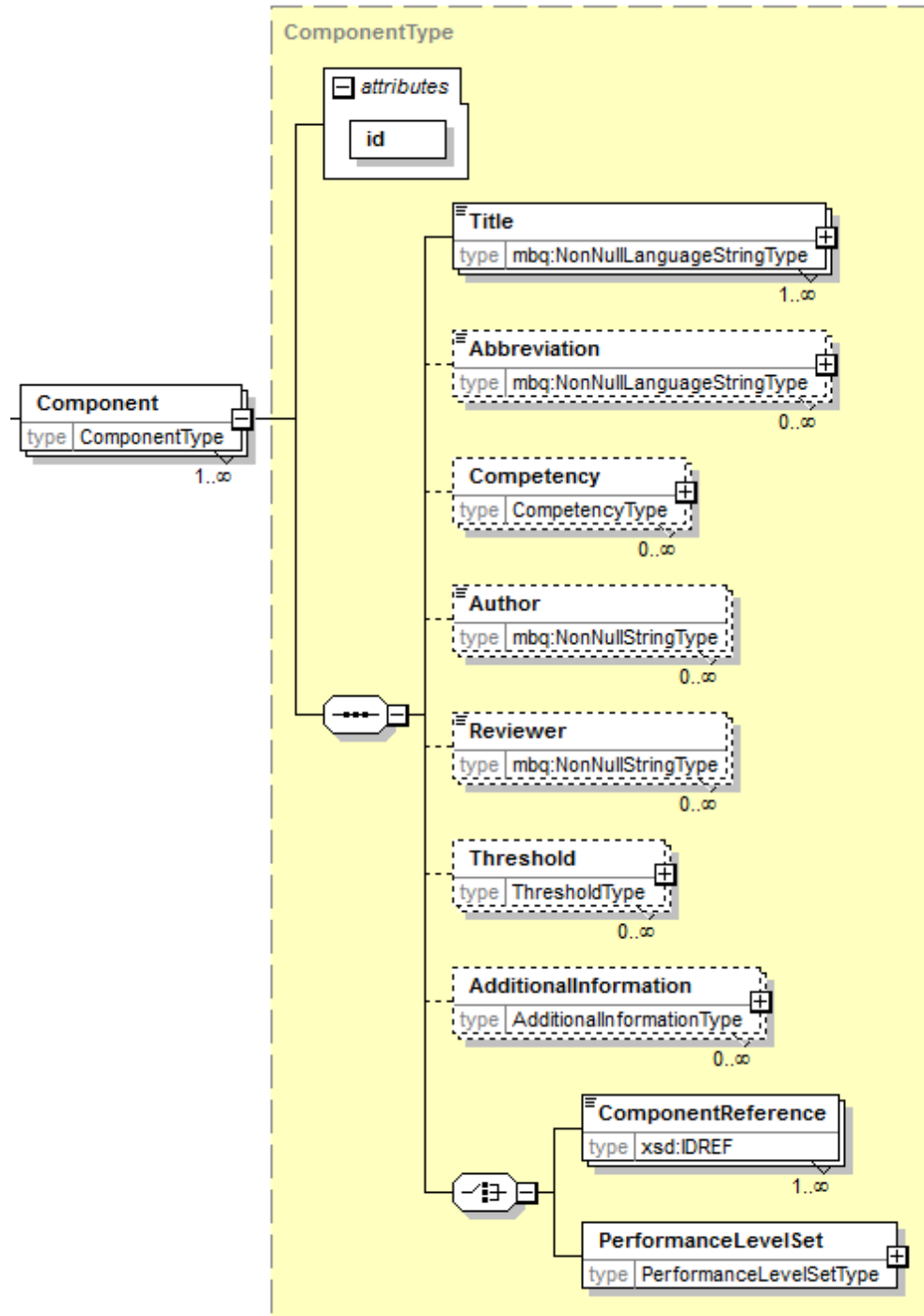
Component Element Information

Element	Description	Required	Multiplicity	Datatype
Component	Component contains subelements that define a component of this performance framework. Component has the following attribute: *id* a unique identifier for this component. The identifier must be unique within the scope of this report. Use of the *id* attribute is required.	Required	1 or more	Container
Title	The title of this component. Often the title mirrors the title of the competency for which the performance levels are detailed.	Required	1 or more	NonNullLanguage StringType For more information, see [Common].
Abbreviation	An abbreviation for the component.	Optional	0 or more	NonNullLanguage StringType For more information, see [Common].

Element	Description	Required	Multiplicity	Datatype
Competency	Competency contains subelements that reference a competency in a competency framework. See section Competency for more information.	Optional	0 or more	Container
Author	An author of this component of the performance framework.	Optional	0 or more	NonNullStringType For more information, see [Common].
Reviewer	A reviewer of this component of the performance framework.	Optional	0 or more	NonNullStringType For more information, see [Common].
Threshold	Threshold contains subelements that define a threshold score for a particular action or decision, such as progression in training or entrustment. See section Threshold for more information.	Optional	0 or more	Container
AdditionalInformation	Additonal information, such as background, references., resources, etc. about this component. See section AdditionalInformation for more information.	Optional	0 or more	Container

Element	Description	Required	Multiplicity	Datatype
ComponentReference	The ID of a nested Component.	Either Component Reference or Performance LevelSet is required.	0 or more	IDREF
PerformanceLevelSet	PerformanceLevelSet contains subelements that define a spectrum of performance levels. See section PerformanceLevelSet for more information.	Either Component Reference or Performance LevelSet is required	0 or 1	Container

Example:

```
<Component id="comp_sbp4">
    <Title xml:lang="en">Transitions patients effectively within and
across health delivery systems.</Title>
    <Abbreviation xml:lang="en">Transitions patients</Abbreviation>
   <Competency>
.  .  .
   </Competency>
   <Author>Gertrude Stein</Author>
   <Reviewer>Pablo Picasso</Reviewer>
   <Threshold>
.  .  .
   </Threshold>
    <AdditionalInformation>
.  .  .
   </AdditionalInformation>
    <PerformanceLevelSet>
.  .  .
    </PerformanceLevelSet>
   </Component>
```

7.5.1   Competency

Competency contains subelements that reference a competency in a competency framework. These subelements indicate a competency to which the defined components or performance levels apply.

Competency Element Information

Element	Description	Required	Multiplicity	Datatype
Competency	Competency contains subelements that reference a competency in a competency framework.	**Optional**	0 or more	Container
Reference	A reference to a competency object or competency framework. References should occur twice: once to reference a competency object, once to reference the relevant competency framework including the referenced competency object. The Reference element uses the ReferenceType datatype from the MedBiquitous Common Specifications.	Required	2	Container For more information, see [Common].

Example:
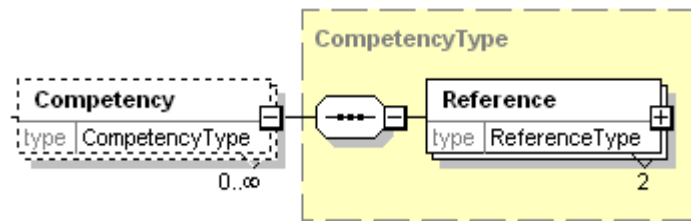
```
<Competency>
    <Reference>
        <rdf:description
about="http://www.example.org/milestone/SBP4.xml"/>
        <rdf:type
rdf:resource="http://ns.medbiq.org/competencyobject/v1/"/>
    </Reference>
    <Reference>
        <rdf:description
about="http://www.example.org/im_milestones.xml"/>
        <rdf:type
rdf:resource="http://ns.medbiq.org/competencyframework/v1/"/>
        <dcterms:format>application/xml</dcterms:format>
    </Reference>
</Competency>
```

7.5.2   Threshold

Threshold contains subelements that define a threshold score for a particular action or decision, such as progression in training or entrustment. For example, a regulatory body may wish to indicate that a score of 2 on this component is required to progress to the second phase of training.

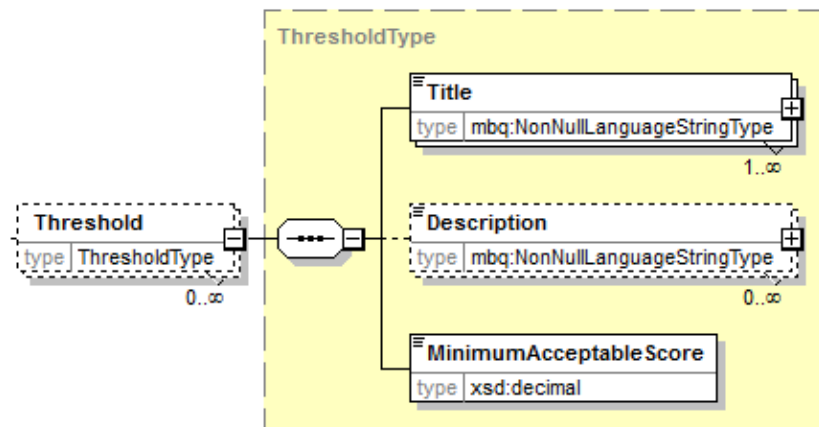| Element	Description	Required	Multiplicity	Datatype
Threshold	Threshold contains subelements that define a threshold score for a particular action or decision, such as progression	Optional	0 or more	Container

	in training or entrustment.			
Title	The title of this threshold. For example, Progression to Phase 2	Required	1 or more	NonNullLanguage StringType For more information, see [Common].
Description	A description of the threshold.	Optional	0 or more	NonNullLanguage StringType For more information, see [Common].
MinimumAcceptableScore	The minimum acceptable score associated with this threshold.	Required	1	Decimal

Example:

```
<Threshold>
   <Title xml:lang="en">Entrustment</Title>
   <Description xml:lang="en">The level of attainment trainees must
demonstrate to be considered eligible for entrustment with regard to this
competency.</Description>
   <MinimumAcceptableScore>4</MinimumAcceptableScore>
</Threshold>
```

7.5.3   AdditionalInformation

Additonal information allows framework developers to include additional information in a performance framework, including background, references, resources, assessment methods, examples, and notes, to name a few. AdditionalInformation may be associated with a Component, Performance level, or Indicator.
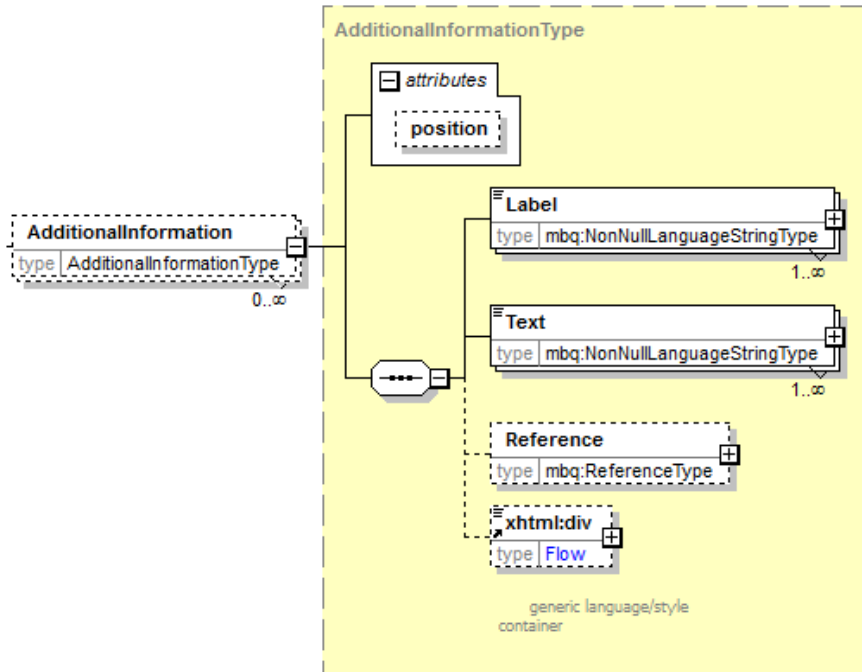
AdditionalInformation Element Information

Element	Description	Required	Multiplicity	Datatype
AdditionalInformation	AdditionalInformation includes subelements that provide additional information about a component, performance level, or indicator. AdditionalInformation has the following attribute: *position* An integer indicating the position of this additional information in relation to other additional information with the same label. Position can be used to order notes, references, etc. Position should be unique within the scope of AdditionalInformation elements with the same label.	**Optional**	0 or more	Container
Label	A label for this additional information. Recommended values are: assessment method, background, example, note, reference, and resource.	Required	1 or more	NonNullLanguageStringType
Text	The text of the additional information.	Required	1 or more	NonNullLanguageStringType For more information, see [Common].

Element	Description	Required	Multiplicity	Datatype
Reference	A reference to an external resource. MedBiquitous uses RDF and DCMI subelements to specify details about references. See section Reference for more information.	Optional	0 or 1	Container
xhtml:div	A div element is a mixed type element referenced from XHTML. The div element can include a mix of text and XHTML tags as specified by the XHTML schema.	Optional	0 or 1	Container For more information, see [XHTML]

Example:

```
    <AdditionalInformation position="1">
       <Label xml:lang="en">Note</Label>
       <Text xml:lang="en">Residents must ensure excellent transitions of care when they are unable to
provide direct care for patients. </Text>
    </AdditionalInformation>
    <AdditionalInformation label="resource">
       <Text>The Joint Commission Transitions of Care Portal</Text>
       <Reference>
          <rdf:Description rdf:about="http://www.jointcommission.org/toc.aspx"/>
          <dcterms:format>text/html</dcterms:format>
       </Reference>
    </AdditionalInformation>
```
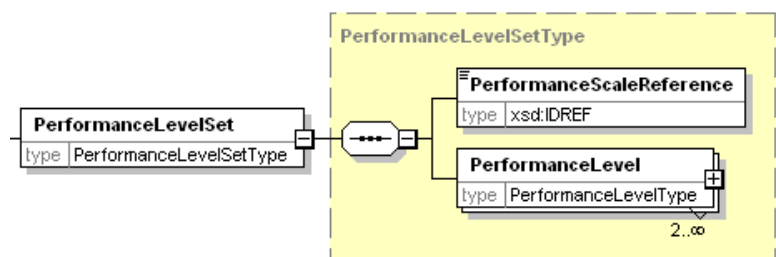
7.5.4   PerformanceLevelSet

PerformanceLevelSet contains subelements that define a spectrum of performance levels. A performance level set may be defined to describe the spectrum of performance for a specific competency, or a performance level set may be defined to be generally applied across competencies.

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PerformanceLevelSet Element Information

Element	Description	Required	Multiplicity	Datatype
PerformanceLevelSet	PerformanceLevelSet contains subelements that define a spectrum of performance levels.	Either a ComponentReference or a PerformanceLevelSet is required.	0 or 1	Container
PerformanceScaleReference	The identifier of a PerformanceScale defined in this document. The PerformanceScaleReference indicates the scale used for this performance level set.	Required	1	IDREF
PerformanceLevel	PerformanceLevel contains subelements that describe a single level of performance within this performance level set. See section PerformanceLevel for more information.	Required	2 or more	Container

Example:

```
<PerformanceLevelSet>
    <PerformanceScaleReference>scale_1to5</PerformanceScaleReference>
        <PerformanceLevel>
.  .  .
        </PerformanceLevel>
        <PerformanceLevel>
.  .  .
        </PerformanceLevel>
        <PerformanceLevel>
.  .  .
        </PerformanceLevel>
    </PerformanceLevelSet>
```

7.5.4.1   PerformanceLevel

The subelements of PerformanceLevel define a single level of performance in detail. There are multiple performance levels in a set. Together, they create a scale of performance with behavioral measures.

Generated by XMLSpy   www.altova.com
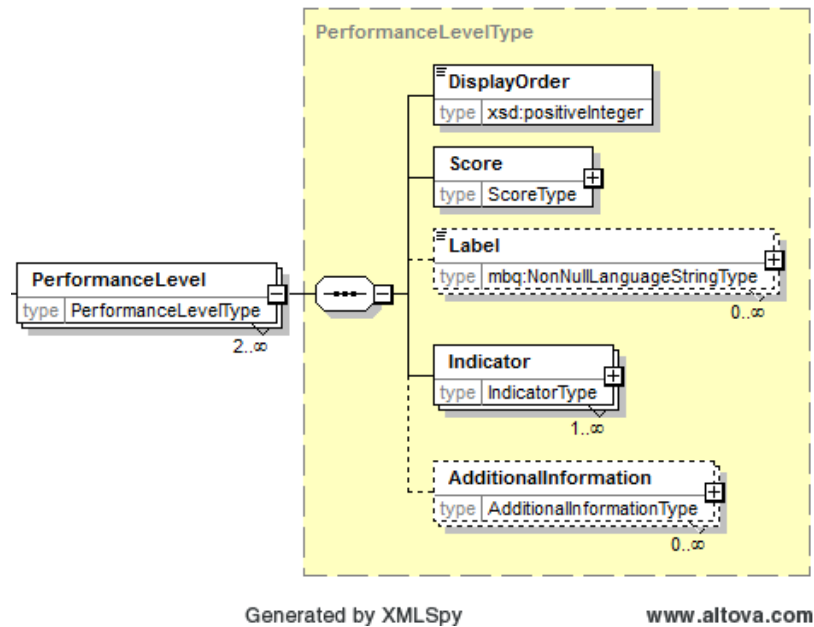
PerformanceLevel Element Information

Element	Description	Required	Multiplicity	Datatype
PerformanceLevel	PerformanceLevel contains subelements that describe a single level of performance within this performance level set.	Required	2 or more	Container
DisplayOrder	A positive integer indicating the order of display for this performance level in relation to other performance levels in the performance level set.	Required	1	positiveInteger

Element	Description	Required	Multiplicity	Datatype
Score	Score contains subelements that describe either a single score value or a range of values associated with this performance level. See section Score for more information.	Required	1	Container
Label	A label associated with this performance level. For example, Aspirational.	Optional	0 or more	NonNullLanguage StringType For more information, see [Common].
Indicator	Indicator contains subelements that describe an indicator or behavioral marker associated with this performance level. See section Indicator for more information.	Required	1 or more	Container
AdditionalIInformation	Additonal information, such as background, references., resources, etc. about this performance level. See section AdditionalInformation for more information.	Optional	0 or more	Container

Example:

```
<PerformanceLevel>
    <DisplayOrder>1</DisplayOrder>
    <Score>
      <SingleValue>1</SingleValue>
  </Score>
    <Label xml:lang="en">Critical Deficiencies</Label>
    <Indicator id="sbp4_1_1">
    . . .
    </Indicator>
    <Indicator id="sbp4_1_2">
    . . .
    </Indicator>
</PerformanceLevel>
```

7.5.4.2   Score

Score contains subelements that describe either a single score value or a range of values associated with a performance level.
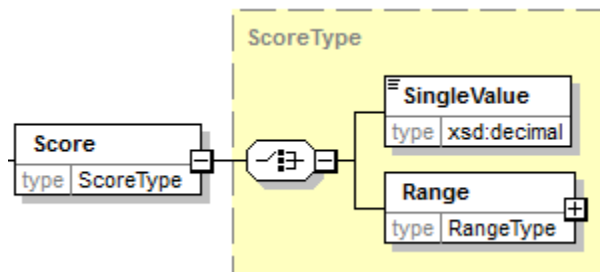
Score Element Information

Element	Description	Required	Multiplicity	Datatype
Score	Score contains subelements that describe either a single score value or a range of values associated with this performance level.	Required	1	Container
SingleValue	An integer indicating a single score associated with this performance level.	Either SingleValue or Range is required	0 or 1	Decimal

Element	Description	Required	Multiplicity	Datatype
Range	Range contains subelements that describe a range of scores associated with this performance level. See section Range for more information.	Either SingleValue or Range is required	0 or 1	Container

Example1 :

```
<Score>
    <SingleValue>4</SingleValue>
</Score>
```

Example 2:

```
<Score>
    <Range>
        <MinScore>1</MinScore>
        <MaxScore>3</MaxScore>
    </Range>
</Score>
```

7.5.4.3   Range

Range contains subelements that describe a range of scores associated with this performance level.

Range Element Information

Element	Description	Required	Multiplicity	Datatype
Range	Range contains subelements that describe a range of scores associated with this performance level.	Either SingleValue or Range is required	0 or 1	Container
MinScore	The minimum score associated with this performance level. A MinScore may be lower or higher than a MaxScore depending on how the PerformanceScale is defined.	Required	1	Decimal
MaxScore	The maximum score associated with this performance level. A MaxScore may be higher or lower than a MinScore depending on how the PerformanceScale is defined.	Required	1	Decimal

Example:

```
<Range>
        <MinScore>1</MinScore>
        <MaxScore>3</MaxScore>
</Range>
```

7.5.4.4   Indicator

Indicator contains subelements that describe an indicator or behavioral marker associated with this performance level.

Indicator Element Information

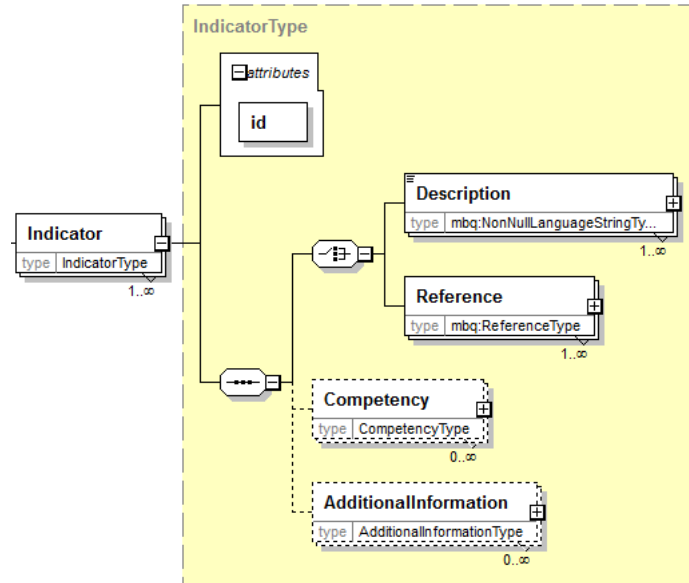| Element	Description	Required	Multiplicity	Datatype
Indicator	Indicator contains subelements that describe an indicator or behavioral marker associated with this performance level. Indicator has the following attribute: *id* A unique identifier for this indicator. The identifier must be unique within the scope of this report. Use of the *id* attribute is required.	Required	1 or more	Container

Element	Description	Required	Multiplicity	Datatype
Description	A description of the indicator or behavioral marker associated with this performance level.	Either Reference or Description is required	1 or more	NonNullLanguage StringType For more information, see [Common].
Reference	A reference to an indicator from another document. The Reference element uses the ReferenceType datatype from the MedBiquitous Common Specifications.	Either Reference or Description is required	0 or more	Container For more information, see [Common].
Competency	Competency contains subelements that reference a competency in a competency framework. See section Competency for more information.	Optional	0 or more	Container
AdditionalInformation	Additional information, such as background, references, resources, etc. about this indicator. See section AdditionalInformation for more information.	Optional	0 or more	Container

Example:

```
<Indicator id="sbp4_1_1">
   <Description>Disregards need for communication at time of
transition</Description>
   <Competency>
```

```
      . . .
      </Competency>
      <AdditionalInformation>
      . . .
      </AdditionalInformation>
</Indicator>
<Indicator id="sbp4_1_2">
      <Reference>
            <rdf:description
about="http://www.example.org/im_milestones.xml#spb412"/>
            <rdf:type
rdf:resource="http://ns.medbiq.org/performanceframework/v1/"/>
            <dcterms:format>application/xml</dcterms:format>
        </Reference>
</Indicator>
```

8   Sample XML Documents

8.1   Sample Document in one language

```xml
<?xml version="1.0" encoding="UTF-8"?>
<PerformanceFramework xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance"
xsi:schemaLocation="http://ns.medbiq.org/performanceframework/v1/
performanceframework.xsd"
xmlns="http://ns.medbiq.org/performanceframework/v1/"
xmlns:lom="http://ltsc.ieee.org/xsd/LOM"
xmlns:cf="http://ns.medbiq.org/competencyframework/v1/"
xmlns:cobj="http://ns.medbiq.org/competencyobject/v1/"
xmlns:xhtml="http://www.w3.org/1999/xhtml"
xmlns:dcterms="http://purl.org/dc/terms/"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
  <lom:lom>
    <lom:general>
      <lom:identifier>
         <lom:catalog>URI</lom:catalog>
         <lom:entry>
http://www.example.com/internal_medicine_milestones_2013_us
         </lom:entry>
      </lom:identifier>
      <lom:description>
         <lom:string>The framework is designed only for use in evaluation
of resident physicians in the context of their participation in accredited
residency programs. The framework is for the assessment of the development
of the resident physician. It does not represent the entirety of
physician competency.</lom:string>
      </lom:description>
    </lom:general>
    <lom:lifeCycle>
      <lom:status>
         <lom:source>LOMv1.0</lom:source>
         <lom:value>final</lom:value>
      </lom:status>
      <lom:contribute>
         <lom:role>
            <lom:source>LOMv1.0</lom:source>
            <lom:value>publisher</lom:value>
         </lom:role>
         <lom:entity>BEGIN:VCARD\nFN:Fictional Board of Internal
MedicineEND:VCARD</lom:entity>
      </lom:contribute>
```

```
        </lom:lifeCycle>
    </lom:lom>
    <EffectiveDate>2013-01-01</EffectiveDate>
    <SupportingInformation>
        <Reference>
            <rdf:Description
rdf:about="http://www.example.org/performanceguide2013.pdf"/>
            <dcterms:format>application/pdf</dcterms:format>
        </Reference>
     </SupportingInformation>
     <SupportingInformation>
        <xhtml:div>
            <xhtml:h1>Foreword</xhtml:h1>
            <xhtml:p>
The College is committed to fostering the <xhtml:strong>highest
standards</xhtml:strong> of surgical care and professional
behaviour. Being a surgeon carries a responsibility for participation in
lifelong learning, and a
willingness to monitor performance in the workplace.
            </xhtml:p>
            <xhtml:p>
To aid these processes, and to complement the existing program, work was
undertaken by the <xhtml:em>
Assessment Steering Committee</xhtml:em> during 2010 and 2011, under the
governance of the
<xhtml:em>Professional Development and Standards Board</xhtml:em>.
            </xhtml:p>
        </xhtml:div>
     </SupportingInformation>
    <PerformanceScale id="scale_1to5">
       <LeastCompetent>1</LeastCompetent>
       <MostCompetent>5</MostCompetent>
    </PerformanceScale>
    <PerformanceScale id="scale_1to2">
       <LeastCompetent>1</LeastCompetent>
       <MostCompetent>2</MostCompetent>
    </PerformanceScale>
    <Component id="comp_sbp4">
        <Title>Transitions patients effectively within and across health
delivery systems.</Title>
        <Abbreviation>Transitions patients</Abbreviation>
     <Competency>
        <Reference>
            <rdf:description
about="http://www.example.org/milestone/SBP4.xml"/>
            <rdf:type
rdf:resource="http://ns.medbiq.org/competencyobject/v1/"/>
        </Reference>
        <Reference>
```

```
        <rdf:description
about="http://www.example.org/im_milestones.xml"/>
        <rdf:type
rdf:resource="http://ns.medbiq.org/competencyframework/v1/"/>
        <dcterms:format>application/xml</dcterms:format>
      </Reference>
    </Competency>
    <Author>Gertrude Stein</Author>
    <Reviewer>Pablo Picasso</Reviewer>
     <Threshold>
       <Title>Entrustment</Title>
       <Description>The level of attainment trainees must demonstrate to be
considered eligible for entrustment with regard to this
competency.</Description>
       <MinimumAcceptableScore>4</MinimumAcceptableScore>
     </Threshold>
     <AdditionalInformation position="1">
       <Label>Note</Label>
       <Text>Residents must ensure excellent transitions of care when they
are unable to provide direct dare for patients. </Text>
    </AdditionalInformation>
    <AdditionalInformation>
       <Label>Resource</Label>
       <Text>The Joint Comission Transitions of Care Portal</Text>
       <Reference>
         <rdf:Description
rdf:about="http://www.jointcommission.org/toc.aspx"/>
         <dcterms:format>text/html</dcterms:format>
       </Reference>
    </AdditionalInformation>
     <PerformanceLevelSet>
       <PerformanceScaleReference>scale_1to5</PerformanceScaleReference>
        <PerformanceLevel>
          <DisplayOrder>1</DisplayOrder>
          <Score>
            <SingleValue>1</SingleValue>
         </Score>
          <Label>Critical Deficiencies</Label>
          <Indicator id="sbp4_1_1">
         <Description>Disregards need for
                        communication at
                        time of transition</Description>
        </Indicator>
        <Indicator id="sbp4_1_2">
           <Description>Does not respond to
                        requests of
                        caregivers in other
                        delivery systems</Description>
        </Indicator>
```

```
    </PerformanceLevel>
    <PerformanceLevel>
      <DisplayOrder>2</DisplayOrder>
      <Score>
        <SingleValue>2</SingleValue>
    </Score>
      <Indicator id="sbp4_2_1">
        <Description>Inconsistently utilizes
                    available resources to
                    coordinate and ensure safe
                    and effective patient care
                    within and across delivery
                    systems</Description>
    </Indicator>
    <Indicator id="sbp4_2_2">
        <Description>Written and verbal care
                    plans during times of
                    transition are incomplete
                    or absent</Description>
    </Indicator>
    <Indicator id="sbp4_2_3">
          <Description> Inefficient transitions of
                    care lead to unnecessary
                    expense or risk to a patient
                    (e.g. duplication of tests
                    readmission</Description>
    </Indicator>
    </PerformanceLevel>
    <PerformanceLevel>
      <DisplayOrder>3</DisplayOrder>
      <Score>
        <SingleValue>3</SingleValue>
    </Score>
    <Indicator id="sbp4_3_1">
          <Description>Recognizes the importance of
                    communication during times
                    of transition</Description>
    </Indicator>
    <Indicator id="sbp4_3_2">
          <Description>Communication with future
                    caregivers is present but with
                    lapses in pertinent or timely
                    information</Description>
    </Indicator>
    </PerformanceLevel>
    <PerformanceLevel>
      <DisplayOrder>4</DisplayOrder>
      <Score>
        <SingleValue>4</SingleValue>
```

```
          </Score>
            <Label>Ready for unsupervised practice</Label>
            <Indicator id="sbp4_4_1">
                                              <Description>Appropriately
    utilizes available
                              resources to coordinate care
                              and ensures safe and effective
                              patient care within and across
                              delivery systems</Description>
          </Indicator>
          <Indicator id="sbp4_4_2">
                  <Description>Proactively communicates with
                              past and future care givers to
                              ensure continuity of care</Description>
          </Indicator>
          </PerformanceLevel>
          <PerformanceLevel>
            <DisplayOrder>5</DisplayOrder>
            <Score>
              <SingleValue>5</SingleValue>
          </Score>
            <Label>Aspirational</Label>
            <Indicator id="sbp4_5_1">
              <Description>Coordinates care within and
                              across health delivery systems
                              to optimize patient safety,
                              increase efficiency and ensure
                              high quality patient outcomes</Description>
          </Indicator>
          <Indicator id="sbp4_5_2">
                  <Description>Anticipates needs of patient,
                              caregivers and future care
                              providers and takes
                              appropriate steps to address
                              those needs</Description>
          </Indicator>
          <Indicator id="sbp4_5_3">
                  <Description>Anticipates needs of patient,
                              caregivers and future care
                              providers and takes
                              appropriate steps to address
                              those needs</Description>
          </Indicator>
          <Indicator id="sbp4_5_4">
                  <Description>Role models and teaches
                              effective transitions of care</Description>
          </Indicator>
          </PerformanceLevel>
        </PerformanceLevelSet>
```

```
    </Component>
  </PerformanceFramework>
```

8.2   Sample Document in two languages

```xml
<?xml version="1.0" encoding="UTF-8"?>
<PerformanceFramework xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance"
xsi:schemaLocation="http://ns.medbiq.org/performanceframework/v1/
performanceframework.xsd"
xmlns="http://ns.medbiq.org/performanceframework/v1/"
xmlns:lom="http://ltsc.ieee.org/xsd/LOM"
xmlns:cf="http://ns.medbiq.org/competencyframework/v1/"
xmlns:cobj="http://ns.medbiq.org/competencyobject/v1/"
xmlns:xhtml="http://www.w3.org/1999/xhtml"
xmlns:dcterms="http://purl.org/dc/terms/"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
  <lom:lom>
    <lom:general>
      <lom:identifier>
        <lom:catalog>URI</lom:catalog>

   <lom:entry>http://www.example.com/multilingual_framework</lom:entry>
      </lom:identifier>
      <lom:description>
        <lom:string>The framework is designed to evaluate trainees. It is
represented in both French and English.</lom:string>
      </lom:description>
    </lom:general>
    <lom:lifeCycle>
      <lom:status>
        <lom:source>LOMv1.0</lom:source>
        <lom:value>final</lom:value>
      </lom:status>
      <lom:contribute>
        <lom:role>
           <lom:source>LOMv1.0</lom:source>
           <lom:value>publisher</lom:value>
        </lom:role>
        <lom:entity>BEGIN:VCARD\nFN:Fictional Board of
MedicineEND:VCARD</lom:entity>
      </lom:contribute>
    </lom:lifeCycle>
  </lom:lom>
  <EffectiveDate>2013-01-01</EffectiveDate>
  <SupportingInformation>
      <Reference>
        <rdf:Description
rdf:about="http://www.example.org/performanceguide2013.pdf"/>
        <dcterms:format>application/pdf</dcterms:format>
      </Reference>
   </SupportingInformation>
```

```
   <SupportingInformation>
      <xhtml:div lang="en">
         <xhtml:h1>Foreword</xhtml:h1>
         <xhtml:p>
The College is committed to fostering the <xhtml:strong>highest
standards</xhtml:strong> of surgical care and professional
behaviour. Being a surgeon carries a responsibility for participation in
lifelong learning, and a
willingness to monitor performance in the workplace.
         </xhtml:p>
      </xhtml:div>
   </SupportingInformation>
      <SupportingInformation>
      <xhtml:div lang="fr">
         <xhtml:h1>Foreword</xhtml:h1>
         <xhtml:p>
Le Collège s'est engagé à promouvoir les normes <xhtml:strong> les plus
élevées</xhtml:strong> de soins chirurgicaux et professionnel
comportement. Être un chirurgien exerce une responsabilité pour la
participation à la formation continue, et une
volonté de surveiller le rendement en milieu de travail.
         </xhtml:p>
      </xhtml:div>
   </SupportingInformation>
  <PerformanceScale id="scale_1to5">
    <LeastCompetent>1</LeastCompetent>
    <MostCompetent>5</MostCompetent>
  </PerformanceScale>
  <PerformanceScale id="scale_1to2">
    <LeastCompetent>1</LeastCompetent>
    <MostCompetent>2</MostCompetent>
  </PerformanceScale>
  <Component id="comp_sbp4">
     <Title xml:lang="en">Transitions patients effectively within and
across health delivery systems.</Title>
     <Title xml:lang="fr">Transitions patients efficace au sein des
systèmes de prestation de santé.</Title>
     <Abbreviation xml:lang="en">Transitions patients</Abbreviation>
     <Abbreviation xml:lang="fr">Transitions patients</Abbreviation>
   <Competency>
     <Reference>
       <rdf:description
about="http://www.example.org/milestone/SBP4.xml"/>
       <rdf:type
rdf:resource="http://ns.medbiq.org/competencyobject/v1/"/>
     </Reference>
     <Reference>
       <rdf:description
about="http://www.example.org/im_milestones.xml"/>
```

```
        <rdf:type
rdf:resource="http://ns.medbiq.org/competencyframework/v1/"/>
        <dcterms:format>application/xml</dcterms:format>
      </Reference>
    </Competency>
    <Author>Gertrude Stein</Author>
    <Reviewer>Pablo Picasso</Reviewer>
     <Threshold>
      <Title xml:lang="en">Entrustment</Title>
      <Title xml:lang="fr">Charger</Title>
      <Description xml:lang="en">The level of attainment trainees must
demonstrate to be considered eligible for entrustment with regard to this
competency.</Description>
      <Description xml:lang="fr">Le niveau des stagiaires à atteindre doit
démontrer à être admissible à charger à l'égard de cette
compétence.</Description>
      <MinimumAcceptableScore>4</MinimumAcceptableScore>
    </Threshold>
    <AdditionalInformation position="1">
      <Label xml:lang="en">Note</Label>
      <Label xml:lang="fr">Remarque</Label>
      <Text xml:lang="en">Residents must ensure excellent transitions of
care when they are unable to provide direct dare for patients. </Text>
      <Text xml:lang="fr">Les résidents doivent assurer une excellente
transition des soins quand ils sont incapables de fournir osent directe
pour les patients.</Text>
    </AdditionalInformation>
     <PerformanceLevelSet>
      <PerformanceScaleReference>scale_1to5</PerformanceScaleReference>
        <PerformanceLevel>
          <DisplayOrder>1</DisplayOrder>
          <Score>
            <SingleValue>1</SingleValue>
          </Score>
           <Label xml:lang="en">Critical Deficiencies</Label>
           <Label xml:lang="fr">Lacunes critiques</Label>
           <Indicator id="sbp4_1_1">
          <Description xml:lang="en">Disregards need for
                            communication at
                            time of transition</Description>
            <Description xml:lang="fr">Ignore besoin de communication au
moment de la transition</Description>
          </Indicator>
          <Indicator id="sbp4_1_2">
              <Description xml:lang="en">Does not respond to
                            requests of
                            caregivers in other
                            delivery systems</Description>
```

```
                    <Description xml:lang="fr">Ne pas répondre aux demandes
    des soignants dans d'autres systèmes de livraison</Description>
            </Indicator>
          </PerformanceLevel>
          <PerformanceLevel>
            <DisplayOrder>5</DisplayOrder>
            <Score>
              <SingleValue>5</SingleValue>
          </Score>
            <Label xml:lang="en">Aspirational</Label>
            <Label xml:lang="fr">Ambitieux</Label>
            <Indicator id="sbp4_5_1">
              <Description xml:lang="en">Coordinates care within and
                             across health delivery systems
                             to optimize patient safety,
                             increase efficiency and ensure
                             high quality patient outcomes</Description>
                  <Description xml:lang="fr">Coordonner les soins à
    l'intérieur et à travers les systèmes de prestation de santé afin
    d'optimiser la sécurité des patients, accroître l'efficacité et d'assurer
    des résultats de haute qualité pour les patients</Description>
            </Indicator>
            <Indicator id="sbp4_5_2">
                  <Description xml:lang="en">Anticipates needs of patient,
                             caregivers and future care
                             providers and takes
                             appropriate steps to address
                             those needs</Description>
                      <Description xml:lang="fr">Anticipe les besoins de
    patients, les soignants et les futurs fournisseurs de soins et prend les
    mesures appropriées pour répondre à ces besoins</Description>
            </Indicator>
          </PerformanceLevel>
        </PerformanceLevelSet>
      </Component>
    </PerformanceFramework>
```

9   References

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