**SIF Data Model Extension Proposal Template**

*This document describes the LearningStandardAssociation ("LSA") object which allows the association between any piece of content or SIF object to be associated with a LearningStandardItem ("LSI") object or a LearningStandardDocument ('LSD") object.*

*It is designed to be a “living document” and contains two “status tracking” sections which should be maintained and updated as the change approval process for this extension evolves.*

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| --- | --- | --- | --- |
| Extension Proposal Version Control | | | |
| Version | Date: | Author/Organization: | Comments |
| 1.0 | 6/5/11 | Alex Jackl, Wayne Ostler, Vince Paredes, Jill Abbot | This object proposal is the result of dozens of conversations about how to best handle the LearningStandard references in objects. It is a starting point. |
| 1.1 | 6/30/11 | Alex Jackl (Choice Solutions) | Put the proposal into at least initial object proposal format, integrated some more content |
| 1.2 | 12/02/11 | Ron Kleinman (SIF) | Corrected and added sections, added comments |
| 1.3 | 01/03/12 | Alex Jackl (Choice) | Filled in sections and responded to comments |
| 1.4 | 01/29/12 | Alex Jackl (Choice) | Incorporated latest comments and finished XML example. |

# **1 Identification**

|  |  |
| --- | --- |
| Proposed Extension Name | Learning Association |
| Submitted by (Project Team or Individual) | Teaching and Learning team |
| Date of initial submittal | 6/30/2011 |
|  |  |
| What is the base SIF Data Model release? | V2.6 |
| What is the base SIF Infrastructure release? | V2.5 Infrastructure + |
|  |  |
| What existing SIF object(s) if any will be affected? | None |
| What is the name of any new object(s)? | LearningStandardAssociation |
|  |  |
| DM Extension ID (to be assigned when submitted) |  |

**Status Tracker Phase 1: Documentation and Approval**

*The steps in this initial phase document the proposed extensions to the SIF Data Model to the point where they can be reviewed and approved by the Tech Board as deserving of further effort. Completion of the detailed design and evaluation of the dependencies and migration impacts are left until Phase II.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Template Section** | **Draft Completed**  **(Owner / Date)** | **Reviewed (R) or Accepted (A)**  **(Owner / Date)** | **Comments** |
| Rationale and Business Case | Champion: *Alex Jackl*  **Date: 06/30/2011** | Tech Board (A)  **Date: 07/12/2011** | Assign to relevant Project Team(s): *Teaching and Learning* |
| Use Case(s) | Champion / Project Team: *T&L*  **Date:12/02/2011** | Project Team (R)  **Date: 12/02/2011** |  |
| Proposal approval | Project Team:*T&L*  **Date: 01/03/2012** | Tech Board (A)  **Date: 01/11/2012 (Proposed)** | Placed in Fast Track or Object Pipeline |

# **2. Proposal**

## 2.1 Rationale for Extension

*Explain the rationale for the proposed extension to the SIF Data Model:*

* *What are the problems / limitations to be addressed?*
* *What is the additional information required?*

In the current education environment many objects and pieces of information are tied to Learning Standards, particularly Assessment results and Formative instruction Outputs and Instructional Content. As different sources might actually tie content to learning standards in different ways and those relationships may change over time and with varying viewpoints we need a way to represent that and provide context. It is standard SIF design practice to do this with an Association object (like StudentSchoolEnrollment for instance) .

### Timeline

It is hoped that this extension will be ready for US SIF Data Model Specification v2.6. It is also a good candidate for non-US data model releases as well.

## 2.2 Business Case

*Provide a specific example of an example where the additional information defined in this proposal will be used in one or more educational processes*

*It should focus exclusively on the business problem to be solved and avoid proposing solutions.*

As SIF begins to be used more and more in the Instruction, Curriculum, and Assessment space (Teaching and Learning- "T&L") there will be more and more call for Learning Standards to be associated with T&L objects and we have not even begun to understand what all those objects are or will be.

Some of our current SIF objects embed Learning Standards in them but more and more there will be multiple authorities (content publishers, LMS systems, teachers' tools, state databases, non-profit education institutions, just to name a few) determining linkages to learning standards. In order to support the multiple association interpretations from multiple sources authorities and T&L applications will need a way to communicate these "learning standard associations" over the wire to other applications and teacher and student tools.

This solution will also need to allow different authorities to associate different learning standards to the same content.

This issue will become more and more prevalent as more and more learning standard outcomes and content is used in educational systems.

# **3. Use Cases**

*The proposal champion or the assigned project team must provide one or more high-level use cases illustrating the interactions between “actors” (typically applications) that become possible if this proposal is adopted and successfully implemented. Use one copy of the form below for each.*

## 3.1 LearningStandardAssociation Use Case 1:

|  |  |
| --- | --- |
| **Summary Description** | Content provider "Awesome Lesson Plans" executes dozens of associations between their awesome lesson plans (which I will describe as "Curriculum Objects") and the state's learning standards. They then publish those out so the new Learning Management System (the "LMS") the District (District "Delta") purchased can provide them to educators assigned to teach certain standards. |
| **Actors and types:**  **One or more of:**   * **Requestor** * **Provider** * **Publisher** * **Subscriber** | 1. State Data Warehouse ("SLDS")  - Publisher (of LSI and LSD objects)  2. Content provider "Awesome Lesson Plans"  - Publisher (of LSA and Curriculum objects)  - Subscriber (to LSI objects)  3. Learning Management System ("LMS")  - Subscriber (to LSA objects and Curriculum objects)  4. Lesson Plan District Cops ("LPDC")  - Subscriber (to Curriculum objects)  - Publisher (of LSD, LSI, and LSA objects) |
| **Preconditions** | 1. Appropriate SIF Zones and Zone Architecture and Topology exist and are understood.  2. State Data Warehouse is set up to publish "official state standards" and it is accessible in a "state" Zone.  3. Awesome Lesson Plans and LMS both can access the Delta District Zone and the "State" Zone. |
| **Main Sequence of Events / Action Steps** | 1. [SIF] Awesome Lesson Plans subscribes to LSI and LSD objects in State Zone.  2. [SIF] SLDS publishes LSI and LSD objects.  3. [SIF] Awesome Lesson Plan receives LSI and LSD objects.  4. Awesome Lesson Plan does its internal process to link Learning Standards to content it intends to publish.  5. [SIF] Awesome Lesson Plan publishes a Curriculum object and a LSA Object that ties that Curriculum to a Learning Standard.  6. [SIF] LMS receives the Curriculum objects and the LSA objects  7. Internally LMS makes Curriculum objects available based on any standards they are associated with from the LSA objects. |
| **Alternative Sequence of Events / Action Steps** | 1, [SIF] Lesson Plan District Cops ("LPDC") database subscribes to Curriculum objects.  2. [SIF] LPDC receives Curriculum objects.  3. LPDC application internally associates the Curriculum objects with its own LPDC Standard!  4. [SIF] LPDC publishes LSD, LSI, and LSA objects.  5. [SIF] LMS receives the LSD, LSI, and LSA objects.  6. LMS makes Curriculum objects available based on ANY standards they are associated with from the LSA objects from both LPDC and Awesome Lesson Plans. |
| **Post Conditions** | None |
| **SIF Mandatory Objects** | LearningStandardAssociation, LearningStandardDocument, LearningStandardItem, Curriculum |
| **SIF Optional Objects** | none |
| **Open Issues** | 1, Agents need to be registered in all appropriate Zones |

**Status Tracker Phase 2: Execution of Proposed Changes**

*At this point the initial Data Model extension proposal has been accepted by the Tech Board and is either in the object pipeline, or being fast-tracked. The following sections have to be completed and (where indicated) reviewed and approved before this proposal can be reflected in the SIF specification.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Template Section** | **Draft Completed**  **(Owner / Date)** | **Reviewed (R) or Accepted (A)**  **(Owner / Date)** | **Comments** |
| Dependencies | Staff  **Date: 01/20/2012** | Internal Project Team review |  |
| Object Definition Table | Project Team  **Date: 01/20/2012** | Tech Board (R)  **Date:** |  |
| Migration Plan | Project Team  **Date: 01/20/2012** | Tech Board (A)  **Date:** | TB Approval is part of SIF Release cycle |
| Sample XML | Staff / Project Team  **Date: 01/20/2012** | Optional | Generally provided as part of published specification |

# **4. Impact Assessment**

*This section is the first to consider the actual implementation which will address the use cases previously identified. It requires assessing the impacts to both the existing objects and infrastructure, and to previously deployed applications. It would normally be produced by the Project Team (new or existing) assigned to this data model extension by the Tech Board at the time this proposal was approved.*

## 4.1 External Object Dependencies and Relation Map

*Identify any dependencies on existing XML entities in other SIF objects*

|  |  |  |
| --- | --- | --- |
| **Proposed new Element or Attribute** | **Object & XML Entity dependency**  **(Element, Attribute, Type)** | **Relationship / Reason** |
| LearningStandardAssociation | LearningStandardItem | The new object will contain a RefID to this object. |
| LearningStandardAssociation | LearningStandardDocument | The new object will contain a RefID to this object. |

## 4.2 Infrastructure / International Dependencies and Relation Map

*Identify any dependencies on infrastructure technologies and / or deliverables from the International Technical Board (ITB) which are planned for a future release.*

In this proposal we are suggesting that we leave the Learning Standards links that are in the primary payload objects now, and relate to them as the intended Learning Standards Target for that object.  If new objects are created where the author's intended target is critical or important you would include Learning Standard item in the payload of the document as a reference in the standard manner.

We would also discourage people from using the Learning Standards element structure in the education filters structure in SIF\_Metadata.

|  |  |  |
| --- | --- | --- |
| **Proposed new Object, Element or Attribute** | **Infrastructure or International technology dependency** | **Specifics of dependency** |
| n/a | n/a | n/a |

# **5 Detailed Design**

This proposal defines an object that can link 1 to "n" Learning Standard objects (either LSItems or LSDocuments) with 1 to "n" "Target Objects". "Target Objects" could be any SIF Object like an Assessment Item or an Activity or a Lesson or a Student Result Set.

This also will help clarify some of the confusion caused by some objects having LearningStandards embedded in them and others having it only referenced in the EducationFilters structure in SIF\_Metadata.

*Place the detailed element by element, attribute by attribute breakdown of the Data Model Extension here. This work is normally done by members of the assigned Project Team.*

*The possible values of the “Char” column include*

*One of the following primary (and mutually exclusive) characteristics:*

* ***M – Mandatory****. Item must appear in every Add Event and, where not excluded in a conditional Request, in every Response message for the object*
* ***Q – ReQuired****. Item must either appear in an Add Event or eventually be included in a Change Event, and once added is returned in all corresponding queries.*
* ***S – Supported****. Item may or may not appear in any message relating to the object. However if its value is supplied / available to the sender, the item is provided in Event and Response messages as if it were Mandatory.*
* ***O – Optional****. Item may or may not appear in any message relating to the object. It need not be supported by the sender*

Plus one or more of the following characteristics if applicable:

* ***C******– Conditional.*** *Item is treated as the accompanying primary characteristic if the specified conditions are satisfied*
* ***I –******Immutable.*** *Item value cannot be changed once supplied.*
* ***U –******Unique.*** *Item value is unique from all other objects containing that item (ex: RefId)*
* ***N –******Non-Queryable****. Item is often calculated (ex: an aggregate), and can’t be used as a search key in a conditional Request.*

Plus the following characteristic if applicable:

* ***R ­– Repeatable.*** *Item may appear more than one time.*

*The “type” of each item is either an XML type (ex: integer) or a named SIF Global Type.*

*XML Facets can help to further define the value of an item. These can include length, range, and per-type value restrictions. They should be specified if known.*

*Fill out a separate copy of the following table for each affected new or existing SIF object.*

## 5.1 Object Name: LearningStandardAssociation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Element or**  **@Attribute Name** | **Char** | **Type** | **Description** | **Other Comments** |
| @RefId | MIU | GUID | The RefId of the LSAssociation object. |  |
| LearningStandards | M | List | A list of the Learning standard or standards that are part of this association. |  |
| LearningStandards/LearningStandard | MR | String | Element description for the Learning Standard reference |  |
| LearningStandards/LearningStandard /@Type | MI | SIF Object Name | Would declare whether the this element structure represented a LearningStandardItem or a LearningStandardDocument |  |
| LearningStandards/LearningStandard /@RefId | MIU | GUID | The RefId for the LearningStandardItem |  |
| TargetObjects | M | [List](http://specification.sifinfo.org/Implementation/2.4/DataModel.html#List) | A list of the target objects of the association. |  |
| TargetObjects/TargetObject | MR | String | At least one target for the learning standard linkage |  |
| TargetObjects/TargetObject/@Type | MI | SIF Object Name | (it would have the object type- for instance AssessmentItem or LearningResource |  |
| TargetObjects/TargetObject/@SIF\_RefId | MIU | GUID | The RefId for the target object |  |
| StartDate | M | Date | (of the association) |  |
| EndDate | O | Date | (of the association) |  |
| AuthoritativeSource | M | String | (body or organization creating this association) |  |
| Creator | M | String | Name of the Creator of the relationship |  |
| Creator/@Type | O | SIF Object Name | The object type of the object representing the Creator. |  |
| Creator/@SIF\_RefID | OIU | GUID | RefID of SIF object representing the creator if such exists |  |
| CreationDate | O | Date | (of the relationship) |  |
| SIF\_Metadata | O | SIF\_Metadata |  |  |
| SIF\_ExtendedElements | O | SIF\_ExtendedElements |  |  |

# **6 Migration Plan (for proposed changes to existing objects only)**

**Migration Plan:**

*Using the above techniques or alternative ones, specify the recommended series of incremental component upgrades or deployments (of application, agent or ZIS) which must be performed before the data model changes introduced by this proposal can be successfully incorporated into an existing SIF Zone.*

This is a new object thus no migration is necessary.

|  |  |  |
| --- | --- | --- |
| **Component Replaced** | **Increased Functionality (if any)** | **Effect on Legacy components (if any)** |
| n/a | n/a | n/a |

# **7 Issues**

*List any issues surrounding this proposal which the reviewers or approvers may need to consider.*

## 7.1 Dealing with multiple ways LSI has been used

Some objects now have LearningStandards in the body of their structure. SIF\_Metadata has a LearningStandards structure. We will need to write some clarifying best practice documentation so people use this in a standardized way. This is not unique to this new object but it is necessary for this object. On the other hand this object will clarify that question into the future.

# **8 XML Example(s)**

*One or more examples of XML instances representing the items in the proposed extension should be placed here, as part of work done during the detailed design process.*

<SIF\_Message Version="2.6" xmlns="http://www.sifinfo.org/infrastructure/2.x">

<SIF\_Response>

<SIF\_Header>

<SIF\_MsgId>FAE9D90A38F84B729C92F868CB63C9F3</SIF\_MsgId>

<SIF\_Timestamp>2012-01-21T08:23:26-05:00</SIF\_Timestamp>

<SIF\_SourceId>XXXX Agent</SIF\_SourceId>

<SIF\_DestinationId>STATE</SIF\_DestinationId>

</SIF\_Header>

<SIF\_RequestMsgId>EB79C3D1FF1341D785138B704A511SED</SIF\_RequestMsgId>

<SIF\_PacketNumber>1</SIF\_PacketNumber>

<SIF\_MorePackets>No</SIF\_MorePackets>

<SIF\_ObjectData>

<LearningStandardAssociation RefId="F260716384746B387459000F84717C00">

<LearningStandards>

<LearningStandard

Type="LearningStandardItem"

SIF\_RefID="C78A5F260716384746B387459000F84717C00">

Child Shall Be Able to Add Integers

</LearningStandard>

<LearningStandard

Type="LearningStandardItem"

SIF\_RefID="F48457A260716384746B387459708F84717C00">

Child will be able to Identify Primes

</LearningStandard>

</LearningStandards>

<TargetObjects>

<TargetObject

Type="LearningResource"

SIF\_RefID="F48568A2607163CFA46B387459708F84717C00">

Sesame Street's the Count adding prime numbers

</TargetObject>

<TargetObject

Type="LearningResource"

SIF\_RefID="D995BFA2607163CFAC57387459708F84717C00">

Mr. Johnson's lesson plan on Prime numbers

</TargetObject>

</TargetObjects>

<StartDate>2012-01-21</StartDate>

<EndDate>2015-01-21</EndDate>

<AuthoritativeSource>Math Department Curriculum 2012-2013</AuthoritativeSource>

<Creator Type="StaffPersonal" SIF\_RefID="C000BFA2607163CFAC5738C45FF08F84717C00">

Curriculum Director Halstead

</Creator>

<CreationDate>2011-11-20</CreationDate>

</LearningStandardAssociation>

</SIF\_ObjectData>

</SIF\_Response>

</SIF\_Message>