SLI Portal and Dashboard Integration and Customization – RFP Guidance

SLC Project Document
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Change Log

Date	Version	Name	Change Summary
1/19/12	V1	EFloyd	Initial draft submission to SLC
1/22/12	V1.1	EFloyd	Incorporated A&M copy edits, clarified header/footer customization, updated document structure
1/24/12	V3	KKitano	Incorporated RR edits, updated TOC, formatted.

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1. Introduction

This document is part of a series of documents that contain specifications for application software and system procurement where integration with SLI technologies is required. This *Draft Specification Document* provides a draft view of a future SLC released document and is intended to be referenced in vendor RFPs. As of this writing, the SLI standards are still in development. The technical information in this document should be considered preliminary.

This document provides specifications for Portal and Dashboard Integration and Customization.

1.1. Structure of Document

The draft specification is divided into five sections:

- **Overview** – Provides a broad description of the SLI technology upon which the requirements are based, including use of case summaries.
- **Integration Approach** – Describes one or more approaches for integrating with a core SLI technology.
- **Relationship to Other Standards and Technologies** – Describes how a proposed solution is expected to make use of, or facilitate the use of other SLI technologies.
- **Configuration Options** – Discusses areas of potential configurability.
- **Standards and Technologies** – Identifies applicable standards and technologies and specifies their applicability to this standard. This section also identifies related projects, initiatives, and organizations.
- **Constraints** – Specifies constraints and exclusions that a proposed solution must satisfy.

2. Overview

This section provides an overview of Portal and Dashboard integration.

2.1. What is the SLI Portal and Dashboard?

The SLI Portal is designed to provide an easy way to navigate between SLI web applications. Links to a user's applications are displayed on his or her homepage. This page allows users to switch between web applications approved for use by a State Education Agency (SEA) or Local Education Agency (LEA). In addition to the homepage, the Portal provides a consistent and familiar header and footer for applications. The header and footer present common user interface UI elements and can be customized by SEA and LEA administrators and by applications designed for SLI portal integration.

The SLI Dashboard Application is a fully integrated portal application created and maintained by the SLC. It allows educators to see data about their students individually, and is summarized by class, school, and various other organizational levels. Users can see lists of students, schools, etc. to compare student populations, or drill down to just one student (or school, etc.) profile for more targeted information.

2.2. The Objective

The SLI Portal and Dashboard is intended to provide pre-packaged functionality in order to decrease the barriers to entry and innovation by vendors who wish to build upon the SLI and by SEAs, LEAs, and Educators who wish to leverage SLI facilities for the benefit of their students.

2.3. Use Case Summaries

Selected use case summaries are provided below in order to facilitate a general understanding of the Portal and Dashboard and their expected benefits.

Title	Summary
Ms. Harrison, 9th grade Social Studies Teacher	Uses SLI Dashboard to identify a reading comprehension as a common underlying cause of a student's performance problems in multiple subjects. Uses recommendation engine app on her standard LEA-provided teacher portal configuration to select a unit of study and age-appropriate instructional materials focusing on ELA standards. Post intervention, student assessment results are captured in the SLI data store and reflected on her Teacher Dashboard and in the student's learning map. Student results and teacher evaluations of instructional materials are available on teacher dashboards across the district and state to help inform future recommendations for students like this one.
Julia Sanford, District English Language Learner Coordinator	Uses the ELL app on her customized portal to identify students ready to be designated as Fluent that have also been flagged as at risk of dropping-out based on criteria identified by a data analytics tool. Using her dashboard, she researches similar student populations across multiple districts and finds that the math intervention program that is centered on a specific kind of app has been successful. The app also needs to return student usage and formative assessment data to the school so teachers can see everything on their dashboard. She locates a highly-rated app that also happens to be SLI-compatible, significantly reducing the IT Department's effort to get the app integrated with district systems.

3. Portal Integration Approach

For Release 1.0 (R1.0), SEA or LEA administrators can include any web application on this page by providing these details in an administrative interface:

- An application URL
- An image for the button to be displayed on the homepage
- A short text description of the application
- The LEAs, organizations, or schools that should have access to the application
- One or more default SLI Roles for which the application can be accessed
- One of the integration approaches described below:

Once the application is configured in the administrative interface, a link button for that application appears on the homepage. When the user clicks a link button, the application page is presented in the portal application display area. The integration approach depends on the application's degree of compatibility with the SLI Portal architecture. The following table provides some general guidelines.

Application Compatibility (most-to-least compatible)	**Integration Approach**
Application is built on SLI API and designed for portal integration.	Application is fully integrated with the Portal and has access to the standard portal header and footer HTML. (The SLI Dashboard is an example of a fully-integrated SLI Portal Application.)
Application is, or can be made, compliant with Web Services for Remote Portlets (WSRP), v1.0 or v2.0 standard	Application is embedded as a portlet in the application display area with the standard portal header and footer, but does not have access to the header and footer HTML.
Application is web-based, single-page, does not require navigation.	Application is embedded in an in-line frame in the application display area with the standard header and footer, but does not have access to the header and footer HTML. (Note: iframe support may not be consistent between browsers. Standard browser page-to-page navigation controls may not be available.)
Web-based applications requiring complex navigation, non-web applications.	Not suitable for SLI portal integration.

A wireframe mock-up of a possible portal homepage design is provided below:

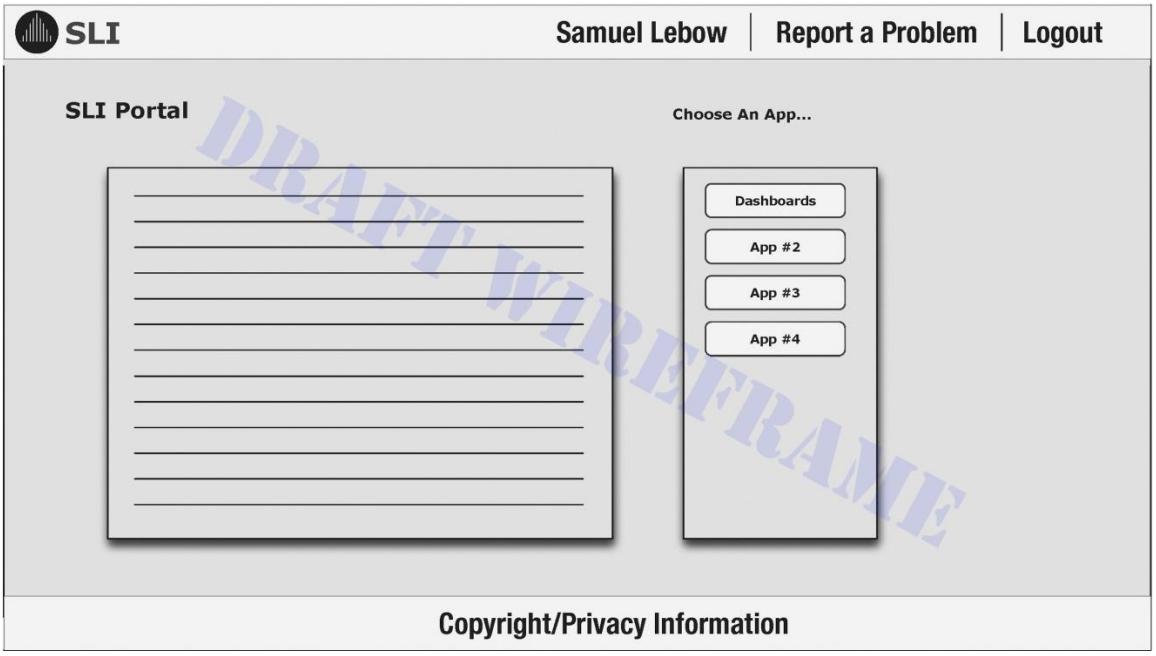

Figure 1: Wireframe of the SLI Portal Header and Footer (in white) wrapped around the home page (in gray). This wireframe does not represent a final design.

The standard header and footer can be hidden by a configuration option and replaced with portlets that provide customized displays and capabilities, such as navigation and search.

Additional information on SLI Portal Integration is available at http://www.slcedu.org.

4. Relationship to Other Standards and Technologies

Portal and Dashboard Integration makes use of and facilitates the use of the following standards and technologies.

4.1. SLI Application Programming Interface (API)

The Application Programming Interface (API) contains the building blocks that are necessary to create SLI applications. Application access to the SLI Data Store is strictly governed by this API. The overall objective of this API is to provide a stable, well-defined interface for software developers. The API is a real-time transactional interface intended for interactive applications, including fully-integrated SLI Portal applications that access the SLI Data Store.

The SLI API is RESTful. It is designed to have predictable, resource-oriented URLs, to use HTTP response codes to indicate API errors, and to use built-in HTTP features, like HTTP authentication and HTTP verbs, which can be understood by off-the-shelf HTTP

clients. The SLI API is designed to be a Level 3 RESTful API in the Richardson Maturity Model. It employs the HATEOAS (Hypertext As The Engine Of Application State) model. Applications that integrate with the SLI Data Store will be consumers of the API RESTful web services.

The SLI API is the subject of another Draft Specification document.

4.2. Identity Integration and Management

For the Dashboard and other fully-integrated SLI Portal applications that use the API, users are required to authenticate against their State (SEA) or Local (LEA) Education Agency Identity Provider. At the start of a session, the API will redirect the user's browser so that the user may login using their configured Single Sign-On (SSO) capabilities. Directing the browser/user-agent to the authentication URL initiates the federated login process, which includes realm selection and authentication against the user's SEA or LEA directory.

In order to access data within the SLI, an application must be granted permission to access the data by an institution (SEA/LEA) Super-Administrator. A Super-Administrator, or their delegate, may grant access to their data for an application via the SLI administrator portal. SLI recognizes the LEA as the ultimate arbiter of who is able to view or manipulate the LEA's data.

In addition to a blanket access to a LEA's data, an LEA Super-Administrator is able to configure permissions based on SLI entities and attributes (or collections of entities and attributes) in the model. As of this writing, constraints on LEA entity- and attribute-level permissions are not yet available. It is reasonable to expect however, that they will include identification of a single "publisher" or "authoritative source" application for any given entity to ensure proper master data management. This is a post-alpha feature of SLI.

An application that is authorized to access data may only access data on behalf of a user. The combination of application permissions and user permissions determines what data the application may retrieve. By default, the SLI's applications (both Core and Third Party) have no access to any SEA/LEA data.

Identity Integration and Management is the subject of another Draft Specification document.

4.3. Core Entity Model

The Dashboard and other SLI Portal applications provide a view into information in the SLI Data Store which is organized according to the SLI Core Entity Model (SLI CEM). The SLI CEM is an abstract, technology-agnostic representation of the K-12 education information domain. The model includes entities that are easily recognized: school, student, course, section, among others. Those entities contain attributes that are also easily recognized, though a complete listing of entities and attributes are beyond the scope of this document.

SLI CEM contains entities along with the relationships that define how the entities interact with one another. Each entity includes sufficient number of attributes to make the model applicable to real-world data. SLI CEM focuses on granular information rather

than aggregate statistics. In addition, the model includes information that is necessary to produce aggregate and other types of statistics.

SLI CEM is expressly focused on representing the instructionally relevant classroom-level student and educator-focused data that educators can use to differentiate instruction, support individual student need, and help to improve student outcomes. The SLI shares this priority use case with the Dell Foundation's Ed-Fi data initiative. For this reason, the SLI CEM is based on the Ed-Fi Logical Data Model.

4.4. Learning Resource Metadata Initiative (LMRI)

Fully-integrated SLI Portal applications that provide learning resource search services will build upon the markup standards, search terms, and identifiers defined as part of the Learning Resource Metadata Initiative (LRMI). The LRMI is a project led by Creative Commons (CC) and the Association of Educational Publishers (AEP) to establish a common vocabulary for describing learning resources. The vocabulary is designed to work with schema.org, the web metadata framework launched June 2, 2011 by Google, Bing, and Yahoo!, thereby improving the practical search and discovery of learning resources online. The primary integration approach for search tool providers is to enable the use of LRMI search terms as filters.

The LRMI is the subject of another Draft Specification document.

SLI applications will also have access to a Learning Registry Index that will include all learning resources. This will be an alternative to relying on search engines to locate content. An additional RFP Guidance document which describes this index in more detail will follow.

5. Configuration

Areas of potential configurability include:

Area	Potential Configuration Items
Portal homepage application links	Applications are configured for the Portal Homepage by the administrative interface as described in Section 3.
Portal look and feel	A select number of design elements in the portal may be customized using Cascading Style Sheets (CSS). CSS customization can include most colors, line-weights as well as text fonts, styles, and sizes. This allows SEA/LEA administrators to control parts of the look and feel of the SLI Portal, to seamlessly integrate it with existing web applications. District and state logos can be customized. End-User Licensing Agreement (EULA) and privacy statement text can be customized.

Area	Potential Configuration Items
Dashboard content	State and district administrators can build specialized lists and profile views to bring together disparate data, to bring insights into classrooms and schools. Curating allows administrators to specify which columns appear in a list, and they can choose from several data visualization options provided by the Dashboard application. For example, a standardized summative state assessment result could appear as a single-scaled numeric value, or as a graph showing performance level. Individual components of profile pages can be customized based on available district data. For Release 1.0, list, profile, and other page customization can be configured by SEA and LEA admins by editing XML documents, using a schema that will be provided by the SLC.
Educator dashboard look and feel	SEA/LEA administrators can create dashboard themes to specify colors, fonts, and line-styles for certain visual elements within the application, using a CSS document. SLC will provide sample CSS documents, a list of CSS classes, and other documentation to help administrators in creating this document. SLI will perform basic validation, but SEAs/LEAs are responsible for validating that look and feel appears correct; invalid documents or those not following best practices may cause parts of the site to display incorrectly.

To facilitate the rollout of the SLI Portal and Dashboard, customizations are inherited by successive levels of the organizational hierarchy. By default, everyone will see the SLI Default configurations. States can then customize to meet particular state needs, and all LEAs in the state will then see that as the default configuration. LEAs and schools can further configure the user-experience to local needs. The hierarchy for inheritance looks like this:

- SLI Default Configuration
- SEA Configuration
- LEA Configuration
- School Configuration

LEAs or Schools do not need to configure the entire user experience. Instead, they can modify just a few elements, and inherit the rest. For example, an LEA may elect to upload only a district logo and add a dashboard view highlighting a district benchmark series, and nothing else. The rest of the UI specifications and dashboard views defined by the SEA would then be inherited. This allows LEAs flexibility to customize the SLI as necessary, but rely on the SLI or SEA defaults to minimize SEA effort.

6. Standards and Technologies

The following standards and technologies are applicable to this specification:

Standard / Technology	Applicability
Web Services for Remote Portlets (WSRP) http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wsrp	OASIS-approved network protocol standard designed for communications with remote portlets. WSRP compliance is one of the permissible SLI Portal application integration strategies
HTML inline frame (iframe) http://www.w3.org/TR/html4/present/frames.html#h-16.5	An iframe is an HTML 4.0 element that is able to nest a webpage within another webpage. It is one of the permissible SLI Portal application integration strategies.

6.1. Related and Affiliated Efforts

Initiative / Project / Organization	Applicability
SLI Application Programming Interface (API) http://www.slcedu.org	Fully-integrated SLI Portal applications use the API to interact with the SLI Data Store.
SLI Core Entity Model http://www.ed-fi.org/wp-content/uploads/2011/06/Public-Ed-Fi-Unifying-Data-Model-1.0-111111.pdf	The SLI Data Store is organized according to the Core Entity Model (CEM).
SLI Data Integration http://www.slcedu.org	Bulk Data Ingestion and Validation are the means by which SEAs and LEAs store information in the SLI Data Store.
Identity Integration and Management http://www.slcedu.org	Ensures security and access control.

Initiative / Project / Organization	Applicability
Learning Resource Metadata Initiative http://www.lrmi.net/	Tagging standards to facilitate content management and discovery.
Learning Maps	Pathways through learning objective standards.

7. Constraints

To be compliant with this specification, solutions will be subject to the following constraints:

1. Applications must be capable of integrating with the SLI Portal by one of the three methods described in Section 3. Preference will be given to applications that can be fully integrated with the SLI Portal.
2. Fully-integrated SLI Portal applications must be able to authenticate using the standard SLI authentication services as described in section 4.2*: Identity Integration and Management*.