

Requirements Analysis

Smarter Balanced Assessment Consortium Test Delivery System

Component: Test Item Bank

Revision History

Revision Description	Author/Modifier	Date
Initial Revision	David Lopez de Quintana	August 27, 2012
Requirement Revisions	Kevin Ptak	September 11, 2012
Updated Level 1 Requirements	Kevin Ptak	October 12, 2012

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1. Component Name: Test Item Bank

2. Component Description

This component is a repository for test items and meta data about the items that is used to store items that are ready for pilot, field, and operational testing.

The following is the overall responsibility of this component:

1. A repository for test items that were created in the Item Bank that have been approved for testing
2. A source of test items for the Test Packager to transfer the items to Test Delivery
3. Provides robust search capabilities based on 10 key fields associated to items and meta data
4. Provide robust query capabilities that will allow the Test Packager to pull items and meta data from the repository
5. Provide the ability to track versions and lineage for items

The Test Item Bank does not own its own user interface. It only exposes APIs for storing and retrieving test items for the Test Authoring component.

3. Responsible Organization

DRC is responsible for developing the Test Item Bank component.

4. Functional Requirements from SMARTER Balanced RFP-11

The following requirements are numbered in the same way as in RFP-11

9.	Test Item Bank Component meets requirements detailed in the SBAC IT Systems Architecture (Appendix C). The detailed requirements below should cover the requirements from Appendix C.
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5. Detailed Requirements from RFP-11 and/or Architecture Document

1.	<p>The Test Item Bank is responsible for the storage and retrieval assessment items along with their assets and metadata. The Test Item Bank is required to store the following types of data associated to items.</p> <ul style="list-style-type: none">• APIP Item Information• Item authoring details• Graphics• Scoring rubrics• Usage information and statistics• Version details• Help content• Audio files• Video files
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	Some of this content may be associated to the items within zip folders with the file paths contained in the APIP XML.
2.	The Test Item Bank will provide an interface that accepts items that have been marked operational or field test ready by the Item Bank (RFP #7).
3.	The Test Item Bank requires the ability to track versions of items that have been used on assessments including lineage.
4.	<p>The Test Item Bank will provide queries and functionality allowing the Test Authoring and Test Packaging components to query the correct versions of items for assessments with the assumption that the latest version should be displayed to the users of the Test Item Bank.</p> <ul style="list-style-type: none"> The query will assume that the latest version should be used during the packaging process. <p>The Test Item Bank will interface with the Test Packaging component with the suggested input and output details.</p>
5.	<p>The Test Item Bank will provide robust search and query capabilities of items that are ready to be presented on tests for the Smarter Balanced system.</p> <ul style="list-style-type: none"> The component will use RESTful APIs for all interfaces The component will leverage XML or JSON formatted messaging for interactions through the API interfaces
6.	<p>The Test Item Bank will provide search capabilities on item details limited to 10 fields.</p> <ul style="list-style-type: none"> Item Status (Operational, Field Test, etc.) Item Type (Multiple Choice, Constructed Response, Hot Spot, Cloze, etc.) Standards Grade Content Area Statistics (Item Difficulty, IRT values, p-value, etc.) – We need to confirm with Smarter Balanced which fields they would like to search for related to statistics Item Authoring Information (Author, Source, etc. – We need to confirm with Smarter Balanced which fields they would like to search for related to authoring information Timestamps and Versions
7.	The search criteria should be stored separately from the APIP XML storage to optimal performance. The search criteria may need to be parsed from the APIP XML during the import process.
8.	The Test Item Bank requires item authoring information from the Item Bank during the import process. The Item Bank needs to supply authoring information, such as the user who created the item, status (operational, field test, etc.), timestamps, etc.
9.	The Test Item Bank requires that the Item Bank component supply all of the items usage and statistical information that will be required for the purpose of Test Delivery and Test Assessment creation.

6. Additional Requirements from Technical Proposal

1.	<p>The Test Item Bank component will provide performance metrics, error logging, and work flow alerts to the monitoring and alerting component, using the framework specified in the Monitoring and Alerting component.</p> <p>Metrics:</p> <ul style="list-style-type: none"> Performance statistics for queries for searching the Test Item Bank Performance statistics for inserting items into the Test Item Bank (RFP #7) Performance statistics for export interfaces to Test Packaging <p>Errors:</p> <ul style="list-style-type: none"> Database transaction errors API Interface errors (Request/Response) <p>Alerts:</p> <ul style="list-style-type: none"> Not enough items available to fulfill a blueprint or specification is raised when a user runs the query to automatically select items for a test with a specific blueprint or specification
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	<ul style="list-style-type: none"> New items are available is raised when new items are released from the Item Bank to the Test Item Bank
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7. Non-Functional Requirements

1.	See Section 7 Non-Functional Requirements in the General Requirements document for up-time requirements as well as additional non-specific non-functional requirements.
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8. Data Utilized

1.	The Test Item Bank component requires a data store for status and versioning. The repository needs version capabilities because items may change over time after they have been packaged for a test.
2.	The Test Item Bank component requires a data store for item and meta data related to the item. The item data should be passed to the component in APIP compliant XML with associated zip files for media files and images.

9. Data Dependencies

Start Point	Input	Output	End Point
Item Bank	APIP XML and metadata	Persisted APIP XML and meta data	Test Item Bank
Test Item Bank	XML/JSON query parameters	APIP XML and meta data	Test Packager
Test Item Bank	XML/JSON error message	XML/JSON error message	Monitoring and Alerting
Test Item Bank	XML/JSON alert message	XML/JSON alert message	Monitoring and Alerting
Test Item Bank	XML/JSON metric message	XML/JSON metric message	Monitoring and Alerting
Test Packaging	XML/JSON query parameters	APIP XML and met data	Test Item Bank
Test Authoring	XML/JSON query parameters	APIP XML and meta data	Test Item Bank
Test Authoring	XML/JSON query parameters	XML/JSON search results	Test Item Bank

NOTE: Monitoring and Alerting will be responsible for routing errors and alerts to the configured entity. All errors and alerts will be routed through that component due to the RESTful nature of the system.