

Item Banking for Performance Testing

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Performance Test Development Series

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An item bank is a structure used to store items for review, modification, and assembly into a test form.

A comprehensive item bank supports the following item development stages.

Construction

The first instance of an item, constructed by an item author. The minimum elements of an item are the item ID, topic, setup, stem and answer. The setup is the condition that must exist for the item to be completed. The stem and answer may include images, audio, video, or other objects. In performance testing, the answer entry may be a scoring rubric. Other parameters and item elements will be filled in as the item matures.

Storage

The item banking system should allow items to be stored and organized by some sort of principle, such as by domain and subdomain ID. It is helpful if the items can be searched for some specific content or set of parameters.

Review

An item is typically reviewed by several teams or specialists. Some review stages are:

Technical	Review of the technical accuracy of the item, done by a subject matter expert. Includes setup and answer.
Grammatical	Check of the vocabulary and grammar used in the item
Psychometric	A review of the item parameters, typically done after beta testing and on a regular annual or semi-annual basis.
Reference	A check on the accuracy of the reference provided.
Bias	A check to make sure item content doesn't prejudice specific protected groups from answering the item correctly.



Figure 1. An item bank needs to be secure. Moreover, the rights of individuals with access to the bank need to be restricted based on their roles.

Revision

Modification of a single item by editing and replacing text or components is essential. Also, when modifying an item, the item banking system should require that the item ID be changed if the item has been used in an active test, since a modified item will have different parameters than its source.

Parameterization

Items in a bank are typically parameterized so they can be assembled into test forms following a specified procedure. Some typical parameters are:

Item ID	An identifier for the item for concise reference
Version	Version of the item
<i>p</i> -value	The % of correct responses to the item
pBis	The correlation of item score to test score
Scenario	The scenario for which the item is one of a sequence of items
Topic	The topic the item addresses
Domain	The domain and subdomain to which the item belongs

Author	The initial author of the item
Status	The stage of development the item is in
Exposures	The number of times the item has been included in a test form, or which the item has been seen by candidates.
Reference	An authoritative source or sources which verify the correctness of the responses scored correct
Enemies	Items which, if included in the same test form, may provide a clue to the correct response.
Comments	Remarks made during test development
History	An item bank often allows for version control

Assembly

The item banking system should have a method allowing the developer to assemble items both into a beta form and into a final test form.

Often assembly is done by an automated process which allows a developer to aggregate items into forms using specific rules for item selection.

Security

Unauthorized access to an item bank would compromise the assets of an examination program. Bank security is thus of paramount importance.

User permissions should be limited by role. An organization with multiple testing programs will want to make sure subject-matter experts for one program only have access to the assets of the program for which they are responsible. In addition, user roles might have a hierarchy similar to, but not limited to, the following:

SME

- Can add new items to the bank
- Can edit items their own items when in draft form

Senior SME; editor; manager

- Can edit any items that are in draft form
- Can approve/reject items
- Can promote items to operational (or retired) status
- Can see forms

Manager

- Can assemble forms

Senior Manager

- Can edit items that have been used (with a new item ID)



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